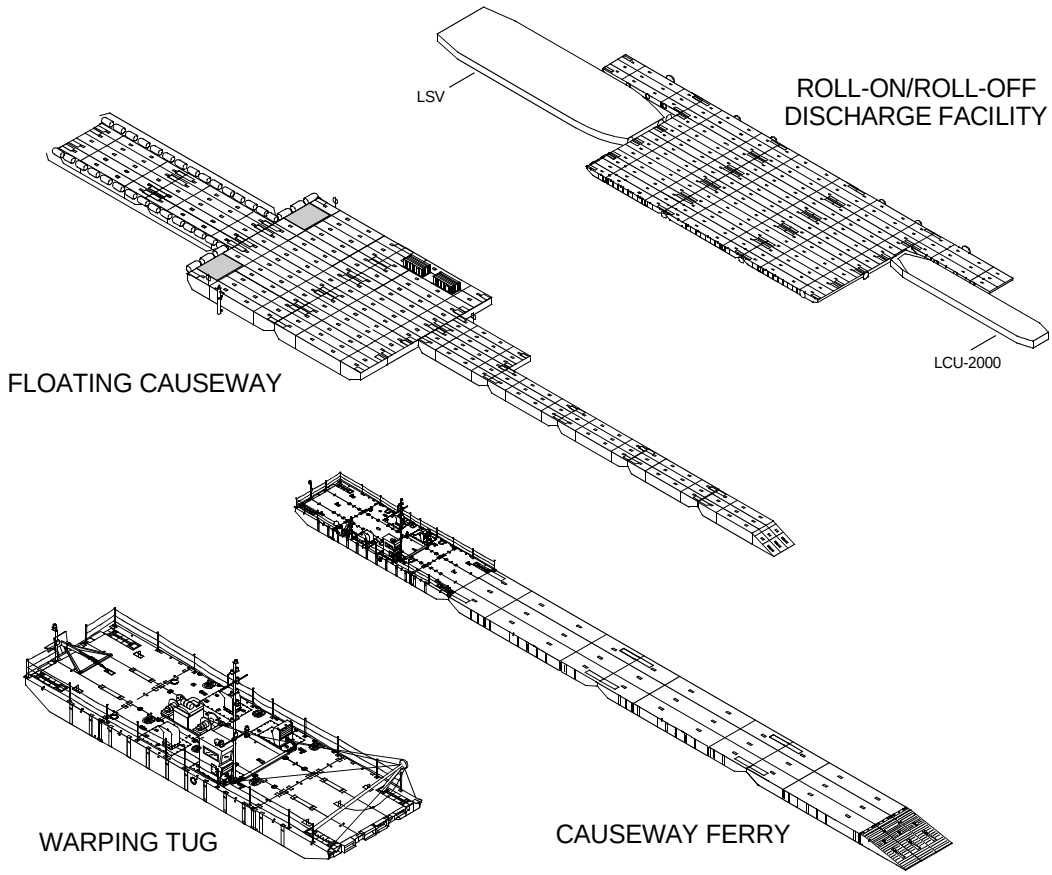
TM 55-1945-205-24-1-1

TECHNICAL MANUAL

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR

MODULAR CAUSEWAY SYSTEM (MCS)
CAUSEWAY FERRY (CF)
CF-1
NSN 1945-01-398-3856



This manual supersedes TM 55-1945-205-24-1 dated 29 August 1997 including all changes.

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

HEADQUARTERS, DEPARTMENT OF THE ARMY
OCTOBER 2003

WARNING SUMMARY

NO SMOKING
Smoking is prohibited aboard this vessel.

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

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

BATTERIES
Do not smoke around batteries. Personnel must wear goggles and chemical resistant gloves when adding electrolyte and cleaning up spills.

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

HIGH VOLTAGE
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.

HAZARDOUS FUMES IN CONFINED SPACES
The lazaret, engine, fuel and storage compartments are confined spaces and may contain hazardous fumes. Refer to FM 55-502 before entering a confined space. Never enter a confined space before checking the confined space with a gas free meter. Operate the exhaust plenum ventilation fan to remove fumes.

TORQUE VALUES
For torque not specified in an individual work package, refer to the Torque Limits Work Package located in the General Maintenance Section of this manual. Failure to tighten fasteners to specified torque may result in damage to equipment and death or injury to personnel.

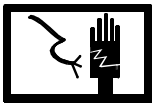
NUCLEAR, BIOLOGICAL OR CHEMICAL
In the event equipment has been exposed to Nuclear, Biological or Chemical warfare, the equipment shall be handled with extreme caution and decontaminated in accordance with FM 3-5, instructions for Immediate, Operational and Through decon procedures adapted for the marine environment. 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 MOPP - level prescribed by the OIC or NCOIC.

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

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

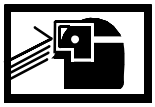
ICE BUILDUP
Cold weather operations could create ice buildup on exposed surfaces producing hazardous footing conditions. Use extreme care when operating under icing conditions; death or serious injury to personnel could occur.

SAFETY WARNING ICONS



ELECTRICAL

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



EYE PROTECTION

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



HEAVY OBJECTS

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



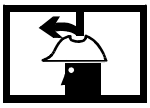
HEAVY PARTS

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



HEAVY PARTS

HEAVY PARTS 3 - Heavy object on human figure shows that heavy parts present a danger to life or limb.



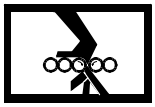
HELMET PROTECTION

HELMET - 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

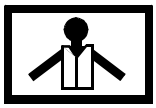
MOVING PARTS - Hand with fingers caught between rollers shows that the moving parts of the equipment present a danger to life or limb.



SLICK FLOOR

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

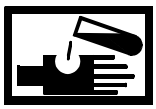
SAFETY WARNNING ICONS - CONTINUED



VEST

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

HAZARDOUS MATERIAL WARNING ICONS



CHEMICAL

CHEMICALS - Drops of liquid on hand shows that the material will cause burns or irritation to 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.



FIRE

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



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.

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Original 1 October 2003

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 1 OCTOBER 2003

TECHNICAL MANUAL

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR

MODULAR CAUSEWAY SYSTEM (MCS)
CAUSEWAY FERRY (CF)
CF-1
NSN 1945-01-398-3856

This manual supersedes TM 55-1945-205-24-1 dated 29 August 1997 including all changes.

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 2028-2 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is http://aeps.ria.army.mil. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS website. Fill out the form and click on "SUBMIT". Using this form on the AEPS website will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, E-mail or fax your letter, DA Form 2028, or DA Form 2028-2 directly to: Commander, U.S. Army Tank-Automotive and Armaments Command, ATTN: AMSTA-LC-CIP-WT, Rock Island, IL 61299-7630. The E-mail address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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HOW TO USE THIS MANUAL

This manual 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 *Location and Description of Major Components*. 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. *Location and Description of Major Components* is found in section L. The work package is found on the right side of the title where the *Location and Description of Major Components* 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 2, *Troubleshooting Procedures.* Under this section, find a 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. The test equipment is identified with an item number and work package number from the *Tool Identification List* located in Chapter 4, *Supporting Information*.

Tools: Lists all tools (standard or special) required to perform the task. Tools are identified with an item number and work package number from the *Tool Identification List* located in Chapter 4, *Supporting Information*.

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 4, *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 Chapter 3, *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. Tools are identified with an item number and work package number from the *Tool Identification List* located in Chapter 4, *Supporting Information*.

Materials/Parts: Lists all parts or materials necessary to perform the task. Expendable and durables are identified with an item number from the applicable work package located in Chapter 4, *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 4, *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. The test equipment is identified with an item number and work package number from the *Tool Identification List* located in Chapter 4, *Supporting Information*.

Repair Parts and Special Tools List

Refer to TM 55-1945-205-24P-1 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 55-1945-205-24P-1. 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

DESCRIPTION AND THEORY OF OPERATION FOR MODULAR CAUSEWAY SYSTEM (MCS) CAUSEWAY FERRY (CF)

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
GENERAL INFORMATION

SCOPE

This manual contains descriptions and instructions for the Causeway Ferry (CF).

Type of Manual: Unit, Direct Support and General Support Maintenance.

Purpose of Equipment: The CF is used to transport containerized and rolling break bulk cargo from ocean going vessels in the stream to the beach. MCS sections, including two powered sections, are assembled to form a CF.

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 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, or as specified by the contracting 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 AND SHIPMENT REFERENCE

Reference TM 55-1945-205-10-1 for preparation for storage or shipment of the CF.

LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation/Acronym	Name
A	Amps
AC	Alternating Current
ANS	Answer
ANT	Antenna
AOAP	Army Oil Analysis Program
AUX	Auxiliary
AWG	American Wire Gauge
BII	Basic Issue Items
C	Centigrade
CAGEC	Commercial and Government Entity Code
CDD	Complete Discharge Device
CF	Causeway Ferry
CLR	Clear
cm	Centimeters
CO2	Carbon Dioxide
COEI	Components of End Item
CPC	Corrosion Prevention Control
CS	Causeway Section
dB	Decibels
DC	Direct Current
Deg	Degrees
DSC	Digital Selective Calling
EIR	Equipment Improvement Recommendations
ESD	Electrostatic Discharge
F	Fahrenheit
FCC	Federal Communications Commission
fl	Fluid
FNC	Function
FSS	Fast Sealift Ship
ft	Feet
ft lbs	Foot Pounds
FWD	Forward
GAL	Gallon
GFI	Ground Fault Indicator
GPH	Gallons Per Hour
gr	grams
H	Height
H/L	High/Low
HP	Horse Power
Hz	Hertz
IAW	In Accordance With
ICM	Intercommunication (short-form)
ID	Inside Diameter
in.	Inches
in. lbs	Inch Pounds
INTL	International
ISO	International Standards Organization
ISOPAK	International Standards Organization Package
Kg	Kilograms
kHz	Kilohertz

LIST OF ABBREVIATIONS/ACRONYMS (CONT'D)

Abbreviation/Acronym	Name
KW	Kilowatt
L	Length
LASH	Lighter Aboard Ship
lb	Pounds
LCD	Liquid Crystal Display
LOTS	Logistics-Over-the-Shore
M	Meters
mA	Milliampere
MCS	Modular Causeway System
MEM	Memory
MHz	Megahertz
min	Minute
ML	Milliliters
MTBE	Methyl Tertiary Butyl Ether
MTO&E	Modified Table of Organization and Equipment
NATO	North Atlantic Treaty Organization
NEMA	National Electric Manufacturers Association
Ni-Cd	Nickel Cadmium
NL	Navy Lighter
N-m	Newton-Meters
NOAA	National Oceanic and Atmospheric Administration
NSA	National Security Agency
ODS	Ozone Depleting Substance
oz	Ounces
PLGR	Precision Lightweight Global Positioning Receiver
PMCS	Preventive Maintenance Checks and Services
ppm	parts per million
PTT	Push To Talk
PWR	Power
rcv	Receive
RF	Radio Frequency
RPM	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
SCR	Scrambler
SCA	Supplemental Coolant Additive
SINCGARS	Single Channel Ground and Airborne Radio
STBD	Starboard
sw	Switch
TAMMS	The Army Maintenance Management System
TEL	Telephone
TEMP	Temperature
TO&E	Table of Organization and Equipment
Tx	Transmit
UTC	Coordinated Universal Time
uV	Ultra Violet
V	Volts
VAC	Voltage, Alternating Current
VDC	Voltage, Direct Current
VHF/FM	Very High Frequency/Frequency Modulation
W	Width
XMIT	Transmit

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DESCRIPTION AND DATA

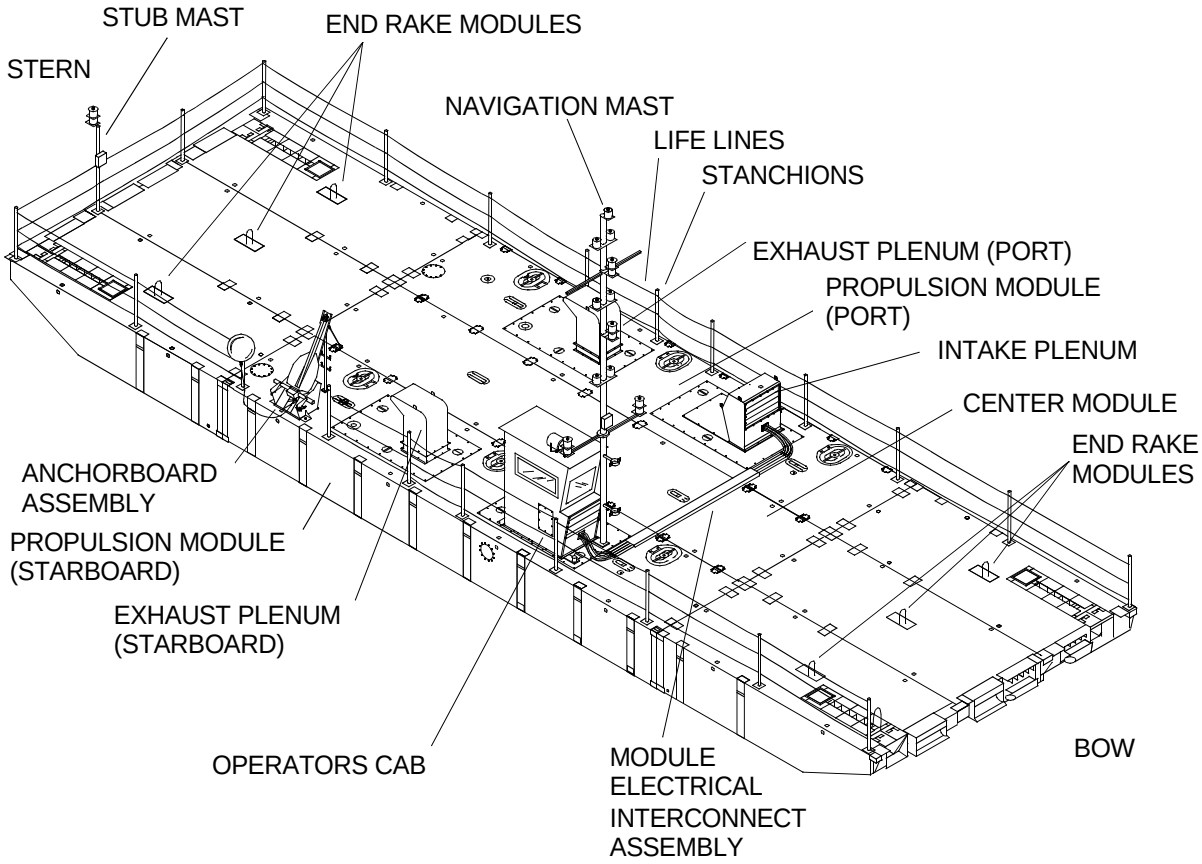
EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The Causeway Ferry (CF) system is a combination of modules assembled to form section assemblies. Individual modules connect together by means of the male/female vertical connectors located around the perimeter of each module. Section assemblies are then connected end-to-end to form the completed CF. The sections are secured to other sections by means of flexor connectors. The assembled CF consists of four sections: one powered section, two (non-powered) intermediate sections and one beach end section. The powered section and the (non-powered) intermediate sections are 24 ft wide and 80 ft long. The (non-powered) beach end section is 24 ft wide and 85 ft long. When all four sections are connected end-to-end they form a single CF 24 ft wide and 325 ft long. The powered section is assembled with two propulsion modules that facilitate self-powered movement and maneuvering. The powered section is fitted with an operators cab, intake and exhaust plenums, interconnect (cable) assembly, navigational lighting system, hand rails and an emergency anchor with all above deck components located to allow drive through operation. The cab and navigational lighting can be installed on either the port or starboard side of the powered section.

The fully assembled CF has a cargo capacity of 350 short tons, can maintain the speed of 6 knots at maximum load capacity in a Sea State 2 condition and carries enough fuel to operate under those conditions for 10 hours. The fully loaded CF will maintain a freeboard of approximately 12 in., can execute a 180° turn within 2 minutes, a 360° turn within 4 minutes and can be brought from full speed (6 knots) to a dead stop within 320 ft. The propulsion (diesel) engines are capable of being started in an ambient temperature of -25°F.

The CF is used to transport containerized and rolling break bulk cargo from oceangoing vessels in the stream to the beach. The unassembled components of the causeway ferry are transported in an International Standards Organization Package (ISOPAK) configuration by Fast Sealift Ship (FSS) and/or commercial container ships to the operational area and assembled after arrival. The CF modules are ISO container compatible and are outfitted with ISO corner fittings. Components can also be transported by rail and motor vehicle over improved and unimproved roads. Upon arrival in the operational area, the CF can be assembled on deck, on land or in water at Sea State 0. The CF is designed to augment the Modular Causeway System (MCS) in applications where powered assemblies are required. The system utilizes the Navy flexor and shear connector system for causeway end-to-end connection and is interchangeable with existing Navy Lighter (NL) and Army hardware at the sectional level.

The CF, with maximum payload, is capable of beaching and retracting under its own power in those gradients commonly found in beach environments and operating in surf conditions up to 5 ft.

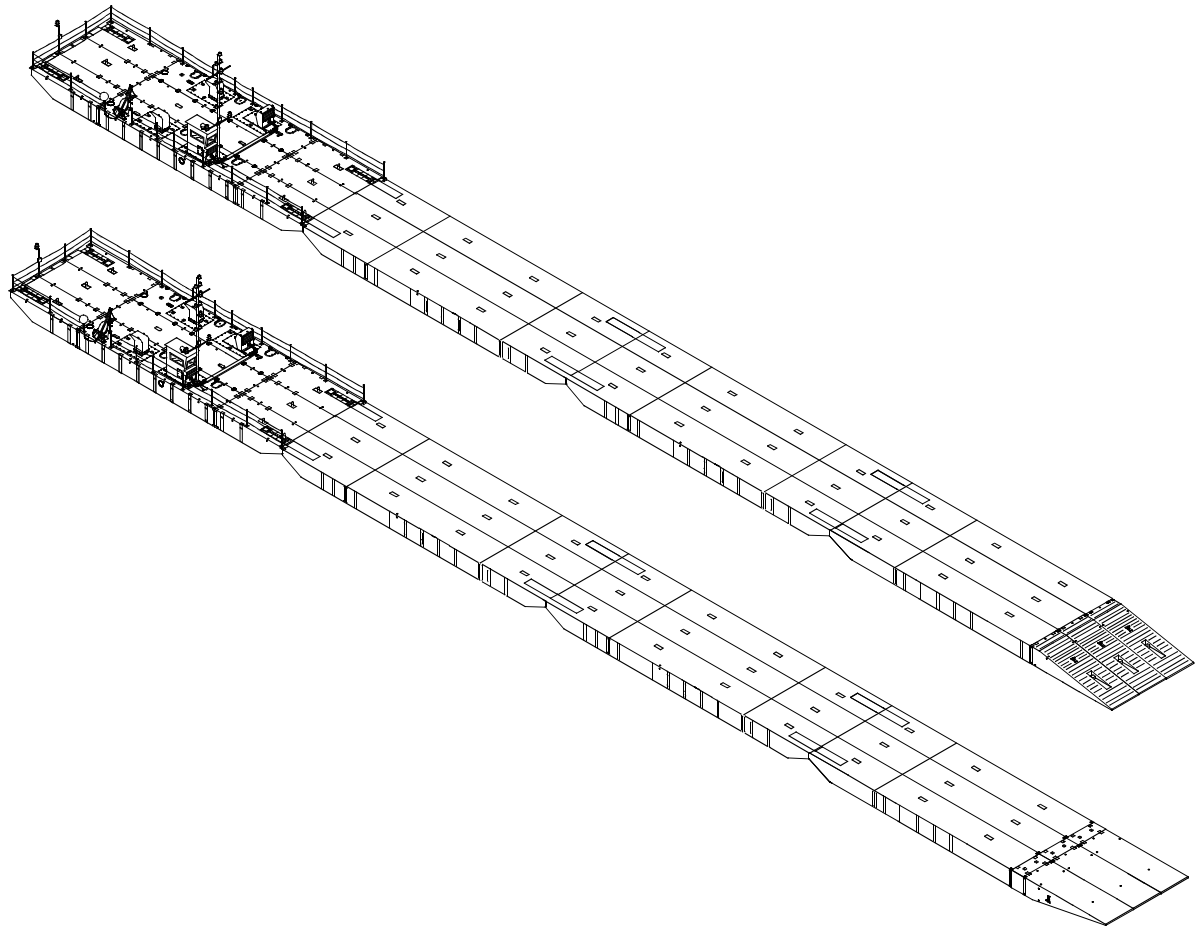


POWERED SECTION

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DESCRIPTION AND DATA

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

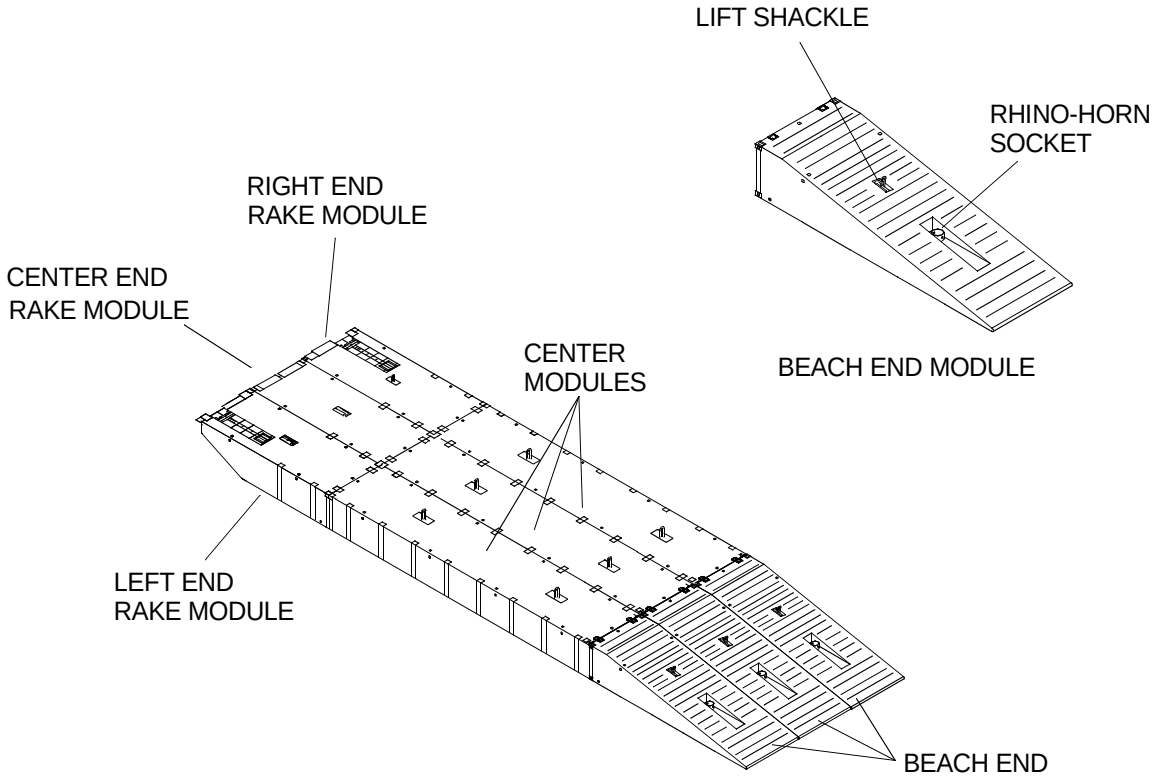
The Causeway Ferry (CF) system consists of one powered section, two intermediate sections and one beach end section. The powered section can be broken down to the propulsion modules, the center module (non-powered), end rake modules, connectors, operators cab, intake plenum, exhaust plenums, navigation masts, module electrical interconnect, anchorboard and hand rails. The intermediate sections can be broken down to center modules (non-powered), end rake modules and connectors. The beach end section can be broken down into center modules (non-powered), end rake modules, connectors and beach end modules, weighs approximately 2950 lb, are 8 ft wide, 3 ft long and 4 ft 6 in. deep and provide an alternate configuration capability. The completely assembled CF is 325 ft long, 24 ft wide. When operating in an optional configuration, using P3 adaptor modules to invert the beach end rake modules, the length is increased to approximately 329 ft.

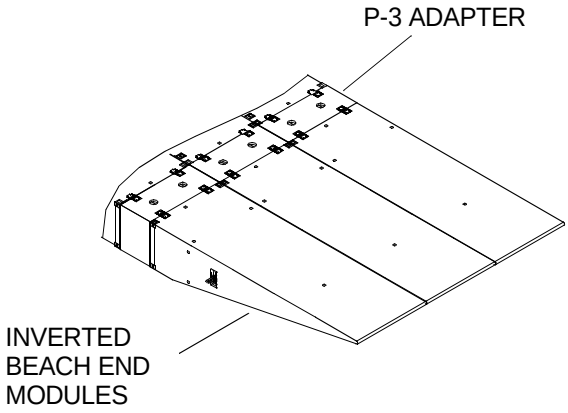


CF (FULL ARRANGEMENT)

BEACH END SECTION

The beach end section is attached to the last intermediate section of the beachward end of the causeway. The beach end section is made up of three center modules (non-powered), three end rake modules (left, center, and right) and three beach end rake modules. All end rakes are compatible with U.S. Navy flexor attachments and shear connectors are fully compatible with ISO-container standards. The P3 adaptors allow the beach end rake modules to be mated in the inverted position.



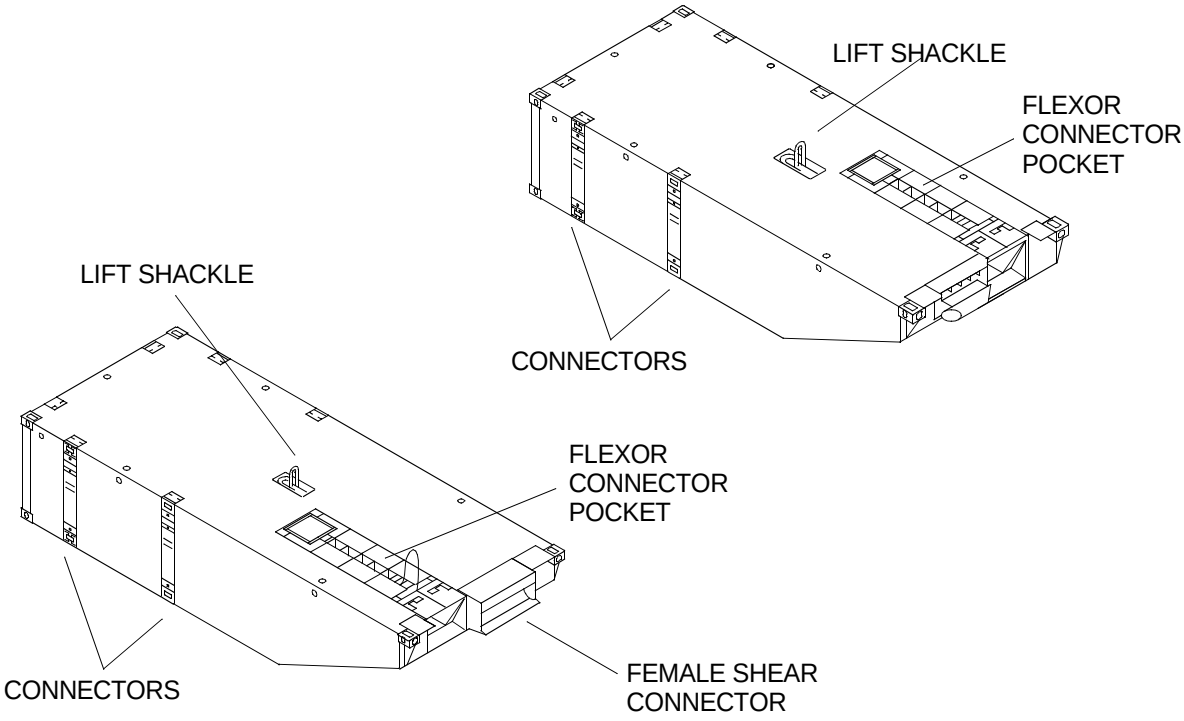


ALTERNATE CONFIGURATION

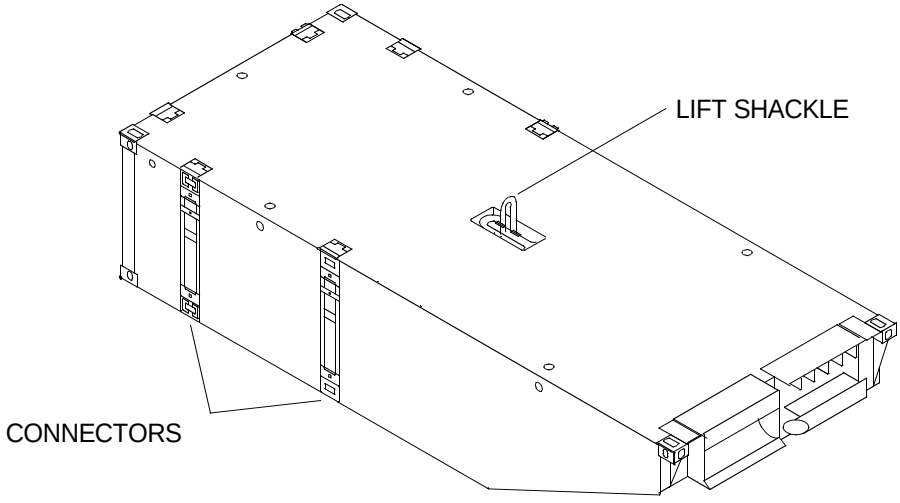
BEACH END SECTION

END RAKE MODULES

The left, right and center end rake modules are empty containers. Nominal dimensions of the left, right and center end rake modules are 8 ft wide, 20 ft long and 4 ft 6 in. deep. Each left, right and 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. The left end rake has a flexor connector pocket for flexor connector installation in the left forward corner of the module. The right end rake has a flexor connector pocket for flexor connector installation in the right forward corner of the module. Weight of the left, right and center end rake modules is approximately 12,500 lb.



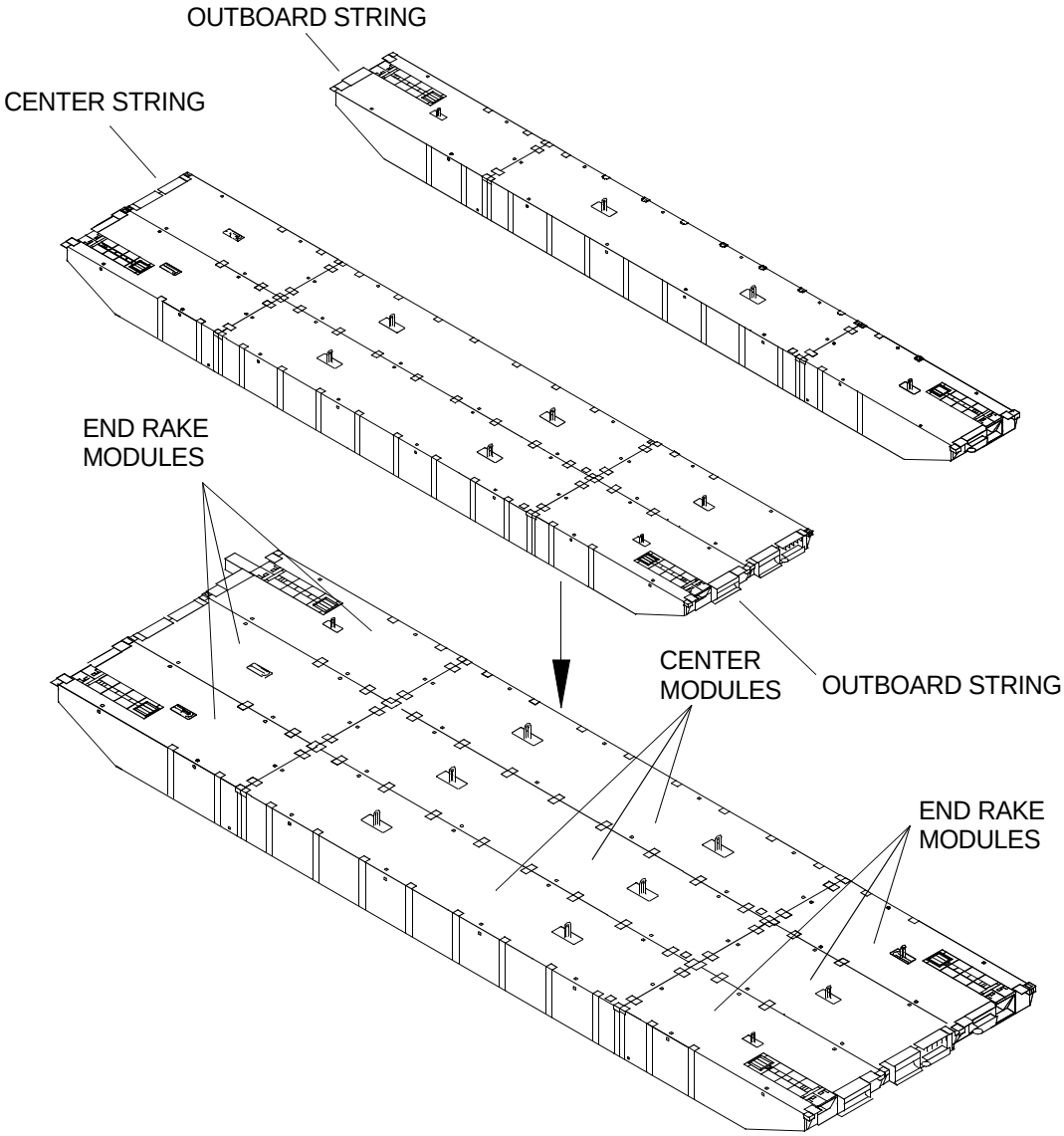
END RAKE MODULES, LEFT HAND (PORT) AND RIGHT HAND (STARBOARD)



END RAKE MODULE, CENTER

INTERMEDIATE SECTION

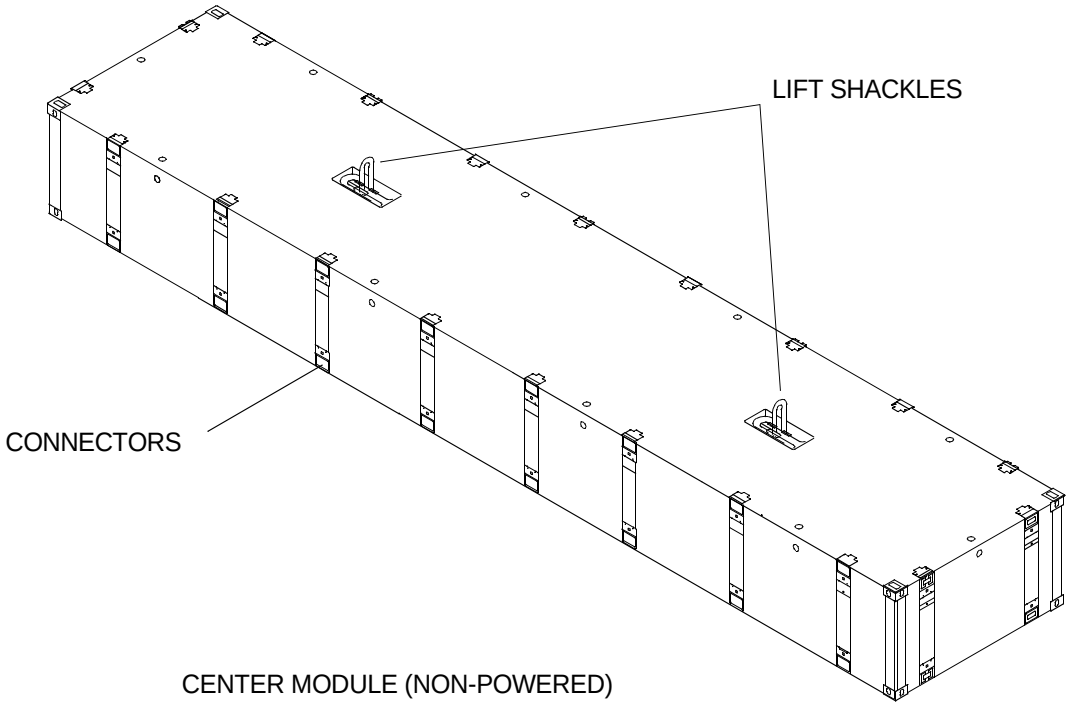
The intermediate section is attached to other intermediate sections to construct a CF segment. The intermediate section is made up of three center modules (non-powered) and six end rake modules. All end rakes are compatible with U.S. Navy flexor attachments and shear connectors are fully compatible with ISO container standards. The complete assembled intermediate section is 80 ft long, 24 ft wide and weighs approximately 142,500 lb.



INTERMEDIATE SECTION

CENTER MODULE

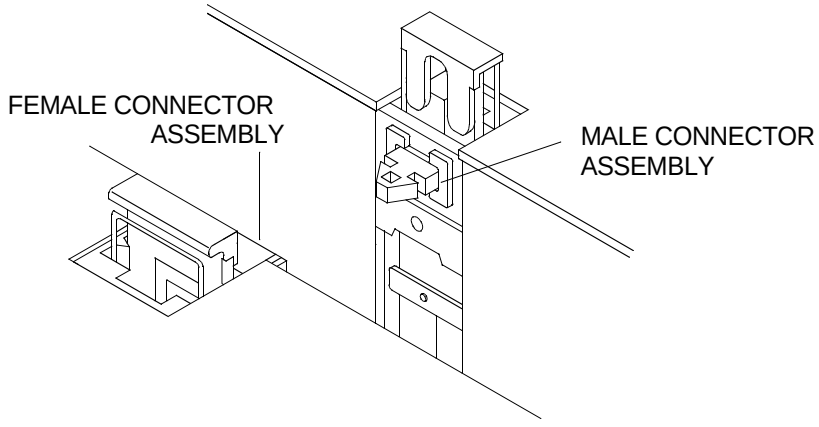
The center module (non-powered) is an empty container. Nominal dimensions are 8 ft wide, 40 ft long and 4 ft 6 in. deep and is ISO compatible. Each center module (non-powered) has two 25 ton capacity lifting shackles flush mounted in the deck. The textured deck and smooth bottom are free of any protrusions that might obstruct stacking. Access for internal leak detection of each compartment is provided by three recessed threaded plugs. Alternating male and female connectors are equally spaced along both sides and ends of the non-powered module. These connectors are stowed flush with the surface and, when deployed, connect modules with minimum clearance. Weight of the center module (non-powered) is approximately 22,500 lb.



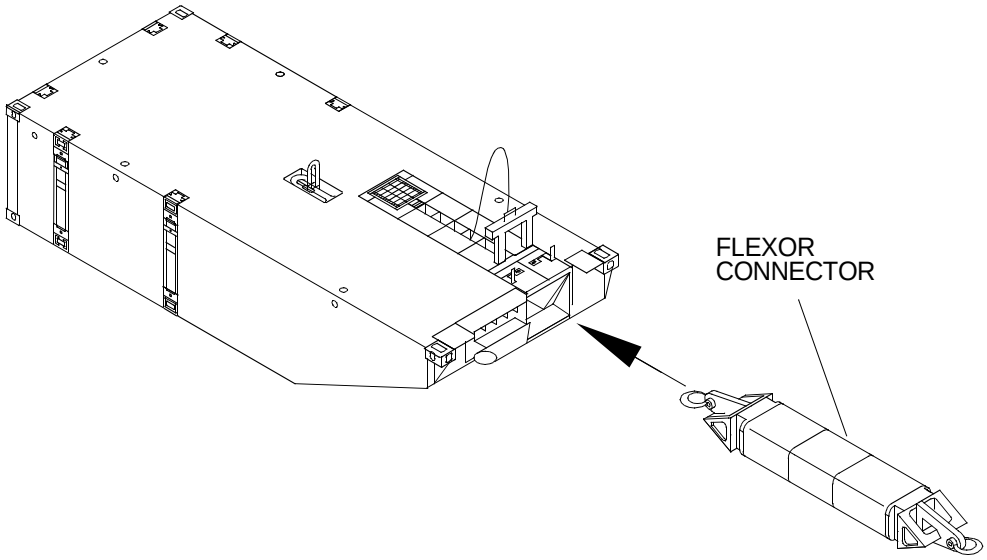
CENTER MODULE (NON-POWERED)

CONNECTOR ASSEMBLIES

Two types of connectors are used in the assembly of the CF platform. A male/female vertical connector is used to connect modules to modules. Flexor connectors are used to connect sections to sections.

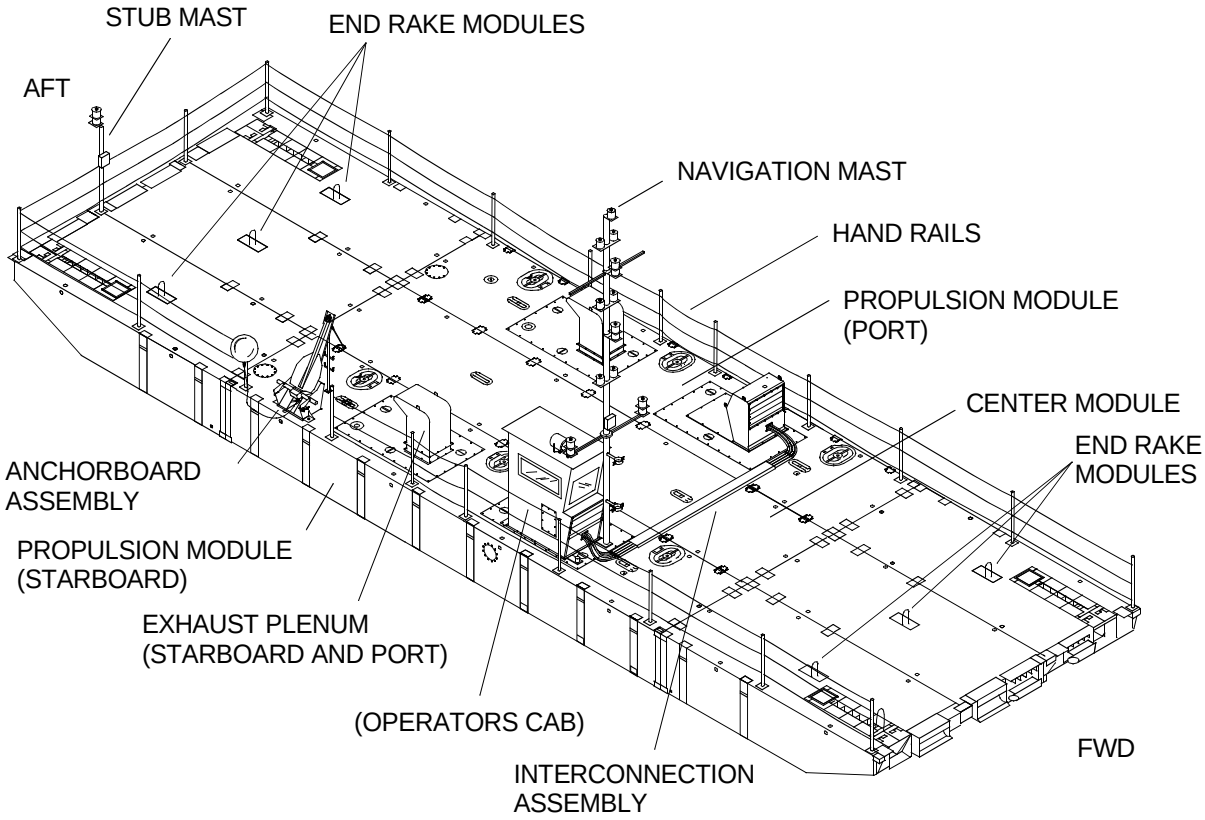


MALE/FEMALE CONNECTOR ASSEMBLY



POWERED SECTION

The powered section is made up of two propulsion modules, one center module (non-powered), two center rake modules and four end rake modules connected together by male/female locking assemblies. The propulsion modules and the non-powered module are each 8 ft wide and 40 ft long. The end rake modules are each 8 ft wide and 20 ft long and are configured as right rake assemblies, center rake assemblies and left rake assemblies. All center modules (non-powered) are 4 ft 6 in. deep. They are fully ISO-compatible and are completely interchangeable. The powered section is the prime mover for the CF and is propelled by two 8 cylinder, 600 HP, diesel marine engines driving two 360° steerable, 5000 lb output, pump-jets. The cab with operators controls is a self-contained unit designed to be removed for transport and can be mounted on either port or starboard propulsion module. Plug-in type electrical connectors are provided to tie electrical control into the cab location. A module electrical interconnect assembly is the electrical control link between the cab to the propulsion module opposite the cab. Navigation lighting is provided in the form of a 28½ ft main navigational mast mounted on the cab and a 8½ ft stub mast that is installed at the extreme aft end of the powered section. Both masts are removable for shipment. Air intake and exhaust plenums are installed on the powered modules to provide air flow through the machinery spaces. One of the air intakes is integral to the cab. A hand held portable fire extinguisher mounts to either exhaust plenum. An anchorboard assembly with a 1500 lb anchor mounts to the starboard propulsion module, aft of the exhaust plenum. A removable personnel safety railing system is installed along both sides and across the aft end of the powered section. The powered section, completely assembled, weighs approximately 171,900 lb.



POWERED SECTION

PROPULSION MODULE

The module is divided into three compartments separated by watertight compartments. The center (machinery) compartment is the largest and contains the drive train, engine cooling and exhaust components, hydraulic system and all electrical components with the exception of one bilge pump, a single bilge pump control panel and a pressure operated switch that are located in the lazaret.

The drive train consists of an engine, marine gear, transfer case and pump-jet. Guarded drive shafts connect the marine gear to the transfer case and the transfer case to the pump-jet.

The engine cooling and exhaust system consists of a sea chest (raw water inlet integral with the structure of the module), a butterfly valve, a duplex strainer, engine raw water pump, intercoolers, fuel cooler, engine cooler heat exchanger, marine gear oil cooler, exhaust water shut-off valve, transfer case oil cooler, transfer case shut-off ball valve, water cooled muffler and exhaust flappers.

The hydraulic system consists of a hydraulic pump driven by the marine gear, a hydraulic motor that drives the primary steering planetary gearbox mounted on the pump-jet, a hydraulic brake which is integral to the auxiliary steering planetary gearbox mounted on the pump-jet, an electrically actuated way-valve with auxiliary manual control, manually operated ball valve, needle valve, braking valve unit, pressure filter and a hydraulic reservoir with return line filter. A manual hydraulic hand pump is also provided for manual release of the hydraulic brake in case of system malfunction.

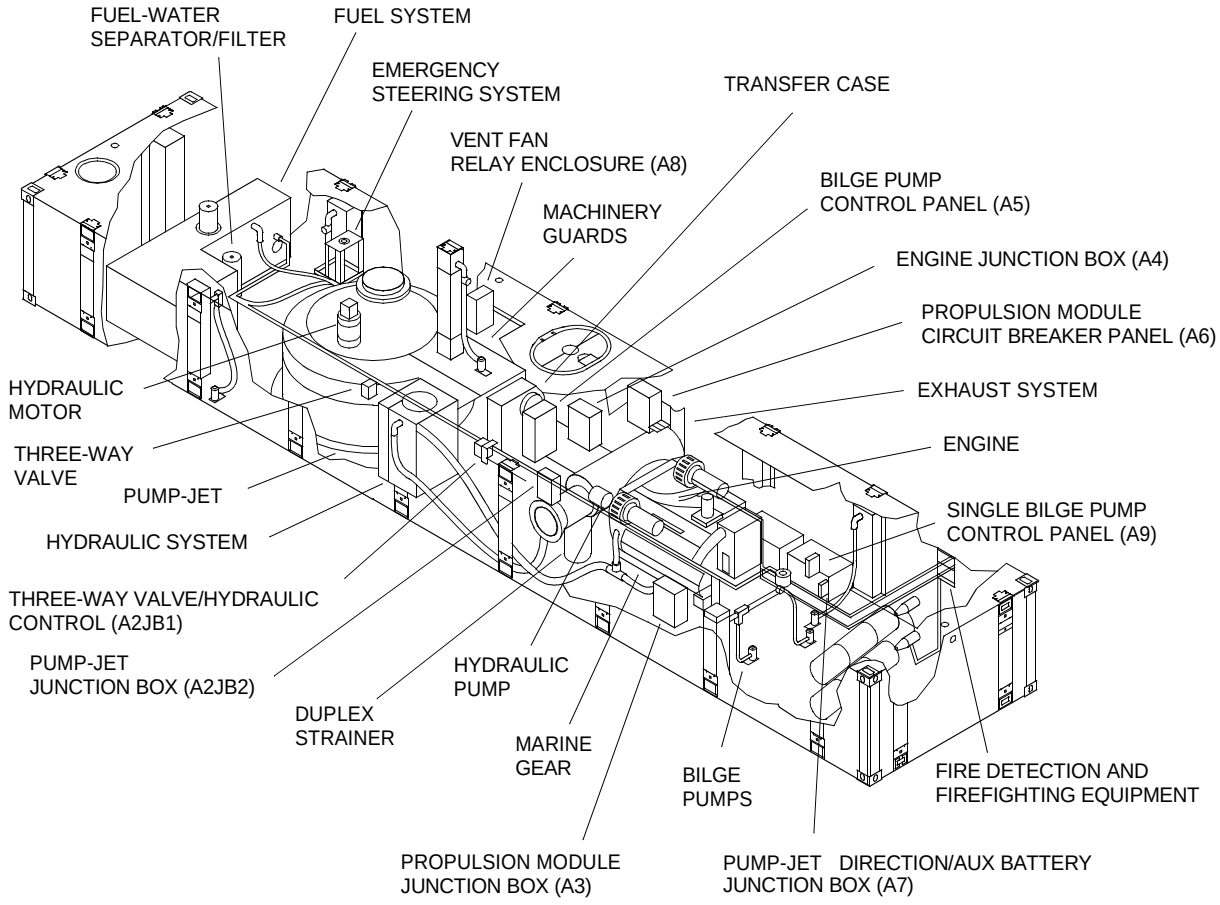
The propulsion module electrical system consists of an engine mounted alternator, four lead-acid storage batteries, propulsion module circuit breaker panel A6, bilge pump control panel A5 and single bilge pump control panel A7, engine junction box with emergency stop control A4, engine mounted emergency stop push button, propulsion module junction box A3, pump-jet thruster junction box A2jb2, pump-jet thruster direction/auxiliary battery junction

box A9, fire detection system consisting of two thermal detectors and a thermal switch electrically tied into the cab controls. If the temperature inside reaches 225°F, a fire alarm will sound in the cab. In the event of a fire, a manually activated fire suppression system will flood this compartment with CO2. This compartment is also equipped with five electrically operated bilge pumps.

The aft (fuel) compartment contains the fuel tank, fuel/water separator and fuel system shutoff valves. This compartment is also protected by the fire suppression system. A bilge pump is not provided in this compartment. Fire detection is accomplished by means of a probe extending through the bulkhead that separates the fuel and machinery compartments with all electrical terminations made on the machinery compartment side. In the event of fire, this compartment is flooded with CO2 upon activation of the fire suppression system.

The forward compartment (lazaret) contains the fire suppression system control and agent storage components and provides stowage for the emergency steering assembly when not in use. This compartment is equipped with a bilge pump control and is not protected by the fire suppression system.

Each propulsion module has six 3700 GPH submersible bilge pumps; five in the machinery compartment and one in the lazaret. The pumps are locally controlled from control stations mounted in the machinery compartment and lazaret or remotely controlled from the operators cab. The pump-jet is driven by an 8 cylinder, diesel marine engine delivering 600 HP at 2100 RPM on the output shaft. Weight of the propulsion module is approximately 41,100 lb dry or 45,000 lb fully loaded. Listed below are detailed descriptions of the major components found in each propulsion module.



PROPULSION MODULE MAJOR INTERNAL COMPONENTS

Engine

The engine is an 8 cylinder, water cooled, turbo charged, after cooled, two cycle diesel marine engine delivering 600 HP at 2100 RPM. All operator control of the engine is accomplished from the operators cab, with the exception of below deck emergency stop push buttons and emergency stop actuation control of the fire suppression system.

Exhaust System

The propulsion module exhaust system consists of a water cooled muffler assembly with inputs directly coupled from both engine turbocharger exhaust ports. The muffler is supplied with two exit ports. One is plugged and one is ported to the exhaust flapper for configuration as either a port or starboard exhaust system. The piping between the turbocharger, muffler and exhaust flapper is a flexible silicon hose to accommodate for thermal expansion in the system.

Fuel System

Each propulsion module is equipped with a 400 gallon stainless steel fuel tank permanently welded inside the fuel compartment. Fuel suction and return lines are fitted with shut-off ball valves to isolate fuel to the tank when not in use or during repairs to the fuel system. A filler neck/strainer basket located on top of the fuel tank is accessible through a deck hatch from outside the fuel compartment. A dual purpose fuel-water separator and filter is located near the fuel tank in the fuel tank compartment at the rear of the module to remove water and contaminants from the diesel fuel.

Fuel-Water Separator/Filter

A dual purpose fuel-water separator and filter is located on the fuel tank in the fuel tank compartment at the rear of the module. Its main function is to remove water and contaminants from the diesel fuel.

Marine Gear

The marine gear provides the capability to reverse the directional rotation of the other drive train components making it possible to backflush the pump-jet. It is mounted directly to the flywheel housing of the diesel engine. The marine gear is equipped with an integral hydraulic system consisting of a pump, shifting valve and internal hydraulic cylinders. The pump utilizes the marine gear lubricating oil to operate hydraulic cylinders which shifts the gears to the backflush, neutral or engaged configurations. The shifting valve is solenoid actuated from a toggle control switch in the operators cab. In addition to powering the shifting cylinders, the pump also circulates case oil through an oil cooler that is plumbed into the engine raw water cooling system. In the event of electrical power loss to the marine gear shifting solenoids, an emergency engagement capability is provided for the marine by replacing a shifting valve solenoid with an emergency lock-up plug that locks the marine gear transmission gearing. The lock-up plug is used to provide independent forward or backflush capabilities and is mounted externally to the shifting valve solenoid housing.

Transfer Case

The transfer case compensates for off-set alignment between the output flange of the marine gear and the input flange of the pump-jet. It has a 1:1 gear ratio, utilizing spur gears throughout, and is equipped with an oil pump that circulates lubricating oil from its gear case through an oil cooler plumbed off of the engine raw water cooling system and back to the top of the transfer case to lubricate the upper gearing. The transfer case is connected to the marine gear and the pump-jet via drive shafts.

Machinery Guards

Removable metal machinery guards cover the drive shafts, engine flywheel and alternator belt to protect personnel from contact with rotating parts.

Pump-Jet

Each propulsion module is equipped with a 360° steerable pump-jet propulsion unit capable of delivering 5,000 lb of thrust. The pump-jet works on the principal of a rotary pump and consists of a drive shaft that drives an upper gearbox assembly, which drives an impeller. Water is sucked into the pump-jet through a feeding funnel on the bottom of the module and fed into the enclosed pressure casing, whose bottom plate is provided with three systematically arranged outlet nozzles from which water is ejected at a 13° angle. A hydraulic steering motor drives a spur gear through a planetary gearbox to rotate the pressure casing and bottom plate (steering nozzles) in both senses of rotation without limitation. A second planetary gearbox is provided to facilitate emergency steering. The emergency steering control stand is mounted above deck and interfaces with the through shaft of the planetary gearbox. The emergency steering gearbox contains a spring set, hydraulically released disc brake. The brake maintains the position of the steering nozzle until rotation is called for by the operator. In the event of hydraulic system failure the brake can be released via the hydraulic hand pump to facilitate emergency steering. An electromechanical feedback unit monitors relative steering position of the steering nozzle and transmits that position to a dial indicator in the operators cab. An electric sensor monitors the oil level in the upper gearbox and sends a signal to an indicating light in the operators cab when the oil level is below the required level.

Duplex Strainer

The duplex strainer is located by the diesel engine and is considered part of the raw water system. Its purpose is to collect debris from raw seawater and prevent it from entering the water pump.

Hydraulic System

The hydraulic system contained within each propulsion module provides the steering control for the pump-jet. The system includes an axial piston hydraulic pump mounted off the marine gear, a fixed displacement hydraulic motor mounted to the planetary gear drive off the pump-jet, hydraulic brake, control valves, filters and a 26 gallon hydraulic reservoir. The reservoir is fitted with an external sight level, in-tank suction strainer and in-tank return line filter. A pressure filter is located between the hydraulic pump and the way valve control block. The interconnect piping between components includes a short section of hose to minimize the effects of vibration.

Hydraulic Pump

A flange mounted, axial piston hydraulic pump driven by the marine gear provides hydraulic pressure to operate the hydraulic steering motor and normal release of the hydraulic steering brake.

Hydraulic Motor

A fixed displacement, axial piston hydraulic motor is flange mounted on the input shaft of the pump-jet steering planetary gearbox. Hydraulic flow from the hydraulic pump is directed through the way-valve unit to drive the hydraulic motor in a clockwise or counterclockwise direction to rotate the steering nozzles.

Way-Valve Unit

The way-valve is controlled hydraulically by means of electrically operated pressure control valves or manually by means of a control lever mounted on the valve unit assembly. The way-valve directs hydraulic fluid via the load retaining valve to the hydraulic motor to control the direction in which the hydraulic motor rotates. A brake valve located on the pump-jet directs hydraulic pressure to the emergency steering planetary gearbox to release the hydraulic brake when rotation of the hydraulic motor is initiated.

Dual Braking Valve

The dual braking valve (load retaining valve) avoids uncontrolled rotation of the hydraulic motor caused by negative loads and locks hydraulic lines to the hydraulic motor tightly when the way-valve is in the rest position.

Three-Way Valve

A manually operated control handle on the valve is positioned to select normal hydraulic operation or to isolate the normal hydraulics so that the emergency steering hydraulic hand pump can be used to release the hydraulic brake in the emergency steering mode.

Two-Way Valve

A two-way (needle) valve is in the closed position during normal operation. The valve must be in the open position to allow for the manual releasing of the hydraulic brake using the hydraulic hand pump.

Manual Hydraulic Hand Pump

The hydraulic hand pump is used to release the hydraulic brake for emergency steering operation. The hand pump is equipped with its own small hydraulic reservoir, pressure relief valve and oil level dipstick.

Hydraulic Reservoir

The hydraulic reservoir is the holding tank for the system hydraulic fluid. The tank is equipped with a fill and drain port for replenishment of the fluid, sight gauge to determine fluid level, return line filter with dirt indicator to filter hydraulic fluid returning to the tank and outlet line strainer. The tank has a removable access panel to facilitate cleaning. A float switch monitors fluid level and lights an indicating light in the operators cab if the fluid level is below the required level.

Bilge Pumps

Each propulsion module is equipped with six bilge pumps capable of pumping 3700 GPH in the event the propulsion module takes on water. Five are located in the machinery compartment and one in the lazaret. The pumps can be controlled remotely from the operators cab by toggle switches and can be tested locally at the bilge pump control panels.

FIRE DETECTION AND FIRE FIGHTING EQUIPMENT

A fixed CO2 fire suppression system is designed to flood the engine and pump-jet compartment, and the fuel storage compartment with CO2 in the propulsion module units if fire breaks out.Thermal detection probes activate an alarm in the operators cab if the temperature in the propulsion module reaches 225°F. One is mounted through the bulkhead behind the pump-jet to monitor the fuel compartment. The other one is mounted below the deck to monitor the machinery compartment. There is no thermal detector in the lazaret compartment. On the terminal strip A4, the fire alarm horn speaker will sound. The lower control panel in the operators cab has PORT FIRE ALARM and STBD FIRE ALARM red indicator lights. Primary system activation is accomplished using a remote cable pull box recessed in the deck and located directly in front of the access hatch and forward of the operators cab. Pulling the handle activates the fire suppression system and floods the compartment with CO2. Manual release levers located below deck are found on the upper 50 lb bottle. When any of the fire suppression controls are manually pulled, four events occur:

- Activates fixed time delayed CO2 fire suppression system that, 30 seconds later, discharges into propulsion module to suffocate fire.
- Cable disconnects from intake plenum inner vent cover causing it to close and shut off oxygen sources.
- Cable action shuts off relay for exhaust fan in exhaust plenum.
- Activates pressure trip mechanism to shut off diesel engine.

A portable CO2 fire extinguisher is mounted on either exhaust plenum.

Emergency Steering System

Each propulsion module is equipped with an emergency steering system consisting of a mounting stand, shaft with pillow block bearing support and hand crank. It is stored in the lazaret and is used to manually maneuver the CF in the event of a hydraulic system failure.

Pump-Jet Junction Box (A2jb2)

The pump-jet junction box is mounted opposite the personnel access hatch approximately midway in the machinery compartment. The box contains relays and circuitry necessary to operate the way-valve steering solenoids circuit breakers for over-current protection.

Pump-Jet Direction/Aux. Battery Junction Box (A9)

The pump-jet direction/auxiliary battery junction box is mounted on the machinery compartment side of the bulkhead that separates the machinery compartment and the lazaret. The box contains an isolation diode, voltage regulator/ battery charging circuit, 24 VDC voltage regulator, two 24 VDC auxiliary battery packs, control relay and two terminal blocks. The enclosure is vented due to possible off-gassing of the batteries.

Propulsion Module Junction Box (A3)

The propulsion module junction box is located forward in the machinery compartment opposite the main storage batteries. The box is the termination point for connection of three of the four main power cables that connect the propulsion modules to the cab.

Engine Junction Box (A4)

The engine junction box is located inboard and next to the personnel access hatch. It is a steel enclosure that contains the diesel engine governor controller, terminal strips and two relays controlling the emergency stop air flap solenoid and the emergency malfunction bell. An engine emergency stop push button is mounted to the enclosure cover.

Bilge Pump Control Panel (A5)

The bilge pump control panel is mounted very near the center line of the propulsion module inboard of the personnel access hatch. The panel consists of a steel enclosure with five toggle switches for each bilge pump in the machinery compartment.

Propulsion Module Circuit Breaker Panel (A6)

The propulsion module circuit breaker panel is located in the machinery compartment, opposite the engine junction box, next to the personnel access hatch. The panel is a steel enclosure with fourteen circuit breakers mounted to the enclosure cover. Thirteen circuit breakers are protected by a plexiglas guard plate mounted with stand-offs. Access slots permit operation of the circuit breakers while protecting them from accidental shut off or damage.

Single Bilge Pump Control Panel (A7)

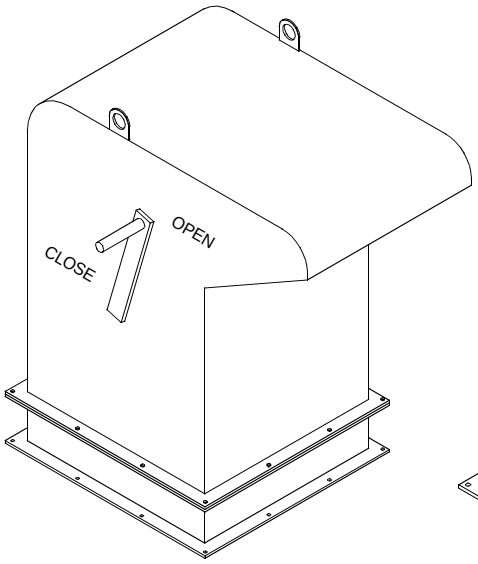
The single bilge pump control panel is located in the lazaret and consists of a steel enclosure mounted to the bulkhead that separates the lazaret from the machinery compartment. A single toggle switch for the lazaret bilge pump operation is mounted to the enclosure cover.

Vent Fan Relay Enclosure (A8)

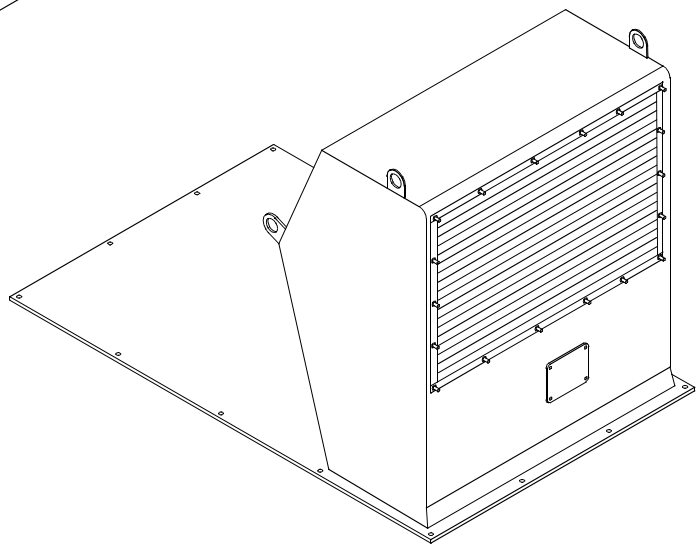
The vent fan relay enclosure is located in the machinery compartment just forward of the pump-jet on the same side as the personnel access hatch. The assembly consists of a steel enclosure with a plug-in type receptacle located on the bottom. The enclosure is the power source for vent fan operation and contains the relay for fan operation. Once the exhaust plenum is mounted, the power cord that is hard wired to the fan can be plugged into the receptacle to complete the installation. A screw-on cover protects the receptacle when not in use. The power cord from the fan is equipped with a screw cap that matches the receptacle thread to secure the cord to the enclosure.

VENTILATION

Although not a part of the propulsion module itself, the intake plenum is mounted over the engine. The other air intake is located in the operators cab. The intake plenum access panel allows connection of the module electrical interconnect cable to the engine operation receptacles. The exhaust plenums are mounted over the pump-jet. The plenums are to facilitate the fresh air flow through the compartment and limit the engine compartment to a temperature rise of 20°F above ambient temperature. The exhaust plenum has a flapper door (damper) that is manually opened and closed.



EXHAUST PLENUM



INTAKE PLENUM

OPERATORS CAB

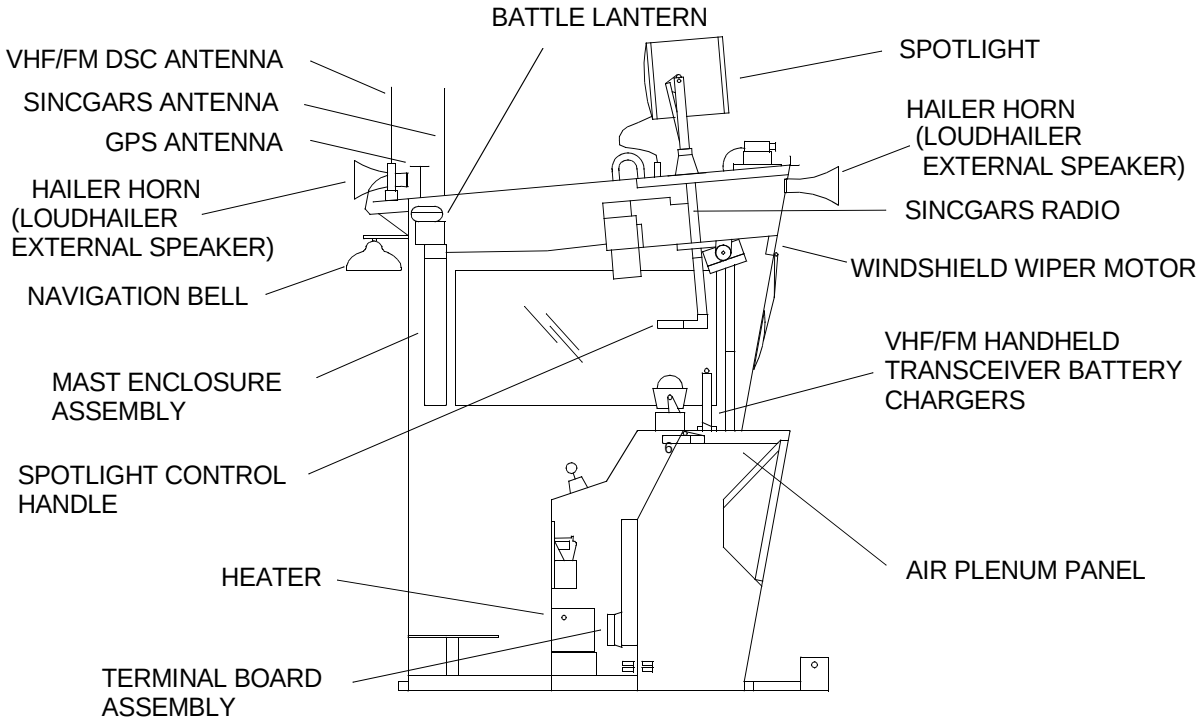
The operators cab is a portable steel fabricated unit which can be mounted on either the port or starboard propulsion module. It houses the middle control panel A1, lower control panel A2, the operators cab circuit breaker panel A3, the mast enclosure assembly A7 (navigation light switch box) that contains primary and spare main and stub mast navigational light controls and indicators, a battle lantern and a magnetic compass. A module electrical interconnect assembly is the electrical control link that allows control of both propulsions modules from the operators cab. The receptacles for the interconnect assembly are located within a operators cab access panel and intake plenum access panel.

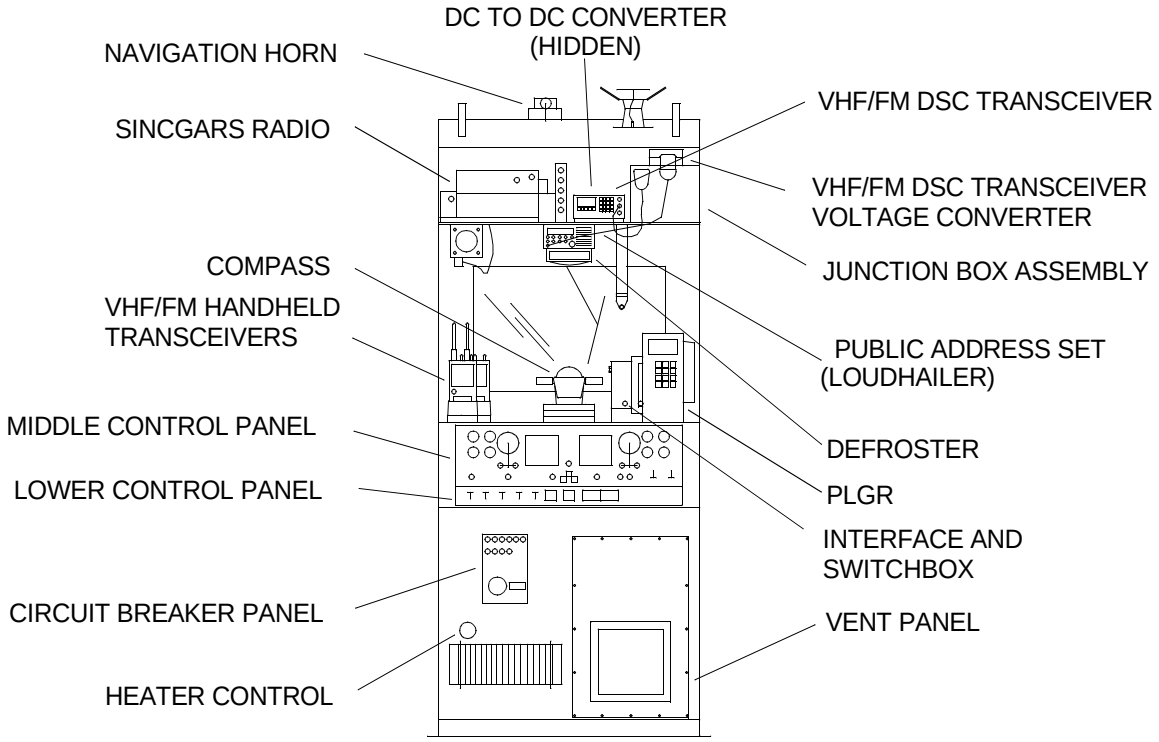
Communications and electronic equipment required to operate the CF include the VHF/FM DSC (Digital Selective Calling) transceiver programmable with weather channel, VHF/FM DSC transceiver voltage converter, AN/VRC-88D SINCGARS radio transmitter, two VHF/FM handheld transceivers with hands free capability and their associated battery chargers, loudhailer, AN/PSN-11(V)1 Precision Lightweight Global Positioning Receiver (PLGR), AN/PSN-11 PLGR interface and switchbox and a DC to DC converter.

Antennas for the VHF/FM DSC transceiver, AN/PSN-11(V)1 PLGR and AN/VRC-88D SINCGARS radio transmitter, along with a navigation horn, two loudhailer speakers (forward and aft) and a 12 in. diameter 24 VDC marine duty spot light are all located on the cab roof. The spotlight can be controlled by a manual remote lever control which penetrates through the cab roof for the operator. An electric toggle switch in the middle control panel A1 activates the spotlight.

The cab contains a heater to maintain temperature at 65°F minimum in an ambient temperature or -10°F. Both the heater and the defroster require hot water which comes from the diesel engine's fresh water cooling system. There are hot water shutoff valves for the operators cab heating system which must be open for water to flow and the heating system on to provide heat. The defroster has inlet, outlet and bleeder valves. Electric toggle switches on the lower control panel A2 activate the heater and defroster.

The receptacles for the interconnection cables to operate both propulsion modules from one set of controls are located within the cab. The main navigational mast mounting clamps and supports are externally mounted to the cab. Miscellaneous cab equipment include a window defroster and a windshield wiper.

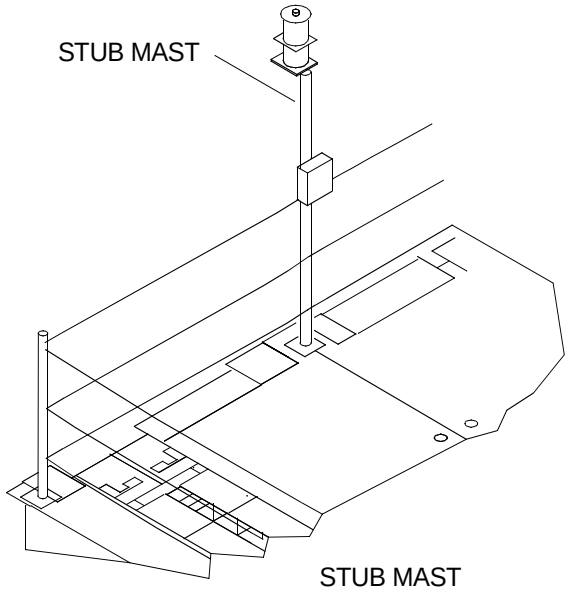


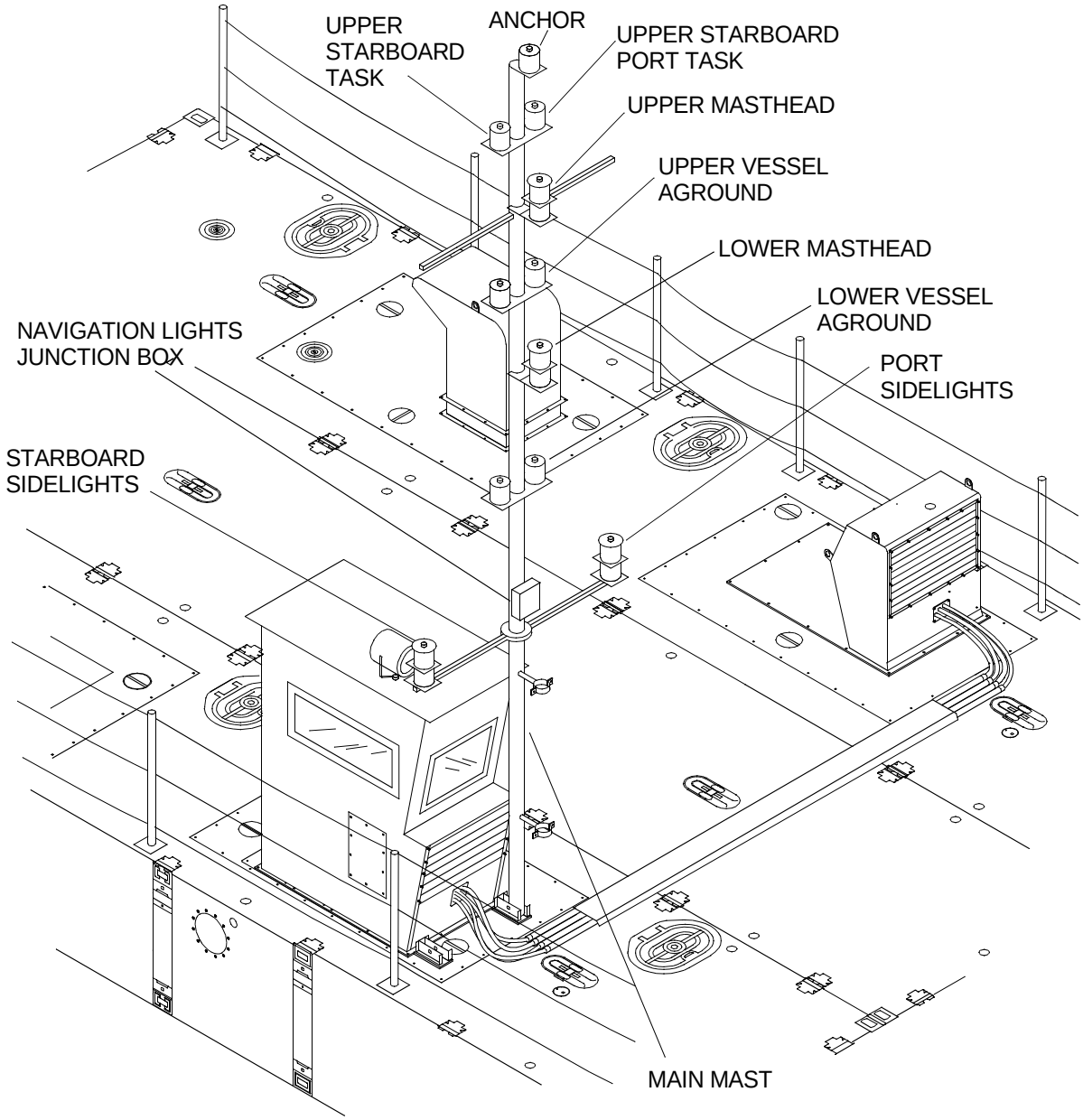


OPERATORS CAB

NAVIGATION LIGHTS

Mounted on the front and side of the operators cab is the main navigational mast. The stub mast is mounted on the aft end of the propulsion module. These masts provide the necessary navigational running lights for signal and safety while the CF is in operation.

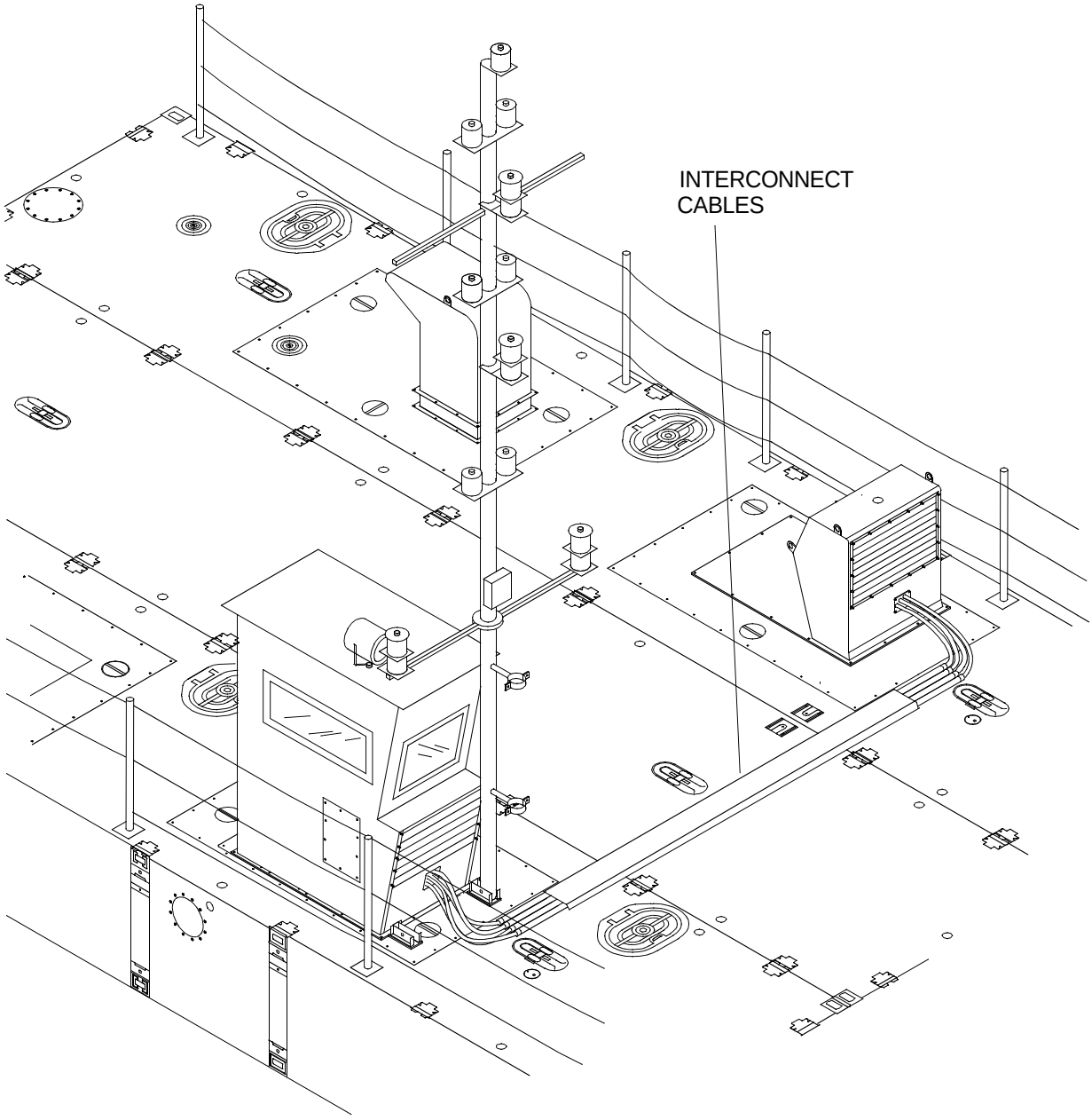




MAIN NAVIGATION MAST

MODULE ELECTRICAL INTERCONNECT CABLES

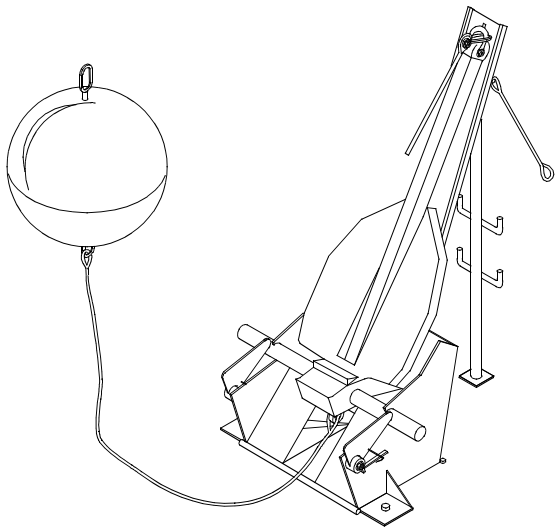
The two propulsion modules are linked together with a reinforced and hardened set of interconnect cables. This cable set allows operation commands for both engines and pump-jet thrusters to come from the one operators cab to be transmitted to both propulsion modules. The cable set is joined at the receptacles located in front of the operators cab and the front of the intake plenum on the opposite propulsion module.



INTERCONNECT CABLES

ANCHORBOARD

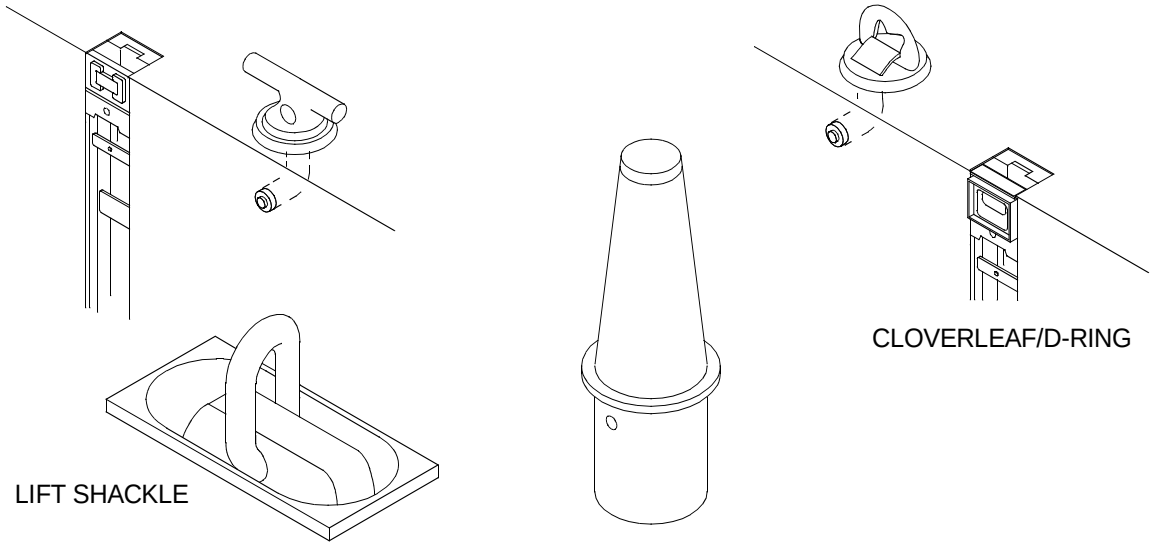
A 3500 lb emergency anchorboard assembly is mounted on the starboard propulsion module. If all power or another emergency causes the CF to lose steering or become inoperative, the 1500 lb anchor with a marking buoy attached can be manually deployed by the crew. When the inoperative CF becomes operational or is towed away, the crew disconnects the anchor. The buoy marks the location of the anchor for retrieval by another watercraft.



ANCHORBOARD ASSEMBLY

DECK FITTINGS

CF assemblies are provided with deck fittings to meet various operational needs. Available fittings include deck cleats and a combination D-ring/cloverleaf. These fittings have a 15,000 lb load capacity. There are 10 tube turns per non-powered module and five per end rakes. The CF modules are provided with recessed lift shackles welded into the deck structure. The lift shackles have a safe working load capacity of 35 tons. There are two lift shackles installed on each non-powered center module and each propulsion module. One lift shackle is installed on each end rake. When stowed, the lift shackles fold down flush with the deck. The rhino horn is used when the CF needs to be mated to Army/Navy Lighters (NL).



DECK FITTINGS

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DESCRIPTION AND DATA

EQUIPMENT DATA

The following tables provides data applicable to major component levels.

Table 1. CF Equipment Data.

ITEM CHARACTERISTIC	DESCRIPTION
CAUSEWAY FERRY SYSTEM	
Length	329 ft with P3 adaptor
Beam	24 ft
Depth	4 ft 6 in.
Freeboard (Unloaded)	40 ft ± 2 in.
Freeboard (Loaded)	12 ft ± 2 in.
Weight (Unloaded)	226 tons
Weight (Fully Loaded)	576 tons
Maximum Speed	6 knots, Sea State 2
Cargo Capacity	350 short tons
Fuel Tank Capacity (Each)	800 gallons
POWERED SECTION	
Length	80 ft
Beam	24 ft
Depth	4 ft 6 in.
Freeboard (Unloaded)	40 ft ± 2 in.
Freeboard (Loaded)	12 ft ± 2 in.
Weight	86 tons dry, 87.9 tons wet
ISO Compatible	Yes
Sea State Operation	SS 2
Engine (2 Per Section)	8V92TA 2 cycle, diesel
Rated Horse Power (Each)	600 HP at 2100 RPM at output shaft
Cylinders	Qty 8
Starting System	24 volt electric
Fuel Capacity	800 gallons (400 gallons per tank)
Average Operating Time Per Tank Of Fuel	10 hours

Table 1. CF Equipment Data. (Continued)

ITEM CHARACTERISTIC	DESCRIPTION
Marine Gear	Twin Disc Model DD-5111V
Pump-Jet (2 Per Section)	Model SPJ-82-T
Pump-Jet Output (Each)	5000 lb horizontal thrust at ship's speed of 6 knots
Steering	360°
Total Thrust	10,000 lb at 2100 engine RPM
Electrical System	24 volt 65 amps
Bilge Pumps	12 each at 3700 GPH
Fire Suppression System	Manually Activated CO2
INTERMEDIATE SECTION	
Length	80 ft
Beam	24 ft
Depth	4 ft 6 in.
Freeboard (Unloaded)	40 ft ± 2 in.
Freeboard (Loaded)	12 ft ± 2 in.
Weight	67.5 tons
ISO Compatible	Yes
Sea State Operation	SS 2
BEACH END SECTION	
Length	85 ft
Beam	24 ft
Depth	4 ft 6 in.
Freeboard (Unloaded)	40 ft ± 2 in.
Freeboard (Loaded)	12 ft ± 2 in.
Weight	77.6 tons
ISO Compatible	Yes
Sea State Operation	SS 2

Table 1. CF Equipment Data. (Continued)

ITEM CHARACTERISTIC	DESCRIPTION
P-3 ADAPTOR ASSEMBLY	
Length	3 ft 2 in.
Beam	8 ft
Depth	4 ft 6 in.
Weight	5 Tons
ISO Compatible	No
Sea State Operation	SS 2
CENTER MODULE	
Length	40 ft
Beam	8 ft
Depth	4 ft 6 in.
Weight	11.25 Tons (approximate)
ISO Compatible	Yes
Sea State Operation	SS 2
END RAKE MODULES	
Length	20 ft
Beam	8 ft
Depth	4 ft 6 in.
Weight	6.25 Tons (approximate)
ISO Compatible	Yes
Sea State Operation	SS 2

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
THEORY OF OPERATION

SYSTEM OPERATION

Operation of the CF revolves around the diesel engine (power) and the pump-jet movement and direction. When the diesel engine is running, the marine gear engages the transfer case into gear, which changes the engine speed to shaft speed. Seawater is brought into the pump-jet through the inlet grating at relatively low velocity in order to minimize the ingesting of debris. Seawater travels through the heliconic converter at high head and moderate velocity, thus reducing the losses due to turbulent flow. Seawater then flows through the discharge port, which contains a hydraulically actuated, specially designed steering nozzle. The accelerated water mass provides a reactive force acting on the vessel's hull. Direction is controlled by rotation of the steering nozzle. Thrust is increased or decreased by varying the speed of the diesel engine. Control and indication necessary to operate the pump-jet are located in the operators cab. The following paragraphs provides the theory of operation of the CF subsystems.

DRIVE TRAIN

The drive train consists of the engine, marine gear, transfer case and pump-jet. Guarded drive shafts connect the marine gear to the transfer case and the transfer case to the pump-jet.

Engine

The engine is an 8 cylinder, water cooled, turbo charged, after cooled, two cycle, diesel marine engine, delivering 600 HP at 2100 RPM. All operator control of the engine is accomplished from the operators cab.

Marine Gear

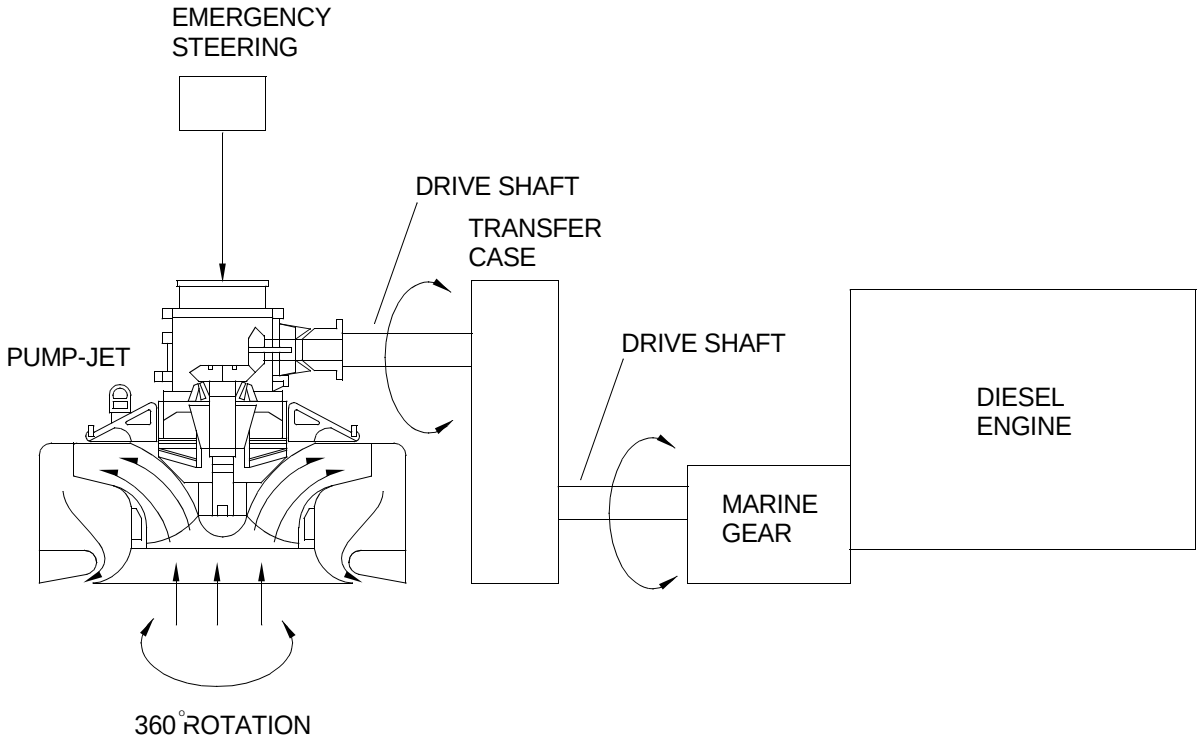
The marine gear is mounted directly to the flywheel housing of the diesel engine and provides the capability to reverse the directional rotation of the other drive train components, making it possible to backflush the pump-jet. The marine gear is equipped with an integral hydraulic system consisting of a pump, shifting valve and internal hydraulic cylinders. The pump utilizes the marine gear lubricating oil to operate hydraulic cylinders, which shifts the gears to the backflush, neutral or engaged configurations. The shifting valve is solenoid actuated from a toggle control switch in the operators cab. In addition to powering the shifting cylinders, the pump also circulates case oil through an oil cooler that is plumbed into the engine raw water cooling system. In the event of electrical power loss to the marine gear shifting solenoids, an emergency engagement capability is provided for the marine by replacing a shifting valve solenoid with an emergency lock-up plug that locks the marine gear transmission gearing. The lock-up plug is used to provide independent forward or backflush capabilities and is mounted externally to the shifting valve solenoid housing.

Transfer Case

The transfer case compensates for offset alignment between the output flange of the marine gear and the input flange of the pump-jet. It has a 1:1 gear ratio, utilizing spur gears throughout, and is equipped with an oil pump that circulates lubricating oil from its gearcase through an oil cooler, which is cooled by the engine raw water cooling system and back to the top of the transfer case to lubricate the upper gearing. The transfer case is connected to the marine gear and the pump-jet via drive shafts.

Pump-Jet

Each propulsion module is equipped with a 360° steerable pump-jet propulsion unit capable of delivering 5,000 lb of thrust. The pump-jet works on the principal of a rotary pump and consists of a drive shaft that drives an upper gearbox assembly that drives an impeller. Water is sucked into the pump-jet through a feeding funnel on the bottom of the module and fed into the enclosed pressure casing, whose bottom plate is provided with three systematically arranged outlet nozzles from which water is ejected at a 13° angle. A hydraulic steering motor drives a spur gear through a planetary gearbox to rotate the pressure casing and bottom plate (steering nozzles) in both senses of rotation without limitation. A second planetary gearbox is provided to facilitate emergency steering. The emergency steering control stand is mounted above deck and interfaces with the through shaft of the planetary gearbox. The emergency steering gearbox contains a spring set, hydraulically released disc brake. The brake maintains the position of the steering nozzle until rotation is called for by the operator. In the event of hydraulic system failure, the brake can be released via the hydraulic hand pump to facilitate emergency steering. An electromechanical feedback unit monitors relative steering position of the steering nozzle and transmits that position to a dial indicator in the operators cab. An electric sensor monitors the oil level in the upper gearbox and sends a signal to an indicating light in the operators cab when the oil level is below the required level.



DRIVE TRAIN

COOLING AND EXHAUST (SEA WATER) SUBSYSTEM

The engine and exhaust system consists of the sea chest (raw water inlet, integral with the structure of the module), butterfly valve, duplex strainer, engine raw water pump, intercoolers, fuel cooler, engine coolant heat exchanger, marine gear oil cooler, exhaust water shut-off valve, transfer case oil cooler, transfer case shut-off ball valve, water cooled muffler and exhaust flappers. The water cooling system dissipates heat generated by the diesel engine, engine exhaust, marine gear and transfer case. This is accomplished by circulating raw (sea) water through the engine raw water pump, fuel cooler, engine heat exchanger, marine gear oil cooler, transfer case oil cooler and muffler. The system is an open loop, drawing naturally cool sea water in one side and discharging heated sea water out of the other side in a continuous cycle. The process requires the interaction of the following five subsystems.

Raw Water (Sea Water) Subsystem

An engine driven raw water pump draws sea water from the sea chest in the bottom of the hull through a duplex strainer to a heat exchanger at the front of the engine. A fuel cooler is located in the raw water system between the raw water pump and the heat exchanger. Fresh water (ethylene glycol) cooling lines are passed through the heat exchanger. The raw water circulates around the engine coolant lines, lowering the temperature of the ethylene glycol coolant. Raw water exiting the heat exchanger is channeled through the marine gear oil cooler. Lubricating oil lines from the marine gear oil cooler is then channeled in two directions. A portion of the water is piped into the exhaust inlets to the muffler, cooling the muffler and exiting the module via the thru hull assembly. The remaining water is piped through the transfer case lube oil cooler and exits the module via an outlet port.

Fresh Water (Ethylene Glycol) Subsystem

Coolant is drawn by the engine water pump from the heat exchanger and is forced through the engine lube oil cooler, cylinder block, cylinder heads and exhaust manifolds to the thermostat housings. A bypass from the thermostat housings to the inlet side of the water pump permits circulation of coolant through the engine when thermostats are closed. When the thermostats are open, the coolant flows through the heat exchanger where it is cooled. Thermostats control and regulate the flow of coolant within the fresh water cooling system to control engine temperature.

Marine Gear Oil Cooler

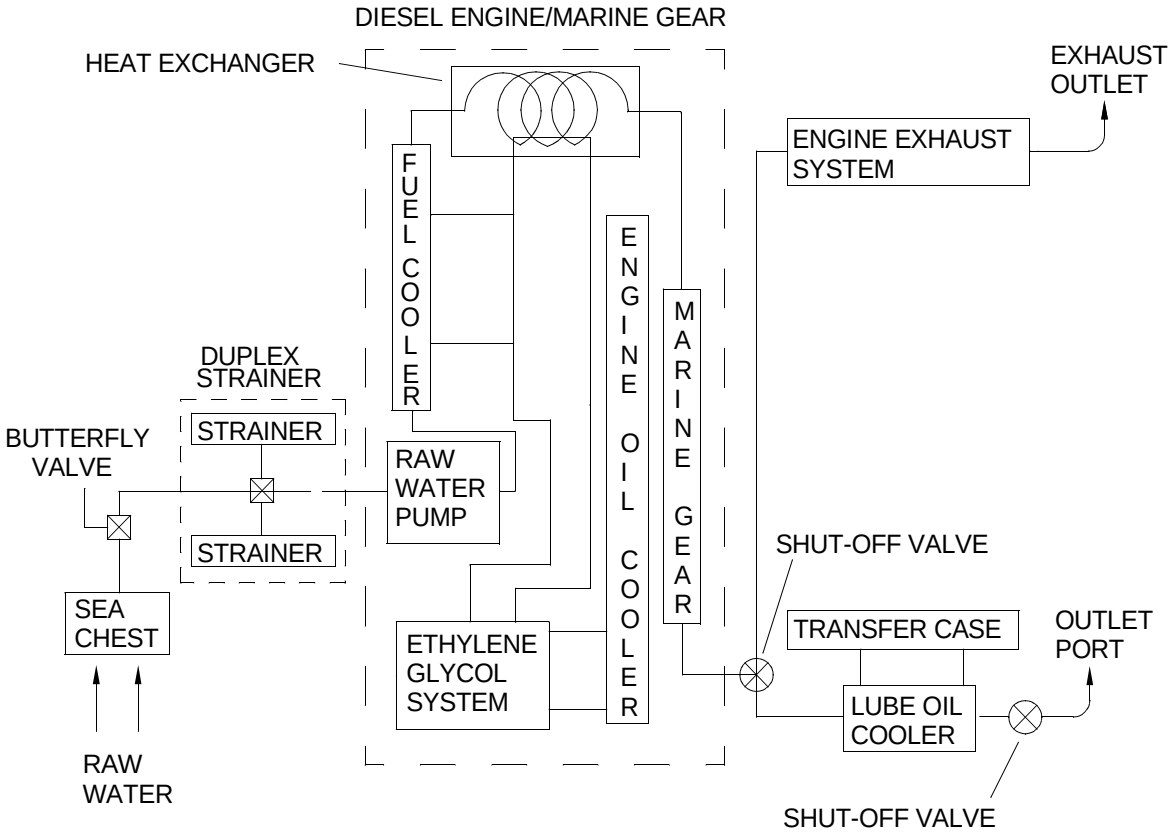
Raw water exiting the engine heat exchanger passes through the marine gear lube oil cooler. A gear pump, integral to the marine gear, circulates case oil from the marine gear through external lines to a heat exchanger type oil cooler and back to the marine gear. Seawater passing through the oil cooler is circulated around the heat exchanger, lowering the temperature of the lube oil. The bearings, clutches and gears are lubricated and cooled by the returning lube oil.

Water Cooled Muffler

A normally open ball valve allows raw water exiting the marine gear oil cooler to be pumped into the exhaust system between the turbo chargers and the muffler, filling the muffler with water and cooling prior to being expelled through the exhaust flapper port with the engine exhaust fumes. In addition to cooling the muffler, the water also acts as a noise dampening media within the muffler itself.

Transfer Case Lube Oil Cooler

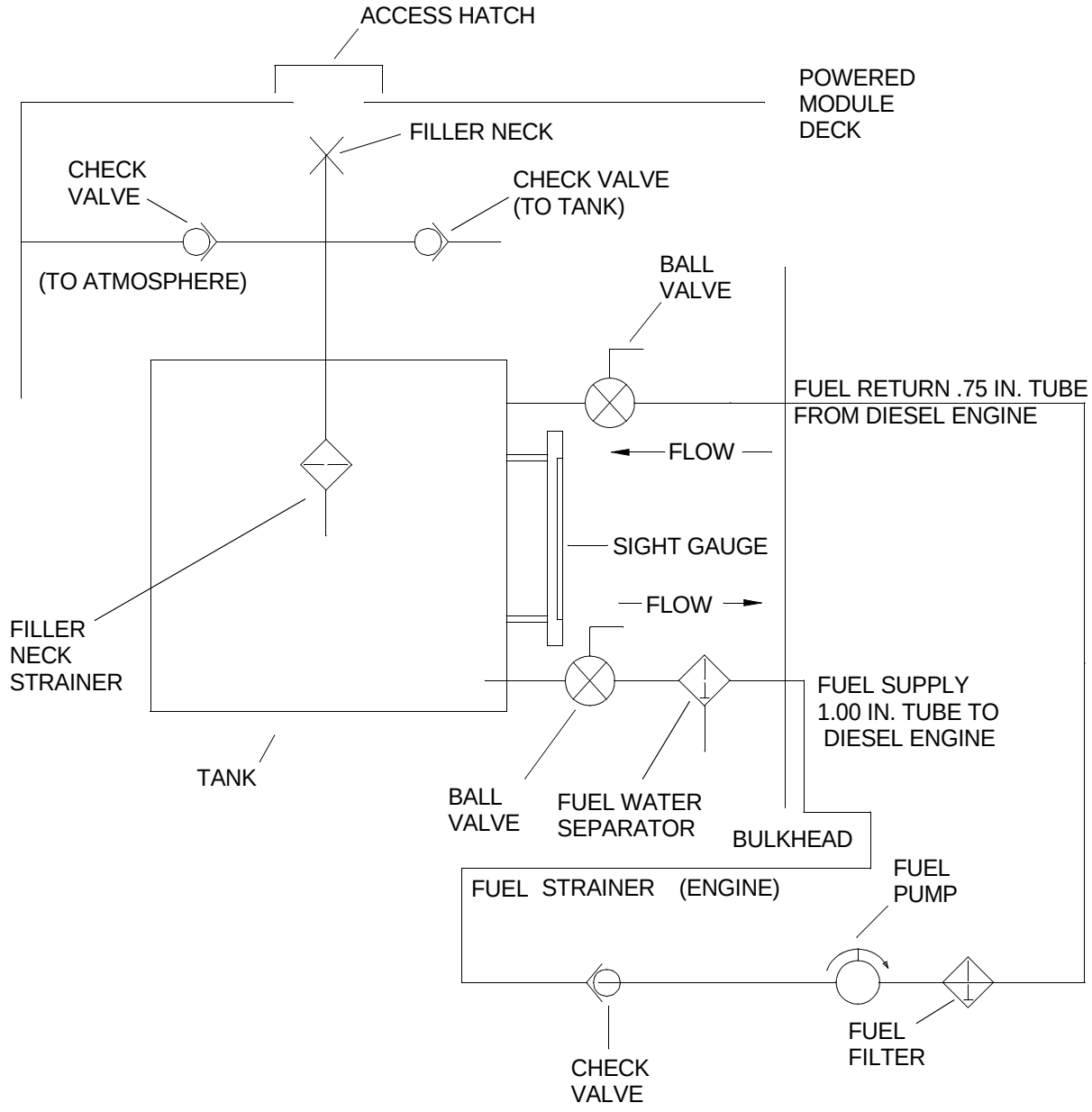
A normally open ball valve allows raw water exiting the marine gear oil cooler to be pumped through the transfer case oil cooler. A gear driven pump, operated by rotation of the transfer case gearing, circulates lube oil from the transfer case through external lines to the heat exchanger type transfer case lube oil cooler and back to the transfer case. Seawater passing through the heat exchanger cools the lube oil. The cooled oil is returned to the top of the transfer case, lubricating the upper gears and bearings and cooling the unit simultaneously.



COOLING SYSTEM SCHEMATIC DIAGRAM

FUEL SYSTEM

The fuel system provides a filtered fuel supply to the diesel engine and is identical for port and starboard propulsion modules. A fabricated steel fuel tank stores 400 gallons of diesel fuel. The level of fuel in the tank can be viewed through a sight gauge located on the side of the tank. Fuel is added to the tank through a filler neck and filtered through a mesh strainer and plug, located on the top of the tank. The filler neck is accessible from the deck of the propulsion module through an 8 in. hatch. During refueling, air is vented from the tank through a check valve. Another check valve allows air to be drawn into the fuel tank as fuel is consumed. Fuel supply and return lines are sized to reduce fuel line pressures. During operation, fuel flows out of the tank through a one in. diameter fuel supply line to a fuel/water separator to remove water (condensation or other moisture) from the fuel. Fuel then travels through the supply line and is drawn through a 10 micron fuel strainer on the engine before entering the inlet fuel manifold, then through the fuel pipes to the inlet side of the fuel injectors. Surplus fuel returns from the outlet side of the fuel injectors to the fuel return manifold and then back to the fuel tank through a 0.75 in. diameter fuel return line. A fitting in the fuel outlet manifold in one of the cylinder heads maintains fuel system pressure. A check valve in the supply line prevents fuel from draining back to the tank when the engine is not running. Ball valves are provided on the supply and return lines to shut off the flow of fuel during maintenance and when the CF is not in operation.



FUEL SYSTEM SCHEMATIC DIAGRAM

VENTILATION SYSTEM

The ventilation system draws outside air and directs it below deck around the engine and other propulsion module components, removing heat and toxic fumes aft to be expelled to the atmosphere through the exhaust plenums. In addition, the intake plenum flapper door closes when the fire suppression system is activated, shutting off the supply of air to the machinery compartment. A secondary purpose of the system is to provide service access to the components below deck through large, removable deck covers. The CF ventilation system is comprised of the following components and operating mechanisms listed below.

Air Intake Plenum

The air intake plenum accepts outside air and directs it below deck to the machinery compartment. It is mounted on the engine hatch of the propulsion module facing forward. The plenum may be located on either the port or starboard side, depending on placement of the operators cab for that section. An air intake plenum is built into the front of the operators cab. The intake plenums also include the conduit entry plates for the electrical interconnect when the propulsion modules are assembled into a powered section.

Air Intake Plenum Flapper Door (Damper)

The intake plenum contains a flapper door which works in conjunction with the fire suppression system. A wire rope, attached to the flapper door within the intake plenum, is released when the fire suppression system is activated. This allows the flapper door to fall due to its own weight and rotate about 45° downward, closing the door and preventing oxygen from feeding a fire within the machinery compartment of the propulsion module.

Ventilation Fan (Exhaust Fan)

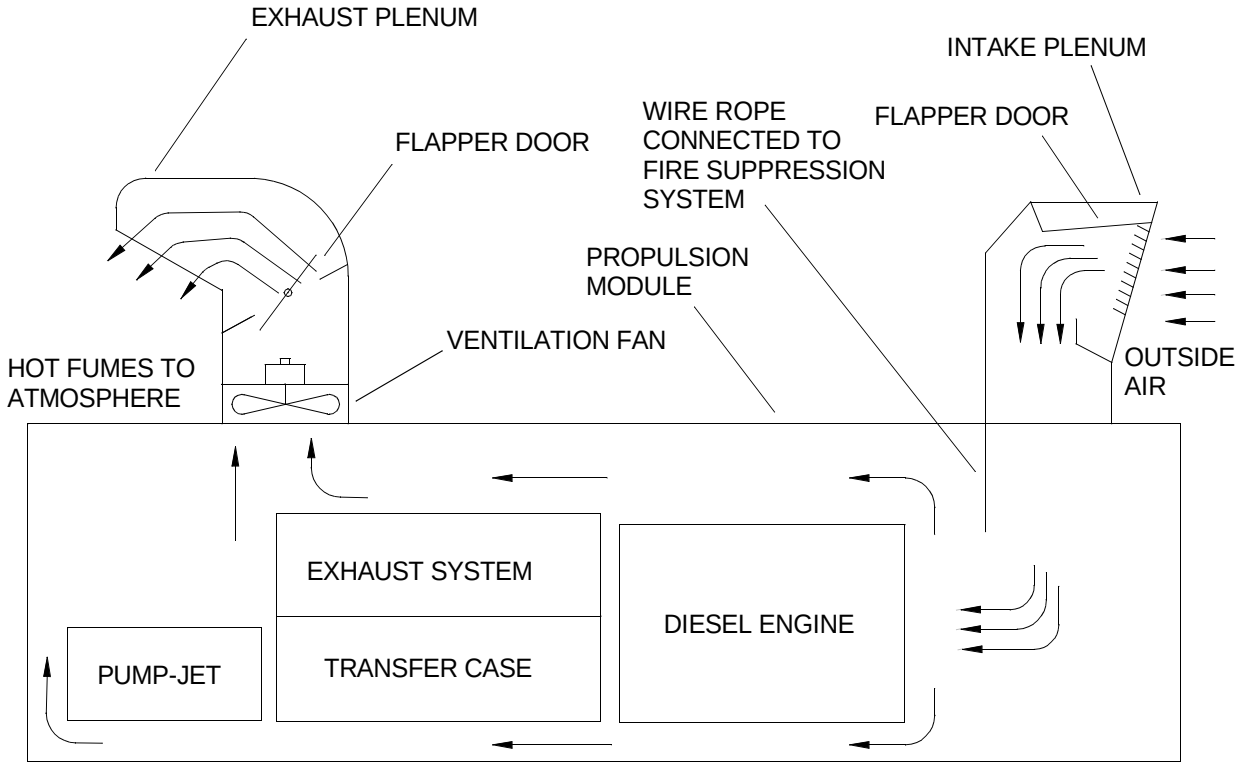
A ventilation fan draws hot fumes from below deck within the machinery compartment of the propulsion module. The blower moves air through the exhaust plenum at 3075 cubic ft per minute. It removes heat from the engine, pump-jet and drive train components, forcing the hot fumes above deck and expelling them to the atmosphere. The marine duty 18 in. inner diameter ventilation fan has a cast aluminum alloy fan and is located at the intake side of the exhaust plenum. The blower has a ¾ HP, 24 VDC motor and runs at 1750 RPM. Under normal operating conditions, the blower is controlled from a toggle switch located in the operators cab. If the fire suppression system is activated, power to the blower is disconnected automatically.

Exhaust Plenum

A welded metal structure, the exhaust plenum contains a ventilation fan and a flapper door. It is mounted on the thruster hatch of the propulsion module facing aft and provides ventilation for the machinery compartment of the propulsion module. A ventilation fan at the intake end of the plenum draws air from below deck, creating a vacuum which draws air through the intake plenum and expels hot, toxic fumes to the atmosphere.

Exhaust Plenum Flapper Door (Damper)

A hinged flapper is housed within the plenum. It is manually opened and closed. If the fire suppression system is activated, the flapper has to be closed manually, eliminating a second source of air to any fire below deck.



VENTILATION SYSTEM FUNCTIONAL DIAGRAM

CF ELECTRICAL SYSTEM

The CF propulsion units are supplied with a 24 VDC main power source. This provides power to the engine starter solenoid and the operating systems. The main power source is charged from the engine regulator/alternator system via the isolation diode. The propulsion units are also equipped with an auxiliary 24 VDC power supply that is used to operate the pump-jet thruster indicator directional system. The two auxiliary battery units are also charged from the engine regulator/alternator via the isolation diode. The auxiliary battery system provides power in case the main 24 VDC power source fails. The main power source provides power to the main circuit breaker panel for distribution to the operating systems. The power cables feed from the propulsion module through the electrical interconnection box up to the cab.

Ventilation

Both port and starboard units are equipped with a ventilation system. This system circulates outside air from the intake plenum through the engine compartment and out the exhaust plenum. The ventilation system is operated by a blower equipped with a ¾ HP, 24 VDC motor. The unit is powered by the 24 VDC main power system, main circuit breaker, CO2 pressure switch, operator switch and A8K1 relay.

Bilge Flood Warning and Control System (Port or Starboard)

The system is powered by the main 24 VDC power source. The power is fed through the propulsion module circuit breaker panel A6 to the bilge pump control panel A5 and single bilge pump control panel A7 up to the cab control. The float switches provide the signal to the cab control that allows the operator to hear the alarm and check the red activated indicator(s) for location of flooding. The alarm silence switch should also be activated. The pump run switch provides power to the pump start relay contacts that start the pump and activates the green indicating lamp.

Communications

AN/VRC-88D SINCGARS RADIO. The AN/VRC-88D SINCGARS radio receives 24 VDC power from the main power system via the cab circuit breaker panel. The signal output of the transmitter is generated from the outdoor antenna.

VHF/FM DSC TRANSCEIVER. The VHF/FM DSC transceiver receives 12 VDC power from the main power system via the VHF/FM DSC transceiver voltage converter. This circuit is protected by an inline 10 amp fuse that is fed through a ferrite line interference conditioner from the cab circuit breaker panel. The signal output of the transceiver is generated from the transceiver antenna.

VHF/FM HANDHELD TRANSCEIVER. The VHF/FM handheld transceiver receives its power from a self-contained, replaceable and rechargeable nickel-cadmium battery pack. The battery packs are recharged by battery chargers. The battery chargers receive 12 VDC power from the main power system via the DC to DC converter.

LOUDHAILER. The loudhailer receives 12 VDC power from the main power system via the DC to DC converter.

VHF/FM DSC TRANSCEIVER VOLTAGE CONVERTER. The 24 VDC to 12 VDC voltage converter receives 24 VDC power from the main power system and reduces the voltage to 12 VDC to power the VHF/FM DSC transceiver.

DC TO DC CONVERTER. The 24 VDC to 12 VDC voltage converter receives 24 VDC power from the main power system and reduces the voltage to 12 VDC to power the loudhailer, interface and switchbox and VHF/FM handheld transceiver battery chargers.

AN/PSN-11 INTERFACE AND SWITCHBOX. The AN/PSN-11 interface and switchbox receives 12 VDC power from the main power system via the DC to DC converter.

AN/PSN-11(V)1 PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR). The AN/PSN-11(V)1 PLGR receives 12 VDC power from the AN/PSN-11 interface and switchbox.

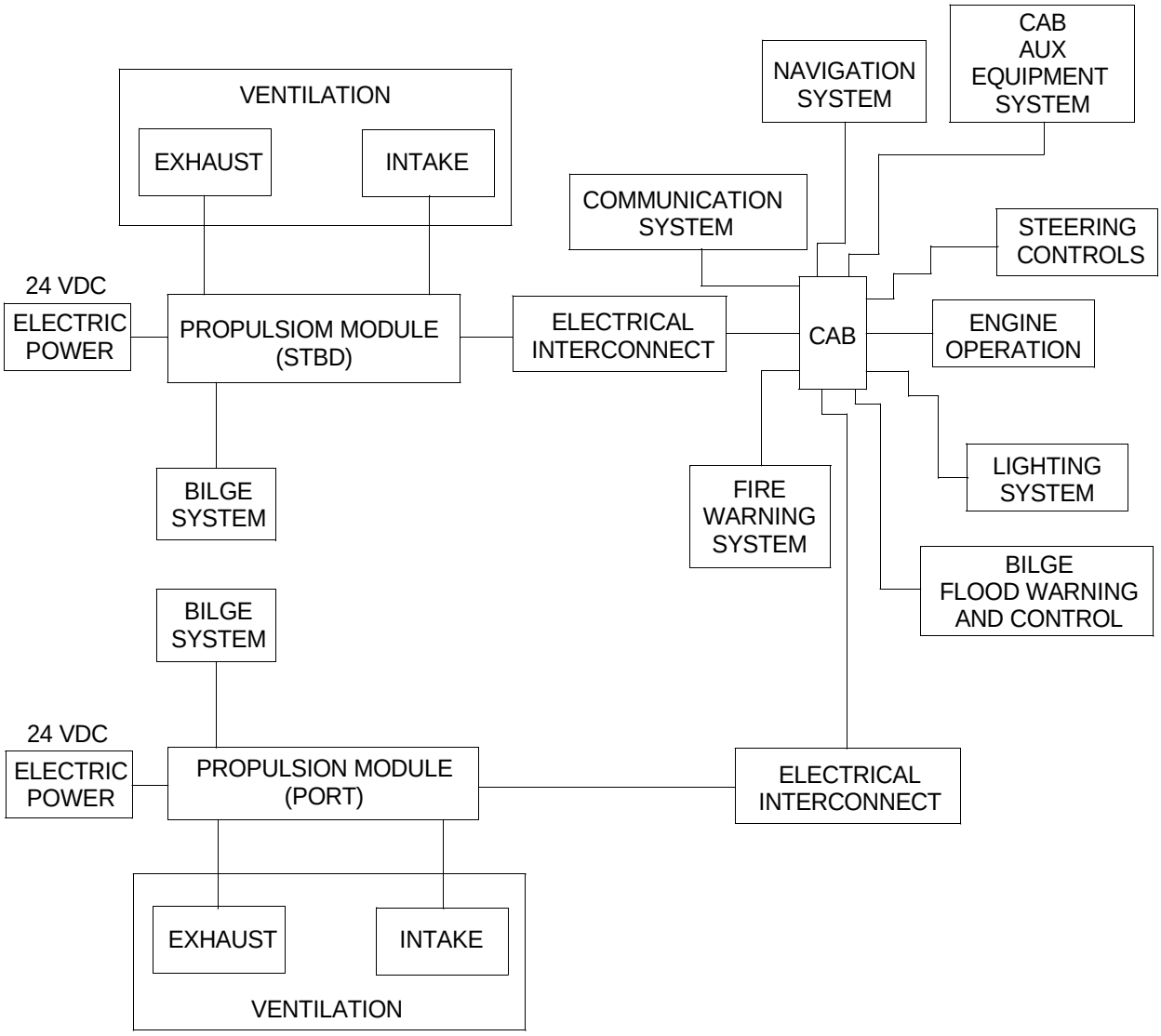
Navigation System

NAVIGATION LIGHTS. The main mast and stub mast navigation lights receive 24 VDC power from the main power system via the cab circuit breaker panel A3 through the cab’s mast enclosure assembly A7. The enclosure contains the switches, warning lights and alarm system for controlling the main mast and stub mast lights.

HORN. The outside horn receives 24 VDC power from the main power system via the cab circuit breaker panel A3 and the operator control pushbutton on the middle control panel A1.

COMPASS. The compass contains an operation light that is powered from the panel dimmer switch fed by the cab circuit breaker panel A3.

SPOTLIGHT. The spotlight receives 24 VDC power from the main power system via the cab circuit breaker panel A3 and the operator control switch on the middle control panel A1.



CF ELECTRICAL BLOCK DIAGRAM

Engine Operation (Port and Starboard)

The engine receives 24 VDC power from the main power system that operates the engine starter motor, starter contact B1 and engine starter solenoids L3, which is activated by a K2 relay-operator control. During cold weather conditions (-25°F or less), an engine cold pack starting aid automatically supplies ether into the air inlet housing of the blower. In case of extreme cold weather starting conditions, the engine power system is also equipped with a NATO jumper cable receptacle. The engine contains the following operation switches of sending units that provide signals to the operator controls listed below.

FUEL OIL PRESSURE SWITCHES. The fuel oil pressure switches provide signals to the operators console for starting or stopping of the engine.

LOW OIL PRESSURE SWITCH. The low oil pressure switch provides a signal to the operators console to activate the K2 relay that activates the engine alarm bell and light.

HIGH WATER TEMP SWITCH. The high water temp switch provides a signal to the operators console to activate the K2 relay that activates the engine alarm bell and light.

WATER TEMP SENDING UNIT. The water temp sending unit provides a signal to the operators console for engine water temperature readout.

OIL TEMP SENDING UNIT. The oil temp sending unit provides a signal to the operators console for engine oil temperature readout.

OIL PRESSURE SENDING UNIT. The oil pressure sending unit provides a signal to the operators console for engine oil pressure readout.

ENGINE NORMAL STOP PUSHBUTTONS. The engine normal stop pushbuttons disconnect the 24 VDC signal to the governor controller that will stop the engine under normal conditions.

ENGINE HOUR METER. The engine hour meter receives 24 VDC power from the main power system and is energized when the fuel oil pressure switch is closed, the engine power switch is turned on and the circuit breaker switch is activated.

Engine Alternator

The engine alternator provides power to recharge the main battery and auxiliary battery systems. It is controlled by the A9VR1 voltage regulator and distributed through the A91S1 isolation diode. The 65 amp alternator also provides a signal to the operators console for the engine RPM/tachometer readout. The operators console ammeter(s) indicate the system batteries charge and discharge in amps.

Electronic Speed Switch

The electronic speed switch provides a signal to the system via the engine magnetic pick-up. This system activates the emergency stop circuit by energizing the air flap solenoid, tripping the air flap closed when the engine RPM exceeds 2300 RPM. The power source is 24 VDC power from the main power system operated through the fuel oil pressure switch from the main breaker.

Engine Governor

The engine governor provides a minimum/maximum speed range (800 - 2100 RPM) for normal engine operation. The power source is 24 VDC power from the main power system operated through the engine power switch on the middle control panel A1 and propulsion module circuit breaker panel A6.

Operator Engine Control, Alarms and Indicator System

The following items extend the engine system for engine operation.

ENGINE GAUGES. The engine gauges receive their signals from the engine and are powered from the fuel oil pressure switch via the main breaker panel and the engine power switch.

ENGINE GAUGES TEST SWITCHES. The engine gauges test switches provide power from the main circuit breaker to the power side of the gauges to activate them during test prior to start-up.

ENGINE POWER SWITCHES. The engine power switches provide power from the main circuit breaker to the engine starting, stopping and fuel oil pressure switch for gauge operation.

ENGINE START SWITCHES. The engine start switches provide power to the engine start relay A1K1 from the main breaker panel through the engine power switch and through the clutch deenergized, normally closed, relay. If the clutch switch is not disengaged from either the engaged forward or backflush positions, the engine will not start.

ENGINE ALARM WARNING/INDICATING SYSTEM. The engine alarm warning/indicating system, upon receiving an alarm from the port or starboard engine high water temp or low oil pressure, will activate an indicating light and bell. At this point, the alarm/silence/test switch can be actuated.

ALARM/SILENCE/TEST SWITCH. The alarm/silence/test switch, when moved from the alarm to the silence position, cuts power to the bell A4LS1 and provides power to the indicating light. When the alarm condition is cleared, the indicating light will go out and the switch can be moved back to the alarm position. The test position will provide power to the bell and the indicating light via the circuit breaker panel. This test position is a momentary contact.

ENGINE THROTTLE CONTROL. The engine throttle control provides a signal to the engine governor that tells the engine to speed up or to slow down. The power source for this control comes from the governor.

MARINE GEAR (FORWARD/DISENGAGED/BACKFLUSH). The marine gear (forward/disengaged/backflush) provides power to shift the gear solenoids. This power comes from the main breaker panel and activates the forward solenoid or backflush solenoid. The A4K2 port and A4K3 starboard relays activate an indicating light. When the clutch is left in the forward or backflush position, the engine stops and the system is shut down. The engine starting system will not work because the clutch relay contacts in the starting circuit will be open and the engine will not start.

Lighting System

OPERATOR STATIONS. The operator stations middle and lower control panel lights receive 24 VDC power from the main power system via the cab circuit breaker panel. The lights are activated by their switch control source and controller by a dimmer switch. The operation lights used for the gauges are red and require no dimming effect. The operation lights are powered from the same circuit, but does not go through the dimmer switch.

CAB SPOTLIGHT. The cab spotlight receives 24 VDC power from the main power system via the operators cab circuit breaker panel and the operator control switch and is used for night deck work and navigation buoy night identification.

BATTLE LANTERNS. The battle lanterns are powered by 6 VDC batteries. The cab light has a red lens and below deck lights have white lenses.

Steering (Port and Starboard) Systems

PUMP-JET THRUSTER DIRECTIONAL CONTROL. The pump-jet thruster directional controls are manually controlled joysticks on the operators console receives 24 VDC power from the main power system to direct port and starboard pump-jet thrusters. The joysticks move forward and backward only. The system is controlled from the main breaker panel through the thruster junction box breaker, which operates the clockwise and counterclockwise rotation relays and contacts K1 and K2 that operate the hydraulic power units thruster solenoids A2jb1-L4 and L5. The reaction speed of the solenoids are controlled by variable resistors A2jb2-R1 and R2.

PUMP-JET THRUSTER DIRECTIONAL INDICATORS. The pump-jet thruster directional indicators receives 24 VDC power from the alternator and the auxiliary 24 VDC battery supply through the propulsion module circuit A6CB14 and is activated by the A9K1 relay contact, which is controlled by the engine starting system. The 24 VDC power to the pump-jet thruster directional signal and indicator has a line converter that stabilizes the 24 VDC power source. The pump-jet thruster directional signal comes from the feedback resistor control.

FIRE ALARM SYSTEM (PORT AND STARBOARD). The fire alarm system (port and starboard) receives 24 VDC power from the propulsion module circuit breaker A6CB4. The circuit is activated by two temperature switches, S8 and S9, that send signals up to the operators console and activates the fire alarm horn and warning light. The circuit also has an alarm/silence/test switch which, when moved from the alarm to the silence position, cuts power to the alarm horn and provides power to the indicating light. When the alarm condition has cleared, the indicating light will go out and the switch can be moved back to the alarm position. The test position will provide power to the horn and indicating light via the cab circuit breaker panel. This test position is a momentary contact.

Cab Auxiliary Systems

HYDRAULIC OIL LOW LEVEL INDICATOR (PORT AND STARBOARD) UNITS. The hydraulic oil low level indicators (port and starboard units) receive a signal from a float switch sending unit in the hydraulic tank, which provides a signal up to the operators console via the main breaker 24 VDC power system.

PUMP-JET GEARCASE LOW OIL LEVEL INDICATOR. The pump-jet gearcase low oil level indicator receives its signal from the oil level sending unit. The 24 VDC power comes from the main breaker panel through the sending unit and activates the low level indicator.

WINDSHIELD WIPER. The operator control switch provides power to the wiper motor from the cab circuit breaker panel main 24 VDC power system.

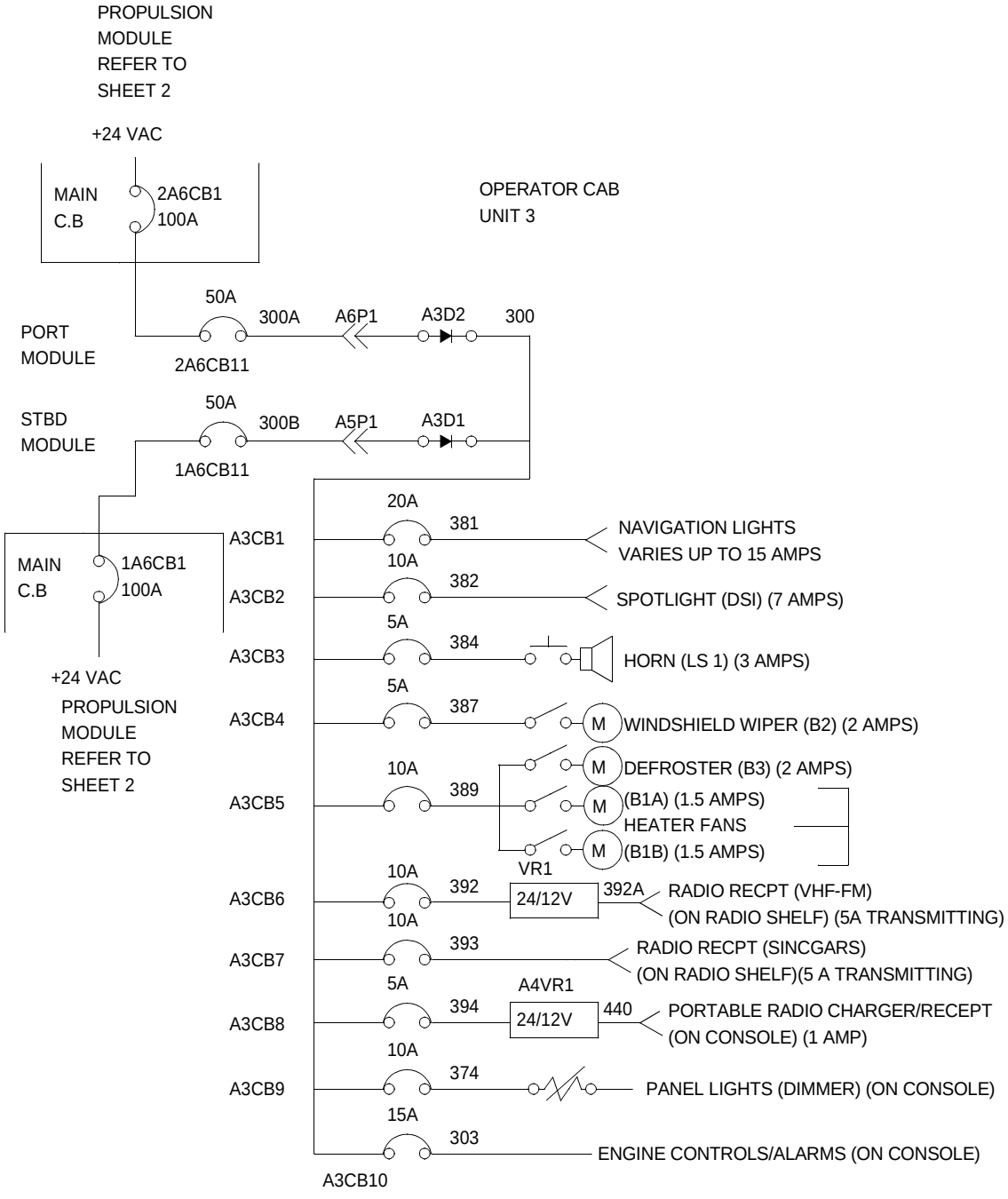
CAB HEATER. Water, heated by the engine cooling system, is circulated through the cab heater. The operator control switch low/off/high provides power to the heater blower motor from the 24 VDC main power system through the cab breaker panel. The blower moves air around the heater coils, heats it and circulates the hot air through the cab.

WINDOW DEFROSTER. Heated air from the engine provides defrosted air. The operator control switch turns 24 VDC on or off to the blower motor from the cab breaker panel via the main power system.

CAB CIRCUIT BREAKER TEST PANEL. The system’s power sources and the subsystems DC voltage supplies have test points on this panel that provide output voltage test points, which can be monitored by a handheld voltmeter.

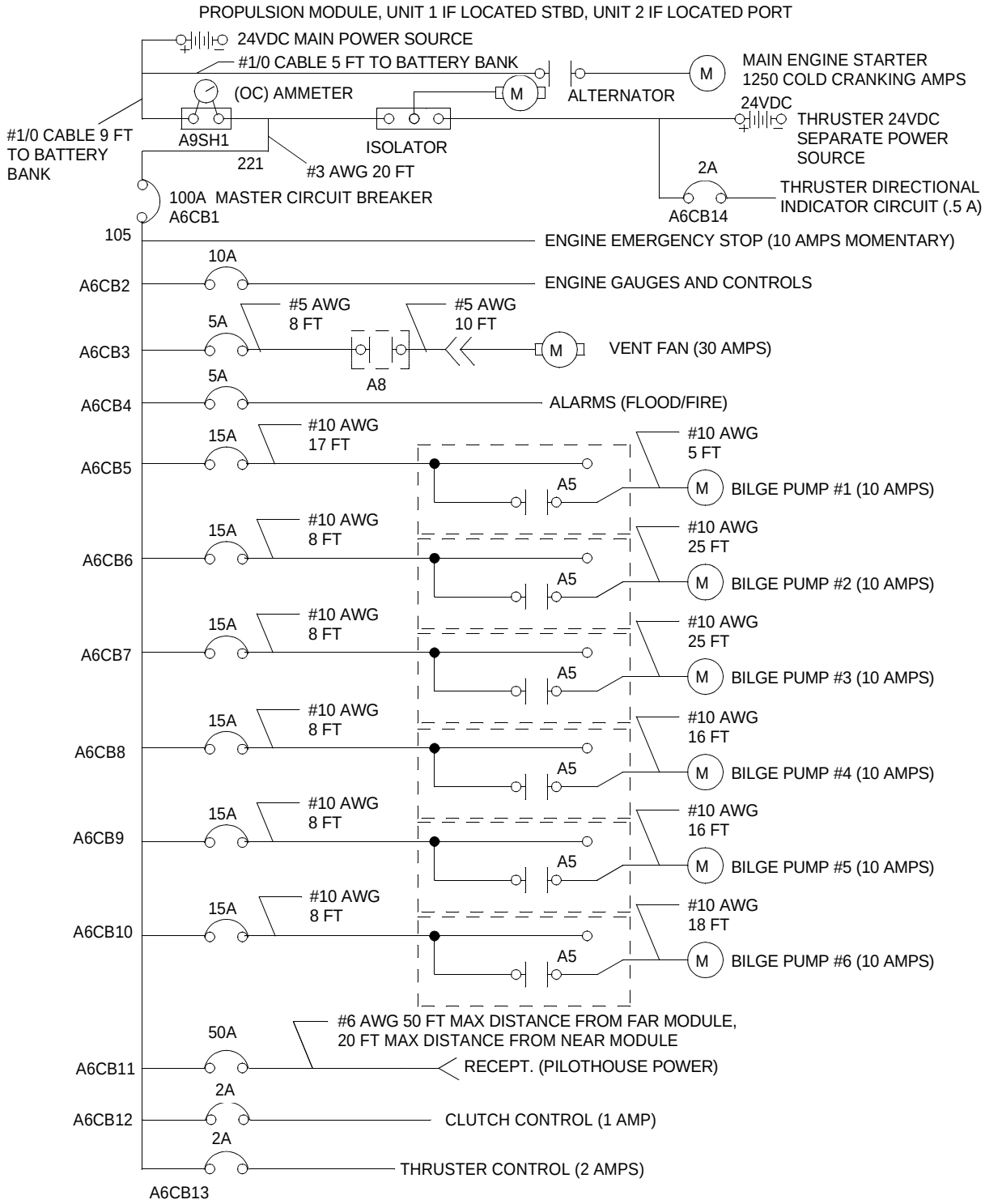
Electrical Interconnect System

This cable cross deck connection provides power and signal information between the cab twist lock plug/receptacles A5/A6 and the air intake plenum twist lock plug/receptacles A5/A6. Interconnection is determined by operators cab location port or starboard.



NOTE: ALL INTERNAL HOOK-UP WIRE IS 14 OR 16 AWG
SOME DEVICES ARE PROVIDED WITH PRE-WIRED PIGTAILS FOR CONNECTIONS.

ELECTRICAL ONE-LINE DIAGRAM (SHEET 1 OF 2)



ELECTRICAL ONE-LINE DIAGRAM (SHEET 2 OF 2)

HYDRAULIC SYSTEM

Powered (Normal) Operation

The hydraulic system contained within each propulsion module provides the steering power and control for rotation of the pump-jet discharge nozzle. The four subsystems comprising this system include: 1) the reservoir system that stores, cools and filters the hydraulic fluid being pumped through the system; 2) the pump drive system, which provides the power to the steering motor; 3) the way valve assembly, which protects the hydraulic system from over pressurization and controls the actuation of the hydraulic steering motor; and 4) the hydraulic steering motor drive system, which turns the discharge nozzle through 360° continuous rotation in both directions.

Emergency (Manual) Operation

In the event of loss of steering control at the cab due to an electrical failure, the steering system can be manually operated by one of two methods: 1) the use of a manual control lever on the way-valve unit; and 2) the fit-up of the emergency steering unit on the auxiliary planetary gearbox with manual release of the hydraulic brake.

Hydraulic Reservoir

In addition to storing the system hydraulic fluid, the hydraulic reservoir also cools 26 gallons of fluid with open air to all sides, including top and bottom. It also filters the oil through the suction line strainer, return line filter and filler neck screen. The reservoir is equipped with an external sight level gauge to determine actual fluid level and an in-tank float switch to monitor fluid level within and to notify the operator via an indicating light in the cab when it falls below the required level.

Hydraulic Pump

The axial piston hydraulic pump provides the power to drive the hydraulic motor. The pump is driven off the marine gear and is fitted with a flow control regulator. The drive shaft of the hydraulic pump drives a cylinder block causing the pistons within to move in an axial direction. The stroke of the pistons is limited by an internal swash plate which adjusts around the vertical axis of the input shaft, varying the displacement of oil flow infinitely.

Way-Valve Unit

The proportional way-valve is controlled by means of the electrically operated proportional pressure valves or manually by means of the lever on the valve unit. The way-valve guides the hydraulic oil via the dual braking valve to the hydraulic motor.

Dual Braking Valve

The dual braking valve (load retaining valve) avoids uncontrolled rotation of the hydraulic motor caused by negative loads and locks the lines to the hydraulic motor tightly when the way-valve is in the rest position.

Hydraulic Motor

The hydraulic motor is mounted on the input shaft of the pump-jet steering planetary gearbox. The axial piston motor is a constant speed unit with fixed oblique discs supporting nine pistons configured as a rotor.

Three-Way Valve

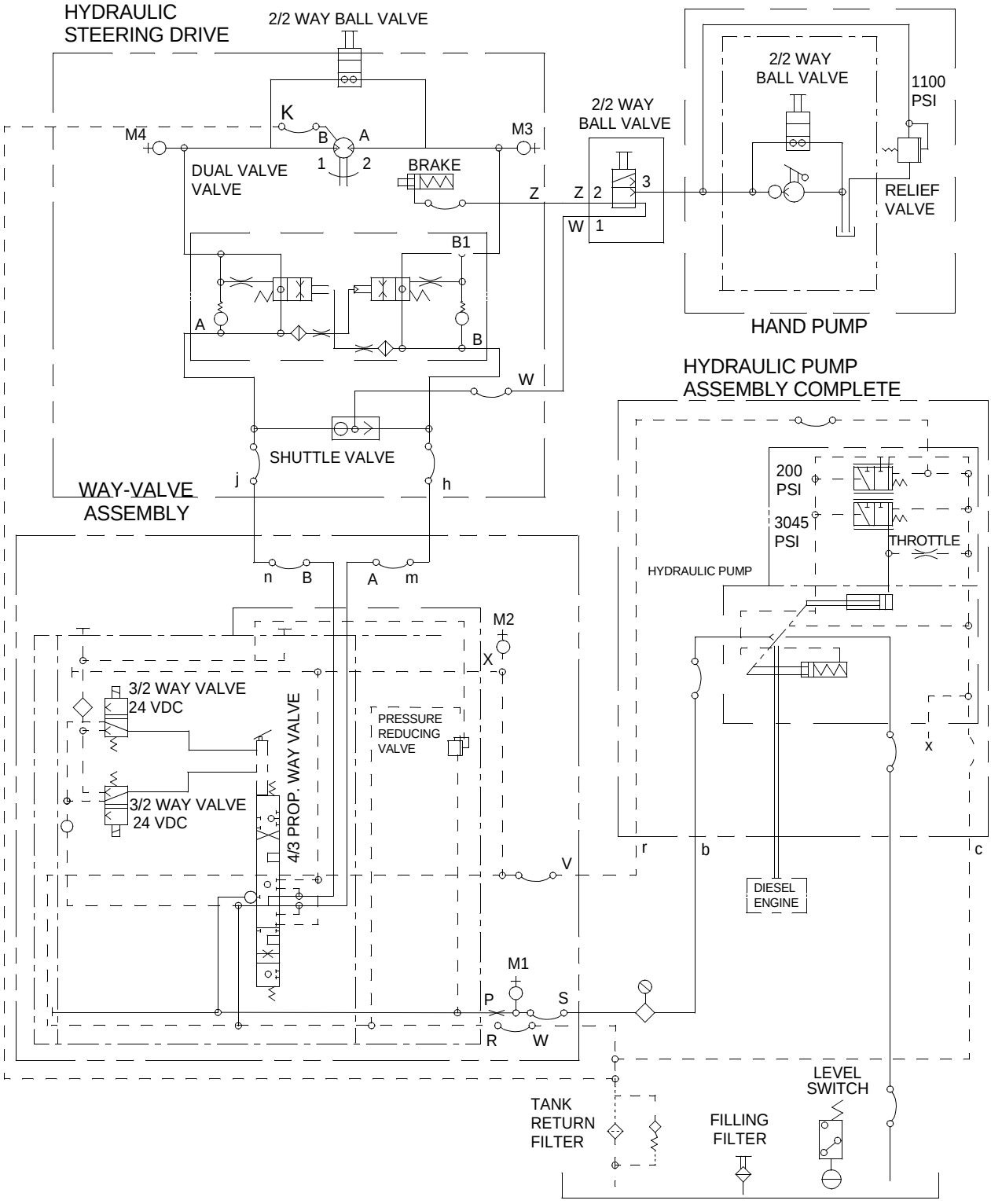
A manually operated, lever actuated, three-way valve is positioned to select normal hydraulic operation or to isolate the normal hydraulic, so the manual hydraulic hand pump can be used to release the hydraulic brake for emergency steering operation.

Two Way-Valve

A two-way (needle) valve in the closed position during normal operation must be opened to allow for the manual releasing of the hydraulic brake via the hydraulic hand pump.

Manual Hydraulic Hand Pump

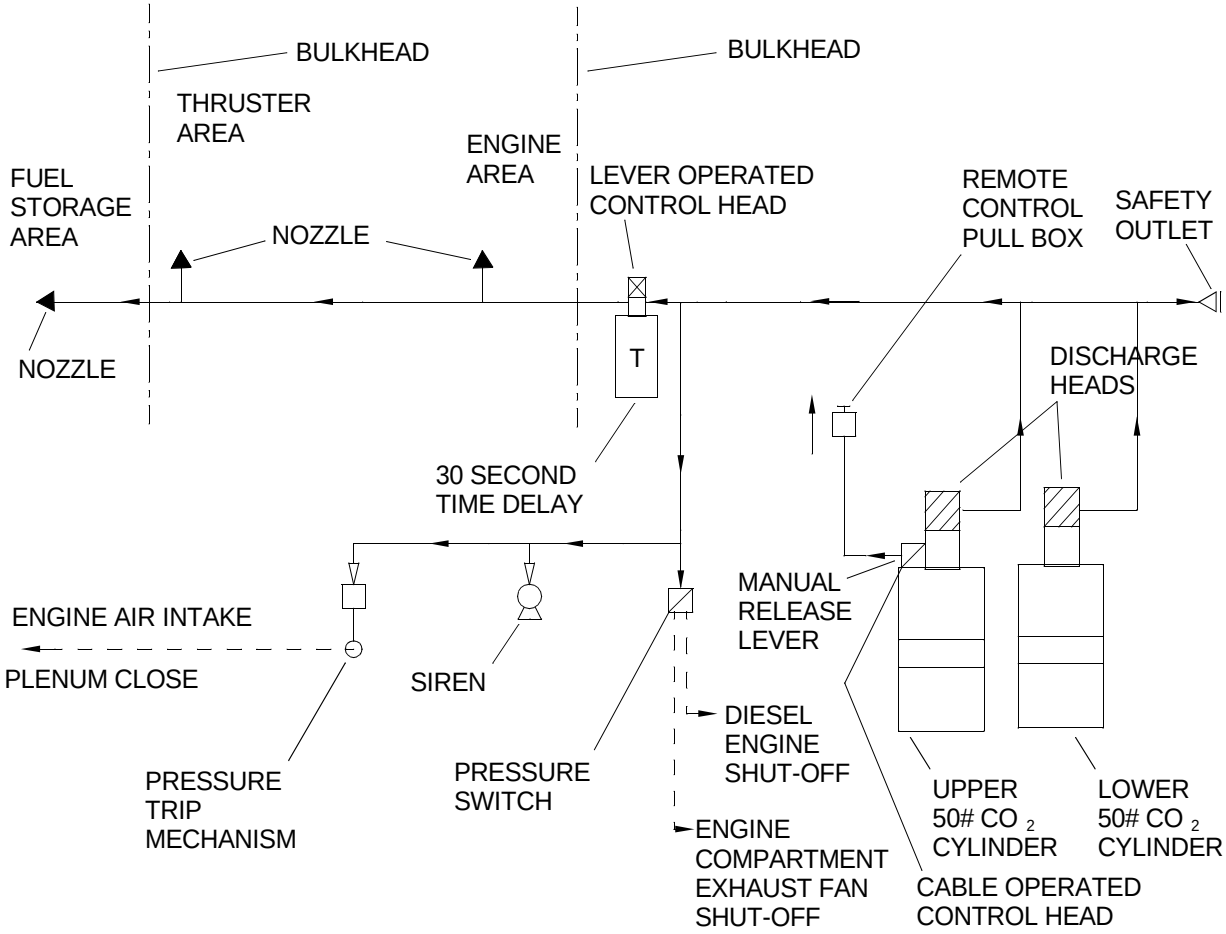
The hydraulic hand pump used to release the hydraulic brake for emergency steering operation is equipped with its own small hydraulic reservoir, pressure relief valve and oil level dipstick.



HYDRAULIC SYSTEM DRIVE

FIRE SUPPRESSION SYSTEM

The fire suppression system is designed to flood the powered module machinery and fuel storage compartments with carbon dioxide (CO2) if a fire breaks out. System activation is accomplished manually using a remote control pull box recessed in the deck directly forward of the operators cab and air intake plenum. Manual activation is also provided below deck in the lazaret, where the agent is stored, but not dispersed. The upper 50 lb CO2 cylinder is equipped with a manual release lever, which initiates discharge the same way as the remote control pull box handle. The 30 second time delay device is also equipped with a manual release handle. However, actuation using this control will bypass the 30 second time delay. Upon activation, CO2 is released into the system. The discharged CO2 is directed down two circuit paths. One circuit directs the agent to a pressure operated switch, which immediately shuts off the diesel engine and machinery compartment exhaust fan. The flow of CO2 also activates a warning siren and operates a pressure trip mechanism to close off the machinery compartment air intake plenum opening. The second circuit directs CO2 to a 30 second time delay device to allow evacuation time for personnel prior to CO2 discharge into the protected compartments via the three nozzles. It also provides the delay time needed for the other circuit to shut-down the engine and close all air intake and exhaust systems.



FIRE SUPPRESSION SYSTEM SCHEMATIC

CHAPTER 2

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT TROUBLESHOOTING PROCEDURES FOR MODULAR CAUSEWAY SYSTEM (MCS) CAUSEWAY FERRY (CF)

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
TROUBLESHOOTING PROCEDURES INDEX

MALFUNCTION/SYMPTOM	TROUBLESHOOTING PROCEDURE
Above Deck Systems	
Interconnect Cable Not Working Between Modules	WP 0053 00
Lamp Fixture On Main or Stub Mast Not Working	WP 0078 00
Lamp Indicator Light On Mast Enclosure Junction Box Not Working	WP 0080 00
Loss Of Power to Main or Stub Mast	WP 0079 00
Navigation Lights Will Not Function	WP 0081 00
One or More Navigation Lights Are Not Functioning	WP 0082 00
Spotlight Not Functioning	WP 0062 00
Stub Mast Stern Light Not Functioning	WP 0083 00
Precision Lightweight Global Positioning Receiver (PLGR)	
Does Not Display a Valid Position	WP 0076 00
Has No Power	WP 0075 00
Diesel Engine	
Alternator Is Not Charging Batteries	WP 0041 00
Becomes Hotter Than Normal Operating Temperature	WP 0012 00
Engine Malfunctions (TM 55-1945-205-24-3-2)	WP 0014 00
Does Not Run Properly	WP 0017 00
Does Not Start In Cold Temperatures	WP 0026 00
Electronic Governor Engine Junction Box A4 Is Completely Dead; Actuator Lever Stays at Minimum Position When Power Is Applied to Governor	WP 0021 00
Exhaust System Has Developed Exhaust Leaks	WP 0025 00
Exhaust System Has Developed Water Leaks	WP 0023 00
Has No Exhaust Smoke	WP 0016 00
Misfiring Caused by Clogged or Damaged Injectors	WP 0020 00
Not Receiving Fuel From Fuel Tank	WP 0019 00
Not Operating; Electronic Governor Actuator Goes To Full Stroke When DC Power Applied	WP 0022 00

MALFUNCTION/SYMPTOM	TROUBLESHOOTING PROCEDURE
Diesel Engine - Continued	
Smoke Is Consistently White In Nature	WP 0015 00
Hydraulic System	
Has High Pressure	WP 0032 00
Has No Pressure	WP 0033 00
Public Address Set (Loudhailer)	
Has No Power	WP 0067 00
Will Not Transmit Voice To Hailer Horn (Loudhailer External Speaker)	WP 0068 00
Will Not Transmit Fog Signal To Hailer Horn (Loudhailer External Speaker)	WP 0069 00
Will Not Transmit VHF/FM DSC Transceiver Audio To (Loudhailer External Speaker)	WP 0070 00
Operators Cab	
A Circuit Controlled By 3A3CB1-3A3CB10 Is Not Functioning	WP 0059 00
All Circuits Controlled By 3A3CB1-3A3CB10 Is Not Functioning	WP 0058 00
Ammeter Indicates Discharging Of System	WP 0042 00
Accessories Do Not Function	WP 0057 00
Clutch Status Light Not Operational	WP 0055 00
Defroster Fan Does Not Operate	WP 0066 00
Fan B1B Does Not Operate With Heater Fan Control In High	WP 0065 00
Fan Control Does Not Work On Low	WP 0063 00
Flood Alarm Beeper Does Not Operate	WP 0009 00
Flood Alarm Light 3A2DS2 Does Not Illuminate In Alarm Mode	WP 0010 00
Gauge Lights Will Not Operate or Vary In Brightness	WP 0056 00
Improper Engine Speed Control from Operators Cab	WP 0018 00
Low Engine Oil Pressure (Engine Audible Alarm and Warning Light Will Come On) (Normal Operation)	WP 0027 00
Mast Light Audible Pulse Beeper Sounds	WP 0077 00
No Steering from Operators Cab	WP 0040 00
No Power to the Operators Cab Control Panel	WP 0054 00

MALFUNCTION/SYMPTOM	TROUBLESHOOTING PROCEDURE
Operators Cab - Continued	
No Steering Control	WP 0037 00
No Steering Control Indication for the Pump-Jet	WP 0038 00
No Steering From Operators Cab - Low Hydraulic System Pressure	WP 0034 00
No Voltage at Test Jacks When Using Built In Test Switch 3A3S1	WP 0061 00
No Voltage at Test Jacks When Using Built In Test Switch 3A3S1 in Any Position	WP 0060 00
Only Fan B1B Operates with Heater Fan Control In High	WP 0064 00
Overheating (Engine Audible Alarm and Warning Light Will Come On)	WP 0028 00
Steering Reacts Sluggishly	WP 0039 00
Vent Fan Operating Status Light Does Not Illuminate	WP 0008 00
Propulsion Module	
Bilge Pump Output has Reduced Flow	WP 0046 00
Bilge Pump Status Lights Are Not Functional	WP 0048 00
Bilge Pump Will Not Shut Off	WP 0047 00
Bilge Pumps Do Not Function	WP 0043 00
Bilge Pumps Will Not Function In Test Mode (From Bilge Junction Boxes A5 & A7)	WP 0044 00
Bilge Pumps Will Not Function In Remote Mode From Operators Cab	WP 0045 00
Drive Train Does Not Operate Freely and Smoothly; Excessive Vibration is Experienced During Operation	WP 0013 00
Fire Alarm Horn 3A4LS2 Does Not Operate	WP 0051 00
Fire Alarm Light 3A2DS2 (STBD) OR 3A2DS1 (PORT) Does Not Illuminate In Alarm Mode	WP 0052 00
Flood Alarm Beeper Does Not Operate	WP 0009 00
Flood Alarm Light 3A2DS2 Does Not Illuminate In Alarm Mode	WP 0010 00
Marine Gear Clutch Will Not Engage In ENGAGE/BACKFLUSH Directions	WP 0030 00
Marine Gear Malfunctions	WP 0029 00
No Propulsion from Pump-Jet	WP 0035 00

MALFUNCTION/SYMPTOM	TROUBLESHOOTING PROCEDURE
Propulsion Module - (Continued)	
Propulsion Module Becomes Hotter than Normal Operating Temperature	WP 0012 00
Pump-Jet Can Only Develop a Small Amount of Thrust (Not Enough Water is Being Delivered)	WP 0036 00
Thermal Detector Does Not Trip Fire Alarm	WP 0050 00
Transfer Case Malfunctions	WP 0031 00
Exhaust Plenum Vent Fan Will Not Operate	WP 0007 00
Exhaust Plenum Ventilation Fan Does Not Work	WP 0011 00
Water Entering Bilge From Pump Discharge Line When Pump is Not Operating	WP 0049 00
Water is Not Expelling Out of Exhaust Outlet Port Ad/Or Transfer Case Cooling System Port	WP 0024 00
VHF/FM DSC Transceiver	
Does Not Display Valid Position	WP 0074 00
Has No Power	WP 0071 00
Will Not Receive	WP 0072 00
Will Not Transmit	WP 0073 00

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
EXHAUST PLENUM VENTILATION FAN
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Personnel Required
Engineer 88L
References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

EXHAUST PLENUM VENT FAN WILL NOT OPERATE

NOTE

This troubleshooting procedure is typical for both the starboard and port vent fans.

SYMPTOM

Vent fan will not operate.

MALFUNCTION

Faulty vent fan toggle switch on lower control panel A2.

CORRECTIVE ACTION

Replace toggle switch. (WP 0264 00)

Perform operational check of vent fan. (TM 55-1945-205-10-1)

MALFUNCTION

Faulty vent fan toggle switch on propulsion module circuit breaker panel A6.

CORRECTIVE ACTION

Replace toggle switch. (WP 0264 00)

Perform operational check of vent fan. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between 3A2S21 (port) or 3A2S22 (stbd) and the operators cab terminal block assembly (unit 3A4).

CORRECTIVE ACTION

With fan control on, use multimeter to check for 24 VDC at TB1-14/TB10-3 and TB3-14/TB10-3 at the operators cab terminal block assembly.

If 24 VDC is not present, use multimeter to check wiring continuity between 3A2S21 and 3A2S22 an the operators cab terminal block assembly. Repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of vent fan. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between operators cab terminal block assembly and the propulsion module junction box.

CORRECTIVE ACTION

With fan control on, use multimeter to check for 24 VDC at TB1-14/TB10-3 and TB3-14/TB10-3 at the operators cab terminal block assembly.

If 24 VDC is present, use multimeter to check for 24 VDC at TB1-15/TB3-5 in the appropriate propulsion module junction box.

If 24 VDC is not present, use multimeter to check continuity of interconnect wiring between the propulsion module junction box and the operators cab lower control panel assembly 3A2S21 (port) and 3A2S22 (stbd). Repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of vent fan. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
VENT FAN STATUS LIGHT
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

VENT FAN OPERATING STATUS LIGHT DOES NOT ILLUMINATE

NOTE

This troubleshooting procedure is typical for both vent fans.

SYMPTOM

Operating status light for the vent fan does not illuminate.

MALFUNCTION

Failed lamp.

CORRECTIVE ACTION

Replace lamp. (WP 0268 00)

Perform operational check of vent fan. (TM 55-1945-205-10-1)

MALFUNCTION

Open wiring to status light A2DS6 (port) or A2DS7 (stbd) in lower control panel A2.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at 3A2S21-3/3A2DS2-2 and 3A2S22-3/3A2DS2-2 in the lower control panel A2.

If 24 VDC is present, use a multimeter to check wiring for continuity between 3A2S21 and 3A2DS6 (port) and 3A2S22 and 3A2DS7 (stbd) as applicable. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of vent fan. (TM 55-1945-205-10-1)

MALFUNCTION

Faulty diode 3A2D15 (port), 3A2D16 (stbd) in lower control panel A2.

CORRECTIVE ACTION

Replace diode 3A2D15 (port) or 3A2D16 (stbd) lower control panel A2. (WP 0360 00)

Perform operational check of vent fan. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
FLOOD ALARM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

FLOOD ALARM BEEPER DOES NOT OPERATE

NOTE

This troubleshooting procedure is typical of both flood alarm beepers.

SYMPTOM

No operation of flood alarm beeper.

MALFUNCTION

24 VDC is not present at beeper A2SL1 in lower control panel A2.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at beeper terminals 3A2LS1(+)/3A2LS1(-) in lower control panel A2.

If 24 VDC is present, replace beeper. (WP 0269 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

If voltage is not present, proceed to next step.

MALFUNCTION

Open beeper circuit.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at 3A2S2/3A2LS(-) in lower control panel A2.

If 24 VDC is present, use multimeter to check continuity of wiring between 3A2S2 and 3A2LS1. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

MALFUNCTION

Failed switch 3A2S2 in lower control panel A2.

CORRECTIVE ACTION

If 24 VDC was not present in the previous step, use multimeter to check for 24 VDC at 3A2S2-1/3ASLS1(-).

If 24 VDC is present, replace switch. (WP 0264 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

MALFUNCTION

Open in wiring between operators cab lower control panel A2 and terminal strip A4.

CORRECTIVE ACTION

If 24 VDC was not present in the previous step, use multimeter to check for 24 VDC at 3A4TB4-18/3A4TB10-3 at the operators cab terminal strip A4.

If 24 VDC is present, use multimeter to check continuity of wiring. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

MALFUNCTION

Open in wiring between operators cab terminal strip A4 and propulsion module junction box A3.

CORRECTIVE ACTION

If 24 VDC was not present in the previous step, use multimeter to check for 24 VDC at TB1-16/TB3-5 in the appropriate propulsion module junction box A3.

If 24 VDC is present, use multimeter to check continuity of wiring between operators cab terminal strip A4 and propulsion module junction box A3. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

MALFUNCTION

Open in wiring between bilge pump control assembly A5 or A7 and propulsion module junction box A3.

CORRECTIVE ACTION

If 24 VDC was not present in the previous step, use multimeter to check for 24 VDC at TB1-3/TB3-2 in the appropriate bilge pump control assembly A5 or A7.

If 24 VDC is present, check continuity of wiring between bilge pump control assembly A5 or A7 and propulsion module junction box A3. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

MALFUNCTION

Failed diode 1A5D1 (stbd), 2A5D1 (port).

CORRECTIVE ACTION

Replace diode. (WP 0360 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
FLOOD ALARM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

FLOOD ALARM LIGHT 3A2DS2 DOES NOT ILLUMINATE IN ALARM MODE

NOTE

This troubleshooting procedure is typical for both flood alarm lights.

SYMPTOM

No illumination of flood alarm light while in alarm mode.

MALFUNCTION

Failed light bulb.

CORRECTIVE ACTION

Replace light bulb. (WP 0268 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between 3A2DS2 and 3A2S2 in lower control panel A2.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at 3A2S2-5/3A2DS2-2 in lower control panel A2.

If 24 VDC is present, use multimeter to check continuity of wiring between 3A2DS2 and 3A2S2. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

MALFUNCTION

Failed switch 3A2S2 in lower control panel A2.

CORRECTIVE ACTION

If 24 VDC is not present, use multimeter to check for 24 VDC at 3A2S2-6/3A2DS2-2 in lower control panel A2.

If 24 VDC is present but was not present in previous step, replace switch. (WP 0264 00)

Perform operational check of flood alarm beeper. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
EXHAUST PLENUM VENTILATION FAN
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

EXHAUST PLENUM VENTILATION FAN DOES NOT WORK

SYMPTOM

The ventilation fan does not work.

MALFUNCTION

Electrical connection to ventilation fan are not connected properly.

CORRECTIVE ACTION

Attach electrical connection to vent fan relay enclosure A8. (TM 55-1945-205-10-1)

Perform operational check of ventilation fan. (TM 55-1945-205-10-1)

MALFUNCTION

VENT FANS circuit breaker in lower control panel A2 is faulty.

CORRECTIVE ACTION

Replace VENT FANS circuit breaker in lower control panel A2. (WP 0264 00)

Perform operational check of ventilation fan. (TM 55-1945-205-10-1)

MALFUNCTION

Ventilation fan is faulty.

CORRECTIVE ACTION

Replace ventilation fan. (WP 0096 00)

Perform operational check of ventilation fan. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

BECOMES HOTTER THAN NORMAL OPERATING TEMPERATURE

SYMPTOM

Operating temperature of propulsion module becomes hotter than normal.

MALFUNCTION

Flapper door contained within the intake plenum assembly is closed.

CORRECTIVE ACTION

Connect wire rope from the fire suppression system to hold flapper door in the open position. (TM 55-1945-205-10-1)

Perform operational check of intake plenum assembly. (TM 55-1945-205-10-1)

MALFUNCTION

Air intake plenum louver assembly is clogged.

CORRECTIVE ACTION

Clean air intake louver assembly.

Perform operational check of intake plenum assembly. (TM 55-1945-205-10-1)

MALFUNCTION

Exhaust vent fan is not operating.

CORRECTIVE ACTION

Turn on VENT FANS circuit breaker on lower control panel A2. (TM 55-1945-205-10-1)

Perform operational check of exhaust vent fan. (TM 55-1945-205-10-1)

MALFUNCTION

Diesel engine is overheating.

CORRECTIVE ACTION

Refer to diesel engine troubleshooting procedures. (TM 55-1945-205-24-1-2)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2
TM 55-1945-205-24-1-3
TM 55-1945-205-24-1-4

TROUBLESHOOTING PROCEDURE

DRIVE TRAIN DOES NOT OPERATE FREELY AND SMOOTHLY; EXCESSIVE VIBRATION IS EXPERIENCED DURING OPERATION

NOTE

This troubleshooting procedure is typical for both the starboard and port marine transmissions.

SYMPTOM

Excessive vibration is experienced during operation of the drive train.

MALFUNCTION

Foreign objects in pump-jet water inlet.

CORRECTIVE ACTION

Backflush pump-jet to remove foreign objects. (TM 55-1945-205-10-1)

MALFUNCTION

Drive shaft mounting bolts are loose on drive shafts between marine gear and transfer case and/or transfer case and pump-jet.

CORRECTIVE ACTION

Tighten drive shaft mounting bolts as necessary. (WP 0117 00)

Perform operational check of drive train. (TM 55-1945-205-10-1)

MALFUNCTION

Failure of drive shaft universal joint bearing on drive shafts between marine gear and transfer case and/or transfer case and pump-jet.

CORRECTIVE ACTION

Replace drive shaft. (WP 0118 00)

Perform operational check of drive train. (TM 55-1945-205-10-1)

MALFUNCTION

Drive shaft balance weights missing from drive shafts.

CORRECTIVE ACTION

Replace drive shaft. (WP 0118 00)

Perform operational check of drive train. (TM 55-1945-205-10-1)

MALFUNCTION

Marine gear mounting foundation bolts are loose.

CORRECTIVE ACTION

Tighten marine gear mounting foundation bolts. (TM 55-1945-205-24-1-3)

Perform operational check of drive train. (TM 55-1945-205-10-1)

MALFUNCTION

Transfer case mounting bolts are loose.

CORRECTIVE ACTION

Tighten transfer case mounting bolts. (TM 55-1945-205-24-1-4)

Perform operational check of drive train. (TM 55-1945-205-10-1)

MALFUNCTION

Engine mounting bolts are loose.

CORRECTIVE ACTION

Tighten engine mounting bolts. (TM 55-1945-205-24-1-2)

Perform operational check of drive train. (TM 55-1945-205-10-1)

MALFUNCTION

Internal damage to marine gear.

CORRECTIVE ACTION

Replace marine gear. (TM 55-1945-205-24-1-3)

Perform operational check of drive train. (TM 55-1945-205-10-1)

MALFUNCTION

Internal damage to transfer case.

CORRECTIVE ACTION

Replace transfer case. (TM 55-1945-205-24-1-4)

Perform operational check of drive train. (TM 55-1945-205-10-1)

MALFUNCTION

Internal damage to engine.

CORRECTIVE ACTION

Replace engine. (TM 55-1945-205-24-1-2)

Perform operational check of drive train. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

DIESEL ENGINE MALFUNCTIONS

For troubleshooting procedures for the diesel engine, reference the diesel engine manual. (TM 55-1945-205-24-1-2)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

DIESEL ENGINE SMOKE IS CONSISTENTLY WHITE IN NATURE

NOTE

This troubleshooting procedure is typical for both engines.

SYMPTOM

Smoke from the diesel engine is consistently white.

MALFUNCTION

Water in the exhaust piping of water jacketed exhaust system components.

CORRECTIVE ACTION

Remove and inspect exhaust system. (WP 0176 00)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

THE DIESEL ENGINE HAS NO EXHAUST SMOKE

NOTE

This troubleshooting procedure is typical for both engines.

SYMPTOM

Diesel engine has no exhaust smoke.

MALFUNCTION

Flapper valve is closed.

CORRECTIVE ACTION

Open flapper valve. (TM 55-1945-205-10-1)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Blockage in exhaust system components.

CORRECTIVE ACTION

Disassemble, locate and remove the blockage within the exhaust system. (WP 0176 00)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

DIESEL ENGINE DOES NOT RUN PROPERLY

SYMPTOM

Diesel engine does not run properly.

MALFUNCTION

Air intake plenum louver assembly is clogged.

CORRECTIVE ACTION

Clean air intake louver assembly.

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Flapper door contained within the intake plenum is closed

CORRECTIVE ACTION

Connect wire rope from the fire suppression system to hold flapper door in the open position. (TM 55-1945-205-10-1)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Diesel engine continues not running properly.

CORRECTIVE ACTION

Refer to diesel engine troubleshooting procedures. (TM 55-1945-205-24-1-2)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE SPEED CONTROL
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

IMPROPER ENGINE SPEED CONTROL FROM OPERATORS CAB

NOTE

This troubleshooting procedure is typical for both drive trains.

SYMPTOM

Improper engine speed control from operators cab.

MALFUNCTION

Engine governor malfunction.

CORRECTIVE ACTION

Check engine speed control. If improper, refer to diesel engine troubleshooting procedures. (TM 55-1945-205-24-1-2)

With the DC to the governor on and the engine off, use a multimeter to measure the DC voltage at the engine governor controller from terminal 6 to terminal 2. This should be approximately 8 VDC. Between terminal 7 to terminal 2 the voltage should be approximately 4 VDC.

If voltages are not correct, refer to diesel engine troubleshooting procedures. (TM 55-1945-205-24-1-2)

If voltages are correct, proceed to the next step.

MALFUNCTION

Open circuit between the engine junction box A4 and the operators cab terminal strip A4.

CORRECTIVE ACTION

NOTE

If governor controller terminal 7 is open, engine speed will increase. If terminal 8 is open, there will be no control by the operators cab throttle. If terminal 6 is open, speed will remain at the value set at the governor controller.

Using a multimeter, check DC voltages at the operators cab terminal strip A4.

If no voltage is measured, use multimeter to check continuity of interconnect wiring between the power module engine junction box and the operators cab terminal board assembly. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the operators cab terminal strip A4 and the engine throttle potentiometers.

CORRECTIVE ACTION

Using a multimeter, check DC voltages at the operators cab lower control panel A2.

If no voltage is measured, use multimeter to check continuity of wiring between the operators cab terminal strip A4 and the throttle controls. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Failed throttle control potentiometer.

CORRECTIVE ACTION

Replace failed lower control panel A2 throttle control. (WP 0263 00)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE FUEL SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

DIESEL ENGINE IS NOT RECEIVING FUEL FROM FUEL TANK

NOTE

This troubleshooting procedure is typical for both engines.

SYMPTOM

Diesel engine is not receiving fuel.

MALFUNCTION

Fuel tank is empty.

CORRECTIVE ACTION

Fill fuel tank. (TM 55-1945-205-10-1)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Failure of fuel pressure switch.

CORRECTIVE ACTION

Replace fuel pressure switch. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Supply and return line shut-off valves are closed.

CORRECTIVE ACTION

Open supply and return line shut-off valves. (TM 55-1945-205-10-1)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Filter element in fuel/water separator is clogged.

CORRECTIVE ACTION

Replace fuel/water separator filter element. (WP 0196 00)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

Replace fuel filter on engine. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Fuel line connections loose.

CORRECTIVE ACTION

Tighten fuel line connections.

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

DIESEL ENGINE IS MISFIRING CAUSED BY CLOGGED OR DAMAGED INJECTORS

NOTE

This troubleshooting procedure is typical for both engines.

SYMPTOM

Misfiring in diesel engine due to clogged or damaged injectors.

MALFUNCTION

Water contaminant in fuel system.

CORRECTIVE ACTION

Inspect fuel tank with detection paste. (WP 0184 00)

Drain fuel tank. (WP 0185 00)

Drain fuel water separator. (WP 0195 00)

Replace engine secondary fuel filter. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE GOVERNOR
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

ELECTRONIC GOVERNOR ENGINE JUNCTION BOX A4 IS COMPLETELY DEAD; ACTUATOR LEVER STAYS AT MINIMUM POSITION WHEN POWER IS APPLIED TO GOVERNOR

Reference the diesel engine troubleshooting procedures. (TM 55-1945-205-24-1-2)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE GOVERNOR
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

ENGINE IS NOT OPERATING; ELECTRONIC GOVERNOR ACTUATOR GOES TO FULL STROKE WHEN DC POWER IS APPLIED

Reference the diesel engine troubleshooting procedures manual. (TM 55-1945-205-24-1-2)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE EXHAUST SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

EXHAUST SYSTEM HAS DEVELOPED WATER LEAKS

NOTE

This troubleshooting procedure is typical for both the starboard and port engines.

SYMPTOM

Water leaks have developed in exhaust system.

MALFUNCTION

Faulty clamps, gaskets, hoses or exhaust system components.

CORRECTIVE ACTION

Replace exhaust system components. (WP 0176 00)

Perform operational check of exhaust system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
TRANSFER CASE COOLING SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

WATER IS NOT EXPELLING OUT OF EXHAUST OUTLET PORT AND/OR TRANSFER CASE COOLING SYSTEM PORT

NOTE

This troubleshooting procedure is typical for both engines.

SYMPTOM

Exhaust outlet port and/or transfer case cooling system port is not expelling water.

MALFUNCTION

Duplex strainer clogged.

CORRECTIVE ACTION

Clean or replace duplex strainer basket. (WP 0103 00)

Perform operational check of exhaust system. (TM 55-1945-205-10-1)

MALFUNCTION

Exhaust flapper is locked.

CORRECTIVE ACTION

Unlock exhaust flapper. (TM 55-1945-205-10-1)

Perform operational check of exhaust system. (TM 55-1945-205-10-1)

MALFUNCTION

Sea chest butterfly valve, exhaust cooling valve or transfer cooling valve is in closed position.

CORRECTIVE ACTION

Place valve(s) in open position. (TM 55-1945-205-10-1)

Perform operational check of exhaust system. (TM 55-1945-205-10-1)

MALFUNCTION

Leakage and/or breaks in raw water cooling system plumbing.

CORRECTIVE ACTION

Repair raw water cooling system plumbing. (TM 55-1945-205-24-1-2)

Perform operational check of exhaust system. (TM 55-1945-205-10-1)

MALFUNCTION

Damage to engine raw water pump.

CORRECTIVE ACTION

Replace raw water pump. (TM 55-1945-205-24-1-2)

Perform operational check of exhaust system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE EXHAUST SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

EXHAUST SYSTEM HAS DEVELOPED EXHAUST LEAKS

NOTE

This troubleshooting procedure is typical for both engines.

SYMPTOM

Leaks have developed in the engine exhaust system.

MALFUNCTION

Faulty clamps, gaskets, hoses or exhaust system components.

CORRECTIVE ACTION

Replace exhaust system components. (WP 0176 00)

Perform operational check of exhaust system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE STARTING SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

DOES NOT START IN COLD TEMPERATURES

NOTE

This troubleshooting procedure is typical for both engines.

SYMPTOM

Cold temperatures prevent diesel engine from starting.

MALFUNCTION

Ether supply cylinder is empty.

CORRECTIVE ACTION

Replace the ether supply cylinder. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Cold start temperature switch mounted on the diesel engine is damaged.

CORRECTIVE ACTION

Replace the cold start temperature switch. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Ether system temperature switch mounted on the diesel engine is damaged.

CORRECTIVE ACTION

Replace the temperature switch. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Ether system control valve mounted on the ether supply bottle is damaged.

CORRECTIVE ACTION

Replace the control valve. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE LUBRICATION SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

LOW ENGINE OIL PRESSURE (AUDIBLE ALARM AND WARNING LIGHT ON) (NORMAL OPERATION)

NOTE

This troubleshooting procedure is typical for both engines.

SYMPTOM

Audible engine alarm and engine warning light is on.

MALFUNCTION

Oil pressure sending unit not transmitting correct reading.

CORRECTIVE ACTION

Check for loose or detached wiring. If attached properly, replace sending unit. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

TROUBLESHOOTING PROCEDURE

ENGINE OVERHEATING (AUDIBLE ALARM AND WARNING LIGHT ON)

NOTE

This troubleshooting procedure is typical for both starboard and port engines.

SYMPTOM

Audible engine alarm and engine warning light are on.

MALFUNCTION

Fresh water or raw water hose(s) has a leak.

CORRECTIVE ACTION

Replace the defective hose(s). (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Fresh water filter is clogged.

CORRECTIVE ACTION

Replace the fresh water filter. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Engine thermostat(s) is sticking or defective.

CORRECTIVE ACTION

Replace thermostat(s). (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Engine water temperature sending unit not transmitting correct reading.

CORRECTIVE ACTION

Check for loose or detached wiring. If attached properly, replace sending unit. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Engine heat exchanger is clogged.

CORRECTIVE ACTION

Clean or replace the heat exchanger core. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Engine raw water pump is not working.

CORRECTIVE ACTION

Replace the raw water pump. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

MALFUNCTION

Engine fresh water pump is not working.

CORRECTIVE ACTION

Replace the fresh water pump. (TM 55-1945-205-24-1-2)

Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
MARINE GEAR
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-24-1-3

TROUBLESHOOTING PROCEDURE

MARINE GEAR MALFUNCTIONS

For troubleshooting procedures for the marine gear, reference the marine gear manual. (TM 55-1945-205-24-1-3)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
MARINE GEAR
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-3

TROUBLESHOOTING PROCEDURE

MARINE GEAR CLUTCH WILL NOT ENGAGE IN ENGAGE/BACKFLUSH DIRECTIONS

NOTE

This troubleshooting procedure is typical for both marine gears.

SYMPTOM

Clutch does not engage in engage/backflush directions.

MALFUNCTION

Open circuit between the operators cab and propulsion module junction box A3.

CORRECTIVE ACTION

With clutch control in the BACKFLUSH position, use multimeter to check for 24 VDC at terminals TB-12/TB1-13 in the propulsion module junctions box A3.

If 24 VDC is present, refer to marine gear troubleshooting procedures. (TM 55-1945-205-24-1-3)

If 24 VDC is not present, use multimeter to check continuity of electrical wiring between the propulsion module junction box A3 and the clutch control switch 3A2S5 (port), 3A2S6 (stbd). If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of marine gear. (TM 55-1945-205-10-1)

MALFUNCTION

Failed control switch.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at 3A2S5-1/3A2DS2-2 (port), 3A2S6-1/3S2DS2-2 (stbd).

If 24 VDC is present, use multimeter to check for 24 VDC at 3A2S5-2/3A2DS2-2 (port), 3A2S6-2/3A2DS2-2 (stbd).

If 24 VDC is present, replace switch A2S5 (port), A2S6 (stbd). (WP 0264 00)

If 24 VDC is not present, use multimeter to check continuity of wiring between A2S5-2 (A2S6-2) and the appropriate propulsion module circuit breaker panel A6. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of marine gear. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
TRANSFER CASE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-24-1-4

TROUBLESHOOTING PROCEDURE

TRANSFER CASE MALFUNCTIONS

For troubleshooting procedures for the transfer case, reference the transfer case manual. (TM 55-1945-205-24-1-4)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

HYDRAULIC SYSTEM HAS HIGH PRESSURE

NOTE

This troubleshooting procedure is typical for both starboard and port powered modules.

SYMPTOM

Hydraulic system has high pressure.

MALFUNCTION

Hydraulic pressure improperly adjusted.

CORRECTIVE ACTION

Adjust hydraulic system pressure. (WP 0137 00)

Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

MALFUNCTION

Dirt in return line and supply line filters.

CORRECTIVE ACTION

Clean hydraulic system reservoir tank strainer. (WP 0141 00)

Replace hydraulic system reservoir return filter element. (WP 0144 00)

Replace hydraulic system return filter assembly. (WP 0146 00)

Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

MALFUNCTION

Way-valve is not functioning properly.

CORRECTIVE ACTION

Repair or replace way-valve. (WP 0169 00, WP 0168 00)

Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

HYDRAULIC SYSTEM HAS NO PRESSURE

NOTE

This troubleshooting procedure is typical for both starboard and port powered modules.

SYMPTOM

No pressure in hydraulic system.

MALFUNCTION

Hydraulic system reservoir fluid level low.

CORRECTIVE ACTION

Fill hydraulic system reservoir to proper level. (WP 0143 00)

Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

MALFUNCTION

Hydraulic filter system is dirty.

CORRECTIVE ACTION

Clean hydraulic system reservoir tank strainer. (WP 0141 00)

Replace hydraulic system reservoir return filter element. (WP 0144 00)

Replace hydraulic system return filter assembly. (WP 0146 00)

Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

MALFUNCTION

Defective hydraulic pump emits unusual noise or excessive heat.

CORRECTIVE ACTION

Repair or replace hydraulic pump. (WP 0164 00), (WP 0163 00)

Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUMP-JET STEERING
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

NO STEERING FROM OPERATORS CAB - LOW HYDRAULIC SYSTEM PRESSURE

NOTE

This troubleshooting procedure is typical for both the starboard and port steering systems.

SYMPTOM

No steering from operators cab.

MALFUNCTION

Hydraulic system solenoid valves are staying energized.

CORRECTIVE ACTION

Isolate steering control 3A2S23 terminal 4 (port) and 3A2S24 terminal 4 (stbd) on the lower control panel A2. With the steering control held in either the clockwise or counterclockwise position, use multimeter to check for 24 VDC at appropriate steering switch 3A2S23-4/3A2DS2-2 or 3A2S24-4/3A2DS2-2 on the lower control panel A2.

If 24 VDC is present, use multimeter to check continuity of switch 3A2S23-4/3A2DS2-2 and 3A2S24-4/3A2DS2-2 wiring. If continuity is not present, replace switch 3A2S23 or 3A2S24 as necessary. (WP 0264 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

If 24 VDC is not present, use multimeter to check continuity of wiring to the hydraulic system solenoid valves for short circuits. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

Low hydraulic pressure.

CORRECTIVE ACTION

Adjust hydraulic pump pressure. (WP 0137 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

If still no pressure, repair or replace hydraulic pump. (WP 0164 00, WP 0163 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUMP-JET
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-3

TROUBLESHOOTING PROCEDURE

NO PROPULSION FROM THE PUMP-JET

NOTE

This troubleshooting procedure is typical for both the starboard and port pump-jets.

SYMPTOM

The pump-jet is not delivering propulsion.

MALFUNCTION

The CLUTCH circuit breaker located on the propulsion module circuit breaker panel A6 located in the machinery compartment is not on.

CORRECTIVE ACTION

Position CLUTCH circuit breaker to on. (TM 55-1945-205-10-1)

Perform operational check of pump-jet. (TM 55-1945-205-10-1)

MALFUNCTION

The pump-jet intake is plugged with foreign objects.

CORRECTIVE ACTION

Backflush the appropriate pump-jet to clear the intake. (TM 55-1945-205-10-1)

Perform operational check of pump-jet. (TM 55-1945-205-10-1)

MALFUNCTION

The drive train is not providing power to the pump-jet.

CORRECTIVE ACTION

Check to make sure drive train and its components are working. (TM 55-1945-205-10-1)

Perform operational check of pump-jet. (TM 55-1945-205-10-1)

MALFUNCTION

Electronic control gear on the marine gear is not operating properly.

CORRECTIVE ACTION

Repair or replace the selector valve. (TM 55-1945-205-24-1-3)

Perform operational check of pump-jet. (TM 55-1945-205-10-1)

MALFUNCTION

The pump-jet is still not delivering propulsion.

CORRECTIVE ACTION

Repair or replace the pump-jet. Contact depot maintenance.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUMP-JET
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

PUMP-JET DEVELOPS ONLY A SMALL AMOUNT OF THRUST (NOT ENOUGH WATER IS BEING DELIVERED)

NOTE

This troubleshooting procedure is typical for both the starboard and port pump-jets.

SYMPTOM

Pump-jet produces only a small amount of thrust.

MALFUNCTION

Pump-jet intake is clogged with debris.

CORRECTIVE ACTION

Backflush the appropriate pump-jet to clear the intake. (TM 55-1945-205-10-1)

Perform operational check of pump-jet. (TM 55-1945-205-10-1)

MALFUNCTION

Diesel engine is not operating at required speed.

CORRECTIVE ACTION

Increase diesel engine operating speed. (TM 55-1945-205-10-1)

Perform operational check of pump-jet. (TM 55-1945-205-10-1)

MALFUNCTION

Pump-jet is defective.

CORRECTIVE ACTION

Repair or replace pump-jet as necessary. Contact depot maintenance.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
STEERING SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

NO STEERING CONTROL

NOTE

This troubleshooting procedure is typical for pump-jet steering on both the starboard and port powered modules.

SYMPTOM

No control over the steering.

MALFUNCTION

Low hydraulic pressure from hydraulic pump.

CORRECTIVE ACTION

Adjust hydraulic pump pressure. (WP 0137 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

If still no pressure, repair or replace hydraulic pump. (WP 0164 00, WP 0163 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

3/2 ball valve is not properly set.

CORRECTIVE ACTION

Set 3/2 ball valve handle to proper position. (TM 55-1945-205-10-1)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

Bypass needle valve is opened.

CORRECTIVE ACTION

Close bypass needle valve. (TM 55-1945-205-10-1)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

24 VDC not present at electric control valve connectors of way-valve.

CORRECTIVE ACTION

Repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

Improper operation of valves in the way-valve assembly.

CORRECTIVE ACTION

Repair or replace hydraulic way-valve. (WP 0169 00, WP 0168 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

NO STEERING CONTROL INDICATION FOR THE PUMP-JET

NOTE

This troubleshooting procedure is typical for both the starboard and port pump-jets.

SYMPTOM

The thrust direction dial is not indicating pump-jet position.

MALFUNCTION

Low voltage is being supplied by the pump-jet directional/auxiliary battery junction box A9 batteries.

CORRECTIVE ACTION

Replace the pump-jet directional/auxiliary battery junction box A9 batteries. (WP 0220 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

The thrust indicating device servo unit is defective.

CORRECTIVE ACTION

Repair thrust indicating device servo unit. (WP 0257 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

STEERING REACTS SLUGGISHLY

NOTE

This troubleshooting procedure is typical for both the starboard and port steering systems.

SYMPTOM

Steering is reacting sluggishly.

MALFUNCTION

Air in the hydraulic line at test point M2.

CORRECTIVE ACTION

Bleed air from hydraulic system. (WP 0136 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

Low hydraulic pressure.

CORRECTIVE ACTION

Adjust hydraulic pump pressure. (WP 0137 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
STEERING SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-3

TROUBLESHOOTING PROCEDURE

NO STEERING FROM OPERATORS CAB

NOTE

This troubleshooting procedure is typical for both steering systems.

SYMPTOM

No clockwise steering from operators cab.

MALFUNCTION

Open circuit between steering control and clockwise steering solenoid.

CORRECTIVE ACTION

Put steering control in the clockwise position. Using a multimeter, check for 24 VDC at terminals of the operators cab terminal strip A4.

If 24 VDC is present, use multimeter to check continuity of wiring between the operators cab and the appropriate propulsion module steering solenoid. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

Failed clockwise steering solenoid.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at solenoid. If 24 VDC is present, replace steering solenoid. (TM 55-1945-205-24-1-3)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

No counterclockwise steering from operators cab.

CORRECTIVE ACTION

Put steering control in the counterclockwise position. Using multimeter, check for 24 VDC at terminals at the operators cab terminal strip A4.

If 24 VDC is present, use a multimeter to check continuity of wiring between the operators cab and the appropriate propulsion module steering solenoid. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of steering system. (TM 55-1945-205-10-1)

MALFUNCTION

Failed counterclockwise steering solenoid.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at solenoid. If 24 VDC is present, replace steering solenoid. (TM 55-1945-205-24-1-3)

Perform operational check of steering system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIESEL ENGINE CHARGING SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

ALTERNATOR IS NOT CHARGING THE BATTERIES

NOTE

This troubleshooting procedure is typical for alternators on both the starboard and port engines.

SYMPTOM

Batteries are not being charged by the alternator.

MALFUNCTION

Loose or damaged alternator drive belts.

CORRECTIVE ACTION

Adjust alternator drive belt tension. (WP 0175 00)

Replace alternator drive belts. (WP 0173 00)

Perform operational check of alternator. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between alternator and voltage regulator in thruster direction/auxiliary battery junction box assembly A9.

CORRECTIVE ACTION

Using a multimeter, check wiring for continuity between alternator and voltage regulator in thruster direction/auxiliary battery junction box assembly A9. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of alternator. (TM 55-1945-205-10-1)

MALFUNCTION

Alternator failure. (Tachometer malfunctions during alternator failure.)

CORRECTIVE ACTION

Replace alternator. (WP 0174 00)

Perform operational check of alternator. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

AMMETER INDICATES DISCHARGING OF SYSTEM

NOTE

This troubleshooting procedure is typical for both starboard and port engines.

SYMPTOM

System discharge is indicated on the ammeter.

MALFUNCTION

Alternator drive belts loose.

CORRECTIVE ACTION

Adjust alternator drive belt tension. (WP 0175 00)

Perform operational check of alternator. (TM 55-1945-205-10-1)

MALFUNCTION

Alternator drive belts worn or broken.

CORRECTIVE ACTION

Replace alternator drive belts. (WP 0173 00)

Perform operational check of alternator. (TM 55-1945-205-10-1)

MALFUNCTION

Defective alternator.

CORRECTIVE ACTION

Replace alternator. (WP 0174 00)

Perform operational check of alternator. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

BILGE PUMPS DO NOT FUNCTION

NOTE

This troubleshooting procedure is typical for all bilge pumps.

SYMPTOM

Bilge pumps do not function.

MALFUNCTION

MAIN circuit breaker in propulsion module circuit breaker panel A6 is off.

CORRECTIVE ACTION

Turn MAIN circuit breaker in propulsion module circuit breaker panel A6 panel on. (TM 55-1945-205-10-1)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

BILGE PUMP circuit breakers in propulsion module circuit breaker panel A6 are off.

CORRECTIVE ACTION

Turn BILGE PUMP circuit breakers in propulsion module circuit breaker panel A6 panel on. (TM 55-1945-205-10-1)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

BILGE PUMP circuit breakers in bilge pump control assembly A5 or single bilge pump control assembly A7 are turned off.

CORRECTIVE ACTION

Turn on BILGE PUMP circuit breakers on A5 or A7 control assemblies. (TM 55-1945-205-10-1)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the bilge pump control panel assembly and the corresponding junction box located in the engine compartment.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the appropriate terminals in the bilge pump control panel A5 or A7.

If 24 VDC is present, use a multimeter to check continuity of wiring between the bilge pump control assemblies A5 or A7 and the corresponding junction box located in the engine compartment. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the junction box and the pump.

CORRECTIVE ACTION

If wiring to junction box is acceptable, use multimeter to check for 24 VDC at B2-2/B2-1 motor leads in the appropriate junction box.

If 24 VDC is present, use multimeter to check continuity of wiring from the junction box to the pump. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

If wiring is acceptable, replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit in internal wiring of the appropriate switch XA5S1-XA5S5 or XA7S1 in bilge pump control assemblies A5 or A7.

CORRECTIVE ACTION

If 24 VDC was not present at unit XA5 or XA7 terminals, use multimeter to check for 24 VDC at appropriate terminals as listed below in the bilge pump control assembly A5 or A7.

If 24 VDC is present, use multimeter to check continuity of wiring and connections at the appropriate switch XA5S1-XA5S5 or XA7S1 located on the cover of the bilge pump control panel A5 or A7. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Failed bilge pump toggle switch.

CORRECTIVE ACTION

If 24 VDC was present and wiring is acceptable, replace bilge pump control panel A5 or A7 bilge pump toggle switch. (WP 0212 00, WP 0216 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit in wiring from the power module circuit breaker panel A6 to the bilge pump control panel A5 or A7.

CORRECTIVE ACTION

If 24 VDC was not present in previous step, use multimeter to check wiring between the power module circuit breaker panel A6 and the bilge pump control panel A5 or A7. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Float switch is clogged or defective.

CORRECTIVE ACTION

Clean or replace float switch as necessary. (WP 0178 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Bilge pump check valve is defective.

CORRECTIVE ACTION

Replace check valve. (WP 0181 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Bilge pump is defective.

CORRECTIVE ACTION

Replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

BILGE PUMPS WILL NOT FUNCTION IN TEST MODE (FROM BILGE JUNCTION BOXES A5 AND A7)

NOTE

This troubleshooting procedure is typical for all bilge pumps.

SYMPTOM

While in test mode, bilge pumps will not function.

MALFUNCTION

MAIN circuit breaker in propulsion module circuit breaker panel A6 is off.

CORRECTIVE ACTION

Turn MAIN circuit breaker in propulsion module circuit breaker panel A6 panel on. (TM 55-1945-205-10-1)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

BILGE PUMP circuit breakers in propulsion module circuit breaker panel A6 are off.

CORRECTIVE ACTION

Turn on BILGE PUMP circuit breakers in propulsion module circuit breaker panel A6. (TM 55-1945-205-10-1)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the bilge pump control assemblies A5 or A7 and the corresponding junction box located in the engine compartment.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the appropriate terminals in the bilge pump control panel A5 or A7.

If 24 VDC is present, use a multimeter to check continuity of wiring between the bilge pump control panel A5 or A7 and the corresponding junction box located in the engine compartment. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the junction box and the pump.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at B2-2/B2-1 motor leads in the appropriate junction box.

If 24 VDC is present, use multimeter to check continuity of wiring from the junction box to the pump. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

If wiring is acceptable, replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit in internal wiring of the appropriate BILGE PUMP switch XA5S1-XA5S5 or XA7S1 in control assembly A5 or A7.

CORRECTIVE ACTION

If 24 VDC was not present at unit XA5 or XA7 terminals, use multimeter to check for 24 VDC at appropriate terminals in the bilge pump control assembly A5 or A7.

If 24 VDC is present, use multimeter to check continuity of wiring and terminations at the appropriate switch XA5S1-XA5S5 or XA7S1 located on the cover of the bilge pump control panel A5 or A7. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Failed bilge pump toggle switch.

CORRECTIVE ACTION

If 24 VDC was present and wiring is acceptable, replace bilge pump switch. (WP 0212 00, WP 0216 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit in wiring from the power module circuit breaker panel A6 to the bilge pump control assembly A5 or A7.

CORRECTIVE ACTION

If 24 VDC was not present in previous step, use multimeter to check continuity of wiring between the power module circuit breaker panel A6 and the bilge pump control assembly A5 or A7. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Defective bilge pump.

CORRECTIVE ACTION

Replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
WARPING TUG
BILGE PUMP
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

BILGE PUMPS WILL NOT FUNCTION IN REMOTE MODE FROM THE OPERATORS CAB

NOTE

This troubleshooting procedure is typical for all bilge pumps.

SYMPTOM

While in remote mode, bilge pumps will not function from the operators cab.

MALFUNCTION

MAIN breaker in propulsion module circuit breaker panel A6 is off.

CORRECTIVE ACTION

Turn MAIN breaker in propulsion module circuit breaker panel A6 on. (TM 55-1945-205-10-1)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

BILGE PUMP circuit breakers in propulsion module circuit breaker panel A6 are turned off.

CORRECTIVE ACTION

Turn BILGE PUMP circuit breakers in propulsion module circuit breaker panel A6 on. (TM 55-1945-205-10-1)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit from the pump run push button.

CORRECTIVE ACTION

While holding a pump run push button, use a multimeter to check for 24 VDC at the appropriate terminals in the bilge pump control assembly A5 or A7.

Locations: Pump 1-A7K1 relay; Pump 2-A5K2 relay; Pump 3-A5K3 relay; Pump 4-A5K4 relay; Pump 5-A5K5 relay; Pump 6-A5K6 relay.

If 24 VDC is not present, use multimeter to check continuity of wiring between the propulsion module junction box A3 and bilge pump control assembly A5 or A7.

Locations: Pump 1-between A3CFD-1 and A7CFD-1; Pump 2-between A3CFD-8 and A5CFD-4; Pump 3-between A3CFD-8 and A5CFD-3; Pump 4-between A3CFD-8 and A5CFD-7; Pump 5-A3CFD-8 and A5CFD-5; Pump 6-between A3CFD-8 and A5CFD-6.

If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

If wiring is acceptable, replace pump run switch. (WP 0212 00, WP 0216 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit in bilge pump control assembly A5 or A7 internal wiring.

CORRECTIVE ACTION

Using a multimeter, check continuity of wiring bilge pump control assembly A5 or A7. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the bilge pump control assembly A5 or A7 and the corresponding junction box located in the engine compartment.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the appropriate terminals in the bilge pump junction box.

NOTE

Bilge Pump 2 is connected to the A9 Thruster Direction/Auxiliary Battery Junction Box Assembly.

Locations: Pump 1-JB1; Pump 3-JB2; Pump 4-JB8; Pump 5-JB5; Pump 6-JB6

If 24 VDC is present, use a multimeter to check continuity of wiring between the bilge pump control assembly A5 or A7 to the corresponding junction box. If continuity is not present, repair/replace wiring as necessary.
(WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the junction box and the bilge pump motor.

CORRECTIVE ACTION

Using multimeter, check for 24 VDC at B motor leads in the appropriate junction box.

NOTE

Bilge Pump 2 is connected to the A9 Thruster Direction/Auxiliary Battery Junction Box Assembly. Bilge pump motor leads are designated B3.

Locations: Pump 1-JB1B2; Pump 3-JB2B4; Pump 4-JB8B5; Pump 5-JB5B6; Pump 6-JB6B7

If 24 VDC is present, use multimeter to check continuity of wiring from the junction box to the bilge pump motor. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

If wiring is acceptable, replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the junction box and the bilge pump float switch.

CORRECTIVE ACTION

Using multimeter, check for 24 VDC at S float switch leads in the appropriate junction box.

NOTE

Bilge Pump 2 is connected to the A9 Thruster Direction/Auxiliary Battery Junction Box Assembly. Bilge pump float switch leads are designated S11.

Locations: Pump 1-JB1S10; Pump 3-JB2S12; Pump 4-JB8S13; Pump 5-JB5S14; Pump 6-JB6S15

If 24 VDC is present, use multimeter to check continuity of wiring from the junction box to the bilge pump float switch. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

If wiring is acceptable, replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Defective or clogged bilge float switch.

CORRECTIVE ACTION

Clean or replace the float switch as necessary. (WP 0180 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

BILGE PUMP OUTPUT HAS REDUCED FLOW

NOTE

This troubleshooting procedure is typical for all bilge pumps.

SYMPTOM

Output flow from bilge pump is reduced.

MALFUNCTION

Plugged bilge pump strainer.

CORRECTIVE ACTION

Replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Obstruction or kinking in discharge line.

CORRECTIVE ACTION

Remove debris from the discharge line. Adjust hose to avoid any kinks. (WP 0179 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Plugged bilge pump check valve.

CORRECTIVE ACTION

Clean bilge pump check valve. (WP 0179 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Defective bilge pump.

CORRECTIVE ACTION

Replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

BILGE PUMP WILL NOT SHUT OFF

NOTE

This troubleshooting procedure is typical for all bilge pumps.

SYMPTOM

Bilge pump will not shut off.

MALFUNCTION

Float switch plugged with debris.

CORRECTIVE ACTION

Clean debris from around float switch. (WP 0179 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Obstruction or kinking in discharge line.

CORRECTIVE ACTION

Remove debris from the discharge line. Adjust hose to avoid any kinks. (WP 0179 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Defective bilge pump.

CORRECTIVE ACTION

Replace bilge pump. (WP 0182 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP STATUS LIGHTS
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

BILGE PUMP STATUS LIGHTS ARE NOT FUNCTIONAL

NOTE

This troubleshooting procedure is typical for all bilge pumps.

SYMPTOM

Status lights for bilge pump are not functioning.

MALFUNCTION

Bad lamp.

CORRECTIVE ACTION

Replace lamp. (WP 0271 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit in wiring between the lower control panel assembly A2 and the propulsion module junction box A3.

CORRECTIVE ACTION

With pump running, use a multimeter to check for 24 VDC at terminals in the propulsion module junction box A3.

If 24 VDC is present, use multimeter to check for 24 VDC at terminal at the operators cab terminal strip A4 with the appropriate pump running.

If 24 VDC is not present at the operators cab terminal strip A4, use multimeter to check continuity of interconnect wiring between the operators cab terminal strip A4 and the appropriate propulsion module junction box A3. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

If 24 VDC is present at the operators cab terminal strip A4, use multimeter to check continuity of wiring between the operators cab terminal board assembly and the appropriate pump run push button. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

WATER ENTERING BILGE FROM PUMP DISCHARGE LINE WHEN PUMP IS NOT OPERATING

NOTE

This troubleshooting procedure is typical for all bilge pumps.

SYMPTOM

When pump is not operating, water is entering the bilge from the bilge pump discharge line.

MALFUNCTION

Defective check valve in discharge line.

CORRECTIVE ACTION

Replace check valve. (WP 0181 00)

Perform operational check of bilge pumps. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
FIRE SUPPRESSION SYSTEM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

THERMAL DETECTOR DOES NOT TRIP FIRE ALARM

NOTE

This troubleshooting procedure is typical for all thermal detectors.

SYMPTOM

Thermal detector does not trip fire alarm.

MALFUNCTION

PORT FIRE or STBD FIRE circuit breaker on the lower control panel A2 is turned to off.

CORRECTIVE ACTION

Turn PORT FIRE or STBD FIRE circuit breaker on the lower control panel A2 to on. (TM 55-1945-205-10-1)

MALFUNCTION

Open wiring to the detector.

CORRECTIVE ACTION

Using a multimeter, check continuity of wiring to the detector. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of fire suppression system. (TM 55-1945-205-10-1)

MALFUNCTION

Faulty detector.

CORRECTIVE ACTION

Apply heat to detector. Remove heat source. If bulb stays on until set point is reached, the detector is good. If not, replace the detector. Contact depot maintenance.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
FIRE ALARM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

FIRE ALARM HORN 3A4LS2 DOES NOT OPERATE

NOTE

This troubleshooting procedure is typical of both fire alarm horns.

SYMPTOM

Fire alarm horn does not operate.

MALFUNCTION

Open circuit between 3A2S3 (stbd) or 3A2S1 (port) in lower control panel A2 and the operators cab terminal strip A4.

CORRECTIVE ACTION

Using a multimeter, check for continuity at 3A4TB5-9/3A4TB10-3 and 3A4TB5-11/3A4TB10-3 at the operators cab terminal strip A4. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of fire alarm horn. (TM 55-1945-205-10-1)

MALFUNCTION

Failed switch 3A2S3 (stbd) or 3A2S1 (port) in lower control panel A2.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at 3A2S3-1/3A2DS2-2 and 3A2S101/3A2DS2-2. If voltage present, replace switch. (WP 0264 00)

Perform operational check of fire alarm horn. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit in wiring between the operators cab lower control panel A2 and the appropriate propulsion module bilge pump control assembly A5 or A7.

CORRECTIVE ACTION

If 24 VDC is not present, use multimeter to check continuity of wiring between the operators cab lower control panel A2 and the appropriate bilge pump control panel assembly A5 or A7. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of fire alarm horn. (TM 55-1945-205-10-1)

MALFUNCTION

Failed diode 1A5D2 (stbd) or 1A5D2 (port).

CORRECTIVE ACTION

Replace diode. (WP 0360 00)

Perform operational check of fire alarm horn. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
FIRE ALARM
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

FIRE ALARM LIGHT 3A2DS3 (STBD) OR 3A2DS1 (PORT) DOES NOT ILLUMINATE IN ALARM MODE

NOTE

This troubleshooting procedure is typical for both fire alarm lights.

SYMPTOM

No illumination from fire alarm light while in alarm mode.

MALFUNCTION

Failed lamp.

CORRECTIVE ACTION

Replace lamp. (WP 0268 00)

Perform operational check of fire alarm light. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between 3A2DS3 and 3A2S3 (stbd) or 3A3DS1 and 3A2S1 (port) in lower control panel A2.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at 3A2S1-5/3A2DS1-2, 3A2S3-5/3A2DS3-3 in lower control panel A2.

If 24 VDC is present, use multimeter to check continuity of wiring between 3A2DS3 and 3A2S2 and between 3A2DS1 and 3A2S1 as applicable. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of fire alarm light. (TM 55-1945-205-10-1)

MALFUNCTION

Failed switch 3A2S3 (stbd) or 3A2S1 (port) in lower control panel A2.

CORRECTIVE ACTION

If 24 VDC is not present, use multimeter to check for 24 VDC at 3A2S1-6/3A2DS1-2, 3A2S3-6/3A2DS3-2 in lower control panel A2.

If 24 VDC is present but was not present in previous step, replace switch. (WP 0264 00)

Perform operational check of fire alarm light. (TM 55-1945-205-10-1)

MALFUNCTION

Failed diode 3A2D18 in lower control panel A2.

CORRECTIVE ACTION

Replace diode. (WP 0360 00)

Perform operational check of fire alarm light. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
INTERCONNECT CABLE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

INTERCONNECT CABLE NOT WORKING BETWEEN MODULES

SYMPTOM

Interconnect assembly not working between modules.

MALFUNCTION

Interconnect assembly cable plugs loose on operators cab end or air intake plenum end.

CORRECTIVE ACTION

Tighten loose plugs. (TM 55-1945-205-10-1)

Perform operational check of interconnect cable. (TM 55-1945-205-10-1)

MALFUNCTION

Bad or broken cables.

CORRECTIVE ACTION

Using multimeter, check continuity of wiring of interconnect assembly. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of interconnect cable. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CONTROL PANELS
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

NO POWER TO THE OPERATORS CAB CONTROL PANELS

SYMPTOM

The operators cab control panels are not receiving power.

MALFUNCTION

Failed CONTROL PANELS circuit breaker at the operators cab circuit breaker panel A3.

CORRECTIVE ACTION

Using a multimeter, check CONTROL PANELS circuit breaker for open condition. If found, replace CONTROL PANELS circuit breaker on operators cab circuit breaker panel A3. (WP 0275 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

MALFUNCTION

Failed OPR CAB circuit breaker at the propulsion module circuit breaker panel A6.

CORRECTIVE ACTION

Using a multimeter, check OPR CAB circuit breaker for open condition. If found, replace OPR CAB circuit breaker on propulsion module circuit breaker panel A6.
(WP 0214 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

MALFUNCTION

Failed MAIN circuit breaker in the propulsion module circuit breaker panel A6.

CORRECTIVE ACTION

Using multimeter, check MAIN circuit breaker for open condition. If found, replace MAIN circuit breaker at the propulsion module circuit breaker panel A6. (WP 0214 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the propulsion module circuit breaker panel A6 and the operators cab circuit breaker panel A3.

CORRECTIVE ACTION

Using a multimeter, check wiring for continuity between propulsion module circuit breaker panel A6 and operators cab circuit breaker panel A3. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
MARINE GEAR CLUTCH STATUS LIGHT
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-3

TROUBLESHOOTING PROCEDURE

CLUTCH STATUS LIGHT NOT OPERATIONAL

NOTE

This troubleshooting procedure is typical for both marine gears.

SYMPTOM

Light for clutch status not operational.

MALFUNCTION

Indicator light bulb failed.

CORRECTIVE ACTION

Replace light bulb. (WP 0268 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the operators cab and the power module junction box A3.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at TB1-4/TB1-13 in the appropriate propulsion module junction box A3.

If 24 VDC is present, use multimeter to check for 24 VDC at 3A4TB2-16/3A4TB10-3 and 3A4TB4-16/3A4TB10-3 at the operators cab terminal board assembly.

If 24 VDC is present at 3A4TB2-16/3A4TB10-3 and 3A4TB4-16/3A4TB10-3 at the operators cab terminal board assembly, refer to troubleshooting procedures for power take-off clutch and neutral switch in the marine gear manual. (TM 55-1945-205-24-1-3)

If 24 VDC is not present, use multimeter to check continuity of electrical wiring between the operators cab terminal board assembly and the appropriate propulsion module junction box A3. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

If 24 VDC is present, use multimeter to check wiring between the operators cab terminal board assembly and the appropriate clutch status light A2DS4 (port), A2DS5 (stbd). If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

MALFUNCTION

Failed diode 3A2D1 (port), 3A2D2 (stbd) on lower control panel A2.

CORRECTIVE ACTION

Replace diode. (WP 0360 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB GAUGE LIGHTS
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

OPERATORS CAB GAUGE LIGHTS WILL NOT OPERATE OR VARY IN BRIGHTNESS

SYMPTOM

No operation or a variation in brightness from the operators cab gauge lights.

MALFUNCTION

Failed dimmer 3A2R1.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC supply to dimmer at leads 3A2R1-red/3A2R1-black in lower control panel A2.

Using a multimeter, check for variable output 0 - 24 VDC at dimmer leads 3A2R1-blue/3A2R1-black in lower control panel A2.

If output does not vary, replace dimmer. (WP 0266 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between dimmer and panel lights.

CORRECTIVE ACTION

Using a multimeter, check continuity of electrical wiring between dimmer 3A2R1-white, 3A2R1-black and panel lights in lower control panel A2. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between dimmer and panel light dimmer circuit breaker.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at wire 300 on the panel light dimmer circuit breaker A3CB9 on the operators cab circuit breaker panel A3.

If 24 VDC is present at wire 300 on panel light dimmer circuit breaker A3CB9 on the operators cab circuit breaker panel A3, check for 24 VDC at wire 374 on panel light dimmer circuit breaker A3CB9 on the operators cab circuit breaker panel A3. If 24 VDC is not present, replace panel light dimmer circuit breaker A3CB9. (WP 0275 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

If 24 VDC is present at wire 374 on panel light dimmer circuit breaker A3CB9 and gauge lights do not illuminate, check continuity of wire 374 from panel light dimmer circuit breaker A3CB9 to panel lights dimmer. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab control panel. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ACCESSORIES
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

OPERATORS CAB ACCESSORIES DO NOT FUNCTION

SYMPTOM

The operators cab accessories are not functioning.

MALFUNCTION

Open circuit between the MAIN propulsion module circuit breaker and the OPR CAB circuit breaker.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the OPR CAB circuit breaker in the propulsion module circuit breaker panel A6. If 24 VDC is present, check wiring for continuity between propulsion module MAIN circuit breaker and OPR CAB circuit breaker. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab accessories. (TM 55-1945-205-10-1)

MALFUNCTION

Failed OPR CAB circuit breaker in the propulsion module circuit breaker panel A6.

CORRECTIVE ACTION

Using a multimeter, check OPR CAB circuit breaker for open condition. If found, replace OPR CAB circuit breaker on propulsion module circuit breaker panel A6. (WP 0214 00)

Perform operational check of operators cab accessories. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CIRCUIT BREAKER PANEL
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

ALL CIRCUITS CONTROLLED BY 3A3CB1-3A3CB10 ARE NOT FUNCTIONING

SYMPTOM

All circuits controlled by operators cab circuit breaker panel A3 3A3CB1-3A3CB10 are not functioning.

MALFUNCTION

Circuit breakers 1A6CB11and 2A6CB11 located at the stbd and port propulsion module circuit breaker panels (Units 1A6 and 2A6) are off.

CORRECTIVE ACTION

Position both circuit breakers on. (TM 55-1945-205-10-1)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

MALFUNCTION

No 24 VDC supply to operators cab circuit breaker panel A3.

CORRECTIVE ACTION

Using multimeter, check for 24 VDC at 3A3TB1-3/3A3TN2-1 and at 3A3TB1-2/3ATB2-1 in the operators can circuit breaker panel A3.

If 24 VDC is not present, use multimeter to check continuity of wiring between the operators cab circuit breaker panel A3 and the starboard and port propulsion module junction boxes A3. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

If 24 VDC is present, proceed to the next step.

MALFUNCTION

Open circuit in D1/D2.

CORRECTIVE ACTION

Using multimeter, check for 24 VDC at 3A3D2 cathode/3A3TB2-1.

If 24 VDC is not present, verify 3A3D1 and 3A3D2 anode and cathode connections and connections between 3A3CB1-1 through 3A3CB10-1 are secure.

If 24 VDC is present, use multimeter to check continuity of interconnect wiring from 3A3D2 cathode to 3A3CB7-1. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CIRCUIT BREAKER PANEL
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

A CIRCUIT CONTROLLED BY 3A3CB1-3A3CB10 IS NOT FUNCTIONING

SYMPTOM

A circuit controlled by operators cab circuit breaker panel A3 3A3CB1-3A3CB10 is not functioning.

MALFUNCTION

Open circuit in 3A3 internal wiring to the line side of the affected circuit breaker.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at appropriate terminals.

If 24 VDC is not present, use multimeter to check continuity of internal wiring to affected circuit breaker. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

If 24 VDC is present, proceed to the next step.

MALFUNCTION

Failed circuit breaker.

CORRECTIVE ACTION

With the appropriate breaker on, use multimeter to check for 24 VDC at terminal. If 24 VDC is not present, replace circuit breaker. (WP 0275 00)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CIRCUIT BREAKER PANEL
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

NO VOLTAGE AT TEST JACKS WHEN USING BUILT IN TEST SWITCH 3A3S1 IN ANY POSITION

SYMPTOM

When using built in test switch 3A3S1 in any position, there is no voltage at test jacks.

MALFUNCTION

Open circuit between 3A3S1 wiper and test jack J2 (+).

CORRECTIVE ACTION

Using a multimeter, check continuity of wiring between 3A3S1 COMMON and jack J2 (+). If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

MALFUNCTION

Isolation resistor 3A3R1 has failed open.

CORRECTIVE ACTION

Replace isolation resistor. (WP 0272 00)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between TB2-1 and test jack J2 (-).

CORRECTIVE ACTION

Using multimeter, check continuity of wiring between TB2-1 and test jack J2 (-). If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CIRCUIT BREAKER PANEL
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

NO VOLTAGE AT TEST JACKS WHEN USING BUILT IN TEST SWITCH 3A3S1

SYMPTOM

When using built in test switch 3A3S1, there is no voltage at test jacks.

MALFUNCTION

Bad connection/wiring between 3A3S1 and TB.

CORRECTIVE ACTION

Using multimeter, check continuity of wiring for affected 3A3S1 position. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab switches. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
SPOTLIGHT
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

SPOTLIGHT NOT FUNCTIONING

SYMPTOM

Spotlight not functioning.

MALFUNCTION

Burned out bulb.

CORRECTIVE ACTION

Replace bulb (WP 0279 00)

Perform operational check of spotlight. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between operators cab terminal board assembly and spotlight.

CORRECTIVE ACTION

Using multimeter, check for 24 VDC at terminals 3A4TB5-5/3A4TB11-2.

If 24 VDC is present, use multimeter to check continuity of wiring between the operators cab terminal strip A4 and the spotlight. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of spotlight. (TM 55-1945-205-10-1)

Use multimeter to check for 24 VDC of wiring for 3A1S11. If 24 VDC is present, replace 3A1A11. (WP 0254 00)

Perform operational check of spotlight. (TM 55-1945-205-10-1)

MALFUNCTION

Failed 3A1S11.

CORRECTIVE ACTION

Use multimeter to check for 24 VDC of wiring for 3A1S11. If 24 VDC is present, replace 3A1A11. (WP 0254 00)

Perform operational check of spotlight. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB FAN CONTROL
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

FAN CONTROL DOES NOT WORK ON LOW

SYMPTOM

No operation from fan control while on low.

MALFUNCTION

Open circuit between switch 3A2S4 and heater fan 3B1A.

CORRECTIVE ACTION

With 3A2S4 in LOW, use a multimeter to check for 24 VDC at 3A4TB5-7/3A4TB10-3 at the operators cab terminal strip A4.

If 24 VDC is present, use multimeter to check continuity of wiring between the operators cab terminal strip A4 and the heater fan 3B1A. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

Use multimeter to check for 24 VDC at 3A2S4-1/3A2DS2-2 in lower control panel A2.

If 24 VDC is present, use multimeter to check continuity in wiring between 3A2S4 and the operators cab terminal strip A4. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

MALFUNCTION

Failed switch 3A2S4.

CORRECTIVE ACTION

If 24 VDC was not present in the previous step, use multimeter to check for 24 VDC at 3A2S4-2/3A2DS2-2 in lower control panel A2.

If 24 VDC is present, use multimeter to check continuity of switch wiring. If continuity is present, replace switch. (WP 0264 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

Use multimeter to check continuity of wiring between the operators cab circuit breaker panel A3 and switch 3A2S4. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB HEATER FAN
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

ONLY FAN B1B OPERATES WITH HEATER FAN CONTROL IN HIGH

SYMPTOM

With heater fan control on high, only fan B1B operates.

MALFUNCTION

Open circuit between switch 3A2S4 and heater fan 3B1A.

CORRECTIVE ACTION

With 3A2S4 in LOW, use multimeter to check for 24 VDC at 3A4TB5-7/3A4TB10-3 at the operators cab terminal strip A4.

If 24 VDC is present, use multimeter to check wiring continuity between the operators cab terminal strip A4 and the heater fan 3B1A. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

Use multimeter to check for 24 VDC at 3A2S4-1/3A2DS2-2 in lower control panel A2.

If 24 VDC is present, use multimeter to check wiring continuity between 3A2S4 and the operators cab terminal strip A4. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

MALFUNCTION

Failed switch 3A2S4.

CORRECTIVE ACTION

If 24 VDC was not present in the previous step, use multimeter to check for 24 VDC at 3A2S4-2/3A2DS2-2 in lower control panel A2.

If 24 VDC is present, use multimeter to check continuity of switch wiring. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

Use multimeter to check continuity of wiring between the operators cab circuit breaker panel A3 and switch 3A2S4. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB HEATER FAN
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

FAN B1B DOES NOT OPERATE WITH HEATER FAN CONTROL IN HIGH

SYMPTOM

Fan B1B does not operate with heater fan control in high.

MALFUNCTION

Open circuit between switch 3A2S4 and heater fan 3B1B.

CORRECTIVE ACTION

With 3A2S4 in HIGH, use multimeter to check for 24 VDC at 3A4TB5-8/3A4TB10-3 at the operators cab terminal strip A4.

If 24 VDC is present, use multimeter to check wiring between the operators cab terminal strip A4 and the heater fan 3B1B.

If 24 VDC is not present, use multimeter to check for 24 VDC at 3A2S4-6/3A2DS2-2 in lower control panel A2.

If 24 VDC is present, use multimeter to check continuity of wiring between 3A2S4 and the operators cab terminal strip A4. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

MALFUNCTION

Failed switch 3A2S4.

CORRECTIVE ACTION

If 24 VDC was not present in the previous step, use multimeter to check for 24 VDC at 3A2S4-5/3A2DS2-2 in lower control panel A2.

If 24 VDC is present, use multimeter to check continuity of switch wiring. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Use multimeter to check continuity of wiring between the operators cab circuit breaker panel A3 and switch 3A2S4 in lower control panel A2. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab fan. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB DEFROSTER
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

DEFROSTER FAN DOES NOT OPERATE

SYMPTOM

Defroster fan does not operate.

MALFUNCTION

Open circuit between switch 3A2S25 and defroster fan 3B3.

CORRECTIVE ACTION

With 3A2S25 on, use a multimeter to check for 24 VDC at 3A4TB5-15/3A4TB10-3 at the operators cab terminal strip A4.

If 24 VDC is present, use multimeter to check for continuity of wiring between the operators cab terminal strip A4 and the defroster fan 3B3. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab defroster. (TM 55-1945-205-10-1)

If 24 VDC is not present, use multimeter to check for 24 VDC at 3A2S25-3/3A2DS2-2 (wire nos. 442/0).

If 24 VDC is present, use multimeter to check continuity of wiring between 3A2S25 and the operators cab terminal strip A4. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab defroster. (TM 55-1945-205-10-1)

MALFUNCTION

Failed switch 3A2S25.

CORRECTIVE ACTION

If 24 VDC was not present in the previous step, use multimeter to check for 24 VDC at 3A2S25-2/3A2DS2-2 in lower control panel A2. If 24 VDC is present, check switch wiring for continuity. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab defroster. (TM 55-1945-205-10-1)

Use multimeter to check continuity of wiring between the operators cab circuit breaker panel A3 and switch 3A2S25. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of operators cab defroster. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUBLIC ADDRESS SET (LOUDHAILER)
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

PUBLIC ADDRESS SET (LOUDHAILER) HAS NO POWER

SYMPTOM

No indication of power displayed in the loudhailer display window.

MALFUNCTION

Failed loudhailer.

CORRECTIVE ACTION

Using a multimeter, check for 12 VDC at the loudhailer.

If 12 VDC is present, replace loudhailer. (WP 0296 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between junction box and loudhailer.

CORRECTIVE ACTION

Using a multimeter, check for 12 VDC at the appropriate output terminals of the junction box.

If 12 VDC is present, use multimeter to check continuity of wires from junction box to loudhailer. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between DC/DC converter and junction box.

CORRECTIVE ACTION

Using a multimeter, check for 12 VDC at the output of the DC/DC converter.

If 12 VDC is present, use multimeter to check continuity in wires from DC/DC converter to junction box. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between DC/DC converter circuit breaker and DC/DC converter.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the DC/DC converter circuit breaker.

If 24 VDC is present, use multimeter to check continuity in wires between DC/DC converter circuit breaker and DC/DC converter. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between operators cab circuit breaker panel A3 and DC/DC converter circuit breaker.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the appropriate terminal in the operators cab circuit breaker panel A3.

If 24 VDC is present, use multimeter to check continuity in wires from the operators cab circuit breaker panel A3 and the DC/DC converter circuit breaker. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUBLIC ADDRESS SET (LOUDHAILER)
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

PUBLIC ADDRESS SET (LOUDHAILER) WILL NOT TRANSMIT VOICE TO HAILER HORN (LOUDHAILER EXTERNAL SPEAKER)

SYMPTOM

Voice is not being transmitted to the loudhailer external speaker.

MALFUNCTION

Failed loudhailer.

CORRECTIVE ACTION

While transmitting, use multimeter to check for voltage at the speaker wire connector screws at the loudhailer. If no voltage, replace loudhailer. (WP 0296 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

SYMPTOM

Voice not being transmitted to the loudhailer external speaker, voltage is present at the speaker wire connector screws on loudhailer.

MALFUNCTION

Failed speaker.

CORRECTIVE ACTION

Determine if both forward and aft external speakers are inoperative. If only one speaker is inoperative, use a multimeter to check continuity of speaker wire of inoperative speaker. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

If voltage is present is speaker wiring, replace speaker. (WP 0298 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUBLIC ADDRESS SET (LOUDHAILER)
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

PUBLIC ADDRESS SET (LOUDHAILER) WILL NOT TRANSMIT FOG SIGNAL TO HAILER HORN (LOUDHAILER EXTERNAL SPEAKER)

SYMPTOM

Fog signal is not being transmitted to the loudhailer external speaker.

MALFUNCTION

Failed loudhailer.

CORRECTIVE ACTION

While transmitting, use a multimeter to check for voltage at the speaker wire connector screws at the loudhailer. If no voltage, replace loudhailer. (WP 0296 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

MALFUNCTION

Failed speaker, voltage present at loudhailer speaker wire connector screws.

CORRECTIVE ACTION

Determine if both forward and aft speakers are inoperative. If only one speaker is inoperative, use multimeter to check for voltage at inoperative external speaker while transmitting fog signal. If voltage exists, replace external speaker. (WP 0298 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

If no voltage exists, check continuity of external speaker wire. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUBLIC ADDRESS SET (LOUDHAILER)
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

PUBLIC ADDRESS SET (LOUDHAILER) WILL NOT TRANSMIT VHF/FM DSC TRANSCEIVER AUDIO TO HAILER HORN (LOUDHAILER EXTERNAL SPEAKER)

SYMPTOM

VHF/FM DSC transceiver audio is not being transmitted to the loudhailer external speaker.

MALFUNCTION

Failed loudhailer.

CORRECTIVE ACTION

While receiving communication, use a multimeter to check for voltage at the speaker wire connector screws at the loudhailer. If no voltage, replace loudhailer. (WP 0296 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

MALFUNCTION

Failed speaker, voltage present at loudhailer speaker wire connector screws.

CORRECTIVE ACTION

Determine if both forward and aft speakers are inoperative. If only one speaker is inoperative, use a multimeter to check for voltage at inoperative external speaker. Perform test while receiving communication. If voltage exists, replace external speaker. (WP 0298 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

If no voltage exists, use multimeter to check continuity of external speaker wire. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

MALFUNCTION

Failed VHF/FM DSC transceiver.

CORRECTIVE ACTION

Using a multimeter, check for voltage at the grey and pink wires in the VHF/FM interface cable while receiving communications. If no voltage is present, replace VHF/FM DSC transceiver. (WP 0303 00)

Perform operational check of loudhailer. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

VHF/FM DSC TRANSCEIVER HAS NO POWER

SYMPTOM

No indication of power displayed in the transceiver display window.

MALFUNCTION

Failed VHF/FM DSC transceiver.

CORRECTIVE ACTION

Using a multimeter, check for 12 VDC at the VHF/FM DSC transceiver.

If 12 VDC is present, replace VHF/FM DSC transceiver. (WP 0303 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Failed fuse in junction box JB1.

CORRECTIVE ACTION

Replace fuse in junction box JB1. (WP 0202 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Failed VHF/FM RADIO circuit breaker at the operators cab circuit breaker panel A3.

CORRECTIVE ACTION

Replace VHF/FM RADIO circuit breaker at the operators cab circuit breaker panel A3. (WP 0275 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between VHF/FM DSC voltage converter and the VHF/FM DSC transceiver.

CORRECTIVE ACTION

Using a multimeter, check for 12 VDC at the output terminals of the VHF/FM DSC voltage converter.

If 12 VDC is present, use multimeter to check continuity of wires from the VHF/FM DSC voltage converter to the VHF/FM DSC transceiver. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Failed VHF/FM DSC voltage converter.

CORRECTIVE ACTION

Replace VHF/FM DSC voltage converter. (WP 0340 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the VHF/FM RADIO circuit breaker at the operators cab circuit breaker panel A3 and the VHF/FM DSC voltage converter.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the VHF/FM RADIO circuit breaker at the operators cab circuit breaker panel A3.

If 24 VDC is present, use multimeter to check for continuity in wires between the VHF/FM RADIO circuit breaker and the VHF/FM DSC voltage converter. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

VHF/FM DSC TRANSCEIVER WILL NOT RECEIVE

SYMPTOM

No reception from the transceiver.

MALFUNCTION

Failed antenna cable.

CORRECTIVE ACTION

Using a multimeter, check for continuity of center conductor on antenna coaxial cable. If no continuity is present, replace antenna cable. (WP 0307 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Continuity between antenna center conductor and cable connector.

CORRECTIVE ACTION

Using a multimeter, check for continuity between antenna center conductor and cable connector. If continuity exists, replace antenna cable. (WP 0307 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Continuity between antenna center conductor and male connector threads.

CORRECTIVE ACTION

Using a multimeter, check for continuity between antenna center conductor and male connector threads. If continuity exists, replace antenna. (WP 0305 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Transceiver still will not transmit.

CORRECTIVE ACTION

Replace transceiver. (WP 0303 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

VHF/FM DSC TRANSCEIVER WILL NOT TRANSMIT

SYMPTOM

No transmission from the transceiver.

MALFUNCTION

Failed antenna cable.

CORRECTIVE ACTION

Using a multimeter, check for continuity of center conductor on antenna coaxial cable. If no continuity is present, replace antenna cable. (WP 0307 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Continuity between antenna center conductor and cable connector.

CORRECTIVE ACTION

Using a multimeter, check for continuity between antenna center conductor and cable connector. If continuity exists, replace antenna cable. (WP 0307 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Continuity between antenna center conductor and male connector threads.

CORRECTIVE ACTION

Using a multimeter, check for continuity between antenna center conductor and male connector threads. If continuity exists, replace antenna. (WP 0305 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

Transceiver still will not transmit.

CORRECTIVE ACTION

Replace transceiver. (WP 0303 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

VHF/FM DSC TRANSCEIVER DOES NOT DISPLAY A VALID POSITION

SYMPTOM

No indication of valid position displayed in the transceiver display window.

MALFUNCTION

Bad connection of transceiver interface cable at the back of the transceiver.

CORRECTIVE ACTION

Tighten loose connections back of transceiver.

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

No voltage at the interface and switch box.

CORRECTIVE ACTION

Detach J3 cable from interface switch box.

Using a multimeter, check for voltage between pins D and A. Voltage must pulse and exceed 9 VDC.

If voltage is not present, replace PLGR. (WP 0312 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

MALFUNCTION

No voltage at the radio interface cable.

CORRECTIVE ACTION

Using a multimeter, check for voltage at the yellow and orange wires at the NMEA interface cable.

If voltage exists, replace transceiver. (WP 0303 00)

If no voltage exists, replace interface cable. (WP 0311 00)

Perform operational check of VHF/FM DSC transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT GLOBAL
POSITIONING RECEIVER (PLGR)
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR) HAS NO POWER

SYMPTOM

No indication of power displayed in the PLGR display window.

MALFUNCTION

Failed PLGR.

CORRECTIVE ACTION

Using a multimeter, check for 12 VDC at the PLGR end of the PLGR interface cable. If 12 VDC is present, replace PLGR. (WP 0312 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

No power at PLGR interface cable.

CORRECTIVE ACTION

Using a multimeter, check for 12 VDC at the J7 connector on the interface and switchbox. If 12 VDC is present, use multimeter to check continuity of the PLGR interface cable. If continuity is not present, replace PLGR interface cable. (WP 0311 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

No voltage at interface and switchbox J7 connector.

CORRECTIVE ACTION

Remove power connector from interface and switchbox.

Using a multimeter, check for 12 VDC at power connector. If 12 VDC is present, replace interface and switchbox. (WP 0293 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

If 12 VDC is not present at interface and switchbox power connector, use a multimeter to check continuity of power cable. If continuity is not present, replace power cable. (WP 0293 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the junction box and the interface switchbox.

CORRECTIVE ACTION

Using a multimeter, check continuity in the wires between the junction box and the interface and switchbox. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

If continuity exists in wires, replace the interface and switchbox. (WP 0293 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between DC/DC converter and junction box.

CORRECTIVE ACTION

Using a multimeter, check for 12 VDC at the output of the DC/DC converter.

If 12 VDC is present, use multimeter to check continuity in wires from DC/DC converter to junction box. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

If continuity exists, replace junction box. (WP 0342 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between DC/DC converter circuit breaker and DC/DC converter.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the DC/DC converter circuit breaker. If 24 VDC is present, use multimeter to check continuity in wires between DC/DC converter circuit breaker and DC/DC converter. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

If continuity exists in wires, replace DC/DC converter. (WP 0341 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between operators cab circuit breaker panel A3 and DC/DC converter circuit breaker.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the appropriate terminal in the operators cab circuit breaker panel A3.

If 24 VDC is present, use multimeter to check continuity in wires from the operators cab circuit breaker panel A3 and the DC/DC converter circuit breaker. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

If continuity exists in wires, replace DC/DC converter circuit breaker. (WP 0275 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between propulsion module MAIN circuit breaker and operators cab circuit breaker panel A3.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at the appropriate terminal in the propulsion module main circuit breaker.

If 24 VDC is present, use multimeter to check continuity in wires from the propulsion module main circuit breaker to the operators cab circuit breaker panel A3. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

If continuity exists, replace OPR CAB circuit breaker. (WP 0214 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT
GLOBAL POSITIONING RECEIVER (PLGR)
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR) DOES NOT DISPLAY A VALID POSITION

SYMPTOM

No indication of valid position displayed in the PLGR display window.

MALFUNCTION

Failed antenna cable.

CORRECTIVE ACTION

Using a multimeter, check for continuity of center conductor on antenna coaxial cable. If continuity is not present, replace antenna cable. (WP 0319 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

Continuity between antenna center conductor and cable connector.

CORRECTIVE ACTION

Using a multimeter, check for continuity between antenna center conductor and cable connector. If continuity exists, replace antenna cable. (WP 0319 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

Continuity between antenna center conductor and male connector threads.

CORRECTIVE ACTION

Using a multimeter, check for continuity between antenna center conductor and male connector threads. If continuity exists, replace antenna cable. (WP 0319 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

MALFUNCTION

Still no indication of valid position.

CORRECTIVE ACTION

Replace PLGR. (WP 0312 00)

Perform operational check of PLGR. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
NAVIGATION LIGHTS
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

NAVIGATION LIGHT AUDIBLE PULSE BEEPER SOUNDS

SYMPTOM

Audible pulse beeper sounds for navigation light outage.

MALFUNCTION

Single navigation light does not operate.

CORRECTIVE ACTION

Replace light bulb. (WP 0330 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Mast enclosure assembly has blown fuse.

CORRECTIVE ACTION

Replace fuse. (WP 0321 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Mast enclosure assembly has a defective toggle switch.

CORRECTIVE ACTION

Replace toggle switch. (WP 0322 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Audible alarm is still on.

CORRECTIVE ACTION

Check the sonalert beeper. If defective, replace the beeper. (WP 0323 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

The navigation lights terminal box has loose or detached wiring.

CORRECTIVE ACTION

Attach wiring. (TM 55-1945-205-10-1)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Navigation light(s) still do not operate.

CORRECTIVE ACTION

Using a multimeter, perform a continuity test of the electrical wiring from the navigation lights terminal box to the light bulb receptacle of the affected light. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
MAST ASSEMBLY LAMP FIXTURE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

LAMP FIXTURE ON MAIN OR STUB MAST NOT WORKING

SYMPTOM

Main or stub mast lamp fixture not working.

MALFUNCTION

Circuit breaker in the mast enclosure is off.

CORRECTIVE ACTION

Turn on toggle switch for the appropriate breaker in the main mast enclosure A7 to on. (TM 55-1945-205-10-1)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

MALFUNCTION

Loose or broken bulb.

CORRECTIVE ACTION

Tighten or replace bulb. (WP 0330 00, WP 0335 00)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

MALFUNCTION

Defective toggle switch in the mast enclosure A7.

CORRECTIVE ACTION

Replace defective toggle switch in the mast enclosure A7. (WP 0322 00)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
MAIN OR STUB MAST
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

LOSS OF POWER TO MAIN OR STUB MAST

SYMPTOM

Power lost to main or stub mast.

MALFUNCTION

Circuit breaker for the STUB MAST in the mast enclosure A7 or the NAV LIGHTS circuit breaker on operators cab circuit breaker panel A3 has been tripped.

CORRECTIVE ACTION

Reset NAV LIGHTS circuit breaker on the operators cab circuit breaker A3 to the on position. (TM 55-1945-205-10-1)

Reset STUB MAST circuit breaker in main mast enclosure A7 to the on position. (TM 55-1945-205-10-1)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

MALFUNCTION

Loose power cable connection at plug-in point on operators cab.

CORRECTIVE ACTION

Tighten connection. (TM 55-1945-205-10-1)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

MALFUNCTION

Short in power cable wiring.

CORRECTIVE ACTION

Using multimeter, check continuity of wiring in power cable. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
MAST ENCLOSURE LAMP INDICATOR LIGHT
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

LAMP INDICATOR LIGHT ON MAST ENCLOSURE JUNCTION BOX NOT WORKING

SYMPTOM

Lamp indicator light on mast enclosure junction box not working.

MALFUNCTION

Loose or broken bulb.

CORRECTIVE ACTION

Tighten or replace bulb. (WP 0326 00)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

MALFUNCTION

Loose cable connection at plug-in point.

CORRECTIVE ACTION

Tighten cable connection. (WP 0327 00)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

MALFUNCTION

Open in cable wiring.

CORRECTIVE ACTION

Using multimeter, check continuity of cable wiring. If continuity is not present, repair/ replace wiring as necessary. (WP 0361 00)

Perform operational check of mast lights. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
NAVIGATION LIGHTS
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

NAVIGATION LIGHTS WILL NOT FUNCTION

SYMPTOM

None of the navigation lights will function.

MALFUNCTION

Circuit breaker NAV LIGHTS on the operators cab circuit breaker panel A3 is off.

CORRECTIVE ACTION

Turn NAV LIGHTS circuit breaker to the on position. (TM 55-1945-205-10-1)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Mast enclosure assembly A7 has blown fuse(s).

CORRECTIVE ACTION

Replace fuse(s). (WP 0321 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Mast enclosure assembly A7 has defective toggle switch(s).

CORRECTIVE ACTION

Replace defective toggle switch(s). (WP 0322 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Defective reed switch assembly(s).

CORRECTIVE ACTION

Replace reed switch assembly(s). (WP 0324 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Poor connection between navigation lights terminal box and operators cab circuit breaker panel A3.

CORRECTIVE ACTION

Using multimeter, check for 24 VDC in navigation lights terminal box on fuse block wire No. 381 and TB6-47 wire No. 0.

If 24 VDC is present, check cab receptacle J1, located on front of the operators cab above the window, for proper connection.

Using multimeter, check voltage at NAV LIGHTS circuit breaker in operators cab circuit breaker panel A3. If voltage is present, replace NAV LIGHTS circuit breaker. (WP 0275 00).

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
NAVIGATION LIGHTS
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

ONE OR MORE NAVIGATION LIGHTS ARE NOT FUNCTIONING

NOTE

Red lights on mast enclosure assembly indicate NAV lights are active. When a NAV light burns out, an alarm sounds and its associated red light goes out. The alarm may be silenced using the ALARM/SILENCE switch.

SYMPTOM

One or more navigation lights are not functioning.

MALFUNCTION

Circuit breaker NAV LIGHTS on the operators cab circuit breaker panel A3 is off.

CORRECTIVE ACTION

Turn NAV LIGHTS breaker to the on position. (TM 55-1945-205-10-1)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Blown fuse(s) in the main mast enclosure assembly A7.

CORRECTIVE ACTION

Replace the appropriate fuse(s). (WP 0321 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Bad lamp.

CORRECTIVE ACTION

Replace lamp. (WP 0330 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit or poor connection between navigation lights terminal box and operators cab circuit breaker panel A3.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at appropriate terminals between navigation lights terminal box and operators cab circuit breaker panel A3.

If 24 VDC is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Open circuit between the main mast enclosure assembly and inoperative navigation light.

CORRECTIVE ACTION

Using multimeter, check continuity of wiring between the main mast enclosure A7 and the inoperative navigation light. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Mast enclosure assembly A7 has defective toggle switch.

CORRECTIVE ACTION

Using a multimeter, check for 24 VDC at terminals of the inoperative circuit.

If 24 VDC is present, replace switch. (WP 0322 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Short circuit in wiring between test terminals and the appropriate switch.

CORRECTIVE ACTION

Using a multimeter, check continuity of wiring in main mast enclosure between test terminals and the appropriate switch. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

Switch operates properly, but 24 VDC is not present at navigation light(s).

CORRECTIVE ACTION

Using multimeter, check continuity of wiring between the switch and the appropriate fuse. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

MALFUNCTION

24 VDC is not present at circuit breaker NAV LIGHTS in operators cab.

CORRECTIVE ACTION

Using multimeter, check continuity of wiring from battery to circuit breaker NAV LIGHTS in operators cab. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of navigation lights. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
STUB MAST STERN LIGHT
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

TROUBLESHOOTING PROCEDURE

STUB MAST STERN LIGHT NOT FUNCTIONING

SYMPTOM

Stub mast stern light not functioning.

MALFUNCTION

Bad J2/P2 connection.

CORRECTIVE ACTION

Check plug/receptacle connection of the stub mast umbilical cable to the front of the cab to determine if connection is loose or dirty. Tighten or clean as necessary. (TM 55-1945-205-10-1)

Perform operational check of stub mast lights. (TM 55-1945-205-10-1)

MALFUNCTION

Blown fuse.

CORRECTIVE ACTION

Check fuse 4A1F8 on the mast enclosure assembly A7. If fuse is blown, replace fuse. (WP 0321 00)

Perform operational check of stub mast lights. (TM 55-1945-205-10-1)

If fuse is not defective, use multimeter to check continuity of power cable. If continuity is not present, repair/replace wiring as necessary. (WP 0361 00)

If power cable is not defective, use multimeter to check for 24 VDC at terminals TB3-B18/TB6-A6 and TB4-A5/TB6-A6. If 24 VDC is not present, repair/replace wiring as necessary. (WP 0361 00)

Perform operational check of stub mast lights. (TM 55-1945-205-10-1)

MALFUNCTION

Bad lamp.

CORRECTIVE ACTION

Replace lamp. (WP 0335 00)

Perform operational check of stub mast lights. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

CHAPTER 3

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS FOR MODULAR CAUSEWAY SYSTEM (MCS) CAUSEWAY FERRY (CF)

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
SERVICE UPON RECEIPT OF MATERIEL

INITIAL SETUP:

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1
SF 361
SF 368
DA PAM 738-750

GENERAL INFORMATION

This work package shall contain information required for the user to ensure that the equipment will be adequately inspected, serviced and operationally tested before it is subjected to use.

CHECK 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. If the equipment has been modified, submit a Product Quality Deficiency Report (PQDR) using SF 368.

PROCESS UNPACKED EQUIPMENT

Refer to TM 55-1945-205-10-1, Operators Manual for Modular Causeway System (MCS) Causeway Ferry, for instructions to process unpacked equipment. The referenced manual will provide 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

Refer to TM 55-1945-205-10-1, Operators Manual for Modular Causeway System (MCS) Causeway Ferry, for installation of equipment. The referenced manual will identify any connectors, wiring diagrams, or instructions to aide in the installation of such equipment.

ASSEMBLY OF EQUIPMENT

Refer to TM 55-1945-205-10-1, Operators Manual for Modular Causeway System (MCS) Causeway Ferry, for assembly of equipment. Instructions include preparing equipment for use that has been shipped disassembled. As applicable, power requirements, connections, and initial control settings needed for installation purposes shall be included.

PRELIMINARY SERVICING OF EQUIPMENT

Refer to TM 55-1945-205-10-1, Operators Manual for Modular Causeway System (MCS) Causeway Ferry for information on preliminary servicing of equipment.

PRELIMINARY CALIBRATION OF EQUIPMENT

No calibration of equipment is required on the causeway ferry.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)
PROCEDURES INTRODUCTION

INTRODUCTION

General

Preventive Maintenance Checks and Services (PMCS) are performed to keep the causeway ferry equipment in operating condition. The checks are used to find, correct or report problems.

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 further information on how to use this form, see DA PAM 738-750.

Leakage Definition

CAUTION

Equipment operation is allowed with minor leakages (Class I or II), except for fuel leaks. Of course, consideration must be given to the fluid capacity of the item or system being checked. When in doubt, ask your supervisor. Failure to maintain proper fluid levels could result in damage to equipment.

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

Class III leaks should be reported immediately to your supervisor.

It is necessary to know how fluid leakage affects the status of the equipment. The following are definitions of the classes of leakage an operator or crew member needs to know to be able to determine the condition of the leak. Learn and then be familiar with them and REMEMBER - WHEN IN DOUBT, ASK YOUR SUPERVISOR.

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

CLASS II - Leakage of fluid great enough to form drops, but not enough to cause drops to drip from item being checked.

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

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 your supervisor.

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

1. 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.

2. Welds: Many items on the equipment are welded. To check these welds, look for chipped paint, rust, corrosion or gaps. Write up items not fixed on DA Form 2404.

3. Electrical wires, connectors and harnesses: Tighten loose connectors. Look for cracked or broken insulation, bare wires and broken connectors. Write up items not fixed on DA Form 2404.

4. 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 your supervisor.

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 or long periods of hard use will break down the lubricant, requiring you to add or change lubricant more often.

Lubrication Symbols

The following lubrication symbols are used in the PMCS table:

OE/HDO-30 - Lubricating Oil, internal combustion engine, tactical service, SAE 30, MIL-L-2104F or SAE 30, MIL-L-46152. Temperature Range -25° - 0°F.

OE/HDO-40 - Lubricating Oil, internal combustion engine, tactical service, SAE 40, API Class CD-II, MIL-L-2104D, Sulfated Ash: less than 1.0%. Temperature Range -25° - 150°F.

OE/HDO-50 - Lubricating Oil, internal combustion engine, tactical service, SAE 50, MIL-L-2104F or SAE 50, MIL-L-46152. Temperature Range 0° - 150°F.

GO-80/90 - Lubricating oil, gear, multipurpose, MIL-L-2105, Grade 80/90, ISO VG 150, AGMA4 EP.

DTE-25 - Hydraulic fluid, Mobil DTE-25, ISO viscosity grade 46.

LUBRIPLATE - Grease, wire rope, exposed gear, 1200-2, MIL-G-18458.

WTR - Grease, aircraft, general purpose, wide temperature.

GAA - Grease, lithium base, MIL-G-10924.

GGP - Grease, general purpose, MIL-G-23549

S-750 - Antifreeze, ethylene glycol inhibited, heavy duty, MIL-A-46153. Temperature Range -25° - 150°F.

Lubrication Intervals

The following lubrication interval symbols are used in the PMCS table:

M - monthly	A- annually
S - semiannually	H - hours operated

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.

At prescribed hard time intervals.

Army Oil Analysis Program (AOAP)

The CF engines, marine transmission gearcases, transfer cases, hydraulic systems and winch engine oil are enrolled in the Army Oil Analysis Program. Refer to for the Army Oil Analysis Program. Causeway ferry components will be sampled at the following intervals:

CF Engines - Sample crankcase oil every 90 days or 100 operating hours, whichever occurs first, as prescribed by DA PAM 738-750.

Marine Transmission Gearcases - Sample oil every 90 days or 100 operating hours, whichever occurs first, as prescribed by DA PAM 738-750.

Transfer Cases - Sample oil every 90 days or 100 operating hours, whichever occurs first, as prescribed by DA PAM 738-750.

Hydraulic Systems - Sample oil every 180 days, as prescribed by DA PAM 738-750.

Warranty Information

For equipment under manufacturer’s warranty, hard time 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 or extended idling periods.

CLEANING AND LUBRICATION

Proper cleaning and lubrication can aid in avoiding possible problems or trouble, so make it a habit to do the following:

CAUTION

Follow all cleaning and lubrication instructions carefully, failure to do so can result in damage to equipment.

1. Thoroughly wash all equipment exposed to salt spray with clean, fresh water.
2. Clean grease fittings before lubrication.
3. Lubricate all equipment at conclusion of the operation before equipment storage.
4. Always use the PMCS lubrication instructions as a guide.
5. Never use too much lubricant.
6. Never use the wrong type or grade of lubricant.

7. Lubricate more during constant use and less during inactive periods.

8. Use the correct grade of lubricant for seasonal temperature expected.

CORROSION PREVENTION AND CONTROL (CPC)

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

Corrosion is typically associated with rusting of metals or galvanic corrosion which produces a white powder. The category of corrosion also includes 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 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.

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)
AND LUBRICATION PROCEDURES

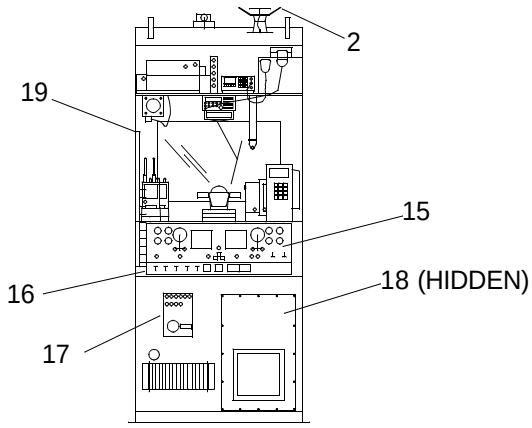
INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

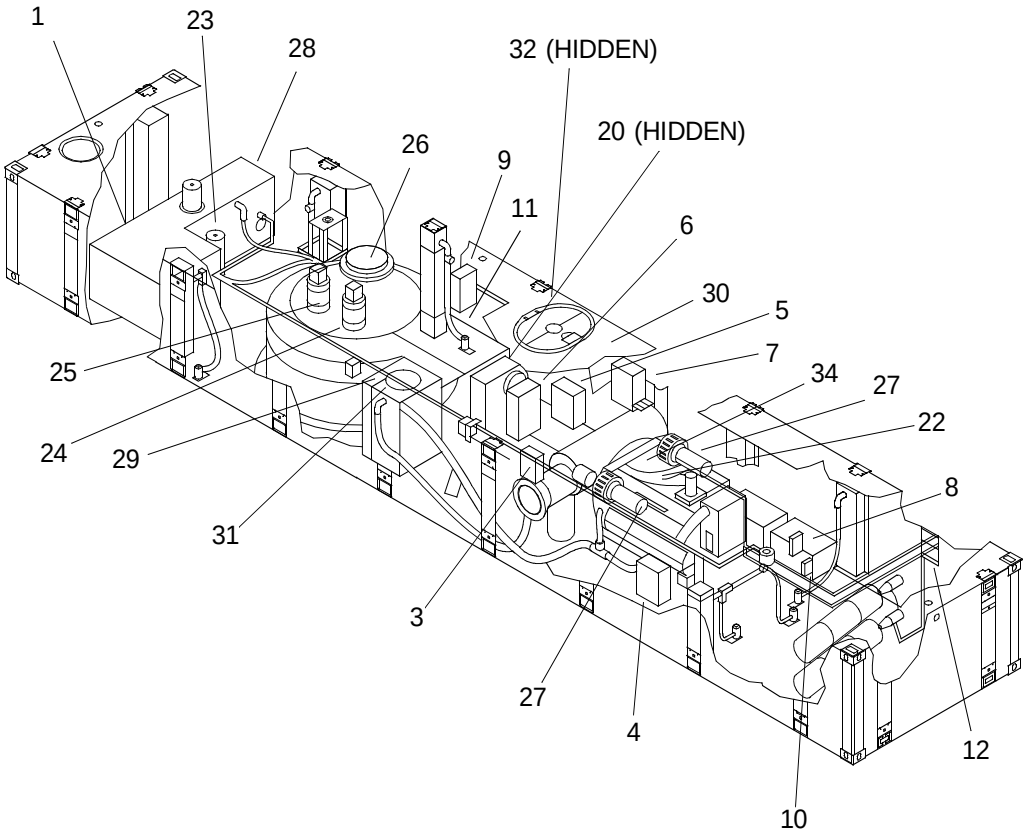
Personnel Required
Seaman 88K

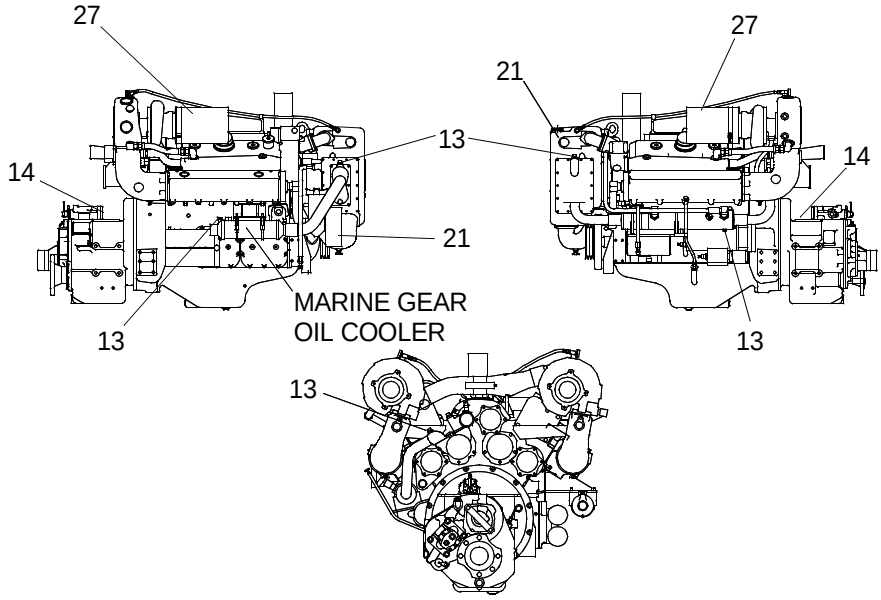
References
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2
TM 55-1945-205-24-1-3
TM 55-1945-205-24-1-4

1. Fuel System
2. Spotlight
3. Junction Box (A2jb2)
4. Junction Box (A3)
5. Junction Box (A4)
6. Bilge Pump Control Panel (A5)
7. Circuit Breaker Panel (A6)
8. Single Bilge Pump Control Panel (A7)
9. Vent Fan Relay Enclosure (A8)
10. Junction Box Assembly Enclosure (A9)
11. NATO receptacle (JB3)
12. Fire Suppression Pressure Switch
13. Raw Water Cooling System Anode Plugs
14. Marine Gear
15. Middle Control Panel (A1)
16. Lower Control Panel (A2)
17. Circuit Breaker Panel (A3)
18. Terminal Board (A4)
19. Mast Enclosure Assembly (A7)
20. Transfer Case
21. Diesel Engine Cooling System
22. Cold-Pack Starting Aid
23. Fuel System Fuel Water Separator
24. Planetary Gearbox, Primary
25. Planetary Gearbox, Auxiliary
26. Pump-Jet Gearcase
27. Engine Air Filter Elements
28. Fuel System Fuel Tank
29. Hydraulic System Filters
30. Engine Oil and Fuel Lines and Hoses
31. Hydraulic System Reservoir
32. Pump-Jet Hydro Hand Pump
33. Non-powered Modules
34. Diesel Engine



OPERATORS CAB


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MARINE GEAR
OIL COOLER
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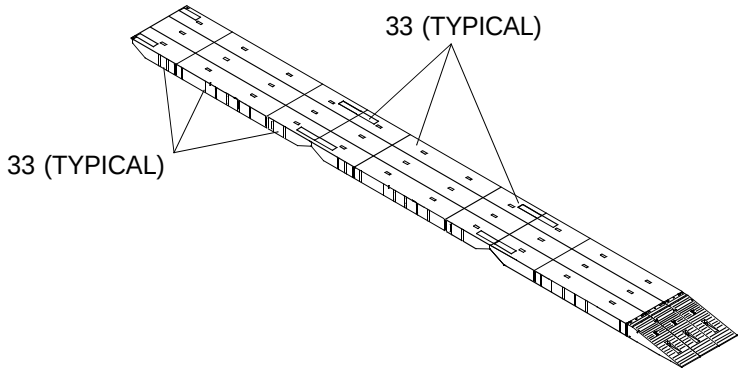


Table 1. Preventive Maintenance Checks and Services for the Causeway Ferry.

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Weekly	1.0	Fuel System	Check for water in fuel tank using water detection paste. (WP 0184 00)	
2	Weekly	1.0	Spotlight	Clean lens and reflector. Inspect for cracked lens, broken seals and corrosion. (WP 0278 00)	
3	Monthly	1.0	Powered Section Electrical System Pump-Jet Junction Box (A2jb2)	Open box and inspect for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0206 00)	
4	Monthly	1.0	Powered Section Electrical System Propulsion Module Junction Box (A3)	Open box and inspect for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0208 00)	
5	Monthly	1.0	Powered Section Electrical System Engine Junction Box (A4)	Open box and inspect for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0210 00)	
6	Monthly	1.0	Powered Section Electrical System Bilge Pump Control Panel (A5)	Open box and inspect for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0212 00)	
7	Monthly	1.0	Powered Section Electrical System Propulsion Module Circuit Breaker Panel (A6)	Open box and inspect for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0214 00)	

Table 1. Preventive Maintenance Checks and Services for the Causeway Ferry. (Continued)

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
8	Monthly	1.0	Powered Section Electrical System Single Bilge Pump Control Panel (A7)	Open box and inspect for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0216 00)	
9	Monthly	1.0	Powered Section Electrical System Vent Fan Relay Enclosure (A8)	Open box and inspect for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0218 00)	
10	Monthly	1.0	Powered Section Electrical System Thruster Direction/ Auxiliary Battery Junction Box Assembly Enclosure (A9)	Open box and inspect for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0220 00)	
11	Monthly	1.0	Powered Section Electrical System NATO receptacle (JB3)	Open receptacle and inspect for corrosion, evidence of moisture and loose or damaged connections/ components. (WP 0361 00)	
12	Monthly	.5	Fire Suppression Pressure Switch	Test the fire suppression switch. If switch is inoperative, contact Specialized Repair Activity (SRA).	Switch is inoperative.
13	Monthly	1.5	Raw Water Cooling System Anode Plugs	Inspect and clean all zinc anodes. (TM 55-1945-205-24-1-2)	
14	Monthly	0.5	Marine Gear	1. Remove emergency lock-up plug and inspect for corrosion, pitting. (TM 55-1945-205-24-1-3) 2. Inspect emergency lock-up plug preformed packings for dry rot, or cracking. Replace as necessary. (TM 55-1945-205-24-1-3) 3. Coat emergency lock-up plug with a thin layer of white lithium grease and install emergency lock-up plug. (TM 55-1945-205-24-1-3)	

Table 1. Preventive Maintenance Checks and Services for the Causeway Ferry. (Continued)

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
15	Monthly	1.0	Operators Cab Electrical System Middle Control Panel (A1)	Remove operators cab access panel (WP 0237 00) and inspect interior of panel A1 for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0361 00)	
16	Monthly	1.0	Operators Cab Electrical System Lower Control Panel (A2)	Remove operators cab access panel (WP 0237 00) and inspect interior of panel A2 for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0361 00)	
17	Monthly	1.0	Operators Cab Electrical System Operators Cab Circuit Breaker Panel (A3)	Remove operators cab access panel (WP 0237 00) and inspect interior of panel A3 for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0361 00)	
18	Monthly	1.0	Operators Cab Electrical System Terminal Board (A4)	Remove operators cab access panel (WP 0237 00) and inspect terminal board (A4) for corrosion, evidence of moisture and loose or damaged connections/components. Repair as necessary. (WP 0276 00)	
19	Monthly	1.0	Operators Cab Electrical System Mast Enclosure Assembly (A7)	Remove operators cab access panel (WP 0237 00) and inspect for corrosion, evidence of moisture and loose or damaged connections/ components. Repair as necessary. (WP 0361 00)	
20	Monthly 24 Hours	0.5	Transfer Case	Change oil after first 24 hours of operation and monthly thereafter. (TM 55-1945-205-24-1-4)	
22	Monthly 200 Hours	.5	Cold-Pack Starting Aid	Weigh the cold pack starting aid fluid cylinder monthly or every 200 operating hours, whichever occurs first. Empty container weighs 16 oz (238 gr), full cylinder weighs 37 oz (510 gr). (TM 55-1945-205-24-1-2)	

Table 1. Preventive Maintenance Checks and Services for the Causeway Ferry. (Continued)

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
21	Quarterly 200 Hours	.5	Diesel Engine Cooling System	1. Test the Supplemental Coolant Additive (SCA) level quarterly or every 200 operating hours, whichever occurs first. (TB 55-1900-207-24) 2. Replace the fresh water filter if the nitrate concentration is below 800 ppm. (TM 55-1945-205-24-1-2)	
23	Semi-annually 300 Hours	3.0	Fuel System Fuel Water Separator	1. Replace fuel water separator filter element semiannually or every 300 operating hours, whichever occurs first. (WP 0196 00) 2. Replace engine secondary fuel filter semiannually or every 200 operating hours, whichever occurs first.. (TM 55-1945-205-24-1-2)	
21	Semi-annually 500 Hours	3.0	Diesel Engine Cooling System	Replace fresh water coolant filter annually or 700 operating hours, whichever comes first. (TM 55-1945-205-24-1-2)	
24	Semi-annually 100 Hours 2,500 Hours	2.0	Hydraulic System Pump-Jet Planetary Gearbox, Primary	Change gearbox lubricating oil after first 100 hours of operation and every 2,500 operating hours or semi-annually, whichever occurs first. (WP 0129 00)	
25	Semi-annually 100 Hours 2,500 Hours	2.0	Hydraulic System Pump-Jet Planetary Gearbox, Auxiliary	Change gearbox lubricating oil after first 100 hours of operation and every 2,500 operating hours or semi-annually, whichever occurs first. (WP 0131 00)	
26	Semi-annually 250 Hours 2,500 Hours	4.0	Hydraulic System Pump-Jet Gearcase	Change gearcase lubricating oil after the first 250 hours of operation and every 2,500 operating hours or semi-annually, whichever occurs first. (WP 0128 00)	
27	Annually	1.0	Engine Air Filter Elements	1. Replace engine air filter elements. (TM 55-1945-205-24-1-2) 2. Clean engine air inlet collector. (TM 55-1945-205-24-1-2)	

Table 1. Preventive Maintenance Checks and Services for the Causeway Ferry. (Continued)

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				3. Clean engine crankcase breather limiters. (TM 55-1945-205-24-1-2)	
28	Annually	10.0	Fuel System Fuel Tank	Drain fuel, remove inspection covers and inspect for corrosion and damage. (WP 0187 00)	
29	Annually 250 Hours	2.0	Hydraulic System Filters	1. Replace the hydraulic reservoir filter every 250 operating hours or annually, whichever occurs first: (WP 0144 00) 2. Replace the hydraulic system pressure filter element. (WP 0144 00)	
21	Annually 500 Hours	20.0	Diesel Engine Cooling System	1. Remove heat exchanger and raw water pump anodes annually or 500 operating hours, whichever comes first. Clean anodes. Replace if worn excessively. (TM 55-1945-205-24-1-2) 2. Clean the exterior of the heat exchanger fins annually or 500 operating hours, whichever comes first. (TM 55-1945-205-24-1-2) 3. Functionally test cooling system thermostat annually or 500 operating hours, whichever comes first. (TM 55-1945-205-24-1-2)	
30	Annually 500 Hours	.1	Engine Oil and Fuel Lines and Hoses	Check oil and fuel hoses for signs of deterioration. Replace hoses as necessary. (TM 55-1945-205-24-1-2)	Class I fuel leakage is found.
31	Annually 500 Hours 2,000H	3.5	Hydraulic System Reservoir	Clean hydraulic reservoir strainer after first 500 operating hours and every 2,000 operating hours or annually, whichever comes first. (WP 0141 00)	
32	Annually 500 Hours 2,000 Hours	.5	Hydraulic System Pump-Jet Hydro Hand Pump	Service pump-jet hydro hand pump reservoir after first 500 operating hours and every 2,000 operating hours or annually, whichever comes first. (WP 0165 00)	

Table 1. Preventive Maintenance Checks and Services for the Causeway Ferry. (Continued)

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
33	Annually 2,400 Hours	1.0	Non-Powered Modules	Pressure test modules and repair leaks, cracks and corrosion. (WP 0235 00)	Leaks present or structural damage which interferes with operation.
21	Biennially 4,000 Hours	3.0	Diesel Engine Cooling System	Replace fresh water coolant biennially or 4,000 operating hours, whichever comes first. (TM 55-1945-205-24-1-2)	
34	150 Hours	1.0	Diesel Engine	1. Change diesel engine crankcase lubricating oil every 150 operating hours or in accordance with AOAP. (TM 55-1945-205-24-1-2) 2. Replace engine oil filters. (WP 0120 00)	
34	200 Hours	.5	Diesel Engine	Check engine alternator belt tension. (WP 0175 00)	
14	300 Hours	2.0	Marine Gear	1. Change marine gear lubricating oil every 300 hours of operation or in accordance with AOAP. (TM 55-1945-205-24-1-3) 2. Clean marine gear manifold filter screen. (TM 55-1945-205-24-1-3)	
34	1,000 Hours	1.5	Diesel Engine	1. With the engine running, check for flow of air from the air box drain tubes. Clean tubes as required. (TM 55-1945-205-24-1-2) 2. Remove, inspect and clean blower screen. (TM 55-1945-205-24-1-2) 3. Remove crankcase breather and clean steel mesh pad. (TM 55-1945-205-24-1-2)	
34	3,000 Hours	1.5	Diesel Engine	Clean the blower bypass valve using cleaner. (TM 55-1945-205-24-1-2)	
34	6,000 Hours	1.5	Diesel Engine	Replace fresh water pump seal. (TM 55-1945-205-24-1-2)	

Table 1. Preventive Maintenance Checks and Services for the Causeway Ferry. (Continued)

ITEM NO.	INTERVAL	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
30	5 Years	20.0	Engine Oil and Fuel Lines and Hoses	Replace all fuel and oil hoses in or out of engine during major engine overhaul or five years, whichever occurs first. (WP 0193 00), (TM 55-1945-205-24-1-2)	
30	6 Years	1.0	Portable CO2 Fire Extinguisher	Hydrostatically test portable fire extinguisher and replace o-rings. Contact Specialized Repair Activity (SRA). Record completion in the deck logbook.	

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION INTAKE PLENUM ASSEMBLY
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Sling, 5300 lb 6 ft (Green) (Item 37, WP 0383 00)
Qty 2
Shackle, ½ in. 2 ton (Item 33, WP 0383 00)
Qty 2

Personnel Required

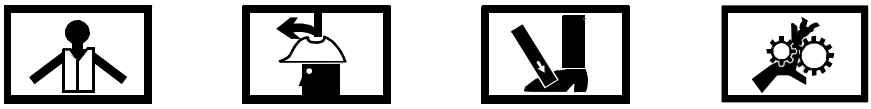
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE POWERED SECTION INTAKE PLENUM ASSEMBLY

WARNING

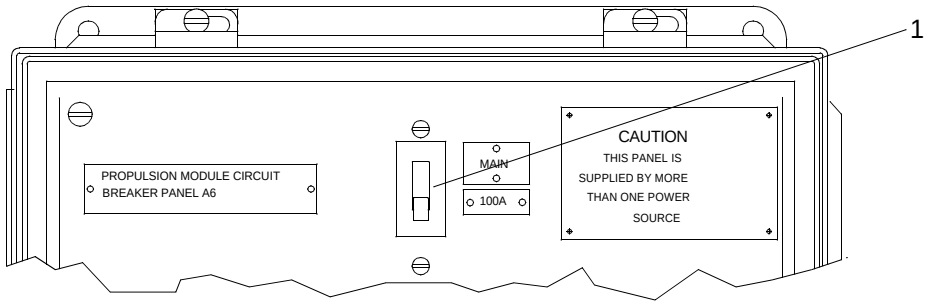


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

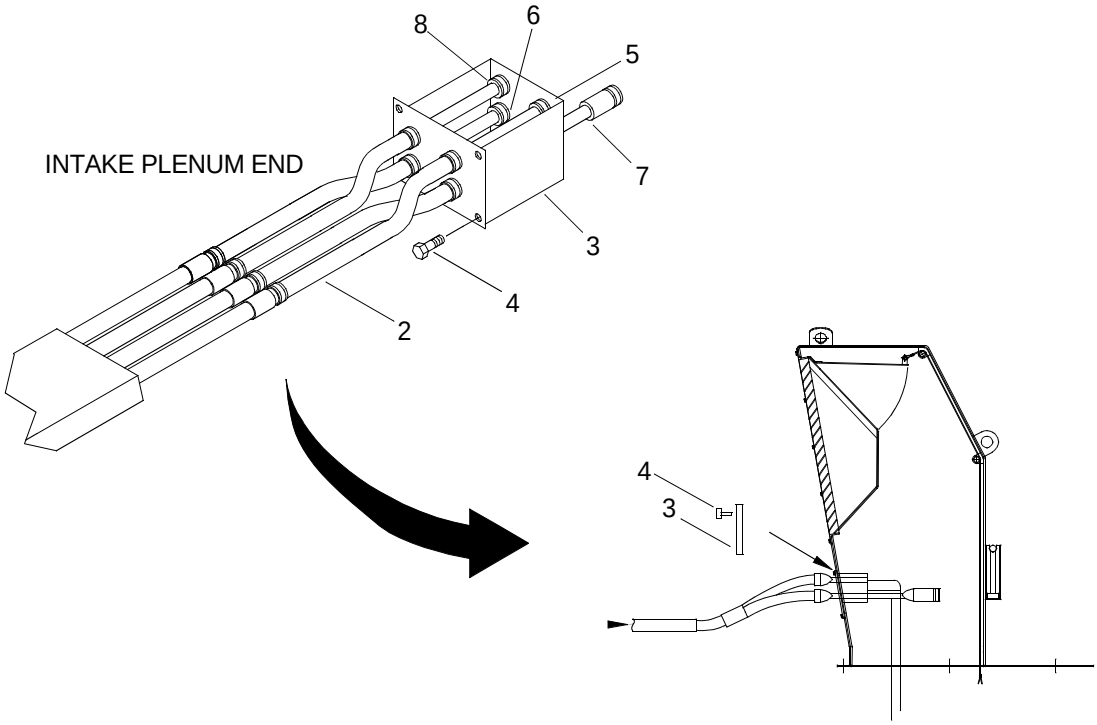
NOTE

The following procedure is typical for the removal and installation of air intake plenums.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove interconnect cable (2) from intake plenum receptacles.



a. Remove the intake plenum conduit entry panel (3).

{1} Remove four bolts (4).

{2} Remove access panel (3).

b. From below deck, remove power module cable from interconnect cable receptacles.

{1} Remove power module A6, P1 from interconnect cable, P1 (5).

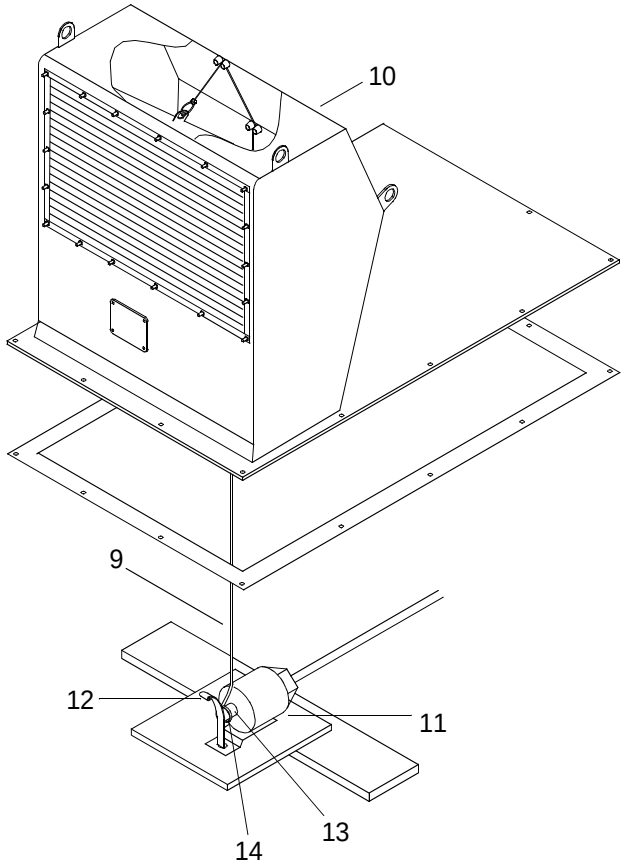
{2} Remove power module junction box A3, P2 from interconnect cable, P2 (6).

{3} Remove power module junction box A3, P3 from interconnect cable, P3 (7).

{4} Remove power module junction box A3, P4 from interconnect cable, P4 (8).

c. Feed the cable (2) from inside the intake plenum through the front panel access.

3. Remove wire rope (9) in the intake plenum (10) from the fire suppression trip mechanism (11).

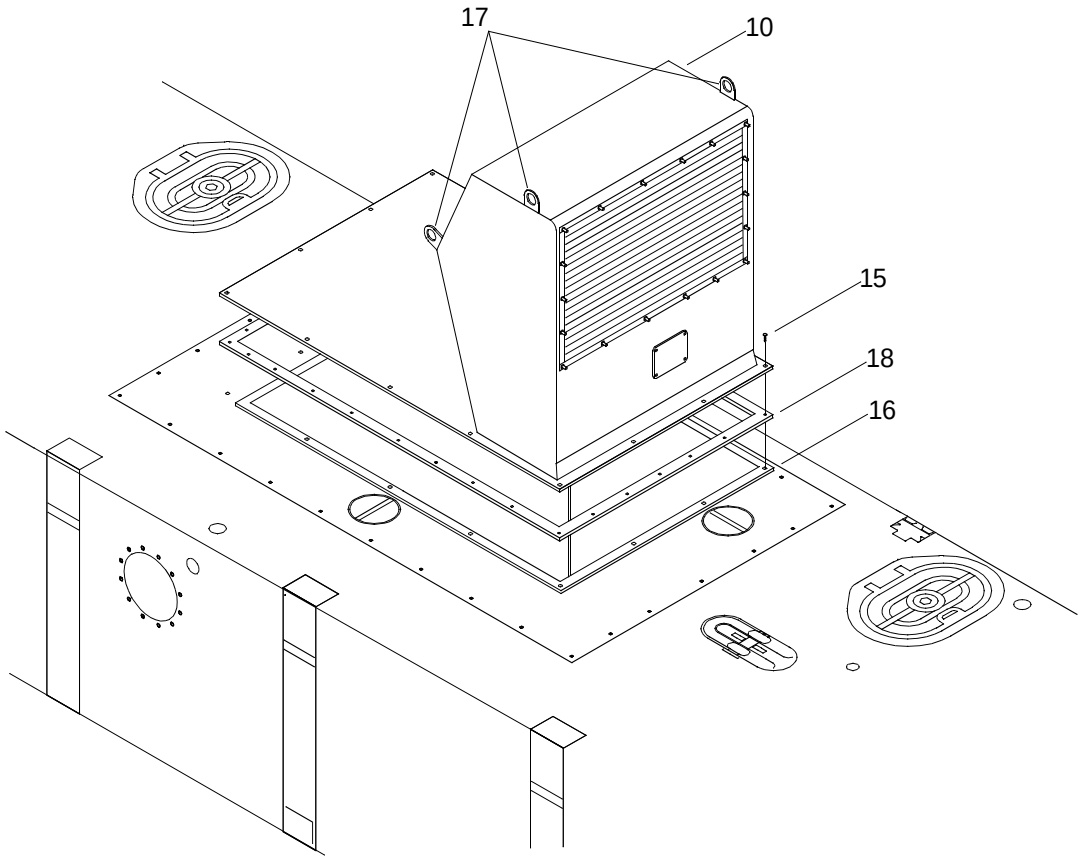


a. Move fire suppression solenoid spring flange (12) away from solenoid shaft (13).

b. Remove wire rope ring (14) from the fire suppression solenoid shaft (13).

c. Release flange (12).

4. Remove 12 bolts (15) attaching intake plenum (10) to propulsion module hatch (16).



5. Attach slings and shackles to lifting eyes (17).

WARNING



HEAVY PARTS

Intake weighs approximately 519 lb. Use appropriate lifting devices when removing or installing. Failure to comply can result in serious injury to personnel.

6. Using crane, slings and shackles, remove intake plenum (10) from port propulsion module hatch (16).

7. Remove air intake plenum gasket (18), if damaged.

8. Remove slings and shackles from intake plenum (10).

INSTALL POWERED SECTION INTAKE PLENUM ASSEMBLY

1. Position new intake plenum gasket (18), if required.
2. Attach slings and shackles to lifting eyes (17).

WARNING



HEAVY PARTS

Intake weighs approximately 519 lb. Use appropriate lifting devices when removing or installing. Failure to comply can result in serious injury to personnel.

3. Using crane, slings and shackles, position intake plenum (10) on port propulsion module hatch (16).
4. Install 12 bolts (15), tighten and secure intake plenum (10) to propulsion module hatch (16).
5. Move fire suppression solenoid spring flange (12) away from solenoid shaft (13).
6. Install wire rope ring (14) on the fire suppression solenoid shaft (13).
7. Release flange (12).
8. Insert interconnect cables (2) into intake plenum front access.
    a. From below deck, connect power module cables to interconnect cable receptacles.
        {1} Connect electrical system propulsion module junction box A3, P2 to interconnect cable, P2 (6).
        {2} Connect electrical system propulsion module junction box A3, P4 to interconnect cable, P4 (8).
        {3} Connect electrical system propulsion module junction box, P3 to interconnect cable, P3 (7).
        {4} Connect electrical system propulsion module circuit breaker panel A6, P1 to interconnect cable, P1 (5).
    b. Install conduit entry plate (3) on air intake plenum (10).
        {1} Align entry plate holes with holes in intake plenum.
        {2} Install four bolts (4) through plate (3) into air intake plenum (10).
        {3} Tighten bolts (4).
9. Remove sling from intake plenum lifting eyes (17).
10. Perform operational check of intake plenum. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION INTAKE PLENUM AIR INTAKE LOUVER REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

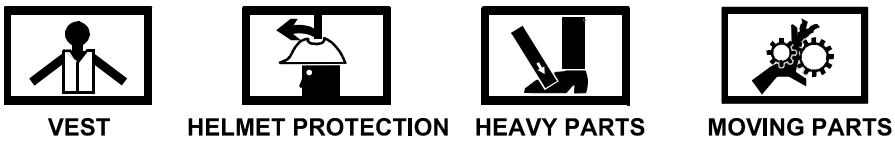
Air Intake Louver Assembly
(34712)
PN E07202

Personnel Required

Engineer 88L

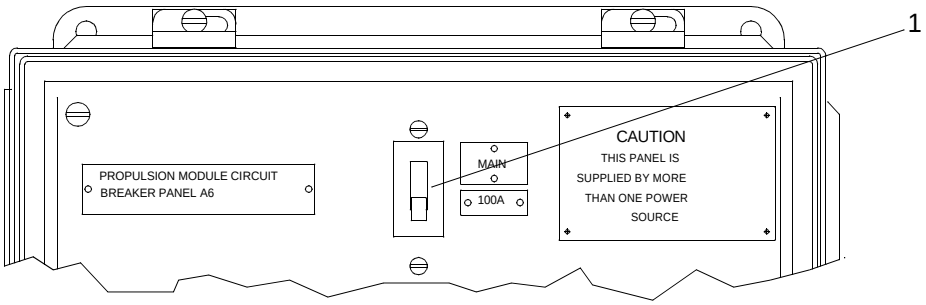
REMOVE INTAKE PLENUM AIR INTAKE LOUVER

WARNING

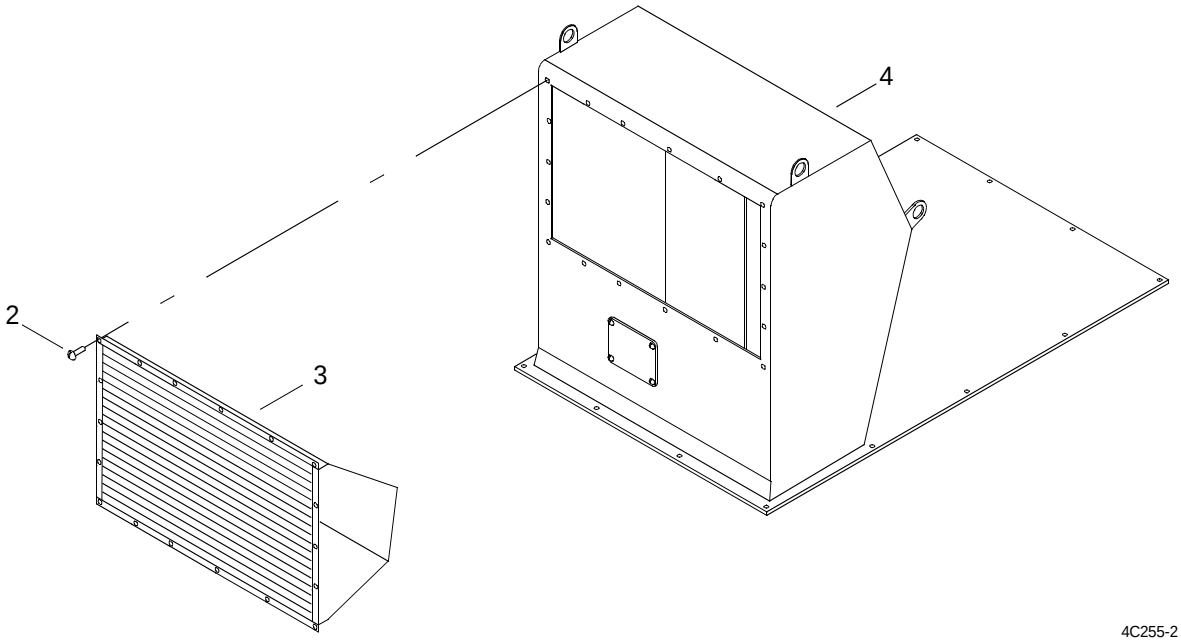


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove eighteen screws (2) from louver (3).



3. Remove louver (3) from intake plenum (4).

4. Discard louver (3).

INSTALL INTAKE PLENUM AIR INTAKE LOUVER

1. Position new louver (3) on intake plenum (4).

2. Install eighteen screws (2) in louver (3).

3. Tighten screws (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION INTAKE PLENUM WIRE ROPE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Crimping Tool, Terminal Hand (Item 8, WP 0383 00)
Socket Wrench Set (Item 51, WP 0383 00)
Socket, Socket Wrench (Item 52, WP 0383 00)

Materials/Parts

Oval Splicing Sleeve
(39428)
PN 3623T14
Wire Rope
(39428)
PN 3461T64

Personnel Required

Engineer 88L

Equipment Condition

Powered Section Intake Plenum Assembly Removed. (WP 0087 00)

REMOVE POWERED SECTION INTAKE PLENUM WIRE ROPE

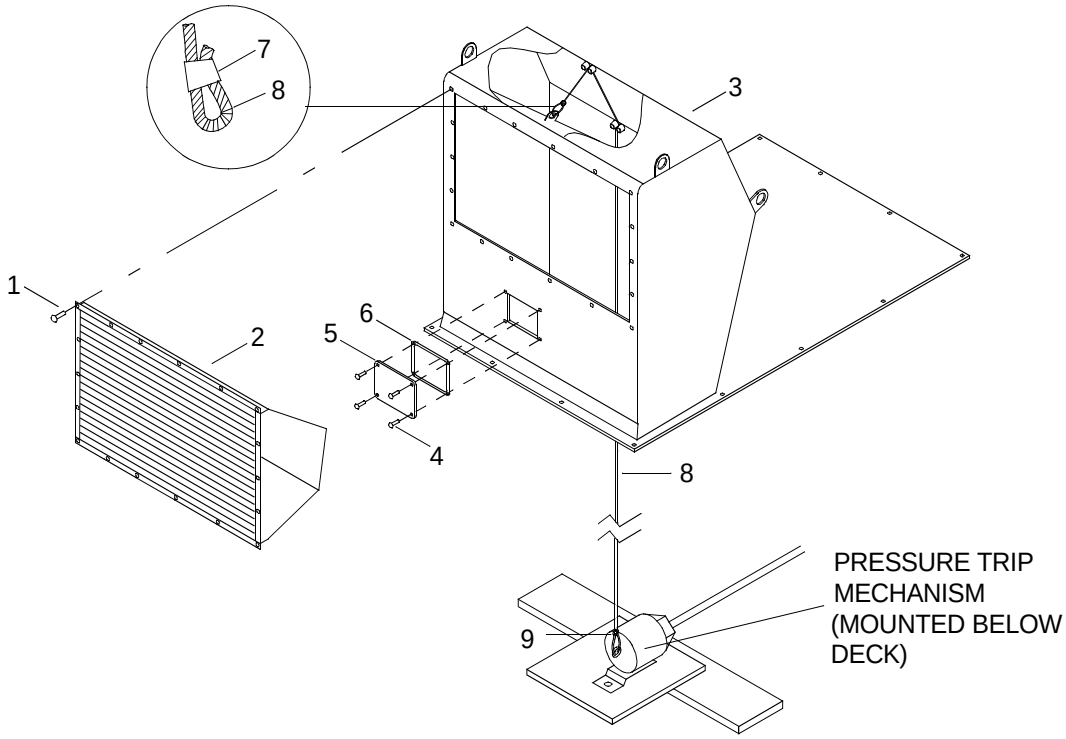
WARNING



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

Use appropriate lifting devices when removing or installing intake plenum. Failure to comply can result in serious injury to personnel.

1. Remove 18 cap screws (1) and remove air intake louver (2) from intake plenum (3).



CAUTION

Use care when handling intake plenum neoprene gasket to prevent tearing or ripping.

2. Remove four screws (4) and remove interconnect cover (5) with interconnect gasket (6) from intake plenum (3).
3. Cut two oval splicing rings (7) from wire rope (8) and discard.
4. Disconnect wire rope (8) from air intake louver (2) and from pressure trip unit (9) in the engine compartment.
5. Remove wire rope (8) and discard.

INSTALL INTAKE PLENUM WIRE ROPE

NOTE

After activation of the fire suppression system or whenever the wire rope is installed or replaced, the rope MUST be reset so the door is in the OPEN position.

1. Connect the new wire rope (8) to the air intake louver (2) and to the pressure trip unit (9) below deck in the lazaret compartment.
2. Adjust wire rope (8) so the louver door is in the open position.
3. Install oval splicing sleeves (7) onto wire rope (8) and compress using a crimping tool.
4. Secure interconnect cover (5) and interconnect gasket (6) to intake plenum (3) with four cap screws (4).
5. Secure air intake louver (2) to the intake plenum (3) with 22 cap screws (1).
6. Install powered section intake plenum assembly. (WP 0087 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION INTAKE PLENUM INTERCONNECT COVER
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

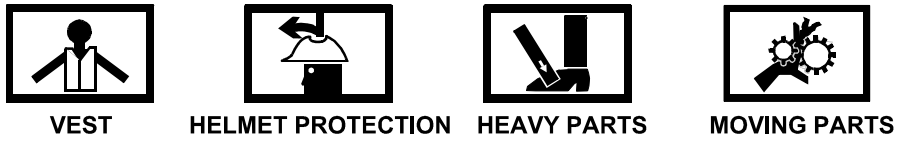
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Personnel Required

Engineer 88L

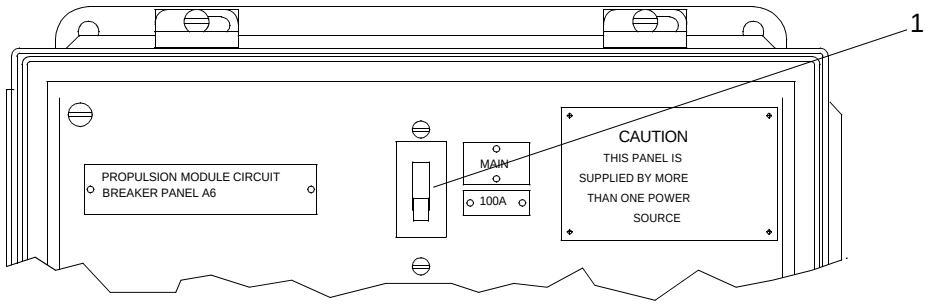
REMOVE POWERED SECTION INTAKE PLENUM INTERCONNECT COVER

WARNING

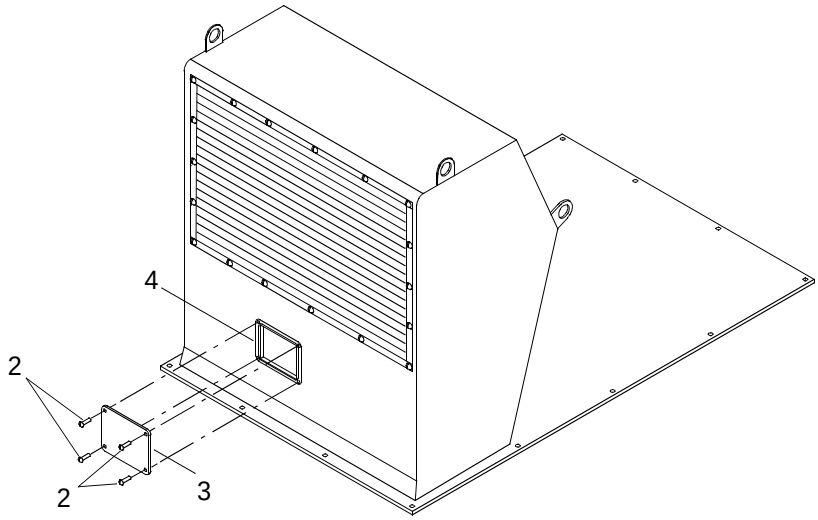


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove four screws (2) from cover (3).



3. Remove cover (3) from gasket (4).

INSTALL POWERED SECTION INTAKE PLENUM INTERCONNECT COVER

1. Position cover (3) on gasket (4).
2. Install four screws (2) in cover (3).
3. Tighten screws (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION INTAKE PLENUM
INTERCONNECT COVER GASKET
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Gasket, Interconnect
(34712)
PN E19161

Personnel Required

Engineer 88L

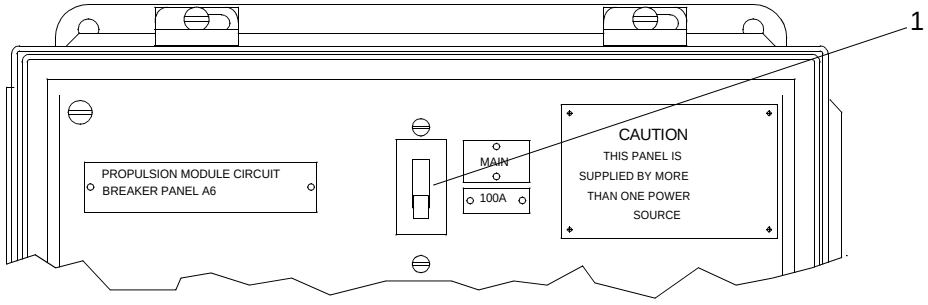
REMOVE POWERED SECTION INTAKE PLENUM INTERCONNECT COVER GASKET

WARNING

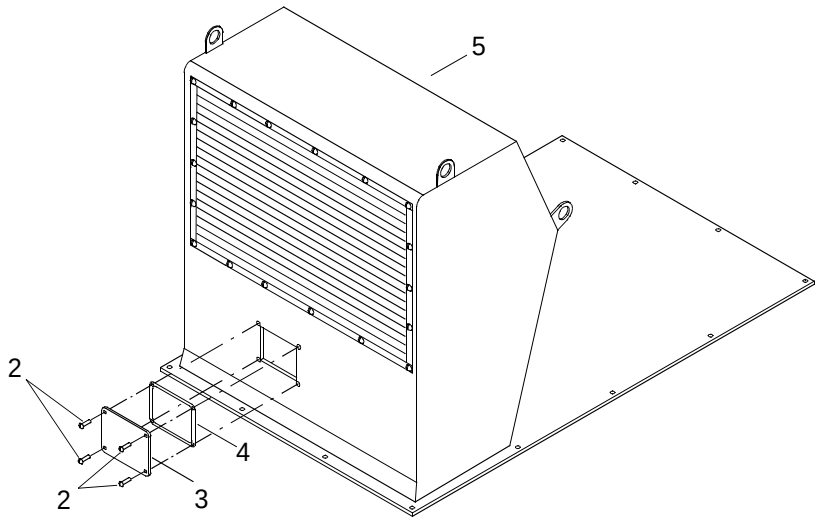


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove four screws (2) from cover (3).



3. Remove cover (3) from gasket (4).

4. Remove gasket (4) from plenum (5).

5. Discard gasket (4).

INSTALL POWERED SECTION INTAKE PLENUM INTERCONNECT COVER GASKET

1. Position new gasket (4) on plenum (5).

2. Position cover (3) on gasket (4).

3. Install four screws (2) in cover (3).

4. Tighten screws (4).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION EXHAUST PLENUM
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Sling, 5300 lb 6 ft (Green) (Item 37, WP 0383 00)
Qty 2
Shackle, ½ in. 2 ton (Item 33, WP 0383 00)
Qty 2

Personnel Required

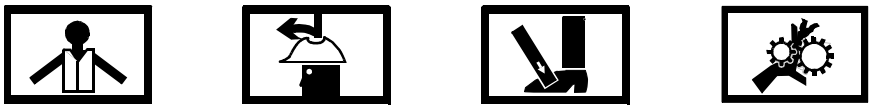
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE POWERED SECTION EXHAUST PLENUM

WARNING

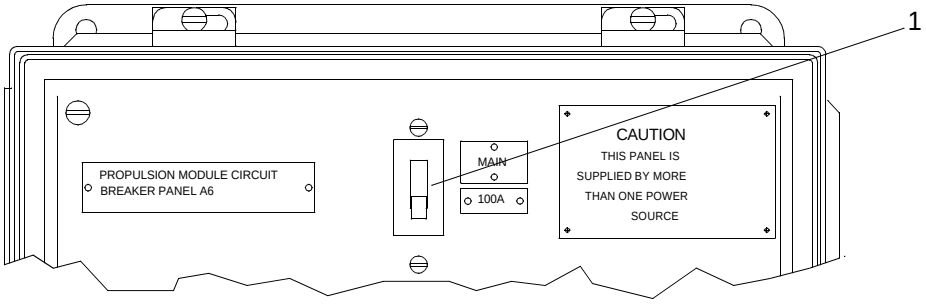


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

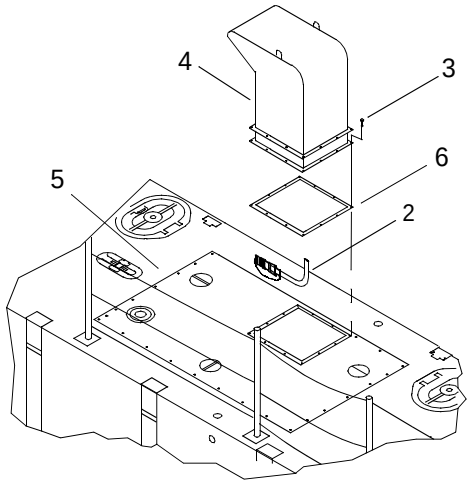
The following procedure is typical for the removal and installation of exhaust plenums.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Turn connector counterclockwise to disconnect cable assembly (2) from vent fan relay enclosure A8 in the machinery compartment.

3. Remove 12 cap screws (3) securing exhaust plenum (4) to the deck (5).



WARNING



HEAVY PARTS

4. Using crane, slings and shackles, lift the exhaust plenum (4) from the deck (5).
5. Remove gasket (6), if damaged.
6. Remove slings and shackles.

INSTALL POWERED SECTION EXHAUST PLENUM

1. Install gasket (6), if removed.

WARNING



HEAVY PARTS

2. Using crane, slings and shackles, set the exhaust plenum (4) onto the deck (5).
3. Install 12 cap screws (3) securing exhaust plenum (4) to the deck (5). Tighten securely.
4. Remove slings and shackles.
5. Connect cable assembly (2) to vent fan relay enclosure A8 in the machinery compartment by turning connector clockwise.
6. Perform operational check of exhaust plenum. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION EXHAUST PLENUM COVER REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Cover, Exhaust Plenum
(34712)
PN E18772

Personnel Required

Engineer 88L

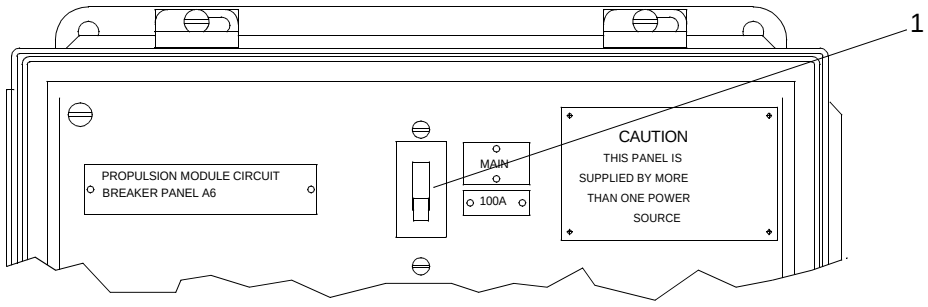
REMOVE POWERED SECTION EXHAUST PLENUM COVER

WARNING

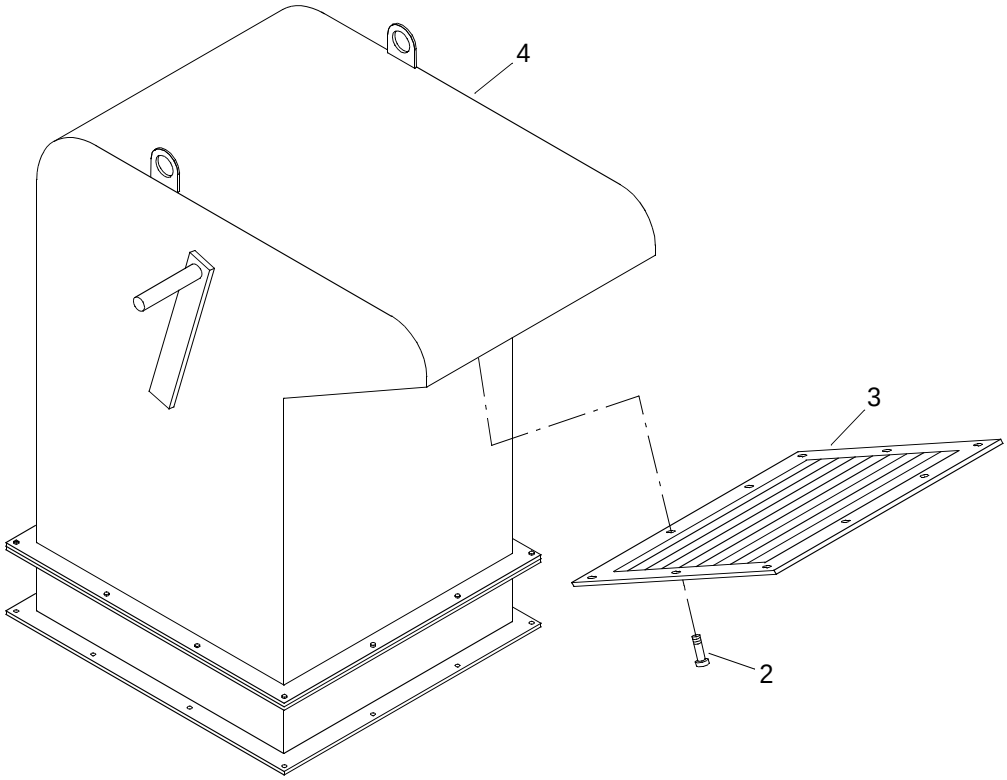


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove ten cap screws (2) from cover (3).



3. Remove cover (3) from plenum (4).

4. Discard cover (3).

INSTALL POWERED SECTION EXHAUST PLENUM COVER

1. Position new cover (3) on plenum (4).

2. Install ten cap screws (2) in cover (3).

3. Tighten cap screws (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION EXHAUST PLENUM DOOR REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Door, Exhaust Plenum
(34712)
PN E18762

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

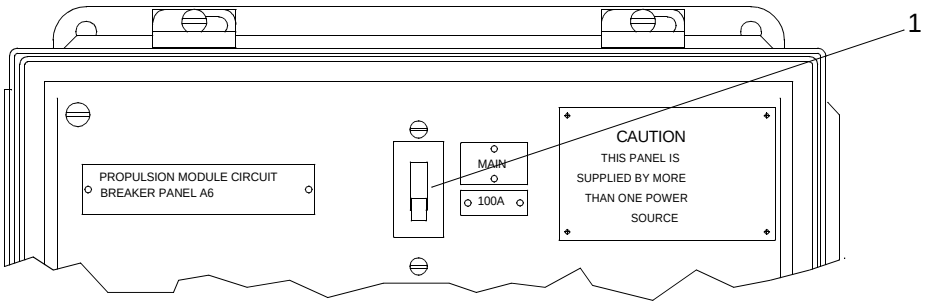
REMOVE POWERED SECTION EXHAUST PLENUM DOOR

WARNING

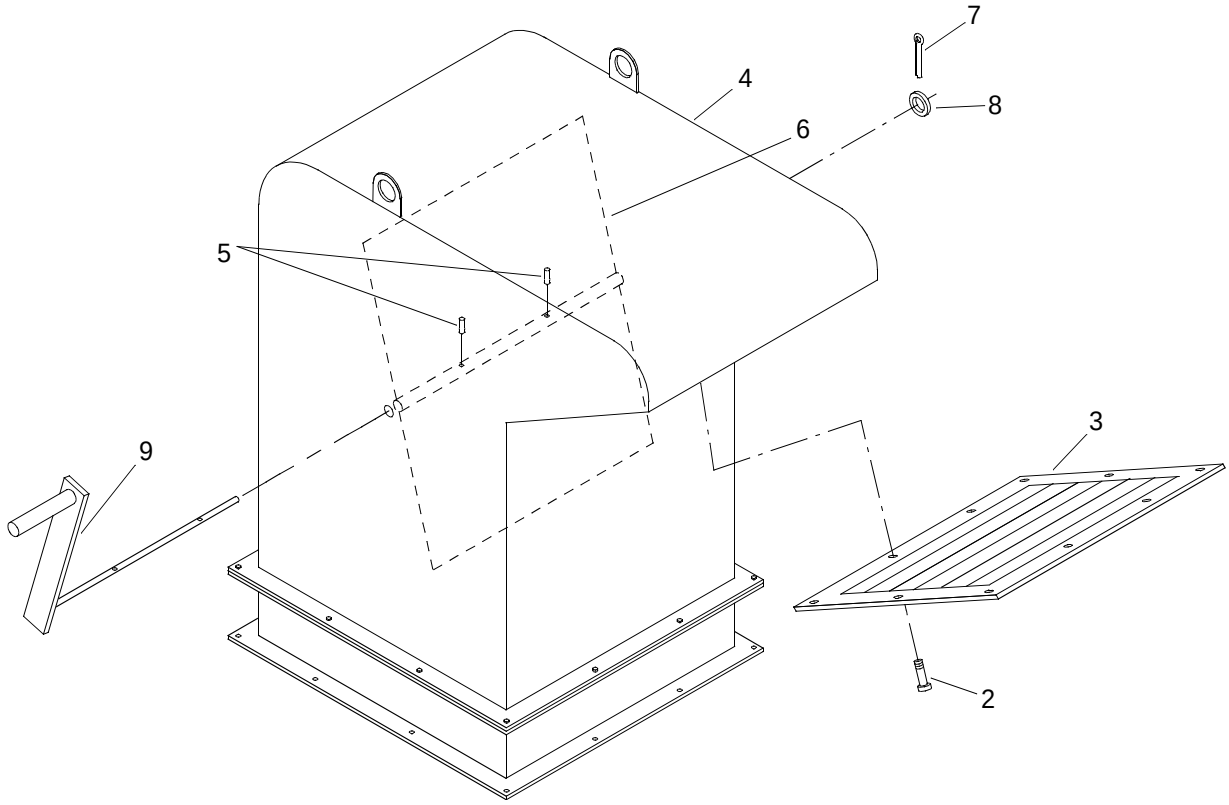


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1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove ten cap screws (2) from cover (3).



3. Remove cover (3) from plenum (4).
4. Remove two drive pins (5) from door (6).
5. Remove cotter pin (7) and flat washer (8) from locking handle (9).
6. Supporting door (6), remove locking handle (9).
7. Remove door (6) from plenum (4) and discard.

INSTALL POWERED SECTION EXHAUST PLENUM DOOR

1. Position new door (6) in plenum (4).
2. Supporting door (6), install locking handle (9).
3. Install flat washer (8) and cotter pin (7) in locking handle (9).
4. Install two drive pins (5) in door (6).
5. Position cover (3) on plenum (4).
6. Install ten screws (2) in cover (3).
7. Tighten screws (2).
8. Perform operational check of exhaust plenum. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION EXHAUST PLENUM LOCKING HANDLE
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Personnel Required

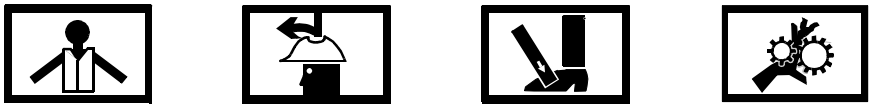
Engineer 88L

Equipment Condition

Powered Section Exhaust Plenum Removed. (WP 0092 00)

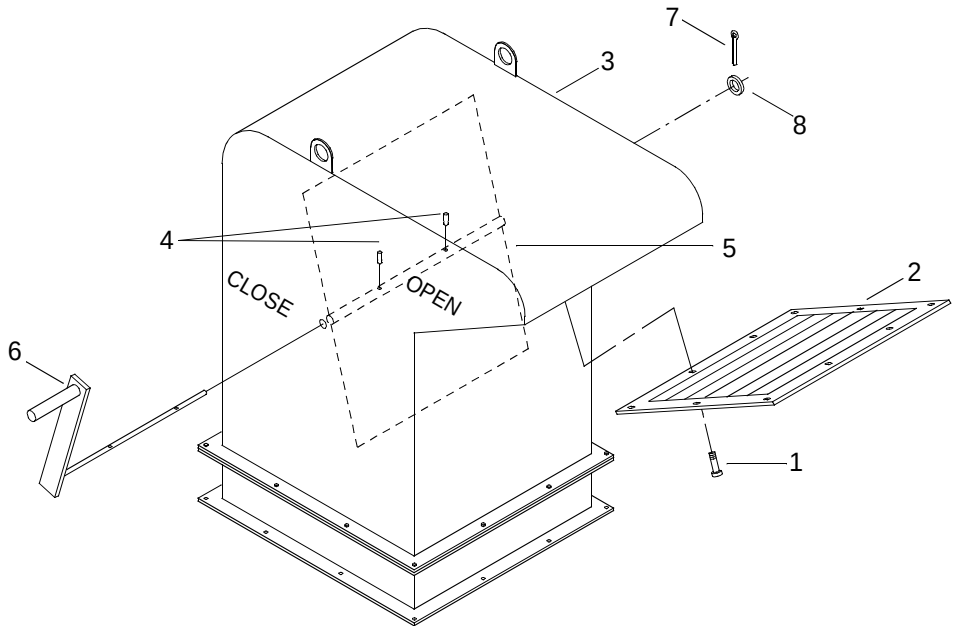
REMOVE POWERED SECTION EXHAUST PLENUM LOCKING HANDLE

WARNING



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

1. Remove eight hex head cap screws (1) securing exhaust plenum cover (2) to exhaust plenum (3).



2. Remove exhaust plenum cover (2).

3. Remove two drive pins (4) securing exhaust plenum door (5) to locking handle (6).

4. Remove cotter pin (7) and lock washer (8) securing locking handle (6) to exhaust plenum (3).

5. Support exhaust door (5) and remove locking handle (6).

INSTALL EXHAUST PLENUM LOCKING HANDLE

1. Hold exhaust plenum door (5) in place and install locking handle (6) through exhaust plenum (3) and exhaust plenum door (6).

NOTE

When in the closed position, door must contact stop and seal bars.

2. Secure locking handle (6) with flat washer (8) and cotter pin (7).

3. Secure exhaust plenum door (5) to locking handle (6) with two drive pins (4).

4. Position exhaust plenum cover (2) on exhaust plenum (3) and secure with eight hex head cap screws (1).

5. Install powered section exhaust plenum. (WP 0092 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION EXHAUST PLENUM VENT FAN
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Blower, Axial (Vent Fan)
(80352)
PN 44-18-DG3

Personnel Required

Engineer 88L

Equipment Condition

Powered Section Exhaust Plenum Removed. (WP 0092 00)

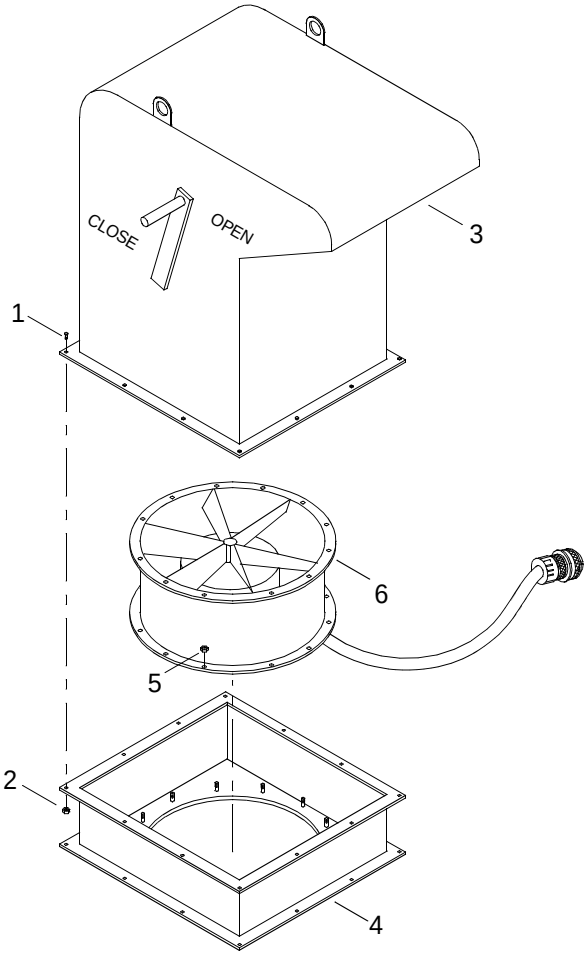
REMOVE POWERED SECTION EXHAUST PLENUM VENT FAN

WARNING



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

1. Remove twelve hex head cap screws (1) and hex nuts (2) securing exhaust plenum cowling (3) to exhaust blower mount (4).



2. Remove exhaust plenum cowling (3).
3. Remove twelve hex nuts (5) securing vent fan (6) to exhaust blower mount (4).
4. Remove vent fan (6).

INSTALL POWERED SECTION EXHAUST PLENUM VENT FAN

1. Position new vent fan (6) on exhaust blower mount (4).
2. Secure vent fan (6) to mount (4) with twelve hex nuts (5).
3. Tighten hex nuts (5).
4. Position exhaust plenum cowling (3) on exhaust blower mount (4).
5. Secure plenum cowling (3) to mount (4) with twelve hex head cap screws (1) and hex nuts (2).
6. Install powered section exhaust plenum. (WP 0092 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION OPERATORS CAB SIDE ACCESS PANEL
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

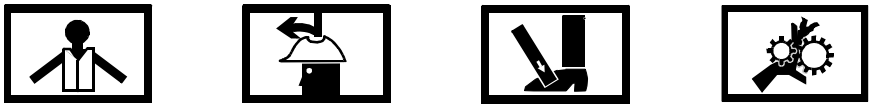
Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

REMOVE POWERED SECTION OPERATORS CAB SIDE ACCESS PANEL

WARNING

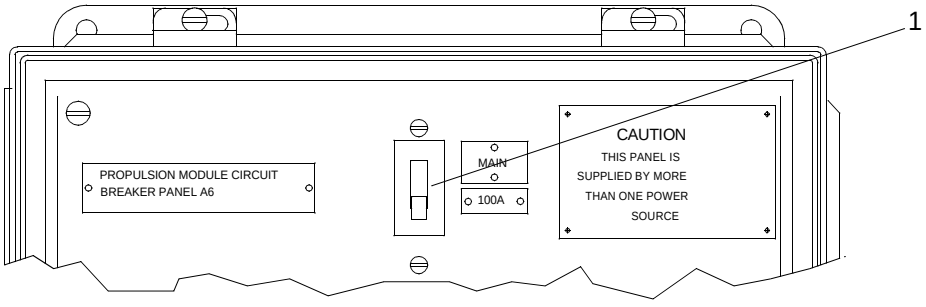


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

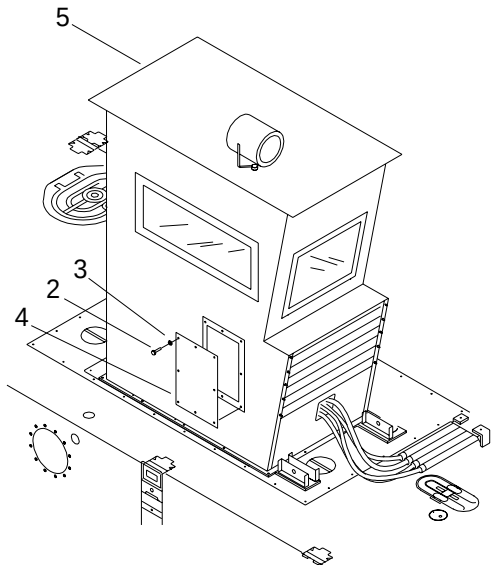
NOTE

The following procedure is typical for the removal and installation of both operators cab side access panels.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



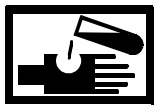
2. Remove eight pan head cap screws (2) and lock washers (3) attaching side access panel (4) to operators cab (5).



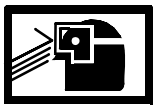
3. Remove side access panel (4).

INSTALL POWERED SECTION OPERATORS CAB SIDE ACCESS PANEL

WARNING



CHEMICAL



EYE PROTECTION

1. Apply adhesive on pan head cap screws (2).
2. Position side access panel (4) on operators cab (5).
3. Install eight pan head cap screws (2) and lock washers (3) to secure side access panel (4) to the operators cab (5).
4. Tighten pan head cap screws (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION OPERATORS CAB
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Sling, 5300 lb 6 ft (Green) (Item 37, WP 0383 00)
Qty 2
Shackle, ½ in. 2 ton (Item 33, WP 0383 00)
Qty 2

Personnel Required

Engineer 88L

References

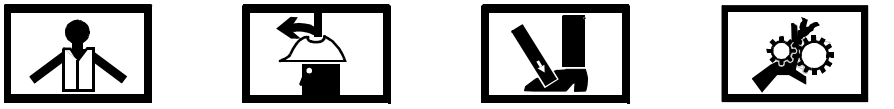
TM 55-1945-205-10-1

Equipment Condition

Main Mast Navigation Assembly Removed. (WP 0328 00)
SINCGARS Antenna Removed. (TM 11-5820-890-10-8)

REMOVE POWERED SECTION OPERATORS CAB

WARNING

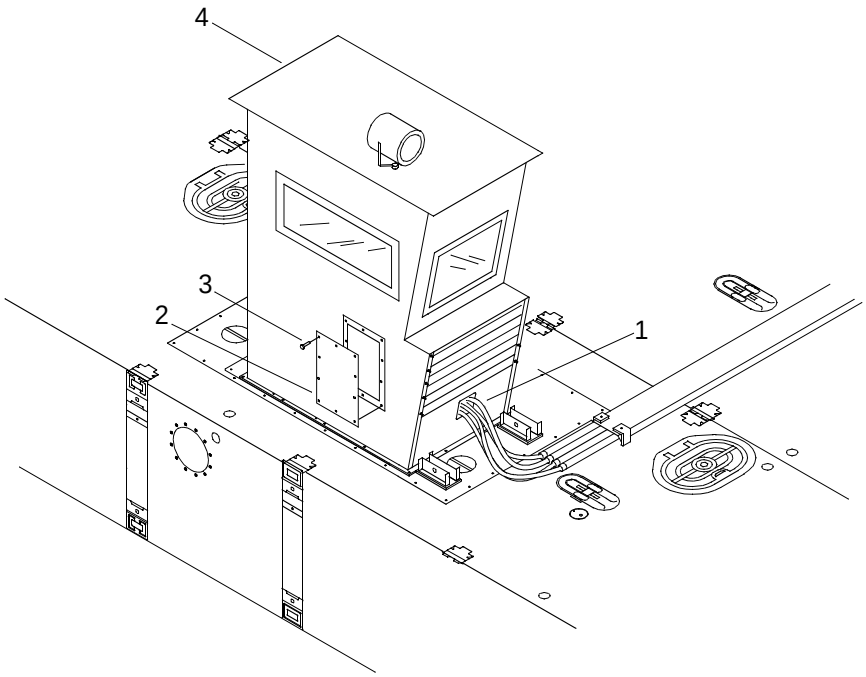


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The operators cab is normally installed on the starboard side. If required, the operators cab may be installed on the port side. This procedure is for installation on the starboard side, unless otherwise noted.

1. Remove operators cab electrical cables (1).



NOTE

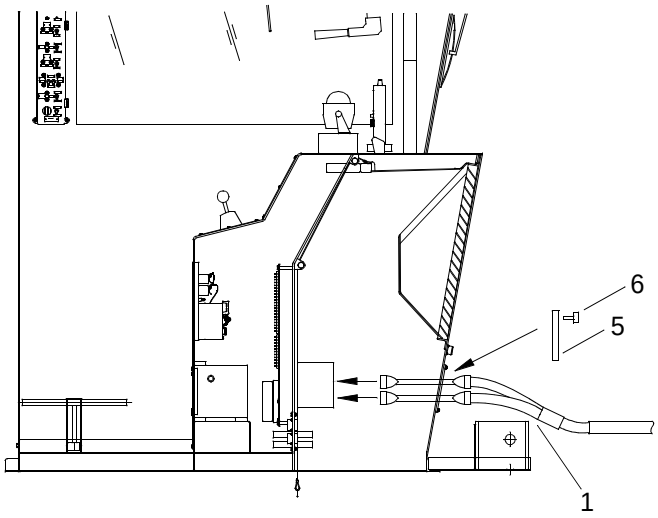
The operators cab side access panel removal is typical for both sides of the operators cab.

a. Remove the operators cab side access panels (2).

{1} Remove bolts (3) attaching side access panels (2) to operators cab (4).

{2} Remove side access panels (2).

b. Remove operators cab conduit entry plate (5).



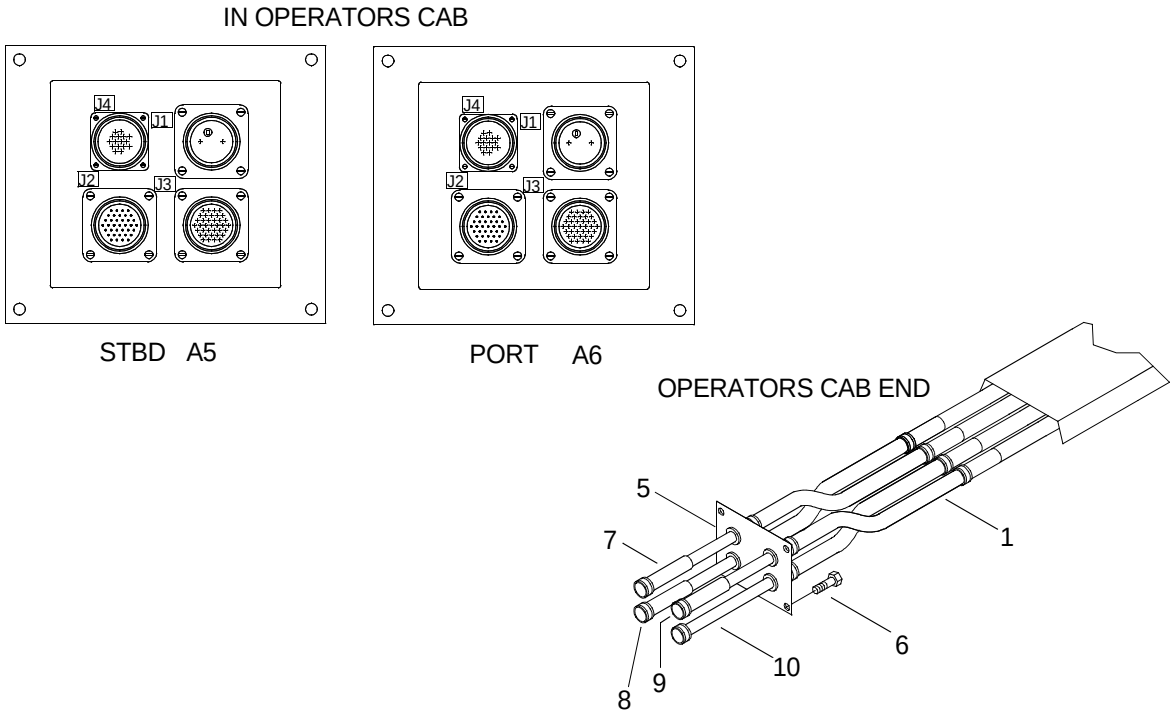
{1} Remove four bolts (6) attaching conduit entry plate (5) to operators cab (4).

{2} Remove entry plate (5).

NOTE

The following steps provide removal of interconnect assembly when the operators cab is installed on the starboard side. When installed on the port side the STBD and PORT receptacles will be reversed.

c. Remove power module cables from STBD receptacle A5.



{1} Remove power module A3, P1 from STBD A5, P1.

{2} Remove power module A6, P3 from STBD A5, P3.

{3} Remove power module A6, P4 from STBD A5, P4.

{4} Remove power module A6, P2 from STBD A5, P21.

d. Remove interconnect cables from PORT receptacle A6.

{1} Remove P4 (7) from PORT receptacle A5, J4.

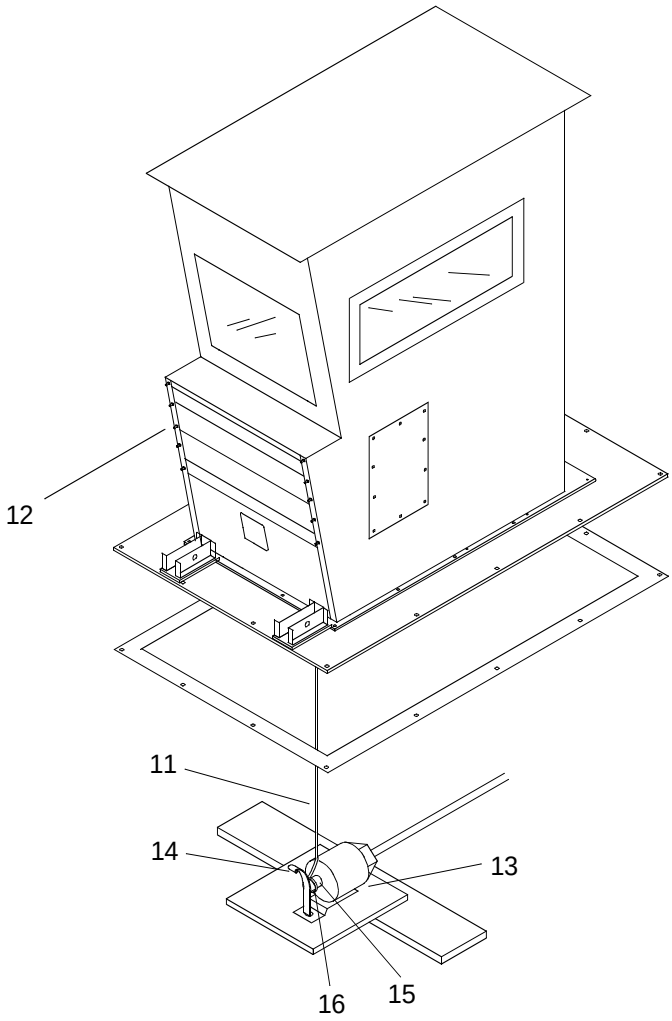
{2} Remove P3 (8) from PORT receptacle A5, J3.

{3} Remove P2 (9) from PORT receptacle A5, J2.

{4} Remove P1 (10) from PORT receptacle A5, J1.

2. Remove interconnect cables (1) from operators cab (4).

3. Remove wire rope (11) in the operators cab intake plenum (12) from the fire suppression trip mechanism (13).

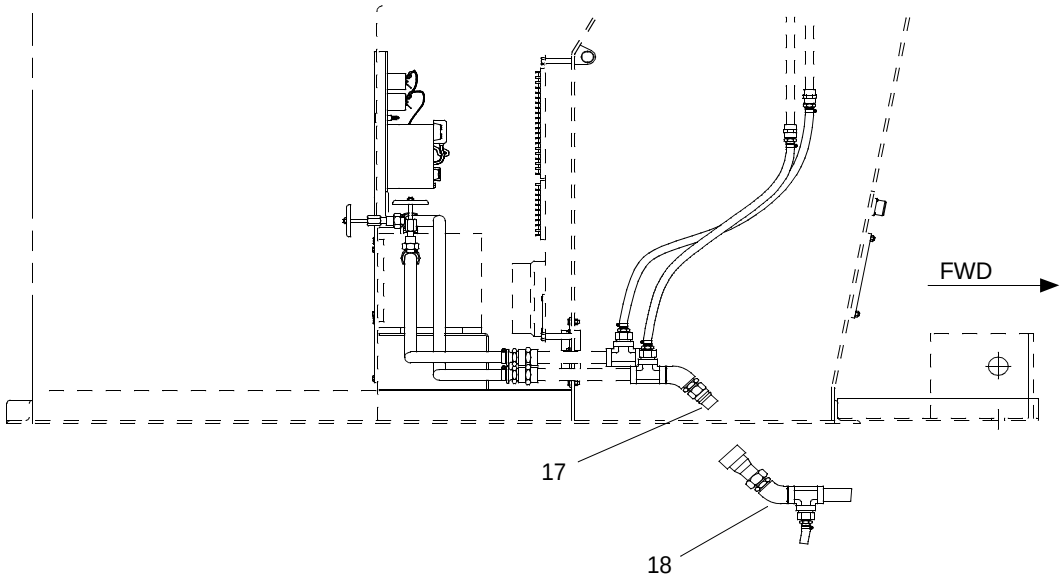


a. Move fire suppression solenoid spring flange (14) away from solenoid shaft (15).

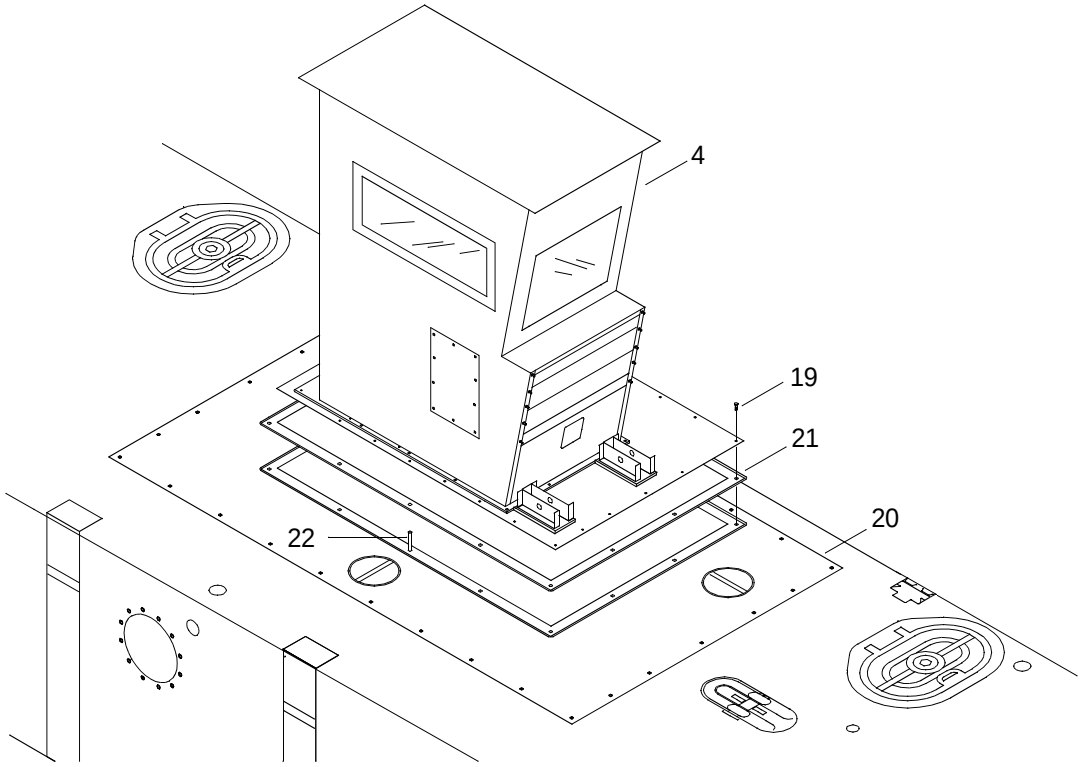
{1} Remove wire rope ring (16) from the fire suppression solenoid shaft (15).

{2} Release flange (14).

b. Through operators cab starboard access, disconnect heating system male (17) and female (18) quick disconnect water hoses.



4. Remove bolts (19) attaching operators cab (4) to propulsion module engine hatch (20).



WARNING



HEAVY PARTS

5. Using crane, slings and shackles, lift operators cab (4) from propulsion module engine hatch (20).
6. Remove gasket (21), if damaged.
7. Remove slings and shackles.

INSTALL POWERED SECTION OPERATORS CAB

NOTE

The operators cab is normally installed on the starboard side. If required, the operators cab may be installed on the port side. This procedure is for installation on the starboard side, unless otherwise noted.

1. Install operators cab (4) on starboard propulsion module engine hatch (20).
   a. Install guide pins (22) to align and install operators cab.
   b. Install new gasket (21), if removed.

WARNING



HEAVY PARTS

   c. Using crane, slings and shackles, align operators cab mounting holes and guide pins (22), lower cab on engine hatch.
   d. Remove guide pins (22).
   e. Install 14 bolts (19), securing operators cab (4) on propulsion module engine hatch (1) until snug.
   f. Tighten bolts (19) until snug using cross method.
   g. Remove slings and shackles.
   h. Connect wire rope (11) in operators cab intake plenum (12) to fire suppression trip mechanism (13).
      {1} Move fire suppression solenoid spring flange (14) away from solenoid shaft (15).
      {2} Install wire rope ring (16) on the fire suppression solenoid shaft (15).
      {3} Release flange (14).
   i. Connect heating system male (17) and female (18) quick disconnect water hoses.

2. Connect interconnect cables to operators cab receptacle.

    a. Insert cables (1) through operators cab (4) front access.

    b. Connect interconnect cables to operators cab PORT receptacle A6.

        {1} Connect P2 to PORT A6, J2.

        {2} Connect P4 to PORT A6, J4.

        {3} Connect P3 to PORT A6, J3.

        {4} Connect P1 to PORT A6, J1.

    c. From below deck, bring the power module A6, cable P1 and power module junction box A3, cables P2, P3, and P4 up through the bottom of the operators cab intake plenum area.

    d. Connect the power module cables to STBD receptacle A5.

        {1} Connect power module A6, P2 to STBD A5, J2.

        {2} Connect power module A6, P4 to STBD A5, J4.

        {3} Connect power module A6, P3 to STBD A5, J3.

        {4} Connect power module A3, P1 to STBD A5, J1.

    e. Secure conduit entry plate (5) to the operators cab (4).

        {1} Align entry plate holes with holes in operators cab.

        {2} Install four bolts (6) through entry plate (5) into operators cab (4).

        {3} Tighten bolts (6).

    f. Install both operators cab side access panels (2).

        {1} Align panel (2) holes with holes in operators cab (4).

        {2} Install ten bolts (3) through side access panels (2) into operators cab (4).

        {3} Tighten bolts (3).

3. Install SINCGARS antenna. (TM 11-5820-890-10-8)

4. Install main mast navigation assembly. (WP 0328 00)

5. Perform operational check of operators cab. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION ENGINE HATCH
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Sling, 5300 lb 6 ft (Green) (Item 37, WP 0383 00)
Qty 3
Shackle, ½ in. 2 ton (Item 33, WP 0383 00)
Qty 3

Personnel Required

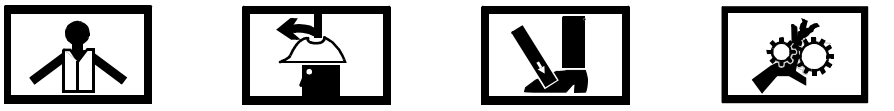
Engineer 88L

Equipment Condition

Main Mast Navigation Assembly Removed. (WP 0328 00)
SINCGARS Antenna Removed. (TM 11-5820-890-10-8)
Powered Section Operators Cab Removed. (WP 0098 00)
Powered Section Intake Plenum Assembly Removed. (WP 0087 00)

REMOVE POWERED SECTION ENGINE HATCH

WARNING

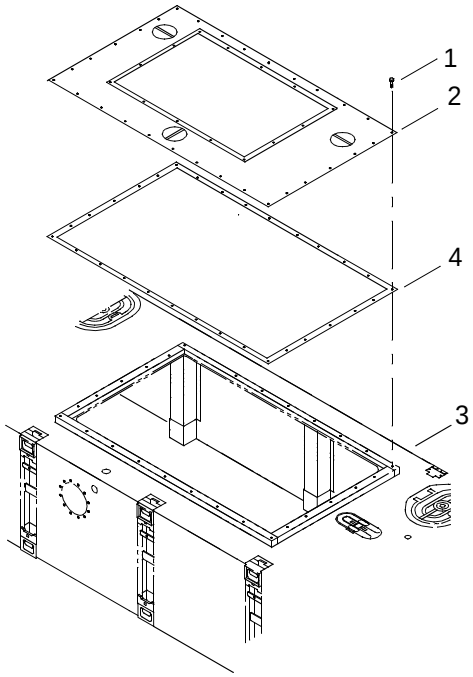


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of engine hatches.

1. Remove fifty-eight cap screws (1) securing hatch (2) to the deck (3).



WARNING



HEAVY PARTS

2. Using crane, slings and shackles, lift the hatch (2) from the deck (3).
3. Remove gasket (4) if damaged.
4. Remove slings and shackles.

INSTALL POWERED SECTION ENGINE HATCH

1. Install gasket (4) if removed.

WARNING



HEAVY PARTS

2. Using crane, slings and shackles, set the hatch (2) onto the deck (3).
3. Install fifty-eight cap screws (1) securing hatch (2) to the deck (3).
4. Tighten fifty-eight cap screws (1).
5. Remove slings and shackles.

6. Install powered section intake plenum assembly. (WP 0087 00)

7. Install powered section operators cab. (WP 0098 00)

8. Install SINCGARS antenna. (TM 11-5820-890-10-8)

9. Install main mast navigation assembly. (WP 0098 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION THRUSTER HATCH
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Sling, 5300 lb 6 ft (Green) (Item 37, WP 0383 00)
Qty 3
Shackle, ½ in. 2 ton (Item 33, WP 0383 00)
Qty 3

Personnel Required

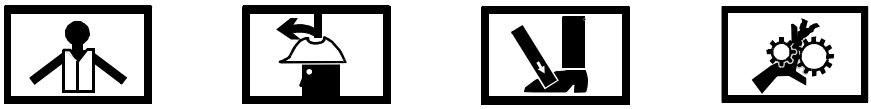
Engineer 88L

Equipment Condition

Powered Section Exhaust Plenum Removed. (WP 0092 00)

REMOVE POWERED SECTION THRUSTER HATCH

WARNING

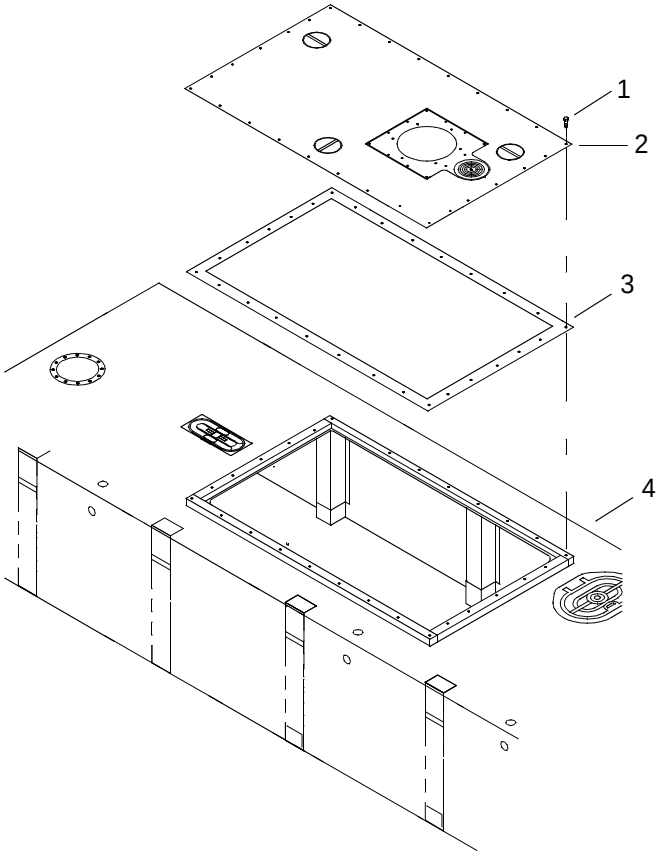


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of thruster hatches.

1. Remove fifty-eight cap screws (1) securing hatch (2) to the deck (3).



WARNING



HEAVY PARTS

2. Using crane, slings and shackles, lift the hatch (2) from the deck (3).
3. Remove gasket (4) if damaged.
4. Remove slings and shackles.

INSTALL POWERED SECTION THRUSTER HATCH

1. Install gasket (4) if removed.

WARNING



HEAVY PARTS

2. Using crane, slings and shackles, set the hatch (2) onto the deck (3).

3. Install fifty-eight cap screws (1) securing hatch (2) to the deck (3).
4. Tighten fifty-eight cap screws (1).
5. Remove slings and shackles.
6. Install powered section exhaust plenum. (WP 0092 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM BUTTERFLY (SEA CHEST) VALVE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Sling, 66,000 lb 30 ft (Olive) (Item 38, WP 0383 00)
Qty 2
Shackle, 1 ¾ in. 40 ton (Item 34, WP 0383 00)
Qty 2

Materials/Parts

Valve, Butterfly (Sea Chest)
(95976)
PN 3245259
Gasket, Flange
(34712)
PN E09151
Qty 2

Personnel Required

Engineer 88L
Qty 2

References

TM 55-1945-205-10-1

Equipment Condition

Propulsion Module Dry-Docked.

REMOVE RAW WATER COOLING SYSTEM BUTTERFLY (SEA CHEST) VALVE

WARNING



HEAVY PARTS

NOTE

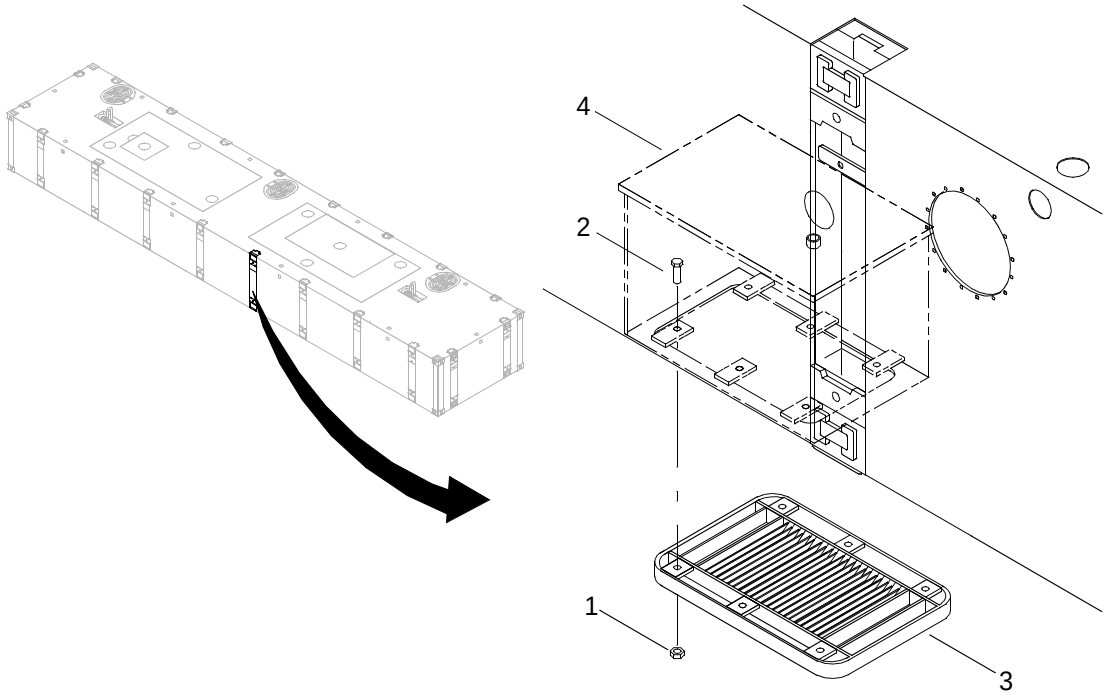
This task is typical for port or starboard propulsion modules.

1. Using crane, slings and shackles, place module on dunnage high enough off of the ground to easily access the bottom of the module.

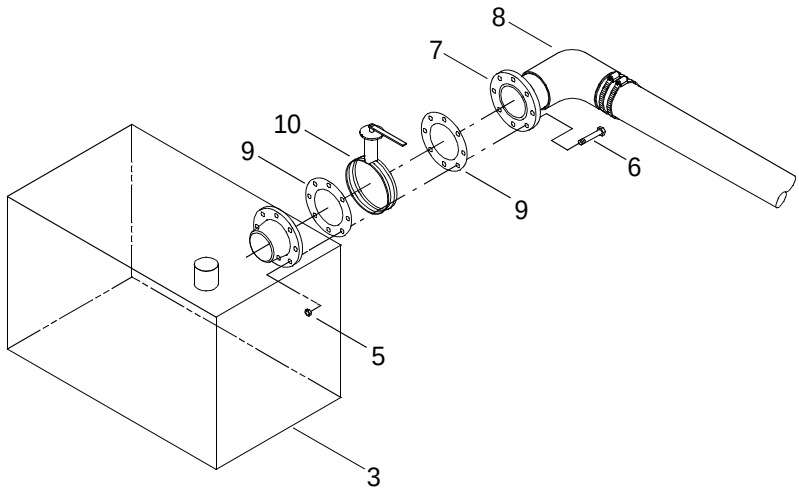
2. Remove slings and shackles.

3. Remove six nuts (1) and bolts (2) from sea chest grate (3) at bottom of sea chest (4).

4. Remove sea chest grate (3).



5. Remove eight nuts (5) inside sea chest (4) from bolts (6).



6. Remove eight bolts (6) from threaded flange (7) and sea chest (4).

7. Move threaded flange (7) and hose assembly (8) away from sea chest (4).

8. Remove two flange gaskets (9) and sea chest valve (10).

9. Discard two flange gaskets (9).

INSTALL RAW WATER COOLING SYSTEM BUTTERFLY (SEA CHEST) VALVE

1. Position new sea chest valve (10) and two new flange gaskets (9) against sea chest (4).
2. Move hose assembly (8) and threaded flange (7) to flange gasket (9).
3. Install eight bolts (6) through threaded flange (7) and sea chest (4).
4. Install eight nuts (5) inside sea chest (4) on bolts (6).
5. Tighten eight nuts (5).
6. Position sea chest grate (3) under sea chest (4).
7. Install six bolts (2) and nuts (1) through sea chest grate (3) and sea chest (4).
8. Tighten six nuts (1).
9. Perform operational check of engine cooling system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM SEA CHEST ZINC ANODE PLUG REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Anode, Zinc
(72582)
PN E 11308
Tape, Antiseize (Item 31, WP 0382 00)

Personnel Required

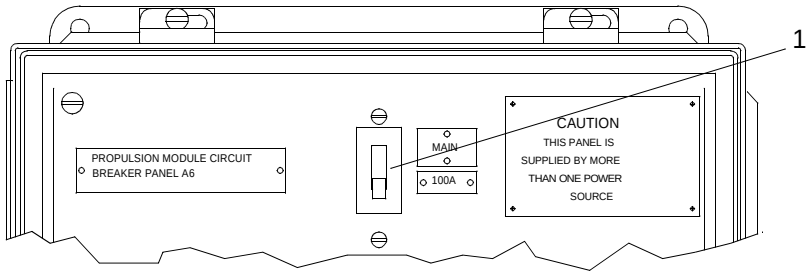
Engineer 88L

Equipment Condition

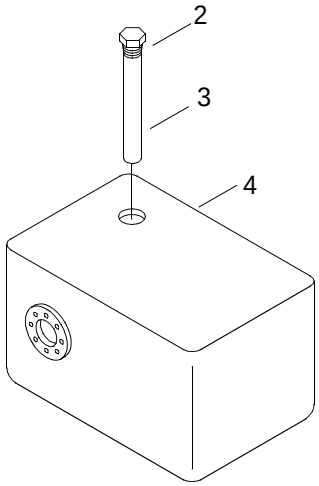
Powered Module Dry Docked.

REMOVE RAW WATER COOLING SYSTEM SEA CHEST ZINC ANODE PLUG

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove support plug (2) with zinc anode (3) from the sea chest (4).



3. Separate old zinc anode (3) from support plug (2). Discard anode (3).

INSTALL RAW WATER COOLING SYSTEM SEA CHEST ZINC ANODE PLUG

1. Install new zinc anode (3) into support plug (2).
2. Apply antiseize tape to threads of support plug (2).
3. Install support plug (2) with zinc anode (3) into the sea chest (4).
4. Tighten support plug (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM STRAINER BASKET
REMOVAL, CLEANING AND INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

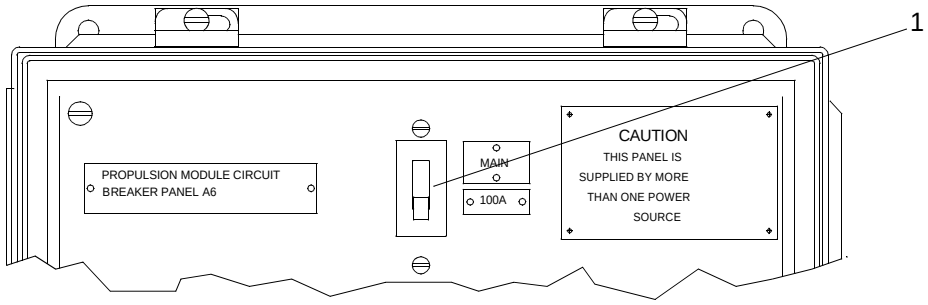
References
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM STRAINER BASKET

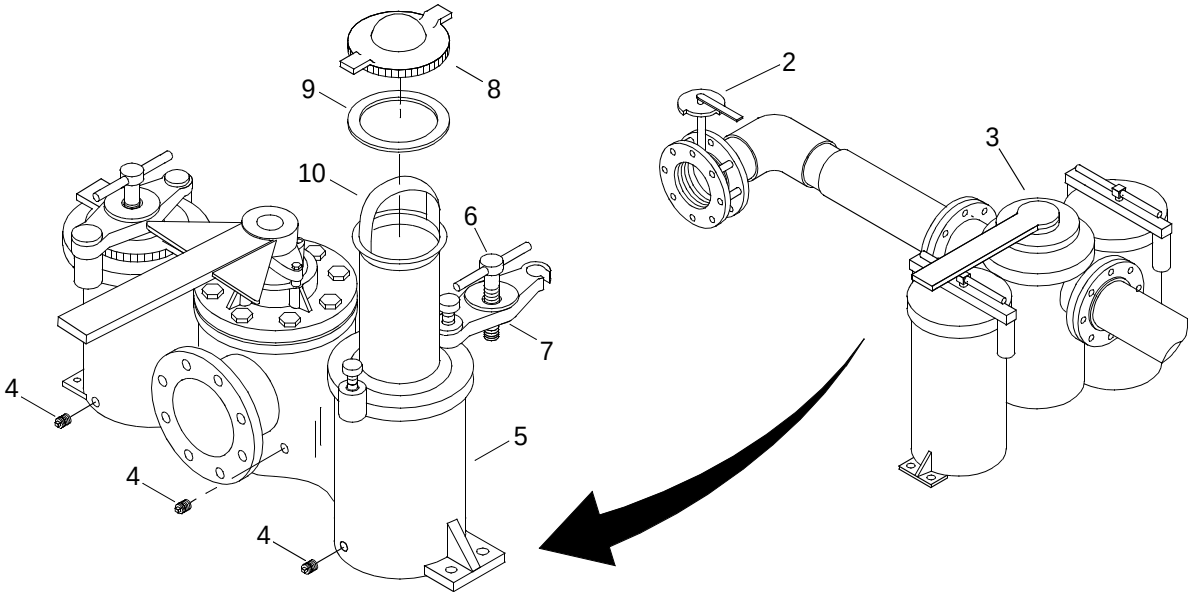
NOTE

The following procedure is typical for the removal and installation of strainer baskets.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Verify sea chest butterfly valve (2) and duplex strainer valve (3) is closed.



3. Remove three pipe plugs (4) from integral body (5). Allow to drain into bilge.
4. Loosen yoke handle (6).
5. Move yoke (7) off body cover (8).
6. Remove body cover (8) and body cover gasket (9) from integral body (5).
7. Remove monel basket (10) from integral body (5).

CLEAN RAW WATER COOLING SYSTEM STRAINER BASKET

1. Inspect monel basket (10) for debris and overall condition.
2. Remove debris as required.
3. Rinse monel basket (10) with clean water.

INSTALL RAW WATER COOLING SYSTEM STRAINER BASKET

1. Install monel basket (10) in integral body (5).
2. Position body cover gasket (9) on integral body (5).
3. Position body cover (8) on body cover gasket (9).
4. Position yoke (7) on body cover (8).
5. Tighten yoke handle (6).
6. Install three pipe plugs (4) in integral body (5).
7. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)
8. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM DUPLEX STRAINER
REPLACEMENT AND ADJUSTMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 14, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 15, WP 0383 00)
Wrench, Torque (0-175 ft lb) (Item 47, WP 0383 00)
Crowbar (Item 9, WP 0383 00)

Materials/Parts

Strainer, Duplex, 4 in.
(34294)
PN 72-48F
Gasket, Flange
(34712)
PN E09151
Qty 2
Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

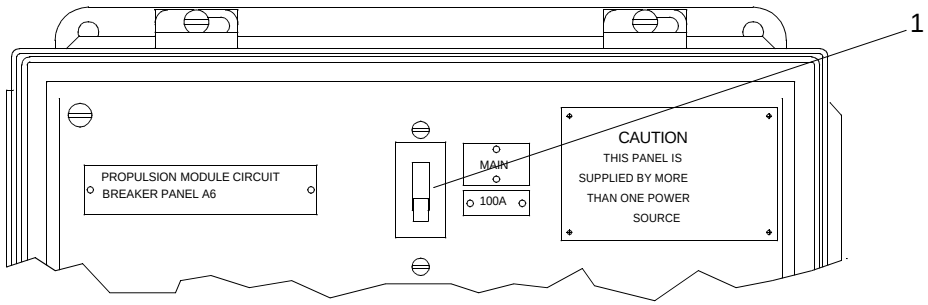
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM DUPLEX STRAINER

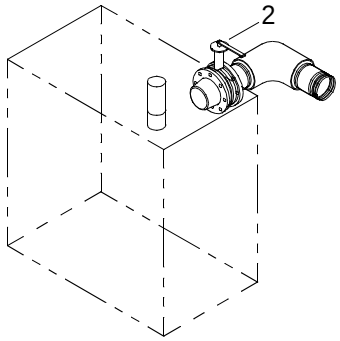
NOTE

This task is typical for both raw water duplex strainers.

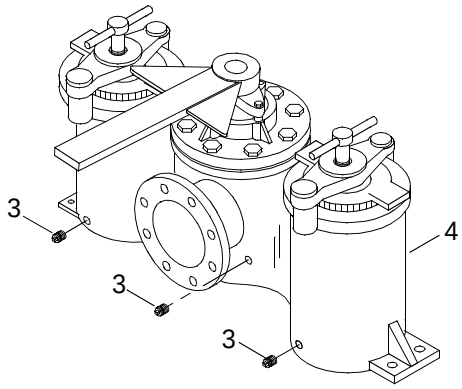
1. Verify that MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



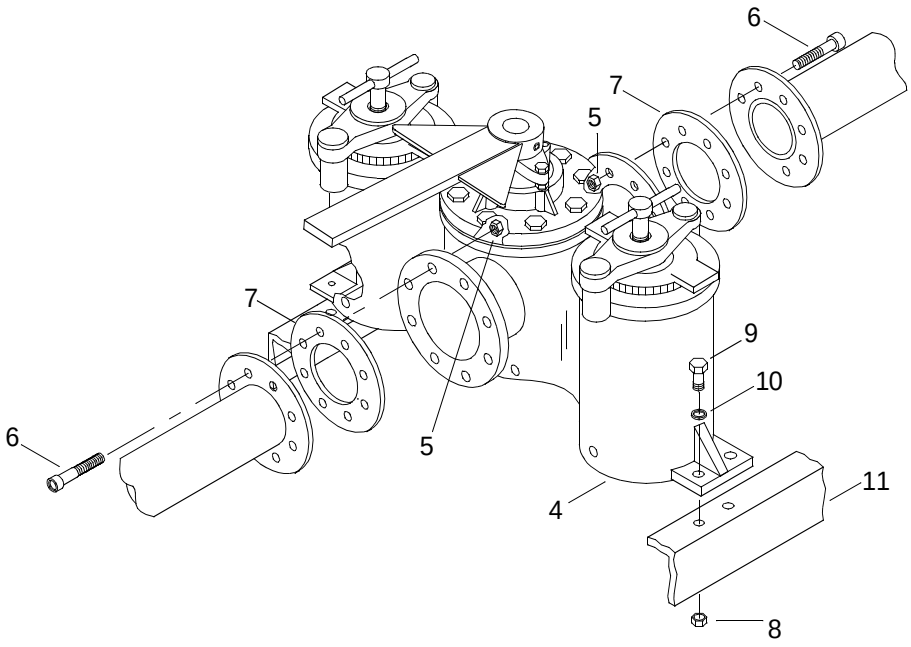
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4) allowing water to drain into bilge.



4. Remove sixteen nuts (5) and cap screws (6) from duplex strainer (4).



5. Remove two gaskets (7) from duplex strainer (4) and discard.

6. Remove four nuts (8), cap screws (9) and washers (10).

WARNING



HEAVY PARTS

7. Remove duplex strainer (4) from duplex strainer mounts (11).

INSTALL RAW WATER COOLING SYSTEM DUPLEX STRAINER

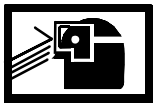
WARNING



HEAVY PARTS

1. Position new duplex strainer (4) on duplex strainer mount (11).

WARNING



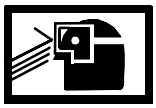
EYE PROTECTION



CHEMICAL

2. Apply adhesive to threads of four cap screws (10).
3. Install four washers (10), cap screws (9) and nuts (8) in duplex strainer (4).
4. Torque four cap screws (10) to 47 ft lb (63.73 N-m).
5. Position two new gaskets (7) on duplex strainer (4).

WARNING



EYE PROTECTION



CHEMICAL

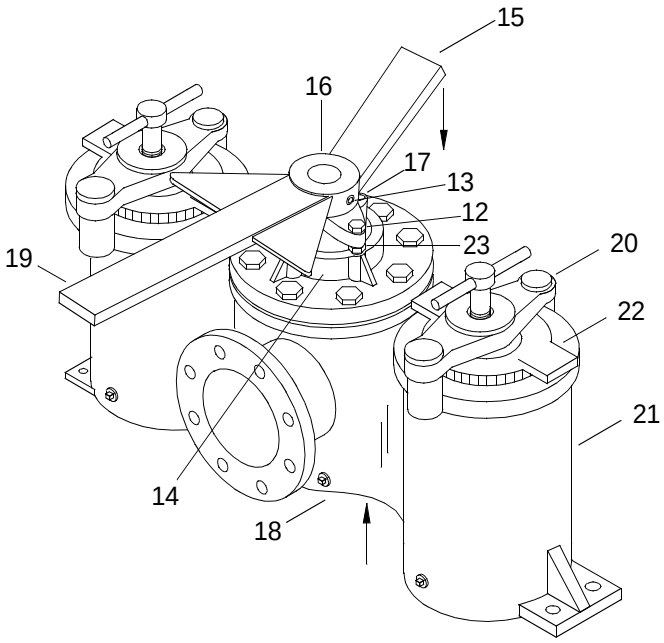
6. Apply adhesive to threads of sixteen cap screws (6).
7. Install sixteen cap screws (6) and nuts (5).
8. Torque nuts (5) to 95 ft lb (128.82 N-m).
9. Install three pipe plugs (3) in duplex strainer (4) and tighten.

ADJUST RAW WATER COOLING SYSTEM DUPLEX STRAINER

NOTE

The following procedure shall be followed if valve plug requires adjustment.

1. Loosen two hex nuts (12).



2. Verify set screw (13) is tight.
3. Free valve plug (14).
   a. Position crowbar (15) beneath valve handle hub (16) and resting on locking flange stub (17).
   b. Apply firm downward pressure to lift valve plug (14).
   c. Using hammer, tap the valve body (18) while lifting valve plug (14).

NOTE

If valve plug is not freed, the following step shall be performed.

   d. Using hammer, tap bottom of valve body (18) with an upward motion while lifting valve plug (14).

CAUTION

Do not force valve plug through operation cycle. Failure to comply could result in damage to equipment.

4. Adjust valve plug (14).
    a. Evenly tighten two hex nuts (12).
    b. Using valve handle (19), continually move valve plug (14) through cycle until resistance is felt.
    c. Remove yoke (20) from chamber (21) not in use.
    d. Remove chamber cover (22).
    e. Verify that water level in chamber (21) does not rise.
    f. Repeat steps 4a through 4e if water level in chamber (21) rises.
5. Tighten jam nuts (23).
6. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)
7. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM DUPLEX STRAINER
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)

Materials/Parts

Gasket
(34294)
PN 72-48F-7
Qty 2

Gasket
(34294)
PN 72-48F-24

Packing
(34294)
PN 72-48F-22

Personnel Required

Engineer 88L

Equipment Condition

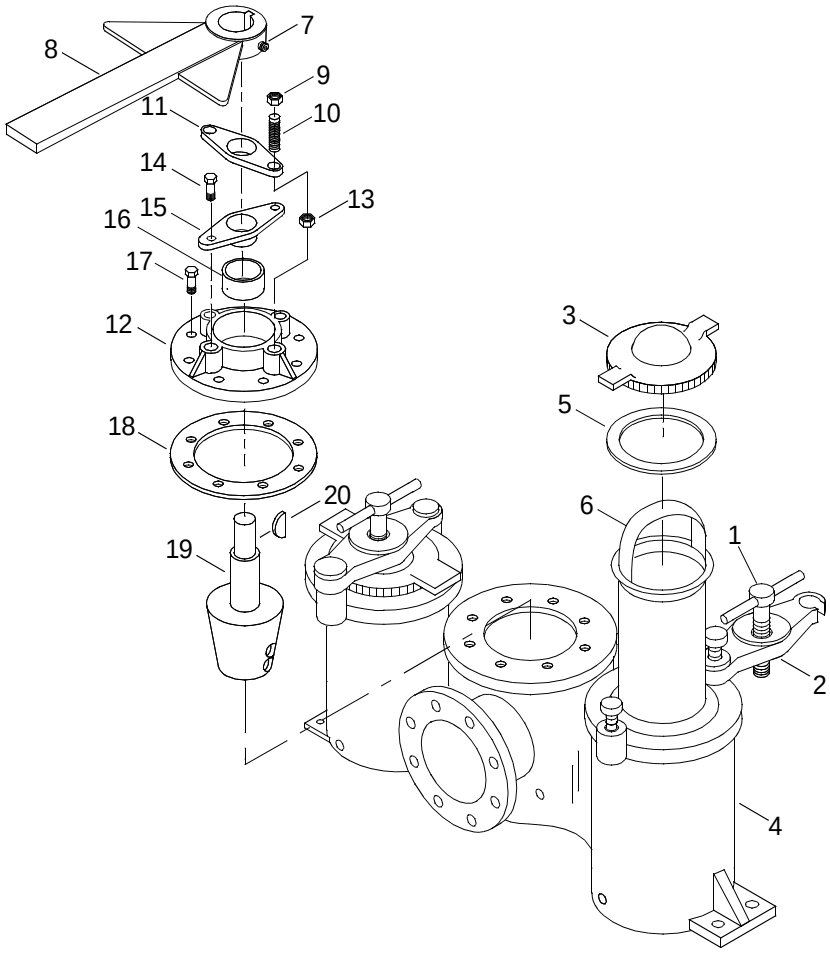
Raw Water Cooling System Duplex Strainer Removed. (WP 0104 00)

DISASSEMBLE RAW WATER COOLING SYSTEM DUPLEX STRAINER

NOTE

Repair is limited to the replacement of damaged components. The following steps are typical for repair of raw water system duplex strainers.

1. Loosen two yoke handles (1).



2. Move two yokes (2) from body covers (3).
3. Remove two body covers (3) from integral body (4).
4. Remove two gaskets (5) from integral body (4) and discard.
5. Remove two monel baskets (6) from integral body (4).
6. Loosen set screw (7) from valve handle (8).
7. Remove valve handle (8).
8. Remove two hex nuts (9) from studs (10).
9. Remove locking flange (11) from valve cover (12).
10. Remove two hex jam nuts (13) from studs (10).
11. Remove two studs (10) from valve cover (12).
12. Remove two gland cap screws (14) from valve cover (12).
13. Remove gland (15) from valve cover (12).

14. Remove packing (16) and discard.
15. Remove eight valve cover cap screws (17) from valve cover (12).
16. Remove valve cover (12) from integral body (4).
17. Remove gasket (18) from integral body (4) and discard.
18. Remove valve plug assembly (19) from integral body (4).
19. Remove woodruff key (20) from valve plug assembly (19).

ASSEMBLE RAW WATER COOLING SYSTEM DUPLEX STRAINER

1. Install woodruff key (20) in valve plug assembly (19).
2. Install valve plug assembly (19) into integral body (4).
3. Position new cover gasket (18) on integral body (4).
4. Position valve cover (12) on integral body (4).
5. Install eight valve cover cap screws (17) in valve cover (12) and tighten.
6. Install new packing (16).
7. Position gland (15) on valve cover (12).
8. Install two gland cap screws (14) in valve cover (12) and tighten.
9. Install two studs (10) in valve cover (12).
10. Install two hex jam nuts (13) on studs (10).
11. Position locking flange (11) on valve cover (12).
12. Install two hex nuts (9) on studs (10).
13. Position valve handle (8).
14. Tighten set screw (7).
15. Install two monel baskets (6) in integral body (4).
16. Position two new gaskets (5) on integral body (4).
17. Position two body covers (3) on integral body (4).
18. Position two yokes (2) on body covers (3).
19. Tighten two yoke handles (1).
20. Install raw water cooling system duplex strainer. (WP 0104 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM BUTTERFLY (SEA CHEST) VALVE TO DUPLEX STRAINER WATER HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Hose
(24161)
PN 37HW
Sealing Compound (Item 26, WP 0382 00)

Personnel Required

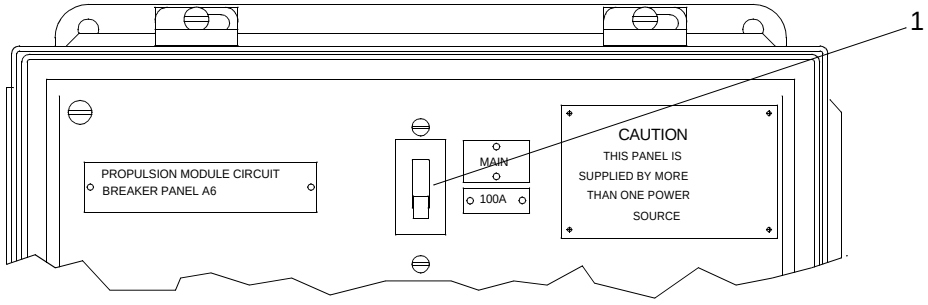
Engineer 88L

References

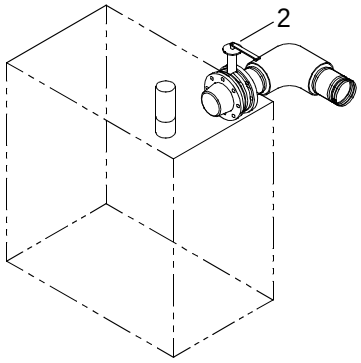
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM BUTTERFLY (SEA CHEST) VALVE TO DUPLEX STRAINER WATER HOSE

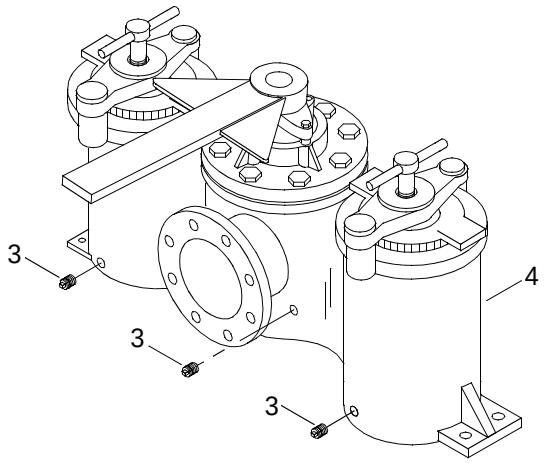
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



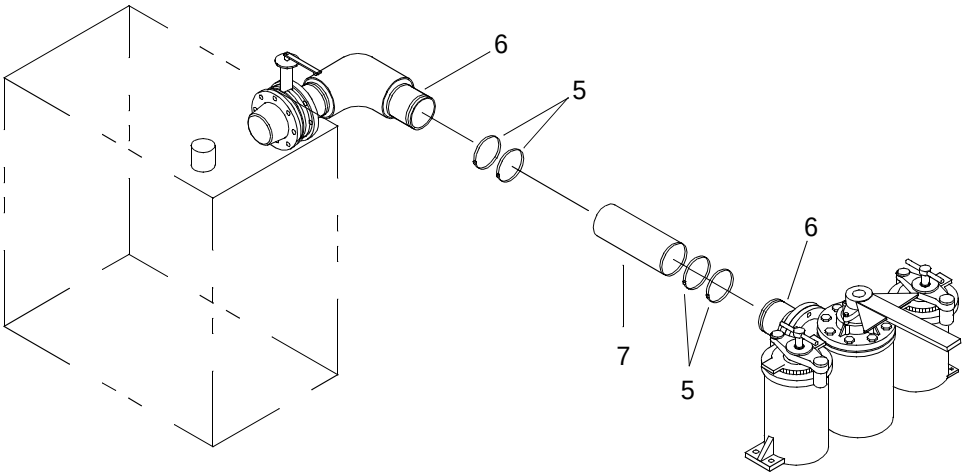
2. Verify the sea chest valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen four hose clamps (5) and slide over two nipples (6).



5. Remove water hose (7) from two nipples (6).

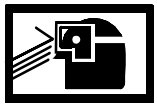
6. Discard water hose (7).

INSTALL RAW WATER COOLING SYSTEM BUTTERFLY (SEA CHEST) VALVE TO DUPLEX STRAINER WATER HOSE

WARNING



CHEMICAL



EYE PROTECTION

1. Apply sealing compound, to threads on two nipples (6).
2. Install new water hose (7) onto two nipples (6).
3. Position four hose clamps (5) on water hose (7).
4. Tighten four hose clamps (5) around water hose (7).
5. Install three pipe plugs (3) into duplex strainer (4).
6. Open sea chest valve (2).
7. Start engine to activate raw water pumps. (TM 55-1945-205-10-1)
8. Check sea chest valve (2) duplex strainer water hose (7) and connections (5) for leaks.
9. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM DUPLEX STRAINER TO RAW WATER PUMP HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Hose

(65948)

PN SW-369

Personnel Required

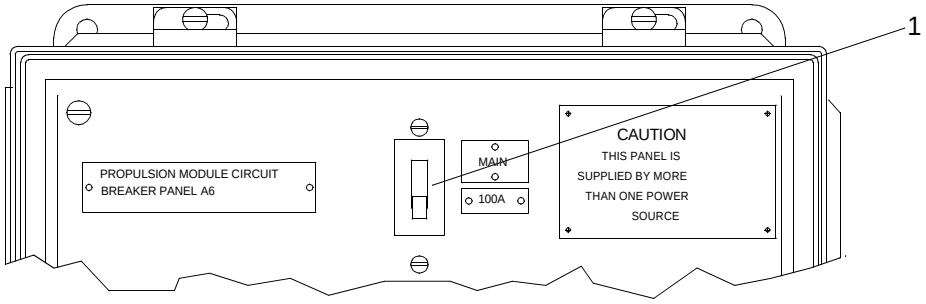
Engineer 88L

References

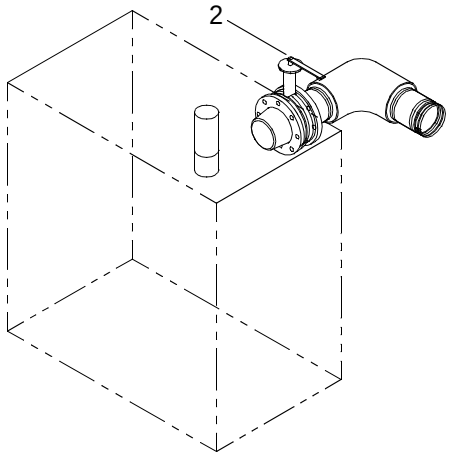
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM DUPLEX STRAINER TO RAW WATER PUMP HOSE

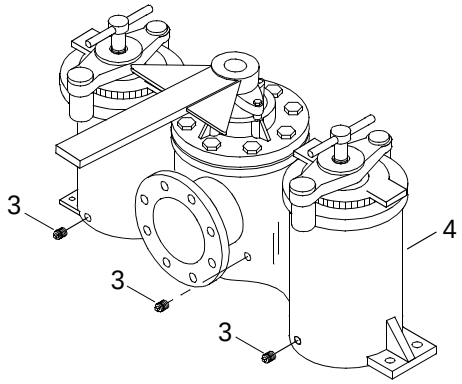
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



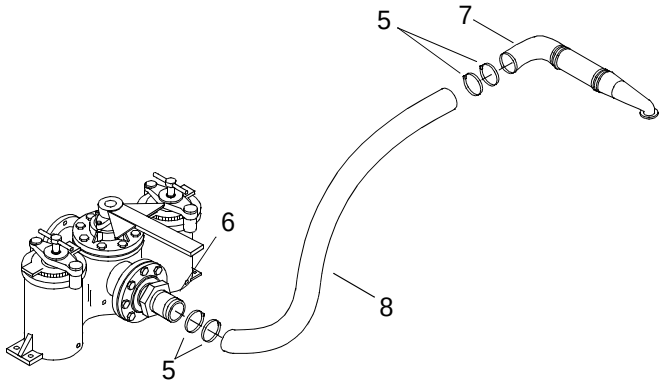
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen four hose clamps (5) and slide over nipple (6) and elbow (7).



5. Remove water hose (8) from nipple (6).

6. Remove water hose (8) from elbow (7).

7. Discard water hose (8).

INSTALL RAW WATER COOLING SYSTEM DUPLEX STRAINER TO RAW WATER PUMP HOSE

1. Install new water hose (8) on elbow (7).

2. Install new water hose (8) on nipple (6).

3. Slide hose clamps (5) on water hose (8).

4. Tighten four hose clamps (5) around water hose (8).

5. Install three pipe plugs (3) into duplex strainer (4).

6. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)

7. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM EXHAUST SHUTOFF BALL VALVE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Valve, Ball, 2 in.
(01029)
PN E09528
Sealing Compound (Item 26, WP 0382 00)

Personnel Required

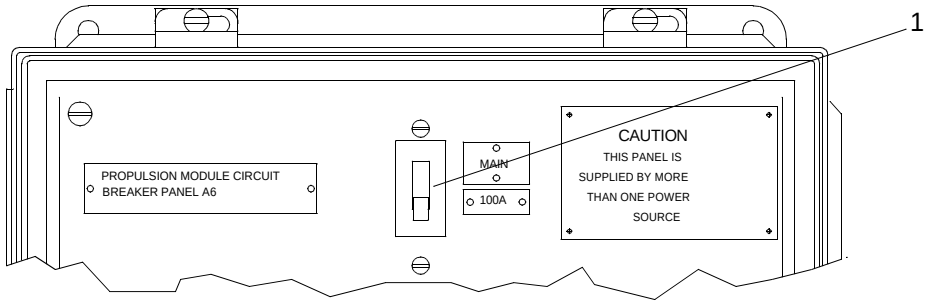
Engineer 88L

References

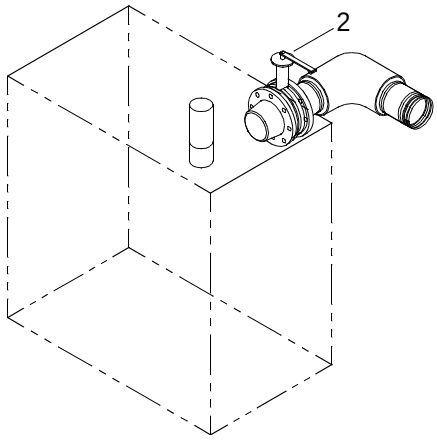
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM EXHAUST SHUTOFF BALL VALVE

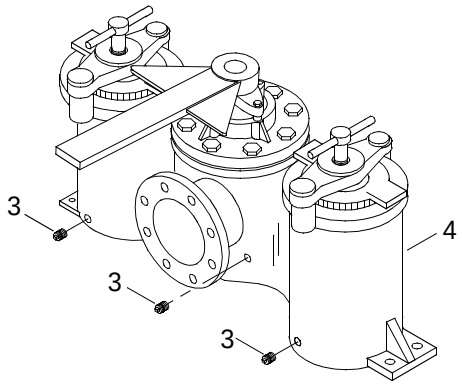
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



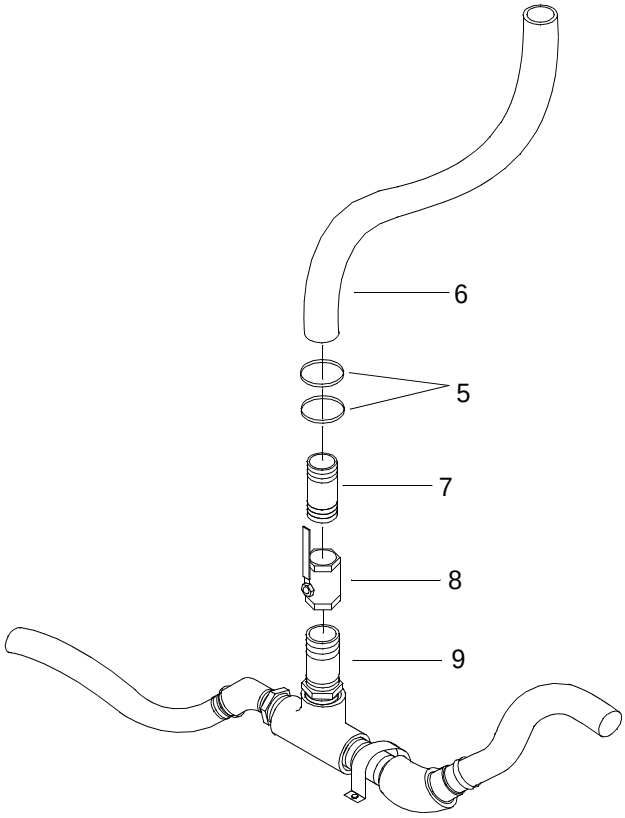
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen two hose clamps (5) and slide over hose (6).



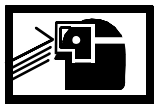
5. Remove hose (6) from nipple (7).
6. Move hose (6) away from ball valve (8).
7. Remove nipple (7) from ball valve (8).
8. Remove ball valve (8) from nipple (9).
9. Discard ball valve (8).

INSTALL RAW WATER COOLING SYSTEM EXHAUST SHUTOFF BALL VALVE

WARNING



CHEMICAL



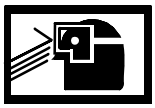
EYE PROTECTION

1. Apply sealing compound to threads on ball valve (8).
2. Install new ball valve (8) on nipple (9).
3. Tighten ball valve (8) on nipple (9).

WARNING



CHEMICAL



EYE PROTECTION

4. Apply sealing compound to threads on nipple (7).
5. Install nipple (7) in ball valve (8).
6. Tighten nipple (7) on ball valve (8).
7. Install hose (6) on nipple (7).
8. Slide two hose clamps (5) over hose (6).
9. Tighten two hose clamps (5) on hose (6).
10. Install three pipe plugs (3) into duplex strainer (4).
11. Open butterfly (sea chest) valve (2)
12. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)
13. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO MARINE GEAR HEAT EXCHANGER WATER HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Hose
(24161)
PN 49HW

Personnel Required

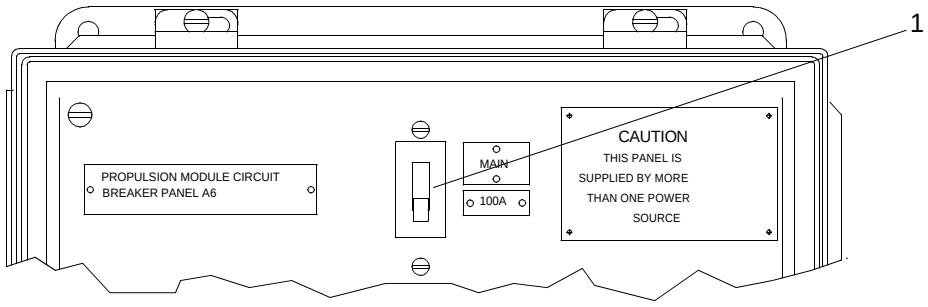
Engineer 88L

References

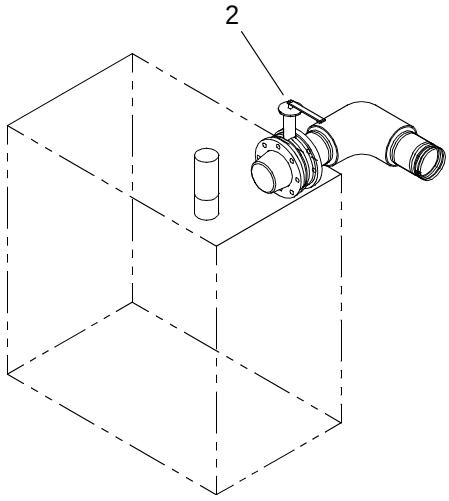
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO MARINE GEAR HEAT EXCHANGER WATER HOSE

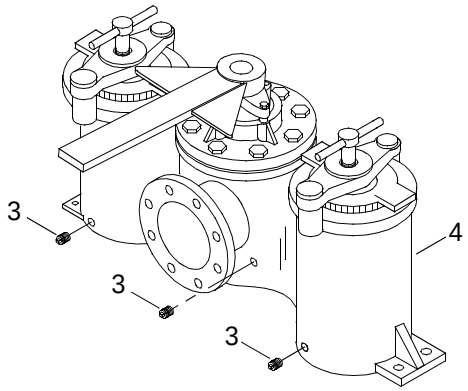
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



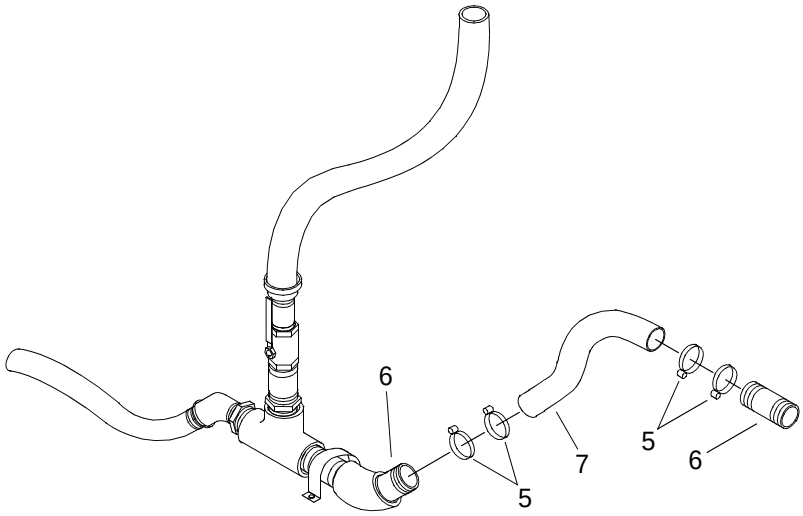
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen four hose clamps (5) and slide over two nipples (6).



5. Remove water hose (7) from two nipples (6).

6. Discard water hose (7).

INSTALL RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO MARINE GEAR HEAT EXCHANGER WATER HOSE

1. Install new water hose (7) onto two nipples (6).

2. Slide four hose clamps (5) on water hose (7).

3. Tighten four hose clamps (5) on water hose (7).

4. Install three pipe plugs (3) into duplex strainer (4).

5. Open butterfly (sea chest) valve (2).

6. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)

7. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO EXHAUST CROSSOVER TEE WATER HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Hose

(24161)

PN 49HW

Personnel Required

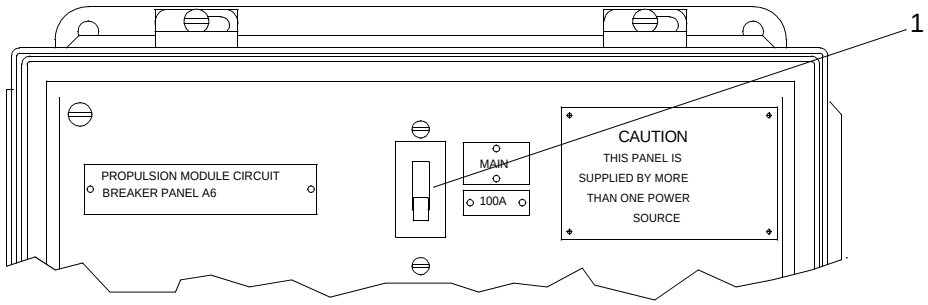
Engineer 88L

References

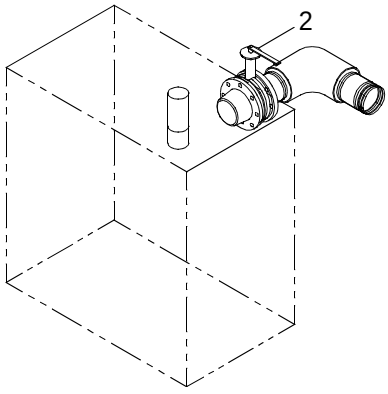
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO EXHAUST CROSSOVER TEE WATER HOSE

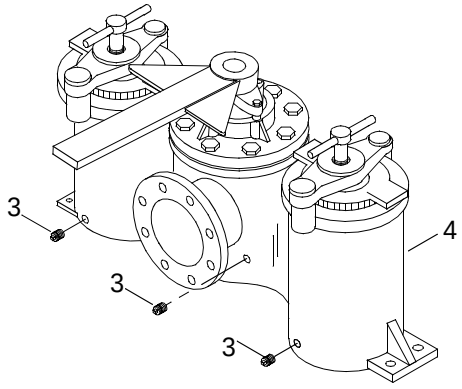
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



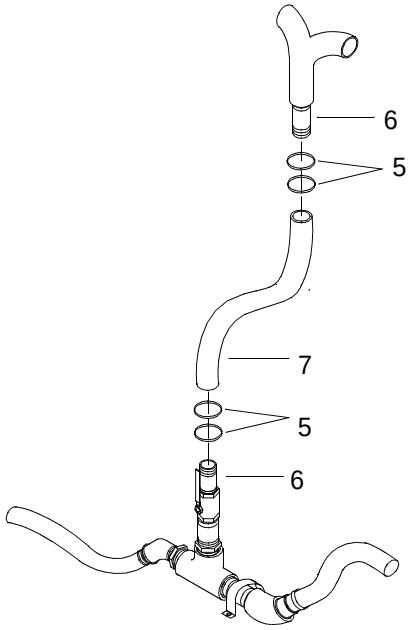
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen four hose clamps (5) and slide over two nipples (6).



5. Remove water hose (7) from two nipples (6) and discard.

INSTALL RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO EXHAUST CROSSOVER TEE WATER HOSE

1. Install new water hose (7) onto two nipples (6).
2. Slide four hose clamps (5) on water hose (7).
3. Tighten four hose clamps (5) on water hose (7).
4. Install three pipe plugs (3) into duplex strainer (4).
5. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)
6. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO TRANSFER CASE HEAT EXCHANGER WATER HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Hose
(24161)
PN 37HW

Personnel Required

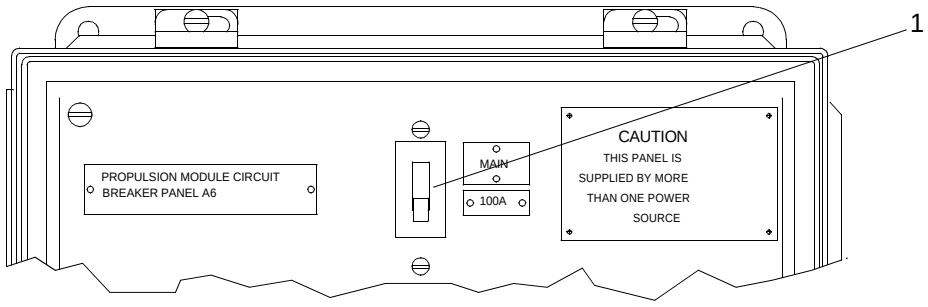
Engineer 88L

References

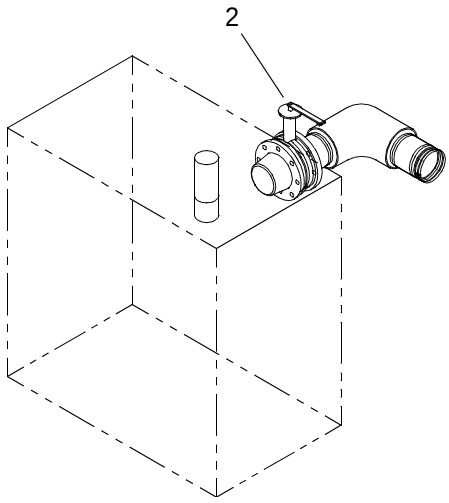
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO TRANSFER CASE HEAT EXCHANGER WATER HOSE

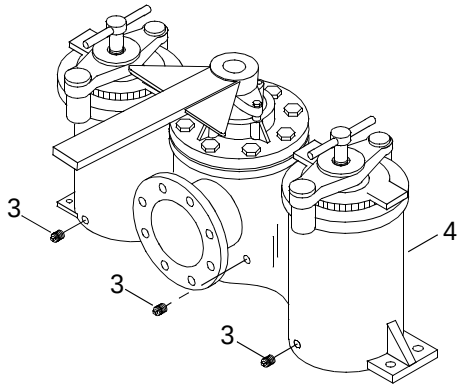
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



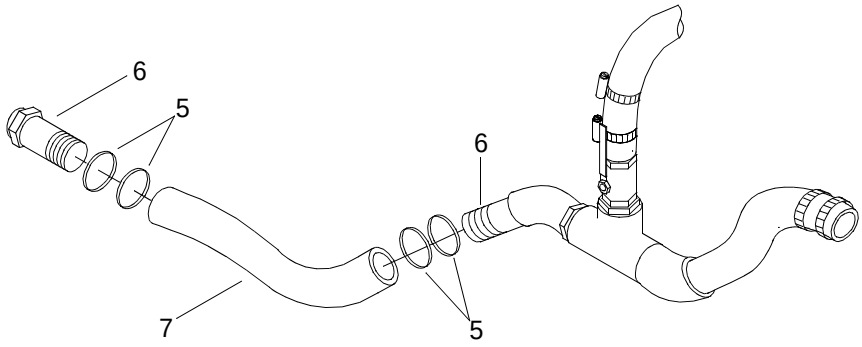
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen four hose clamps (5) and slide over two nipples (6).



5. Remove water hose (7) from two nipples (6).

6. Discard water hose (7).

INSTALL RAW WATER COOLING SYSTEM SHUTOFF BALL VALVE TO TRANSFER CASE HEAT EXCHANGER WATER HOSE

1. Install new water hose (7) onto two nipples (6).

2. Slide four hose clamps (5) onto water hose (7).

3. Tighten four hose clamps (5) around water hose (7).

4. Install three pipe plugs (3) into duplex strainer (4).

5. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)

6. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM TRANSFER CASE HEAT EXCHANGER TO OVERBOARD DISCHARGE WATER HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Hose

(24161)

PN E13028-7

Personnel Required

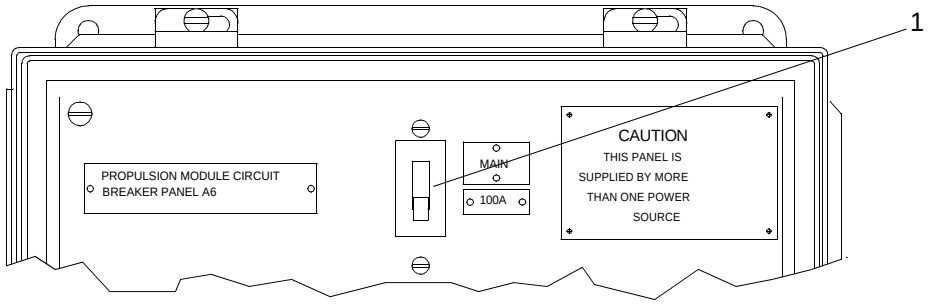
Engineer 88L

References

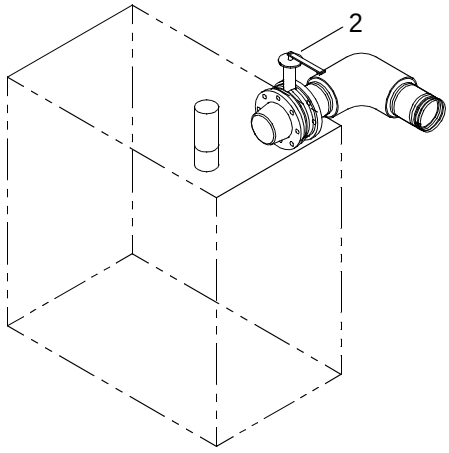
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM TRANSFER CASE HEAT EXCHANGER TO OVERBOARD DISCHARGE WATER HOSE

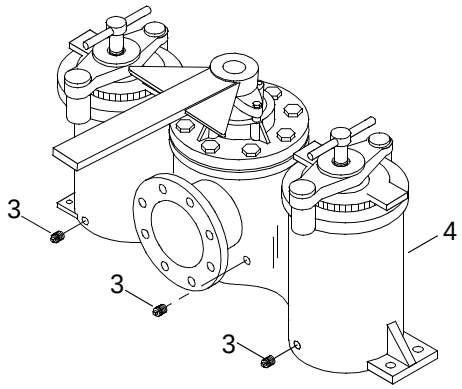
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



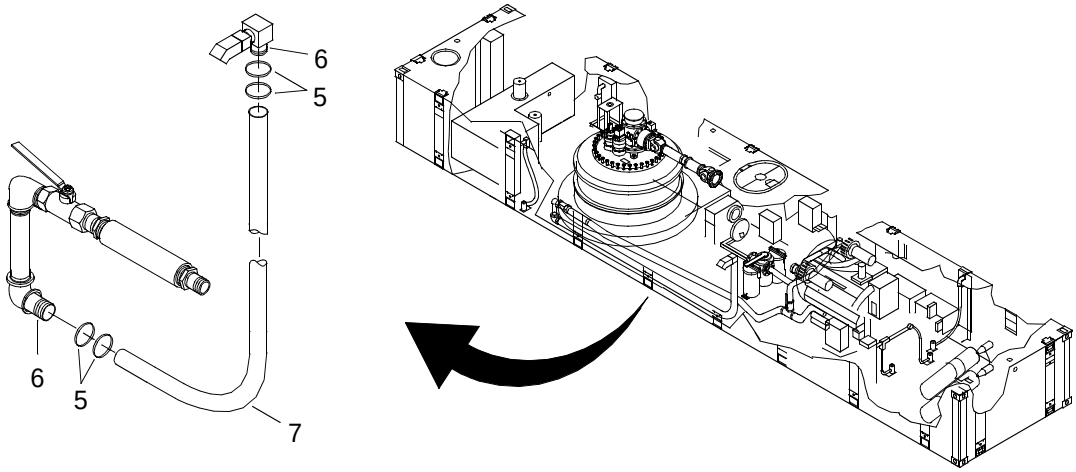
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen four hose clamps (5) and slide over two nipples (6).



5. Remove water hose (7) from two nipples (6).

6. Discard water hose (7).

INSTALL RAW WATER COOLING SYSTEM TRANSFER CASE HEAT EXCHANGER TO OVERBOARD DISCHARGE WATER HOSE

1. Install new water hose (7) onto two nipples (6).

2. Slide four hose clamps (5) on water hose (7).

3. Tighten four hose clamps (5) on water hose (7).

4. Install three pipe plugs (3) into duplex strainer (4).

5. Open sea chest valve (2).

6. Start engine to activate raw water pumps. (TM 55-1945-205-10-1)

7. Check heat exchanger to overboard discharge water hose (7) and connections (5) for leaks.

8. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM MARINE GEAR HEAT EXCHANGER TO ENGINE HEAT EXCHANGER WATER HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Hose
(72582)
PN 23503675

Personnel Required

Engineer 88L

References

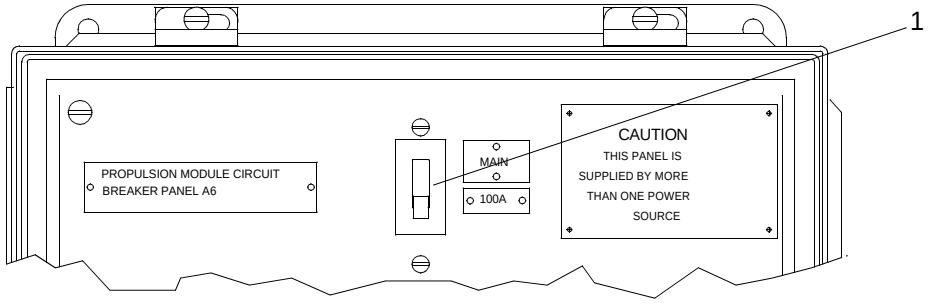
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM MARINE GEAR HEAT EXCHANGER TO ENGINE HEAT EXCHANGER WATER HOSE

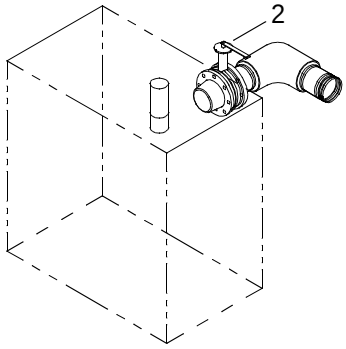
NOTE

This task is typical for the removal and installation of both the marine gear heat exchanger hose and the engine heat exchanger hose.

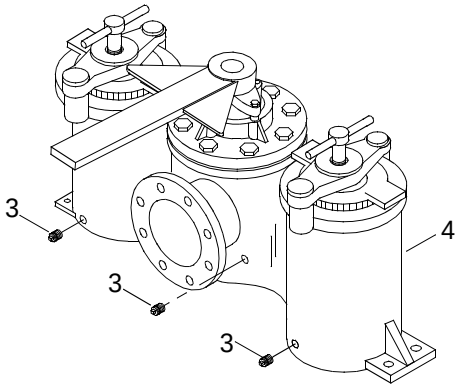
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



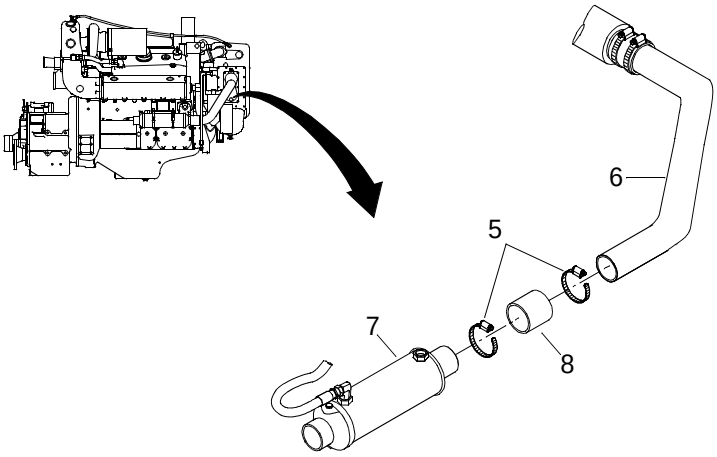
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen two hose clamps (5) and slide over pipe (6) and marine gear heat exchanger (7).



5. Remove water hose (8) from pipe (6) and marine gear heat exchanger (7).

6. Discard water hose (8).

INSTALL RAW WATER COOLING SYSTEM MARINE GEAR HEAT EXCHANGER TO ENGINE HEAT EXCHANGER WATER HOSE

1. Install new water hose (8) onto marine gear heat exchanger (7) and pipe (6).

2. Slide two hose clamps (5) on water hose (8).

3. Tighten two hose clamps (5) on marine gear heat exchanger (7) and pipe (6).

4. Install three pipe plugs (3) into duplex strainer (4).

5. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)

6. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
RAW WATER COOLING SYSTEM PUMP TO ENGINE FUEL COOLER WATER HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Hose
(72582)
PN 5186841

Personnel Required

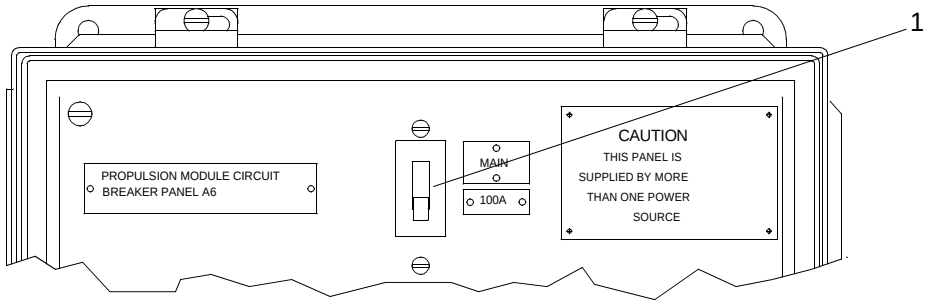
Engineer 88L

References

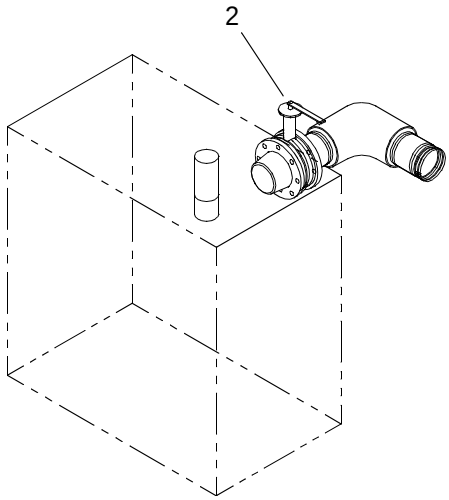
TM 55-1945-205-10-1

REMOVE RAW WATER COOLING SYSTEM PUMP TO ENGINE FUEL COOLER WATER HOSE

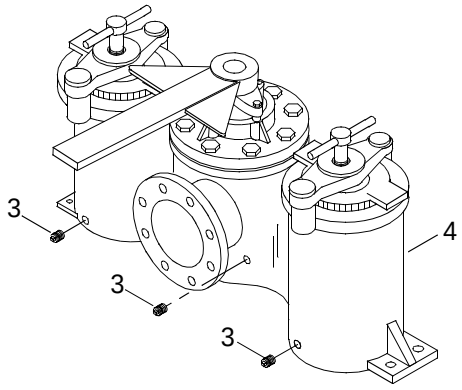
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



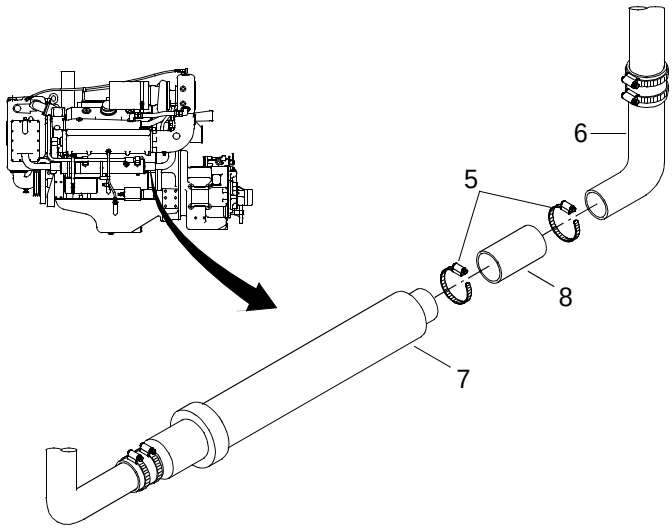
2. Verify the butterfly (sea chest) valve (2) is closed.



3. Remove three pipe plugs (3) from duplex strainer (4). Allow water to drain into bilge.



4. Loosen two hose clamps (5) and slide over pipe (6) and fuel cooler assembly (7).



5. Remove water hose (8) from pipe (6) and fuel cooler assembly (7).

6. Discard water hose (8).

INSTALL RAW WATER COOLING SYSTEM PUMP TO ENGINE FUEL COOLER WATER HOSE

1. Install new water hose (8) onto fuel cooler assembly (7) and pipe (6).

2. Slide two hose clamps (5) on water hose (8).

3. Tighten two hose clamps (5) on fuel cooler assembly (7) and pipe (6).

4. Install three pipe plugs (3) into duplex strainer (4).

5. Start engine to activate bilge pumps. (TM 55-1945-205-10-1)

6. Shut down engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN TRANSFER CASE TO PUMP-JET MACHINERY GUARDS
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)

Personnel Required

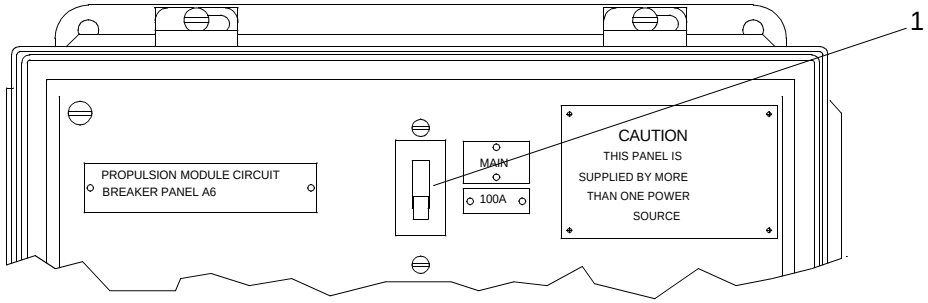
Engineer 88L (2)

REMOVE DRIVE TRAIN TRANSFER CASE TO PUMP-JET MACHINERY GUARDS

NOTE

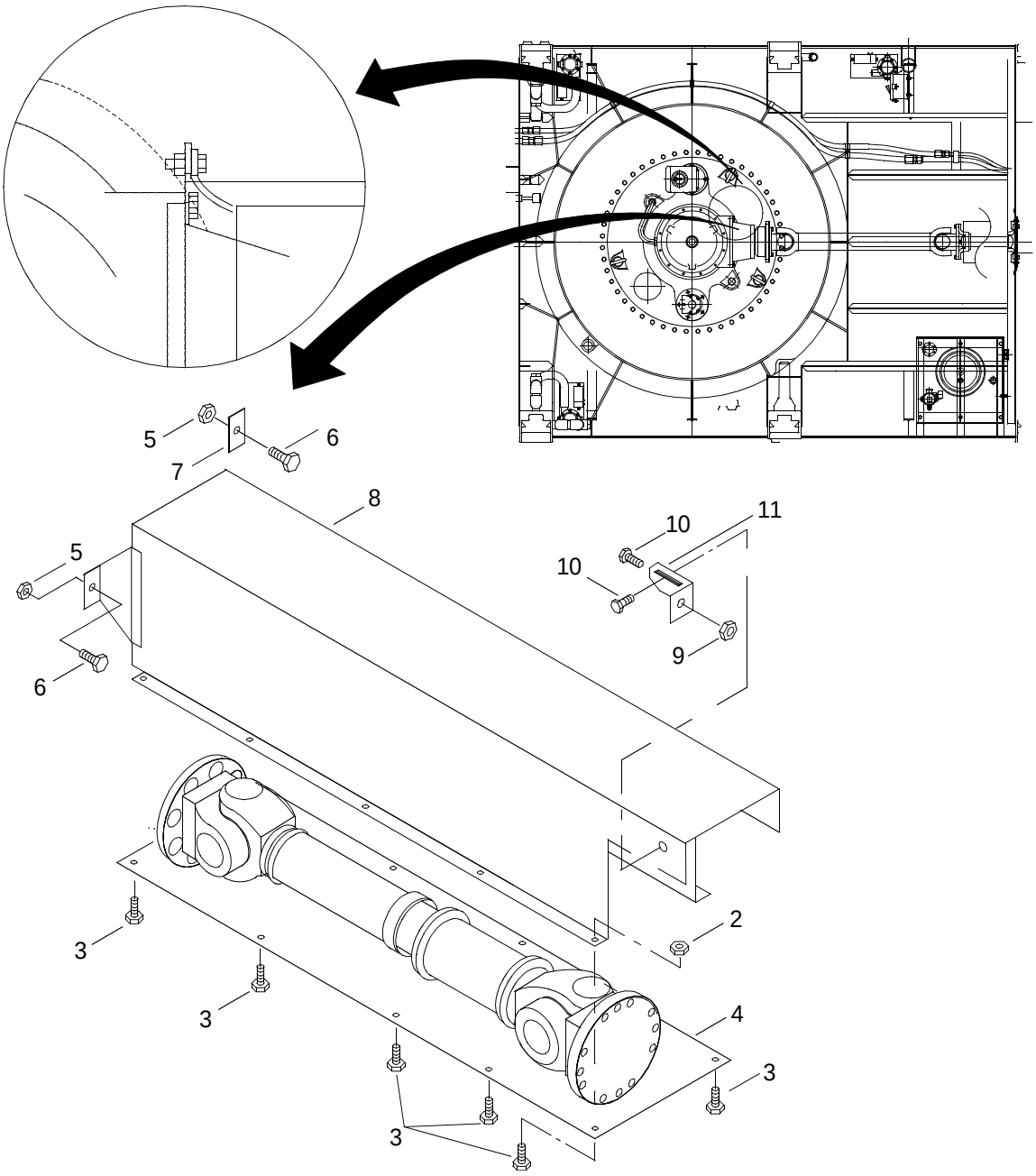
The following procedure is typical for the removal and installation of machinery guards.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen and remove ten hex nuts (2) and hex head cap screws (3) to free cover guard (4).

3. Loosen and remove two self-locking hex nuts (5) and hex head cap screws (6) from mounting plate (7).



WARNING



HEAVY OBJECTS

Machinery guard weighs ninety-five pounds. Lift guard carefully. Failure to comply may result in serious injury to personnel and damage to equipment.

4. With aid of assistant, support machinery guard (8).

5. Remove the four self-locking hex nuts (9) and four hex head cap screws (10) from machine guard bracket (11).

WARNING



HEAVY OBJECTS

6. Remove machinery guard (8).

INSTALL DRIVE TRAIN TRANSFER CASE TO PUMP-JET MACHINERY GUARDS

WARNING



HEAVY OBJECTS

1. With aid of assistant, position machinery guard (8) over drive shaft, between pump-jet and transfer case.

2. Secure machinery guard (8) to machine guard bracket (11) using four self-locking hex nuts (9) and hex head cap screws (10).

3. Secure machinery guard (8) to mount plate (7) using two self-locking hex nuts (5) and hex head cap screws (6).

WARNING



HEAVY OBJECTS

4. Position cover guard (4) and secure to machinery guard (8) using ten hex nuts (3) and hex head cap screws (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN MARINE GEAR TO TRANSFER CASE MACHINERY GUARDS
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)

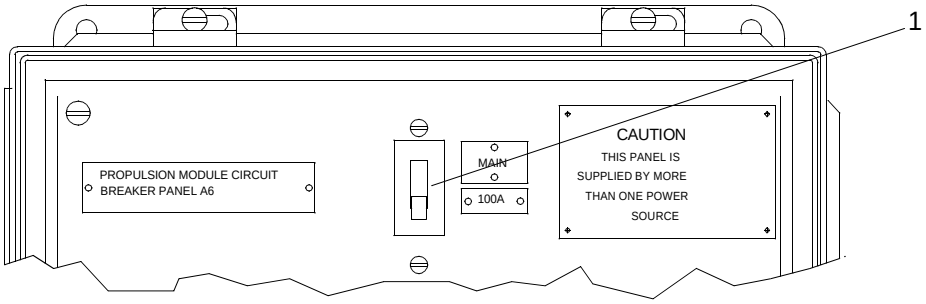
Personnel Required
Engineer 88L (2)

REMOVE DRIVE TRAIN MARINE GEAR TO TRANSFER CASE MACHINERY GUARDS

NOTE

The following procedure is typical for the removal and installation of machinery guards.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



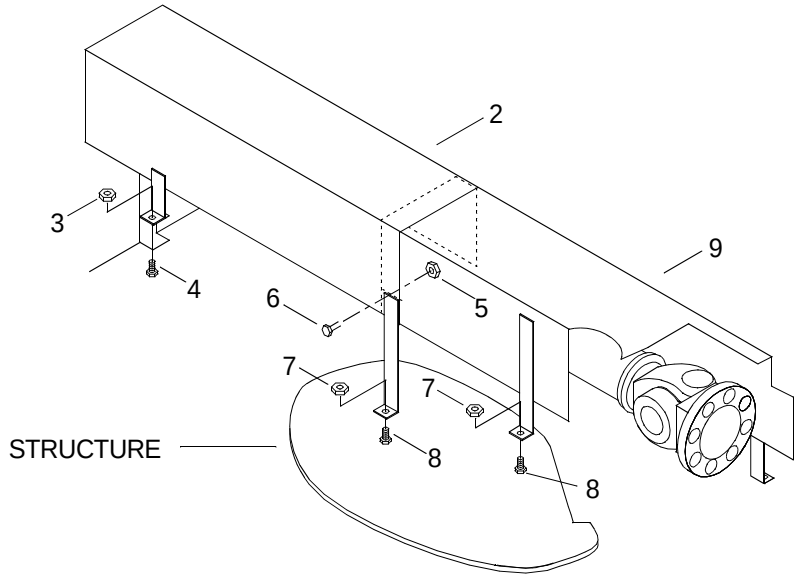
WARNING



HEAVY OBJECTS

Upper machinery guard weighs 57 lb and the lower machinery guard weighs 54 lb. Lift guards carefully. Failure to comply may result in serious injury to personnel.

2. With assistant supporting upper machinery guard (2), remove two hex nuts (3) from tack welded cap screws (4) at base of guard (2).



3. Remove two hex nuts (5) and two cap screws (6) to free upper machinery guard (2).

WARNING



HEAVY OBJECTS

4. Remove four hex nuts (7) from four tack-welded cap screws (8) to free lower machinery guard (9).

INSTALL DRIVE TRAIN MARINE GEAR TO TRANSFER CASE MACHINERY GUARDS

WARNING



HEAVY OBJECTS

1. Using the tack-welded cap screws (8) as guides, lower machinery guard (9) down to deck. Secure to deck with the four hex nuts (7).

WARNING



HEAVY OBJECTS

2. With aid of assistant, position upper machinery guard (2) overlapping lower machinery guard (9), aligning two holes in engine side of upper guard with two holes in lower machinery guard (9).

3. Secure both upper and lower guards at location near middle of drive shaft using two cap screws (6) and two hex nuts (5).

4. Secure top of upper machinery guard (2) with two hex nuts (3) on tack-welded screws (4) at base of guard (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN DRIVE SHAFTS
INSPECTION AND SERVICING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Lubricating Gun, Hand (Item 22, WP 0383 00)

Materials/Parts

Grease, Automotive and Artillery (Item 8, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

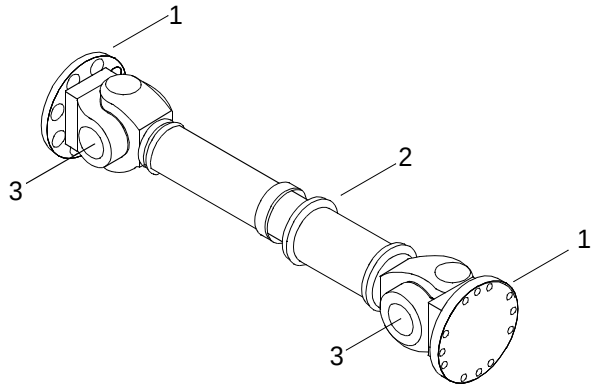
Drive Train Transfer Case To Pump-Jet Machinery Guard Removed. (WP 0115 00)
Drive Train Marine Gear To Transfer Case Machinery Guard Removed. (WP 0116 00)

INSPECT DRIVE TRAIN DRIVE SHAFTS

NOTE

The following procedure is typical for drive shafts.

1. Check bolts and mating flanges (1) for tightness and correct seating.



2. Ensure even tightening of bolts; any loose bolts should be tightened in sequence, alternating sides and moving around flange in only one direction.

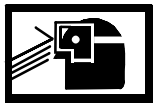
3. Check for play in the cross and bearing and slip spline (2) before regreasing. If any looseness or play is felt the shaft must be overhauled.

SERVICE DRIVE TRAIN DRIVE SHAFTS

WARNING



CHEMICAL



EYE PROTECTION

1. Using lubricating gun and grease, lubricant bearing assemblies (3) until clean grease appears at all journal cross bearing seals.

2. If all seals do not purge when being lubed, move the drive shaft laterally in all four directions, or tap on the yoke lugs with a soft faced hammer while applying pressure to the alemite fitting.

3. Install drive train marine gear to transfer case machinery guard. (WP 0116 00)

4. Install drive train transfer case to pump-jet machinery guard. (WP 0115 00)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN SHAFTS
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, (Chemical) (Item 12, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Brush, Wire Scratch (Item 4, WP 0383 00)
Sling, 5300 lb 6 ft (Green) (Item 37, WP 0383 00)
Wrench, Torque (100-600 ft lbs) (Item 48, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L (2)

Equipment Condition

Powered Section Thruster Hatch Removed (WP 0099 00)
Powered Section Exhaust Plenum Removed. (WP 0092 00)
Drive Train Transfer Case To Pump-Jet Machinery Guard Removed. (WP 0115 00)
Drive Train Marine Gear To Transfer Case Machinery Guard Removed. (WP 0116 00)

REMOVE DRIVE TRAIN SHAFTS

WARNING

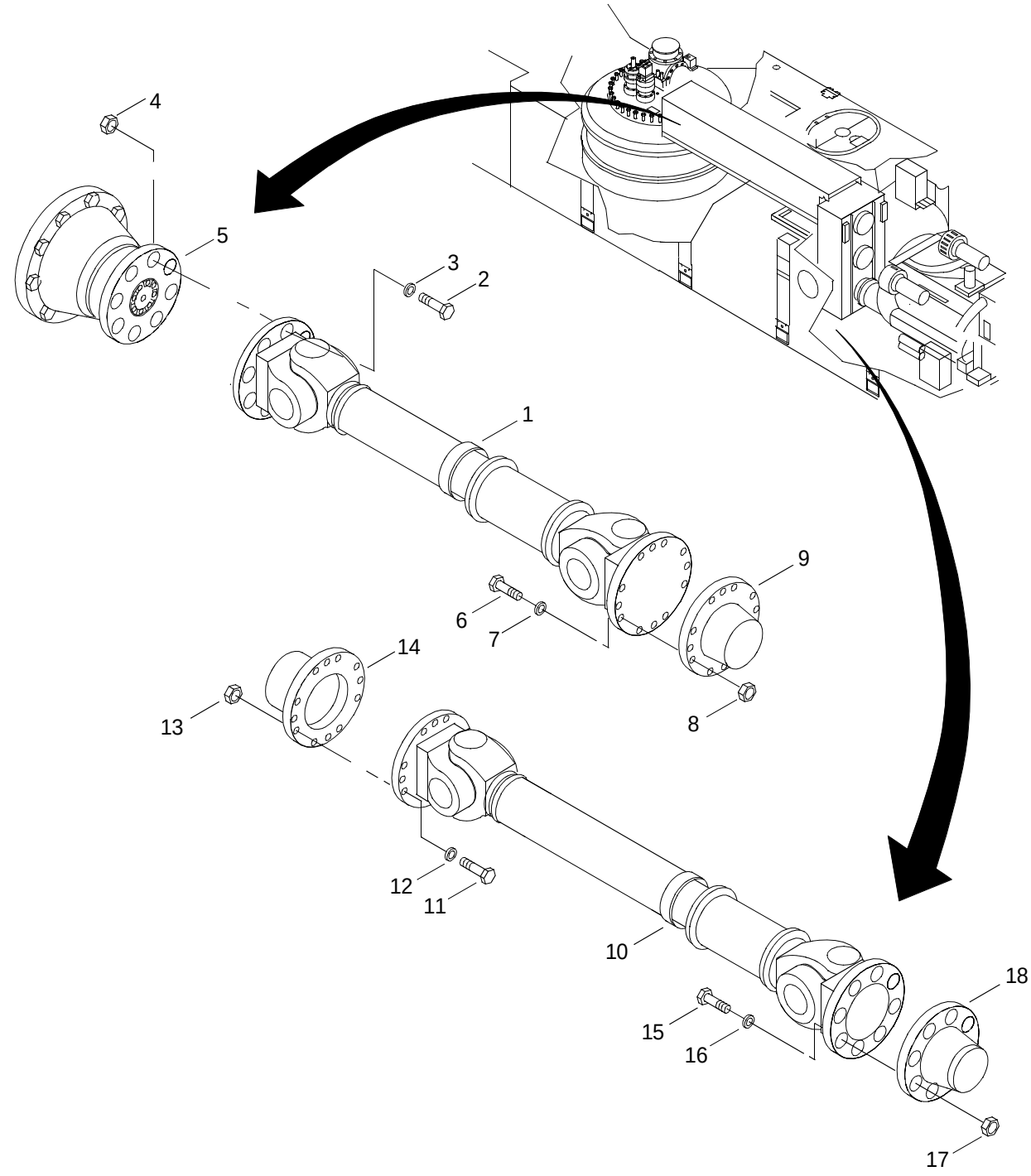


HEAVY PARTS

NOTE

The following procedure is typical for both port and starboard drive train shafts.

1. Support the pump-jet to transfer case drive shaft (1) with a sling attached to crane.



2. Remove eight cap screws (2), lock washers (3) and hex nuts (4) securing shaft (1) to pump-jet flange (5).

3. Remove twelve cap screws (6), lock washers (7) and hex nuts (8) securing shaft (4) to transfer case flange (9).

WARNING



HEAVY PARTS

4. Using crane and sling, lift transfer case drive shaft (1) through exhaust plenum deck opening.

WARNING



HEAVY PARTS

5. Support the marine gear to transfer case drive shaft (10) with a sling attached to crane.

6. Remove twelve cap screws (11), lock washers (12) and hex nuts (13) securing shaft (10) to transfer case flange (14).

7. Remove eight cap screws (15), lock washers (16) and hex nuts (17) securing shaft (10) to marine gear flange (18).

WARNING



HEAVY PARTS

8. Using two men, transport the marine gear to transfer case drive shaft (10) below the exhaust plenum deck opening.

WARNING

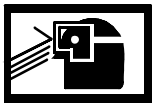


HEAVY PARTS

9. Using crane and sling, lift marine gear to transfer case drive shaft (10) through exhaust plenum deck opening.

INSTALL DRIVE TRAIN SHAFTS

WARNING



EYE PROTECTION

1. Clean all mounting surfaces with a wire brush to ensure residual adhesive, rust inhibitor, dirt or grease is removed.

WARNING



HEAVY PARTS

2. Support the marine gear to transfer case drive shaft (10) with a sling attached to crane.

WARNING



HEAVY PARTS

3. Guide shaft (10) through exhaust plenum deck opening and lower below deck.

WARNING



HEAVY OBJECTS

4. Using two men, transport the marine gear to transfer case drive shaft (10) to the mounting location.

WARNING



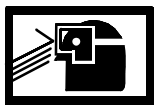
HEAVY OBJECTS

5. Position shaft (10) against marine gear flange (18) so that orientation arrows on shaft (10) and marine gear flange (18) face each other.

WARNING



CHEMICAL



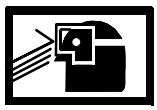
EYE PROTECTION

6. Apply adhesive to cap screws (15).
7. Install eight cap screws (15), lock washers (16), and hex nuts (17) to secure shaft (10) to marine gear flange (18).
8. Torque cap screws (15) to 460 ft lbs (623 N-m).
9. Position shaft (10) against transfer case flange (14).

WARNING



CHEMICAL



EYE PROTECTION

10. Apply adhesive to cap screws (11).
11. Install twelve cap screws (11), lock washers (12) and hex nuts (13) to secure shaft (10) to transfer case flange (14).
12. Torque cap screws (11) to 55 ft lbs (74 N-m).

WARNING



HEAVY PARTS

13. Support the pump-jet to transfer case drive shaft (1) with a sling attached to crane.

WARNING



HEAVY PARTS

14. Guide shaft (1) through exhaust plenum deck opening and lower below deck.

WARNING



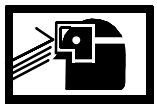
HEAVY OBJECTS

15. Position shaft (1) against transfer case flange (9).

WARNING



CHEMICAL



EYE PROTECTION

16. Apply adhesive to cap screws (6).
17. Install twelve cap screws (6), lock washers (7) and hex nuts (8) to secure shaft (1) to transfer case flange (9).
18. Torque cap screws (6) to 55 ft lbs (74.58 N-m).

WARNING



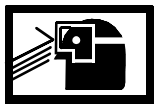
HEAVY OBJECTS

19. Position shaft (1) against pump-jet flange (5) so that orientation arrows on shaft (1) and marine gear flange (5) face each other.

WARNING



CHEMICAL



EYE PROTECTION

20. Apply adhesive to cap screws (2).
21. Install eight cap screws (2), lock washers (3) and hex nuts (4) to secure shaft (4) to pump-jet flange (5).
22. Torque cap screws (2) to 330 ft lbs (447 N-m).
23. Remove sling.
24. Install drive train transfer case to pump-jet machinery guard machinery guard. (WP 0115 00)
25. Install drive train marine gear to transfer case machinery guard machinery guard. (WP 0116 00)
26. Install powered section exhaust plenum. (WP 0092 00)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN
ALIGNMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)

Personnel Required
Engineer 88L (2)

References
TM 55-1945-205-24-1-2
TM 55-1945-205-24-1-4

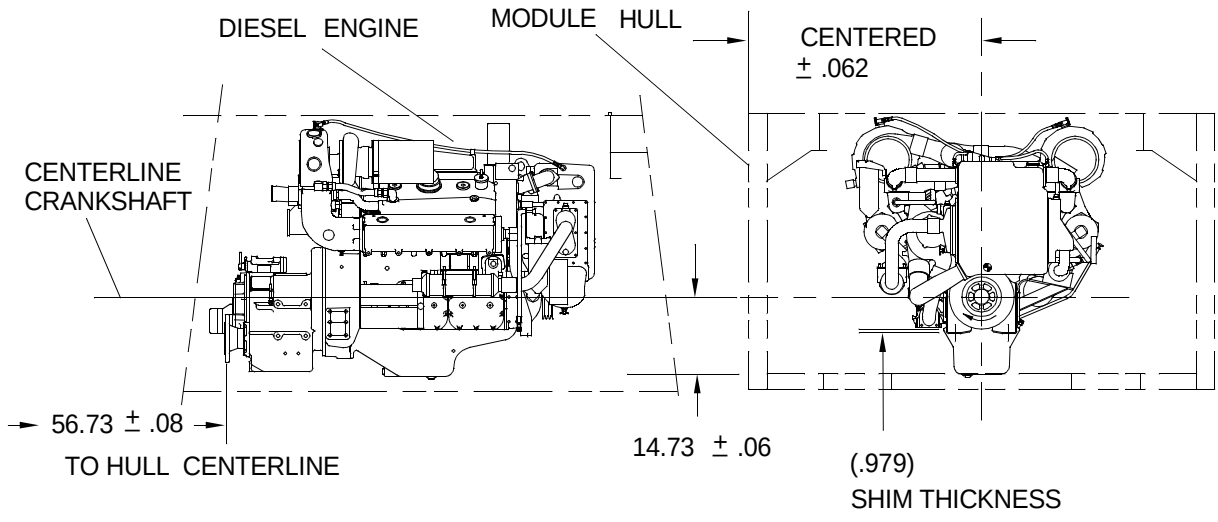
Equipment Condition
Main Mast Navigation Assembly Removed. (WP 0328 00)
SINCGARS Antenna Removed. (TM 11-5820-890-10-8)
Powered Section Operators Cab Removed. (WP 0098 00)
Powered Section Intake Plenum Assembly Removed. (WP 0087 00)
Powered Section Exhaust Plenum Removed. (WP 0092 00)
Powered Section Engine Hatch Removed. (WP 0099 00)
Powered Section Thruster Hatch Removed. (WP 0100 00)
Drive Train Transfer Case To Pump-Jet Machinery Guard Removed. (WP 0115 00)
Drive Train Marine Gear To Transfer Case Machinery Guard Removed. (WP 0116 00)
Marine Gear Aligned. (TM 55-1945-205-24-1-3)

ALIGN DRIVE TRAIN

NOTE

The following procedure is typical for both port and starboard drive trains.

1. Using crane and appropriate sling, support the weight of the engine and insert shims on the engine pedestal mounts to raise or lower the elevation to the measurements depicted below, prior to securing the engine to the deck. (TM 55-1945-205-24-1-2)



2. Ensure diesel engine centerline is parallel, level and square to within +0.062 in. to the hull longitudinal centerline.
3. Ensure transfer case input and output flanges are in line with the marine gear and pump-jet.
4. Shim the transfer case in the same manner as the engine to the elevation shown above. (TM 55-1945-205-24-1-4)
5. Ensure alternator sheave is in line with the engine crank shaft sheave to within +0.5 in. (TM 55-1945-205-24-1-2)
6. Install drive train transfer case to pump-jet machinery guard. (WP 0115 00)
7. Install drive train marine gear to transfer case machinery guard. (WP 0116 00)
8. Install the powered section thruster hatch. (WP 0100 00)
9. Install the powered section engine hatch. (WP 0099 00)
10. Install the powered section exhaust plenum. (WP 0092 00)
11. Install the powered section intake plenum assembly. (WP 0087 00)
12. Install the powered section operators cab. (WP 0098 00)
13. Install SINCGARS antenna. (TM 11-5820-890-10-8)
14. Install main mast navigation assembly. (WP 0328 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN MAIN ENGINE OIL FILTER REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Oil Filter
(72582)
PN 23418524
Qty 2
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

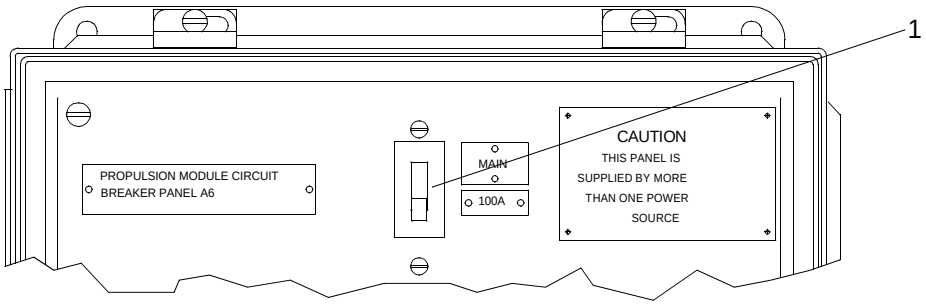
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

REMOVE DRIVE TRAIN MAIN ENGINE OIL FILTER

NOTE

The following procedure is typical for the removal and installation of oil filters.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

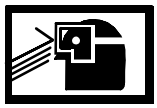


2. Position drain pan beneath oil filters (2).

WARNING

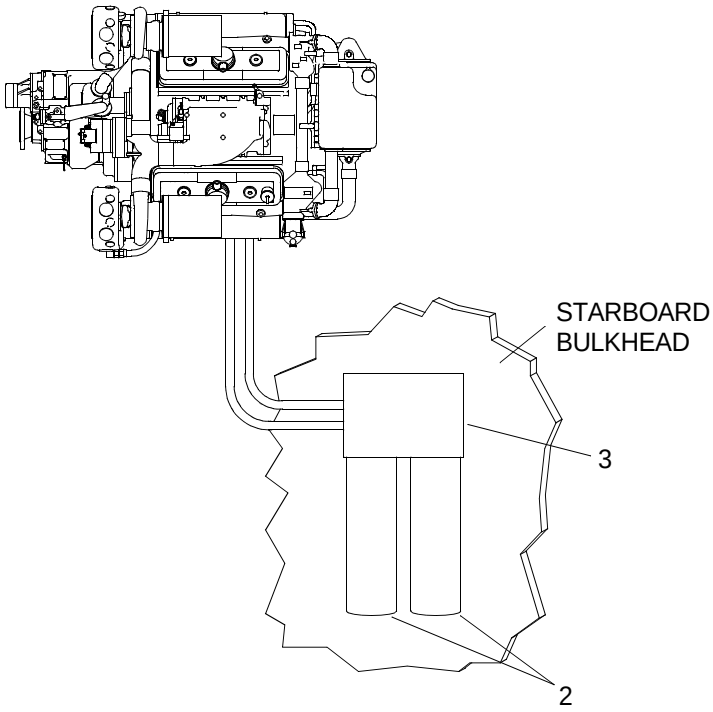


CHEMICAL



EYE PROTECTION

3. Remove the oil filters (2) from the oil filter manifold (3) by turning counterclockwise.

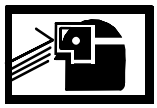


4. Clean the filter mounts of any debris.

WARNING



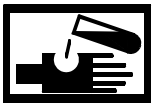
CHEMICAL



EYE PROTECTION

5. Dispose of old oil filters in accordance with local procedures.

WARNING



CHEMICAL



EYE PROTECTION

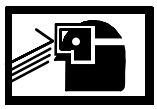
6. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL DRIVE TRAIN MAIN ENGINE OIL FILTER

WARNING



CHEMICAL



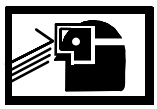
EYE PROTECTION

1. Apply a thin coat of clean oil onto the new oil filter (2) gaskets.

WARNING



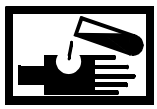
CHEMICAL



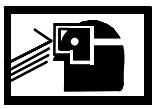
EYE PROTECTION

2. Install the oil filters (2) on the oil filter manifold (3) by turning clockwise.
3. Start engine and check for leaks. (TM 55-1945-205-10-1)
4. Shut down engine. (TM 55-1945-205-10-1)

WARNING



CHEMICAL



EYE PROTECTION



SLICK FLOOR

5. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
6. Service engine crankcase oil. (TM 55-1945-205-24-1-2)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN FAST LUBE SYSTEM HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Fast Lube System Hose Assembly
(34712)
PN E13053
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

Equipment Condition

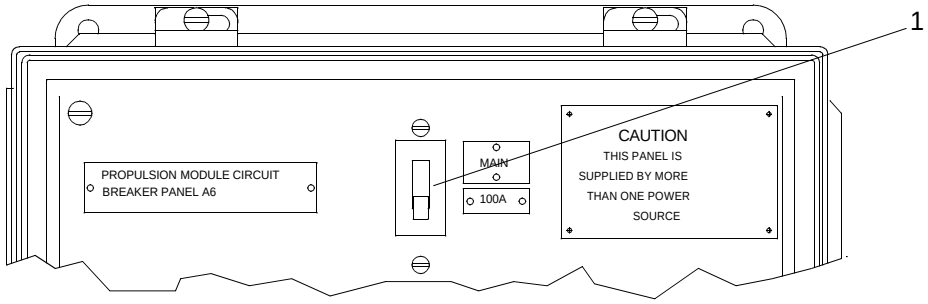
Engine Oil Drained. (TM 55-1945-205-24-1-2)

REMOVE DRIVE TRAIN FAST LUBE SYSTEM HOSE

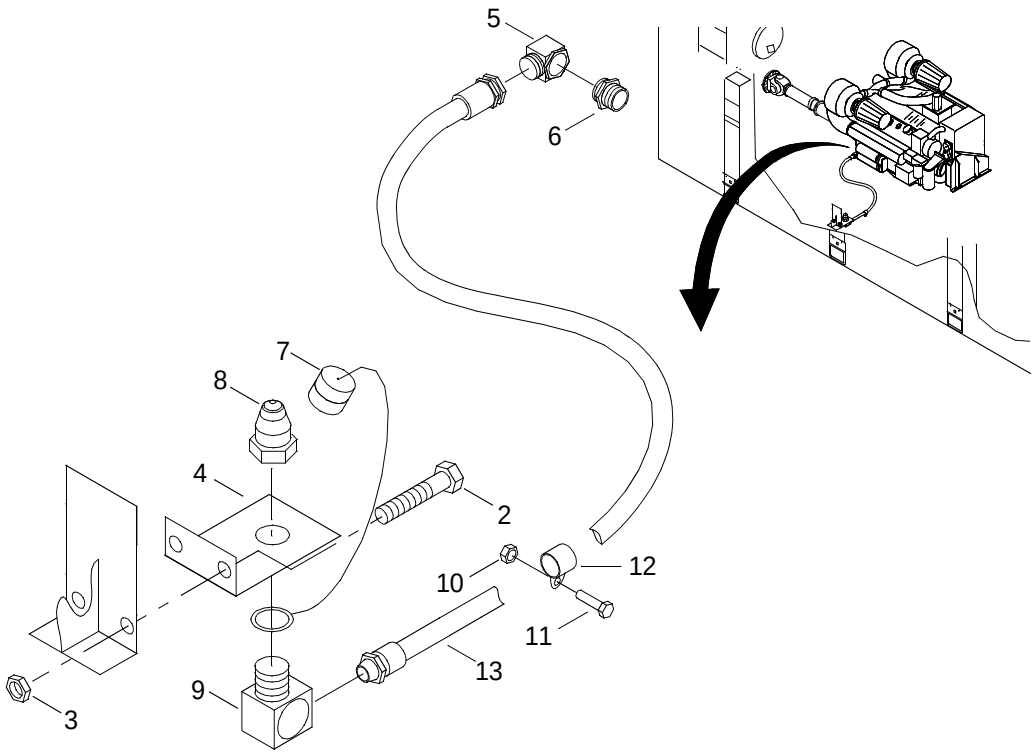
NOTE

The following procedure is typical for the removal and installation of fast lube systems.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove two hex head cap screws (2) and hex nuts (3) from bracket (4).

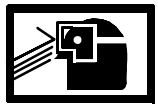


3. Position drain pan beneath engine oil pan.
4. Remove 90° swivel fitting (5) from straight fitting (6).
5. Remove straight fitting (6) from the engine oil pan.
6. Pull off dust cap (7) from half coupling (8).
7. Remove half coupling (8) from 90° adaptor (9).
8. Remove dust cap (7) and 90° adaptor (9) from bracket (4).
9. Remove hex nut (10) and hex head cap screw (11).
10. Remove hose clamp (12) from hose assembly (13).
11. Remove 90° adaptor (9) and 90° swivel fitting (5) from hose assembly (13).

WARNING



CHEMICAL



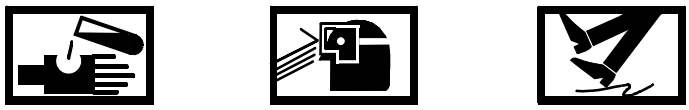
EYE PROTECTION

12. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL DRIVE TRAIN FAST LUBE SYSTEM HOSE

1. Install straight fitting (6) on engine oil pan.
2. Install 90° swivel fitting (5) on straight fitting (6).
3. Install new hose assembly (13) on 90° swivel fitting (5).
4. Position hose clamp (12) on hose assembly (10) and secure to deck using a hex head cap screw (11) and hex head nut (10).
5. Tighten hex head nut (10).
6. Install 90° adaptor (9) on hose assembly (13).
7. Slide dust cap (7) over 90° adaptor (9).
8. Position 90° adaptor (7) in bracket (4).
9. Install half coupling (8) on 90° adaptor (9).
10. Tighten half coupling (8).
11. Cover half coupling (6) with dust cap (7).
12. Align bracket (4) with mounting holes and secure with two hex head cap screws (2) and hex head nuts (3).
13. Tighten hex head nuts (3).
14. Service engine crankcase oil. (TM 55-1945-205-24-1-2)
15. Start engine and check for leaks. (TM 55-1945-205-10-1)
16. Shut down engine. (TM 55-1945-205-10-1)

WARNING



CHEMICAL EYE PROTECTION SLICK FLOOR

17. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN ENGINE OIL FILTER INLET HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 47, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Hose
(87373)
PN E2778-2
Sealing Compound (Item 26, WP 0383 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0383 00)

Personnel Required

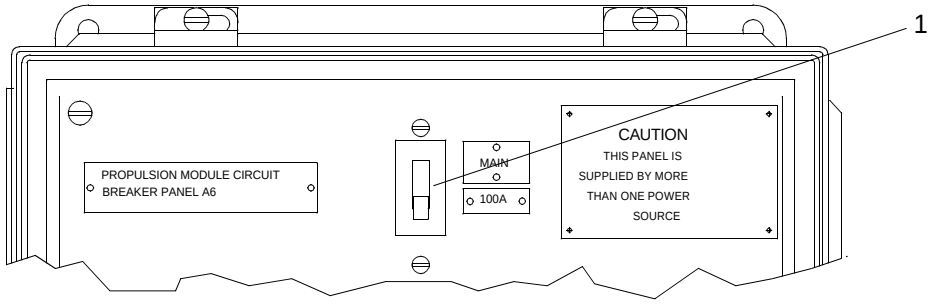
Engineer 88L

References

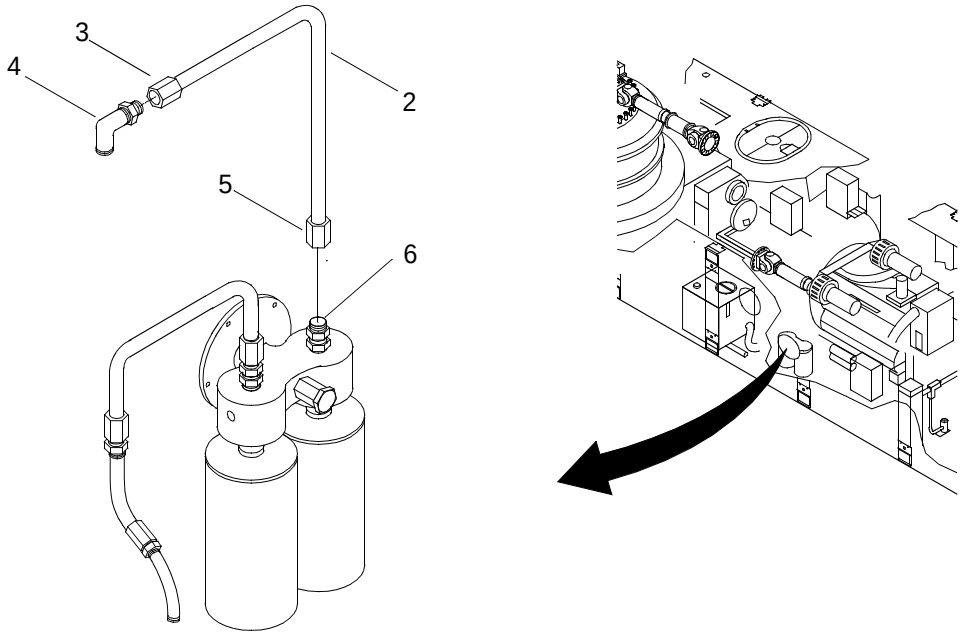
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

REMOVE DRIVE TRAIN ENGINE OIL FILTER INLET HOSE

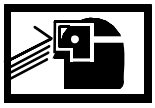
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Place drain pan under oil filter inlet hose (2).



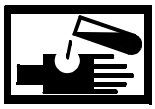
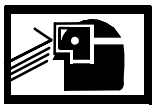
WARNING

CHEMICAL **EYE PROTECTION**

3. Disconnect hose fitting (3) from elbow (4) and position oil filter outlet hose (2) over drain pan.

WARNING

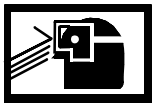
CHEMICAL **EYE PROTECTION**

4. Allow oil filter inlet hose (2) to drain fluids into drain pan.

5. Disconnect hose fitting (5) from male connector (6).

6. Remove oil filter inlet hose (2) and discard.

WARNING

CHEMICAL **EYE PROTECTION**

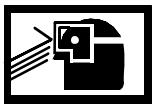
7. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL DRIVE TRAIN ENGINE OIL FILTER INLET HOSE

WARNING



CHEMICAL



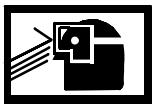
EYE PROTECTION

1. Apply sealing compound to threads on male connector (6) and elbow (4).
2. Position new oil filter inlet hose (2) between male connector (6) and elbow (4).
3. Install hose fitting (5) and tighten.
4. Install hose fitting (3) and tighten.
5. Service engine oil crankcase. (TM 55-1945-205-24-1-2)
6. Start engine and check for leaks. (TM 55-1945-205-10-1)
7. Shut down engine. (TM 55-1945-205-10-1)

WARNING



CHEMICAL



EYE PROTECTION



SLICK FLOOR

8. Clean up spilled fluid with a spill kit and dispose of in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN ENGINE OIL FILTER OUTLET HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Hose
(87373)
PN E27778-1
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

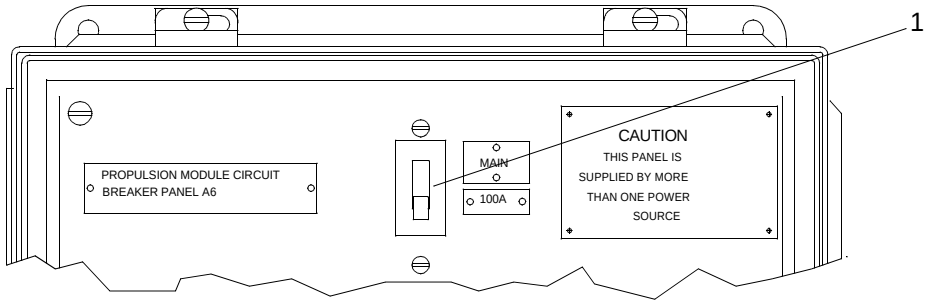
Engineer 88L

References

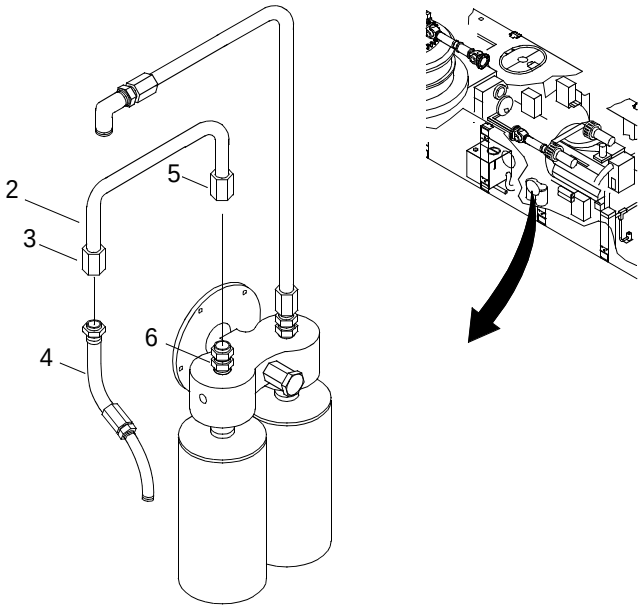
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

REMOVE DRIVE TRAIN OIL FILTER OUTLET HOSE

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

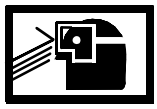


2. Place drain pan under oil filter outlet hose (2).



WARNING

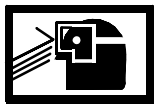

CHEMICAL


EYE PROTECTION

3. Disconnect hose fitting (3) from elbow (4) and position oil filter outlet hose (2) over drain pan.

WARNING


CHEMICAL

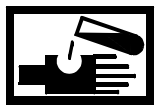

EYE PROTECTION

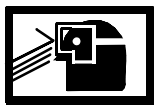
4. Allow oil filter outlet hose (2) to drain into drain pan.

5. Disconnect hose fitting (5) from male connector (6).

6. Remove oil filter outlet hose (2) and discard.

WARNING


CHEMICAL


EYE PROTECTION

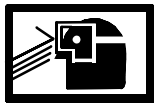
7. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL DRIVE TRAIN OIL FILTER OUTLET HOSE

WARNING



CHEMICAL



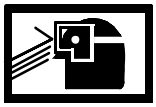
EYE PROTECTION

1. Apply sealing compound to threads on male connector (6) and elbow (4).
2. Position new oil filter outlet hose (2) between male connector (6) and elbow (4).
3. Install hose fitting (5) and tighten.
4. Install hose fitting (3) and tighten.
5. Service engine oil crankcase. (TM 55-1945-205-24-1-2)
6. Start engine and check for leaks. (TM 55-1945-205-10-1)
7. Shut down engine. (TM 55-1945-205-10-1)

WARNING



CHEMICAL



EYE PROTECTION



SLICK FLOOR

8. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN ENGINE OIL FILTER ADAPTOR REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Adaptor
(72582)
PN 5704306
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

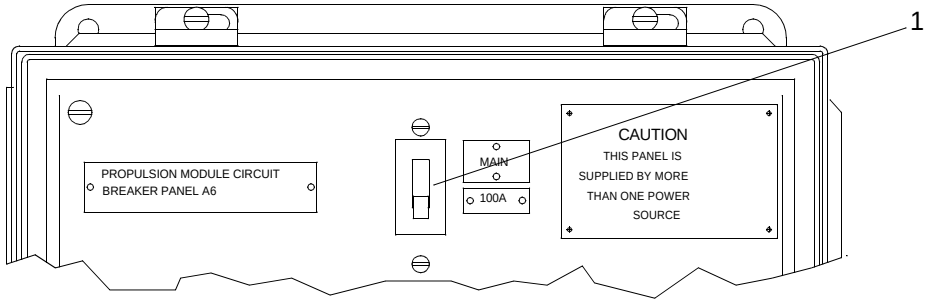
Engineer 88L

References

TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

REMOVE DRIVE TRAIN ENGINE OIL FILTER ADAPTOR

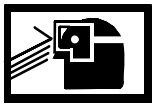
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



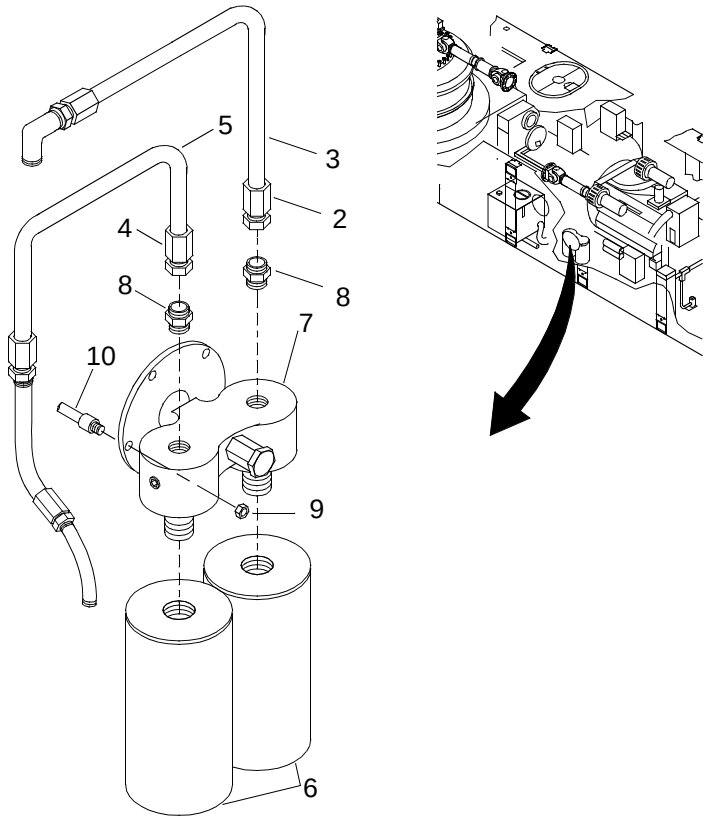
2. Place drain pan under oil filter assembly.

WARNING


CHEMICAL

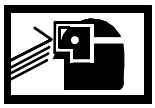

EYE PROTECTION

3. Loosen hose fitting (2) on oil filter inlet hose (3) and drain oil into drain pan.



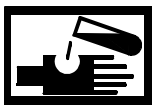
WARNING

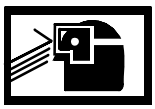

CHEMICAL


EYE PROTECTION

4. Loosen hose fitting (4) on oil filter outlet hose (5) and drain oil into drain pan.
5. Remove two elements (6) from adaptor (7).
6. Remove two male connectors (8) from adaptor (7).
7. Remove four hex nuts (9) from four studs (10).
8. Slide adaptor (7) off four studs (10).
9. Discard adaptor (7).

WARNING



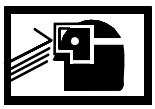


10. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL DRIVE TRAIN ENGINE OIL FILTER ADAPTOR

WARNING

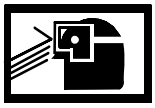




1. Apply sealing compound to threads on four studs (10).
2. Position new adaptor (7) over four studs (10).
3. Install four hex nuts (9) on four studs (10).
4. Tighten four hex nuts (9).

WARNING

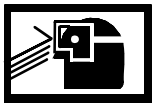




5. Apply sealing compound to threads on bottom of two male connectors (8).
6. Install two male connectors (8) into adaptor (7).

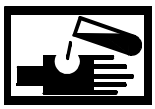
WARNING

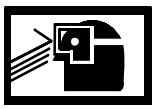




7. Apply sealing compound to threads on bottom of adaptor (7).
8. Install two elements (6) on adaptor (7).

WARNING





9. Apply sealing compound to threads on top of male connector (8) going into hose fitting (4).
10. Position oil filter outlet hose (5) and hose fitting (4) on male connector (8).
11. Tighten hose fitting (4) around male connector (8).

WARNING

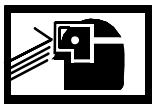




12. Apply sealing compound to threads on top of male connector (8) going into hose fitting (2).
13. Position oil filter inlet hose (3) and hose fitting (2) on male connector (8).
14. Tighten hose fitting (2) around male connector (8).
15. Service engine crankcase oil. (TM 55-1945-205-24-1-2)
16. Start engine and check for leaks. (TM 55-1945-205-10-1)
17. Shut down engine. (TM 55-1945-205-10-1)

WARNING







18. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN ENGINE HEATER HOSE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Hose
(07096)
PN 80-075
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

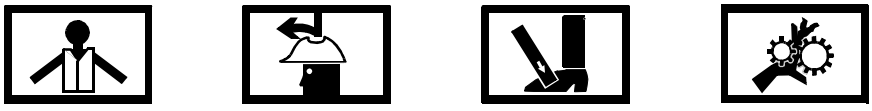
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

Equipment Condition

Cooling System Cool To Touch.
Powered Section Operators Cab Side Access Panel Removed. (WP 0237 00)
Powered Section Operators Cab Side Side Access Panel Removed. (WP 0097 00)

REMOVE DRIVE TRAIN ENGINE HEATER HOSE

WARNING

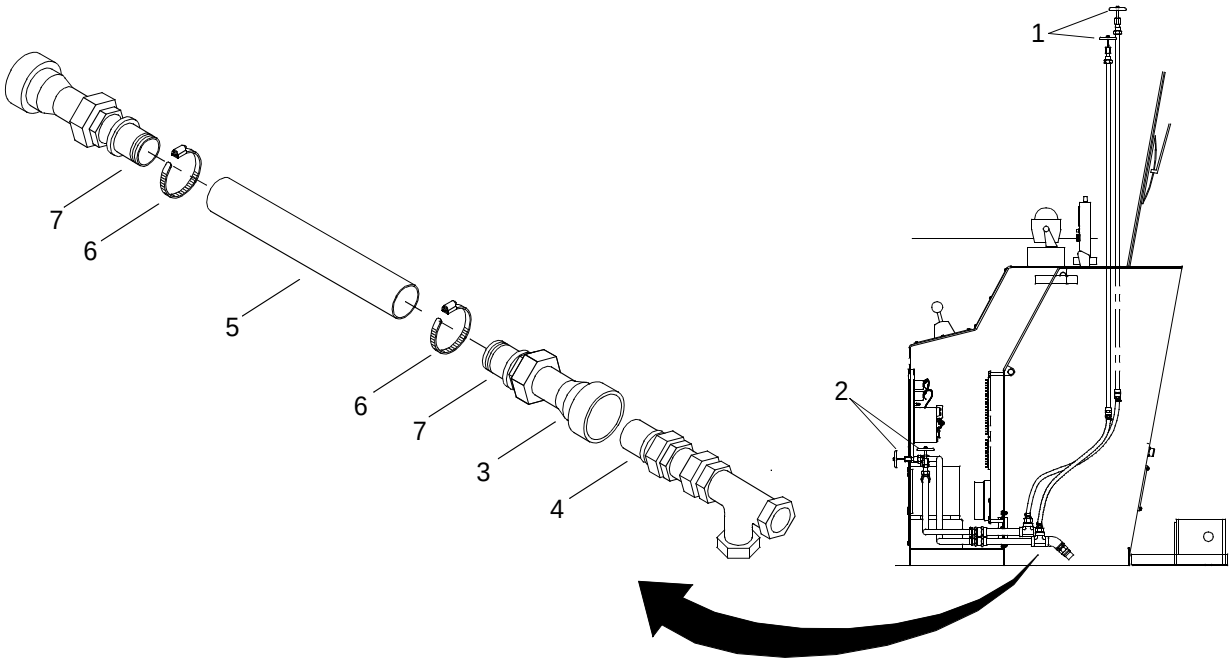


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

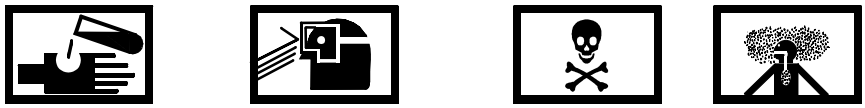
This task is typical for the replacement of operators cab engine heating hoses.

1. Close the inlet/outlet defrost needle valves (1).



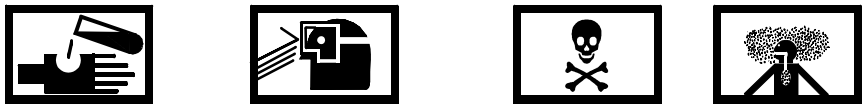
2. Close the inlet/outlet heater needle valves (2).
3. Place a drain pan under female (3) and male (4) quick disconnects.

WARNING



4. Disconnect female (3) and male (4) quick disconnects below cab.
5. Allow heater hose (5) to drain into drain pan.
6. Loosen two hose clamps (6) and slide over two nipples (7).
7. Remove heater hose (5) from two nipples (7) and discard.

WARNING



8. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL DRIVE TRAIN ENGINE HEATER HOSE

WARNING



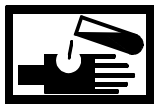
CHEMICAL



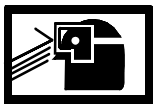
EYE PROTECTION

1. Apply sealing compound to threads on two nipples (7).
2. Install new heater hose (5) on two nipples (7).
3. Slide two hose clamps (6) on heater hose (5).
4. Tighten two hose clamps (6) around heater hose (5).
5. Connect male (4) and female (3) quick disconnects below cab.
6. Open the inlet/outlet heater needle valves (2).
7. Open the inlet/outlet defrost needle valves (1).
8. Service heat exchanger. (TM 55-1945-205-24-1-2)
9. Perform operational check of engine cooling system. (TM 55-1945-205-10-1)

WARNING



CHEMICAL



EYE PROTECTION



POISON



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
11. Powered section operators cab access panel. (WP 0237 00)
12. Install powered section operators cab side access panel. (WP 0097 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
DRIVE TRAIN HEATER HOSE FEMALE QUICK DISCONNECT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Disconnect, Quick-Female
(01276)
PN FD-45-1003-12-12
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

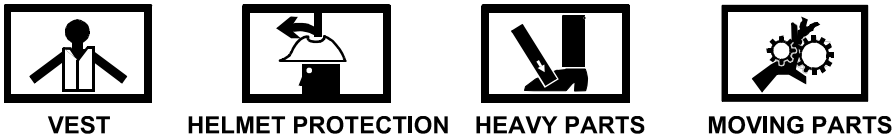
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

Equipment Condition

Cooling System Cool To Touch.
Powered Section Operators Cab Side Access Panel Removed. (WP 0097 00)

REMOVE DRIVE TRAIN HEATER HOSE FEMALE QUICK DISCONNECT

WARNING

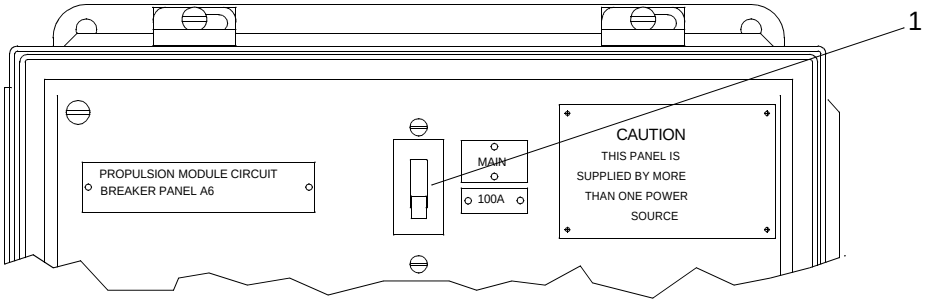


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

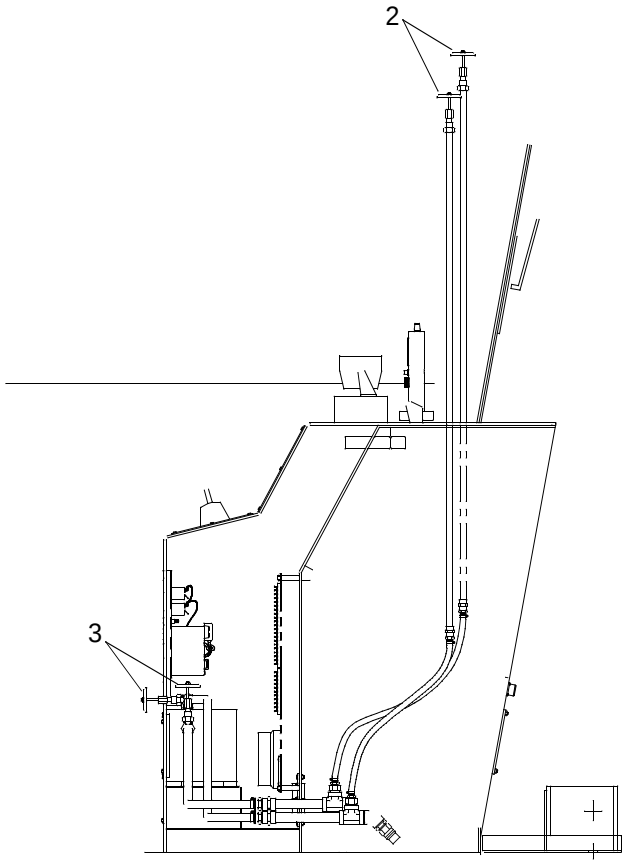
NOTE

This task is typical for the replacement of operators cab heating hose female quick disconnects.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

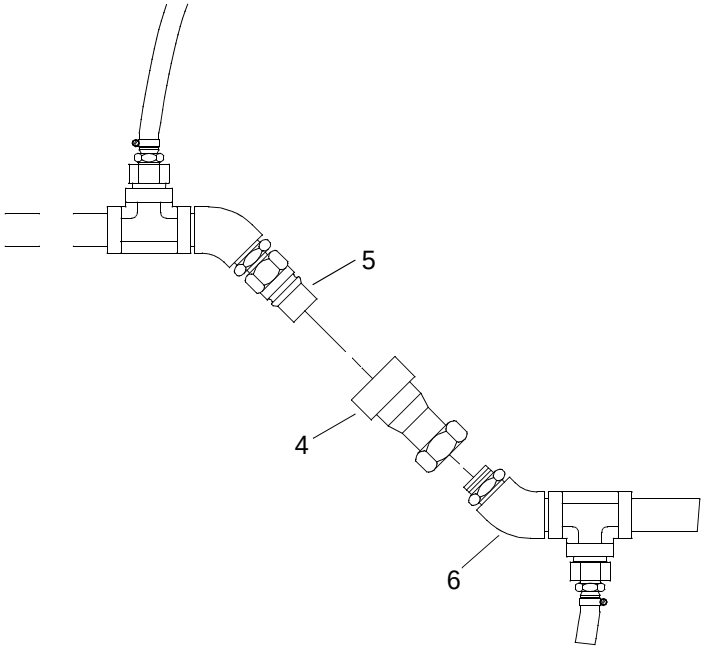


2. Close the inlet/outlet defrost needle valves (2).



3. Close the inlet/outlet heater needle valves (3).

4. Place a drain pan under female (4) and male (5) quick disconnect water hoses.



WARNING



5. Disconnect female (4) and male (5) quick disconnect water hoses below cab.

6. Remove female quick disconnect (4) from elbow (6).

7. Discard female quick disconnect (4).

WARNING

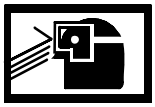


8. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL DRIVE TRAIN HEATER HOSE FEMALE QUICK DISCONNECT

WARNING

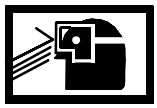

CHEMICAL


EYE PROTECTION

1. Apply sealing compound to threads on female quick disconnect (4).

WARNING


CHEMICAL


EYE PROTECTION

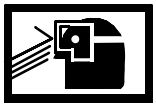

POISON


VAPOR

2. Install new female quick disconnect (4) on elbow (6).
3. Tighten female quick disconnect (4).
4. Connect male (5) and female (4) quick disconnect water hoses below cab.
5. Open the inlet/outlet heater needle valves (3).
6. Open the inlet/outlet defrost needle valves (2).
7. Service heat exchanger. (TM 55-1945-205-24-1-2)
8. Perform operational check of engine cooling system. (TM 55-1945-205-10-1)

WARNING


CHEMICAL


EYE PROTECTION


POISON


VAPOR


SLICK FLOOR

9. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
10. Install powered section operators cab side access panel. (WP 0097 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUMP-JET BRAKING VALVE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Braking Valve Unit
(0XS19)
PN 1101910
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

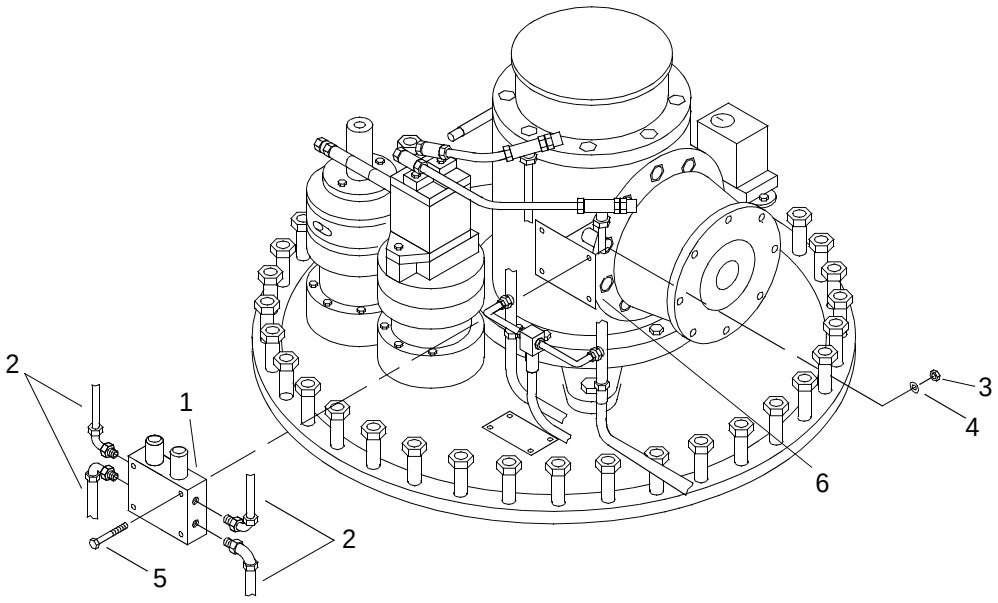
TM 55-1945-205-10-1

Equipment Condition

Hydraulic System Pressure Vented. (WP 0136 00)

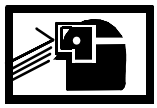
REMOVE PUMP-JET BRAKING VALVE

1. Position drain pan under braking valve unit (1).



2. Remove four hydraulic lines (2) from sides of braking valve unit (1).

WARNING



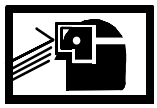
EYE PROTECTION



VAPOR

3. Drain hydraulic fluid from the braking valve unit (1) into drain pan.
4. Remove four hex nuts (3), plain washers (4) and hex bolts (5) securing braking valve unit (1) to the braking valve unit console (6).
5. Remove braking valve unit (1) and discard.

WARNING



EYE PROTECTION



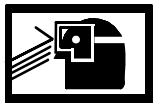
VAPOR

6. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL PUMP-JET BRAKING VALVE

1. Position new braking valve unit (1) on braking valve unit console (6).
2. Install four hex bolts (5) through braking valve unit (1) and braking valve unit console (6).
3. Install plain washers (4) and hex nuts (3) securing braking valve unit (1) to braking valve unit console (6).
4. Tighten hex nuts (3).
5. Install hydraulic lines (2) on braking valve unit (1).
6. Tighten all hydraulic line fittings.

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
8. Service hydraulic system reservoir. (WP 0143 00)
9. Perform operational check of pump-jet. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUMP-JET GEARCASE
SERVICING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Wrench, Torque (150-750 in. lbs) (Item 50, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Pump, Oil Suction (Item 29, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts

Preformed Packing
(0XS19)
PN 1020506
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)
Lubricating Oil, Gear (Item 14, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

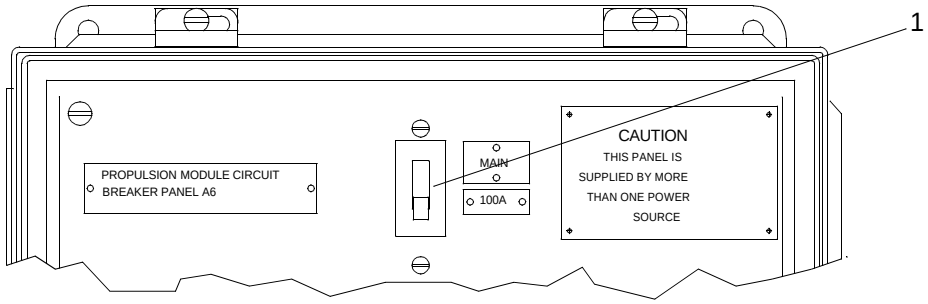
Powered Section Engine Hatch Removed. (WP 0099 00)

SERVICE PUMP-JET GEARCASE

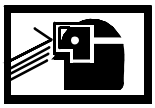
NOTE

The following procedure is typical for port and starboard pump-jets.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

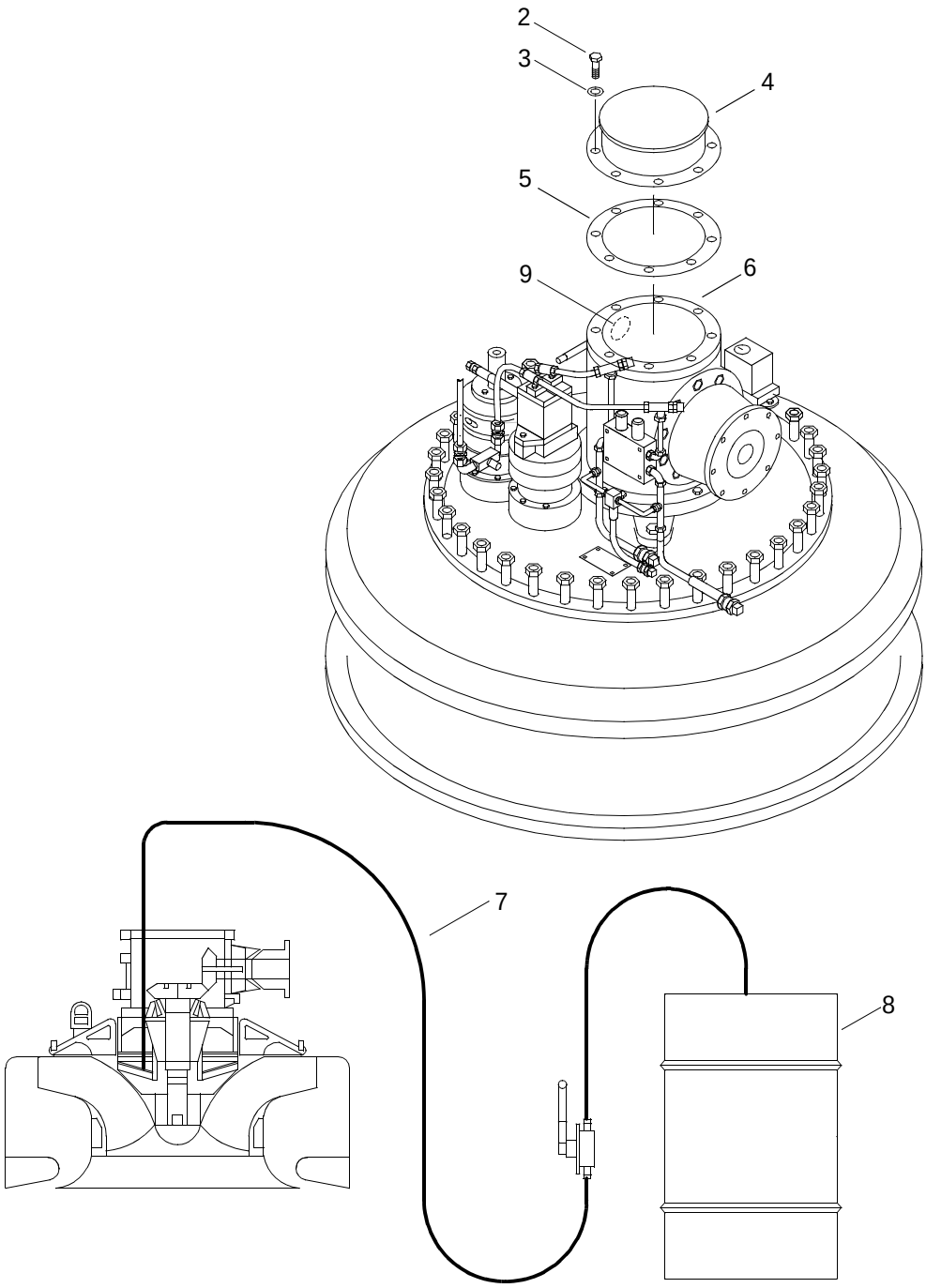


WARNING



EYE PROTECTION

2. Remove twelve cap screws (2), washers (3), cover (4) and preformed packing (5) from top of pump-jet (6). Discard preformed packing (5).



3. Insert tube of oil suction device (7) through opening in the top of the pump-jet (6) as deep as possible.

WARNING



CHEMICAL EYE PROTECTION

4. Pump old oil into container (8).

5. Remove suction device (7).

WARNING



CHEMICAL EYE PROTECTION

6. Remove container and dispose of contents in accordance with local procedures.

WARNING



CHEMICAL EYE PROTECTION

7. Fill the pump-jet gearcase with approximately 20 gallons (76 liters) of clean lubricating oil.

8. Check the oil level through the oil level glass (9). Adjust level as required.

9. Position new preformed packing (5) on top of pump-jet opening (6).

10. Secure cover (4) with twelve cap screws (2) and washers (3).

11. Torque cap screws (2) using the cross-method to 305 in. lbs (34.5 N-m).

WARNING



CHEMICAL EYE PROTECTION SLICK FLOOR

12. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUMP-JET PRIMARY PLANETARY GEARBOX
SERVICING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Lubricating Oil, Gear (Item 14, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

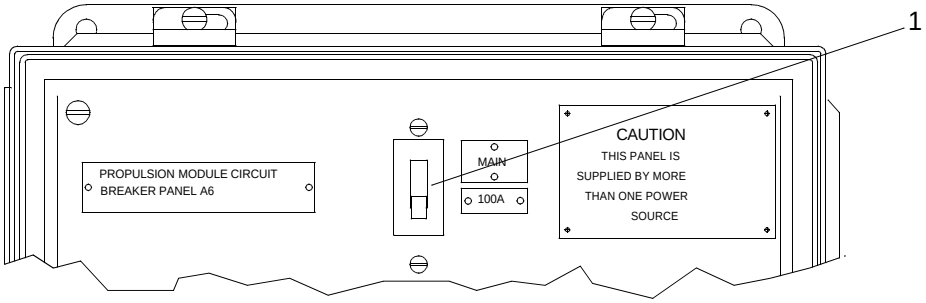
Engineer 88L

SERVICE PUMP-JET PRIMARY PLANETARY GEARBOX

NOTE

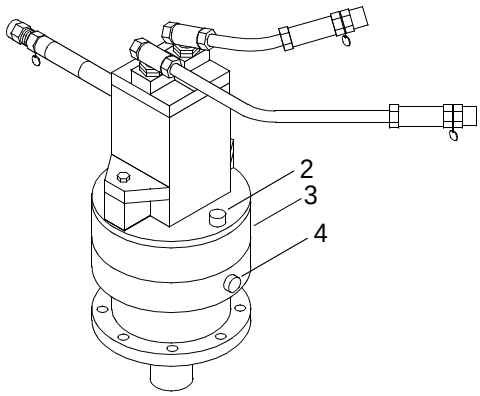
The following procedure is typical for port and starboard pump-jet primary planetary gearboxes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



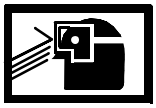
2. Place a drain pan under filler/breather plug (2).

3. Remove filler/breather plug (2) from the primary planetary gearbox (3).



WARNING


CHEMICAL

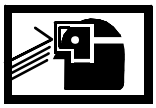

EYE PROTECTION

4. Remove drain plug (4) and drain oil into drain pan.

5. Inspect inside and outside of gearbox (3) for structural damage, corrosion or cracks.

WARNING

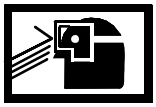

CHEMICAL


EYE PROTECTION

6. Install drain plug (4) on gearbox (3).

WARNING

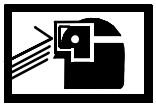

CHEMICAL


EYE PROTECTION

7. Remove drain pan and dispose of contents in accordance with local procedures.

WARNING


CHEMICAL


EYE PROTECTION

8. Fill gearbox (3) with clean lubricating oil through filler/breather (2) until oil level reaches the horizontal part of the elbow tube on the filler breather (2).

9. Install filler/breather plug (2).

WARNING



10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUMP-JET PRIMARY PLANETARY GEARBOX
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Brush, Stencil (Soft Bristle) (Item 3, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Planetary Gearbox, Primary
(0XS19)
PN 1106760
Packing, Preformed
(0XS19)
PN 1001400
Cleaner (Item 5, WP 0382 00)
Grease, General Purpose (Item 10, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

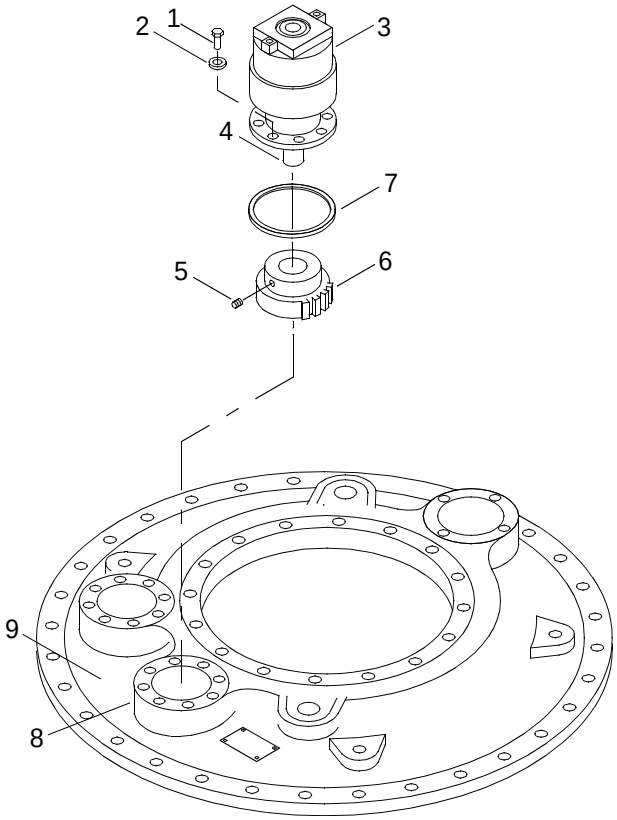
Hydraulic System Pressure Vented. (WP 0136 00)
Pump-Jet Gearcase Drained. (WP 0128 00)
Pump-Jet Hydro-Motor Removed. (WP 0133 00)

REMOVE PUMP-JET PRIMARY PLANETARY GEARBOX

NOTE

The following procedure is typical for the removal and installation of primary planetary gearboxes.

1. Remove eight socket head cap screws (1) and lock washers (2).



2. Position drain pan under all fittings when removing planetary gearbox (3).

WARNING

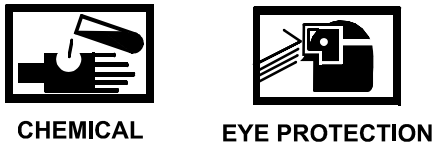


3. Lift the planetary gearbox (3) from the pump-jet (4).

4. Loosen set screw (5) and remove gear (6). Retain gear for reuse.

5. Remove preformed packing (7) and discard.

WARNING



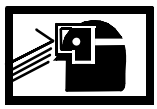
6. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL PUMP-JET PRIMARY PLANETARY GEARBOX

WARNING



CHEMICAL



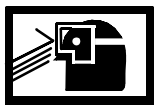
EYE PROTECTION

1. Clean gear (6) and mounting services with cleaner and brush.
2. Ensure all surfaces are free of dirt or rust preventatives.
3. Install gear (6) on gearbox mount opening (8) and secure with set screw (5).
4. Tighten set screw (5).

WARNING



CHEMICAL



EYE PROTECTION

5. Apply general purpose grease to preformed packing groove and install new preformed packing (7) on planetary gearbox mounting base (9).

WARNING



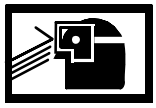
HEAVY OBJECTS

6. Position the new gearbox (3) on the pump-jet (4) to facilitate reconnection of all lines.
7. Install eight lock washers (2) and socket head cap screws (1) to secure planetary gearbox (3) to the pump-jet (4).
8. Tighten screws (1).

WARNING



CHEMICAL



EYE PROTECTION



SLICK FLOOR

9. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
10. Install pump-jet hydro-motor. (WP 0133 00)
11. Service pump-jet gearcase. (WP 0128 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUMP-JET AUXILIARY PLANETARY GEARBOX
SERVICING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Lubricating Oil, Gear (Item 14, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

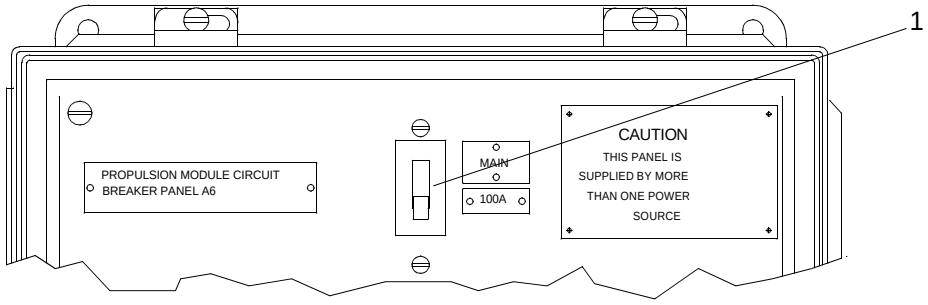
Engineer 88L

SERVICE PUMP-JET AUXILIARY GEARBOX

NOTE

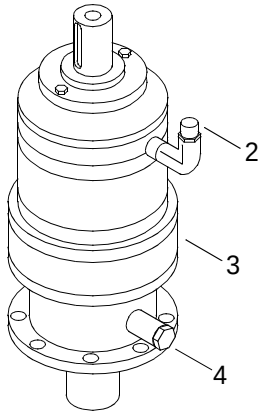
The following procedure is typical for port and starboard pump-jet auxiliary gearboxes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Place drain pan under filler/breather plug (2) on auxiliary planetary gearbox (3).

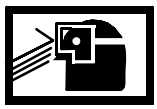
3. Remove filler/breather plug (2) from the auxiliary planetary gearbox (3).



WARNING



CHEMICAL

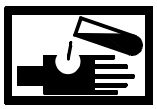


EYE PROTECTION

4. Remove drain plug (4) and drain oil into drain pan.

5. Inspect outside of gearbox (3) for structural damage, corrosion or cracks.

WARNING



CHEMICAL



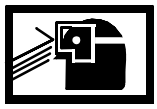
EYE PROTECTION

6. Install drain plug (4) in gearbox (3).

WARNING



CHEMICAL



EYE PROTECTION

7. Remove drain pan and dispose of contents in accordance with local procedures.

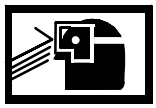
8. Fill gearbox (3) with clean lubricating oil through filler/breather (2) until oil level reaches the horizontal part of the elbow tube on the filler breather (2).

9. Install filler/breather plug (2).

WARNING



CHEMICAL



EYE PROTECTION



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUMP-JET AUXILIARY PLANETARY GEARING
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Brush, Stencil (Soft Bristle) (Item 3, WP 0383 00)

Materials/Parts

Planetary Gearbox, Auxiliary
(0XS19)
PN 1109428
Packing, Preformed
(0XS19)
PN 1001400
Cleaner (Item 5, WP 0382 00)
Grease, Automotive and Artillery (Item 8, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

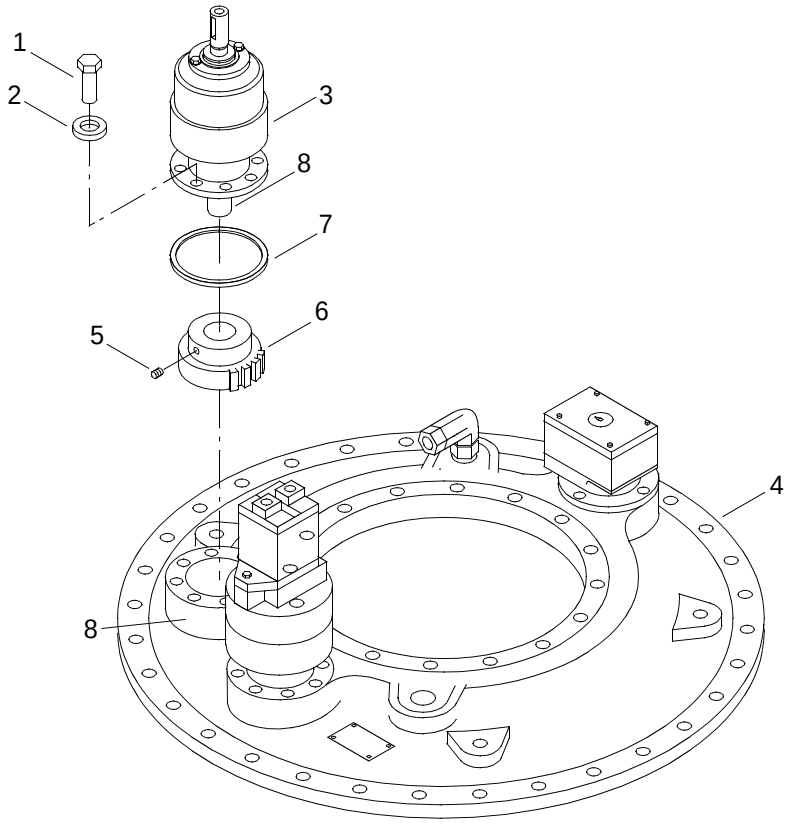
Pump-Jet Gearcase Drained. (WP 0128 00)

REMOVE PUMP-JET AUXILIARY PLANETARY GEARBOX

NOTE

The following procedure is typical for removal and installation of auxiliary gearboxes.

1. Remove eight cap screws (1) and lock washers (2).



2. Position drain pan under all fittings before removing gearbox (3).

WARNING



3. Lift the gearbox (3) from the pump-jet (4).

4. Loosen set screw (5) and remove gear (6).

5. Remove preformed packing (7) and discard.

WARNING



6. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL PUMP-JET AUXILIARY PLANETARY GEARBOX

WARNING



1. Clean gear (6) and mounting area with cleaner and brush.
2. Ensure all surfaces are free of dirt or rust.
3. Install gear (6) on gearbox shaft (8) and secure with set screw (5).
4. Tighten set screw (5).

WARNING



5. Apply grease to preformed packing groove and install new preformed gasket (7) on gearbox mounting base (8).

WARNING



6. Position new gearbox (5) on the pump-jet mounting base (8).
7. Install eight cap screws (1) and lock washers (2) to secure gearbox (3) to the pump-jet (4).
8. Tighten screws (1).

WARNING



9. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
10. Service pump-jet gearcase. (WP 0128 00)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUMP-JET HYDRO-MOTOR
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

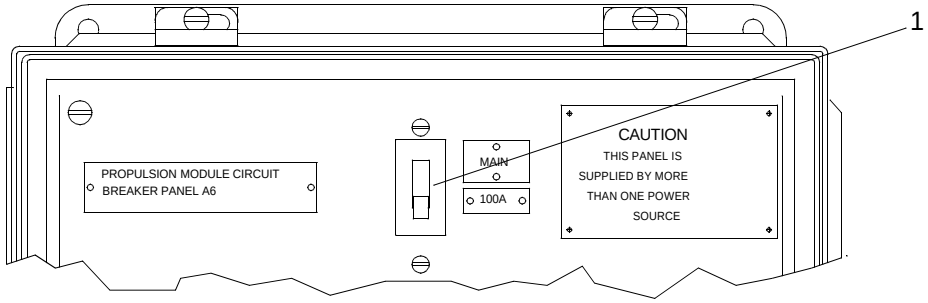
Powered Section Engine Hatch Removed. (WP 0099 00)

REMOVE PUMP-JET HYDRO-MOTOR

NOTE

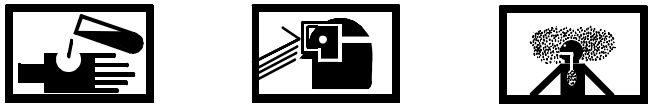
The following procedure is typical for the removal and installation of pump-jet hydro-motors.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

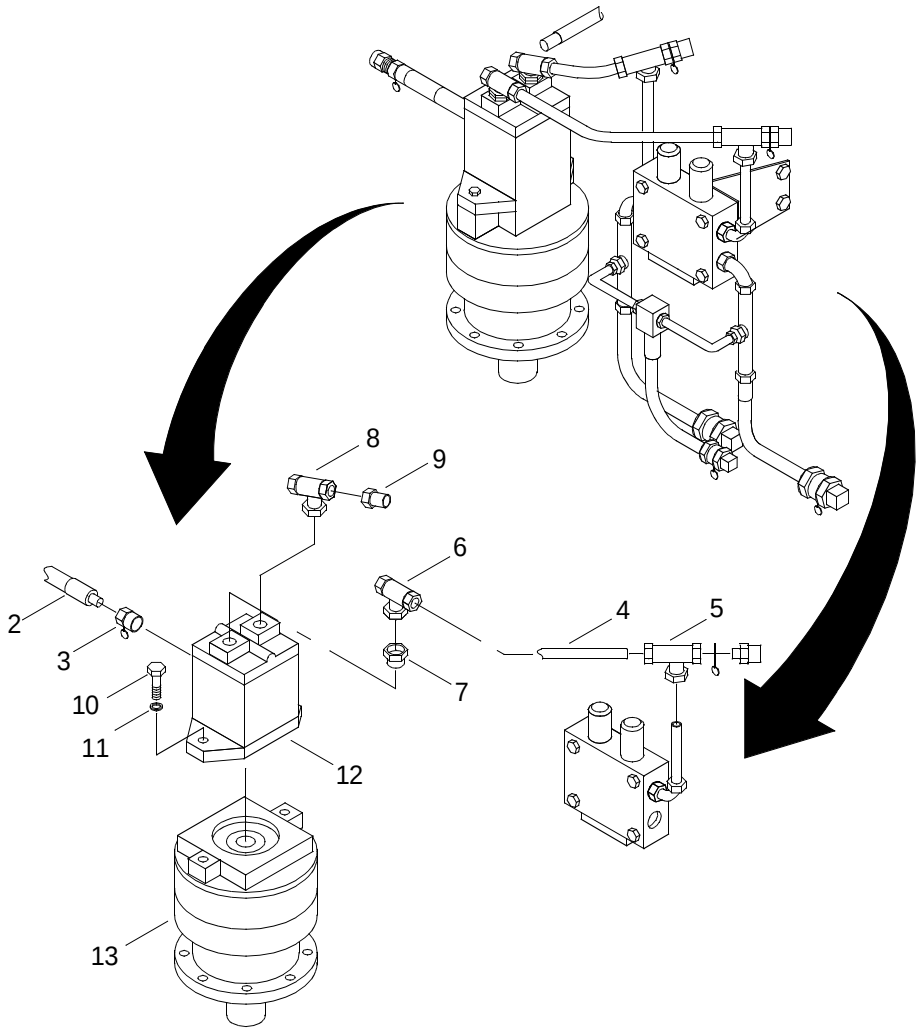


2. Position drain pan under all fittings before removing to hose (2).

WARNING

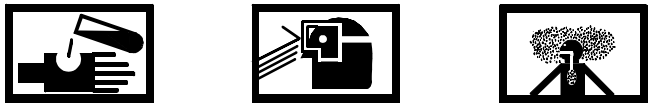


3. Disconnect hydraulic line maximum pressure hose (2) by unscrewing straight male stud fitting (3).



4. Disconnect hydraulic pipe (4) at equal tee (5) and adjustable tee fitting (6).
5. Remove adjustable tee fitting (6) from straight male stud fitting (7).
6. Remove adjustable tee fitting (8) from straight male stud fitting (9).
7. Remove two hex screws (10) and lock washers (11).
8. Remove hydro-motor (12) from planetary gearbox (13).

WARNING



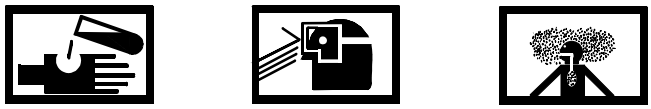
CHEMICAL EYE PROTECTION VAPOR

9. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL PUMP-JET HYDRO-MOTOR

1. Position hydro-motor (12) on planetary gearbox (13).
2. Secure hydro-motor (12) with two hex screws (10) and lock washers (11).
3. Tighten screws (10).

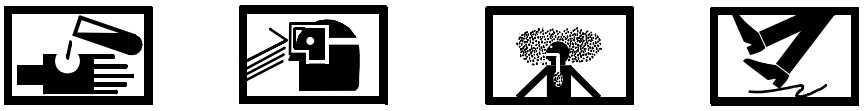
WARNING



CHEMICAL EYE PROTECTION VAPOR

4. Install straight male fitting (9) on adjustable tee fitting (8).
5. Install adjustable tee fitting (8).
6. Install hydraulic pipe (4) by connecting adjustable tee fitting (6) on straight male stud fitting (7).
7. Install hydraulic pipe (4) between equal tee (5) and adjustable tee fitting (6).
8. Connect hydraulic line maximum pressure hose (2) with straight male stud fitting (3).
9. Tighten all fittings.

WARNING



CHEMICAL EYE PROTECTION VAPOR SLICK FLOOR

10. Clean up any spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
11. Vent air from hydraulic system. (WP 0136 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUMP-JET EXPANSION TANK
CLEANING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Preformed Gasket
(34712)
PN E27141
Cloth, Cleaning (Item 6, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

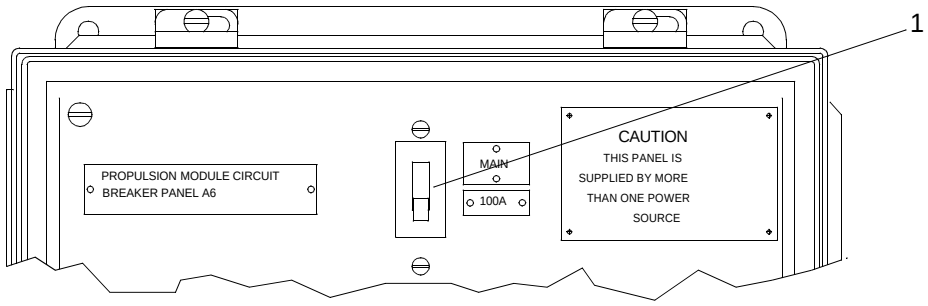
Engineer 88L

CLEAN PUMP-JET EXPANSION TANK

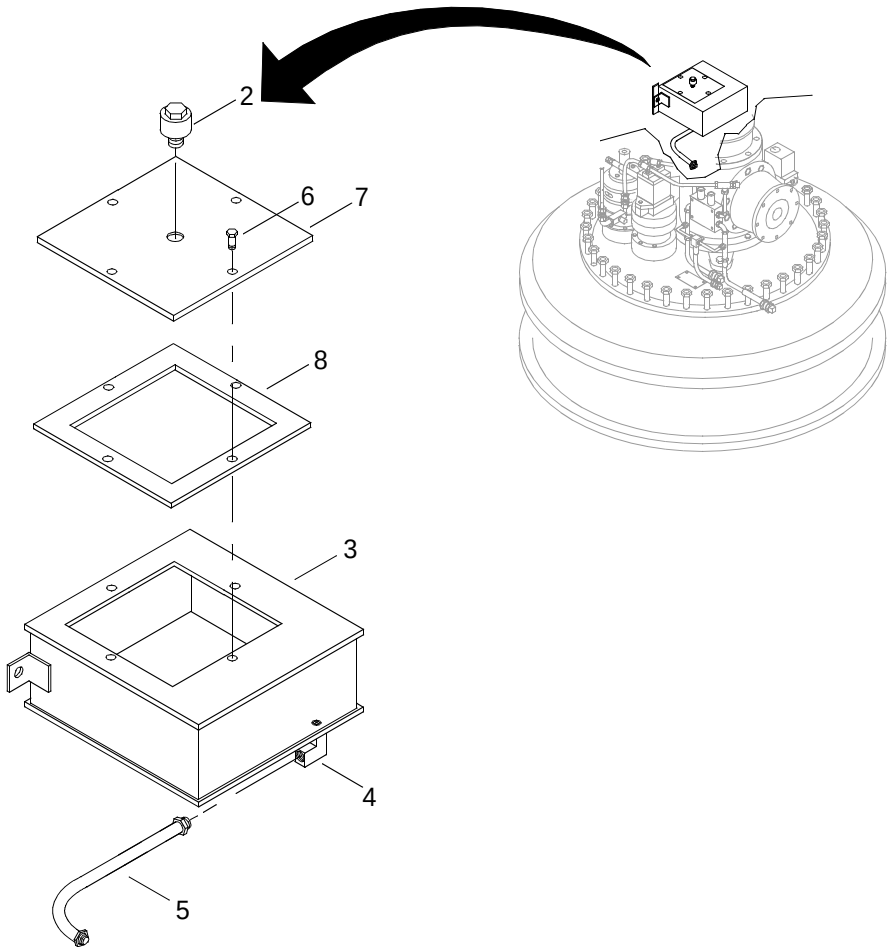
NOTE

The following procedure is typical for port and starboard pump-jet expansion tanks.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

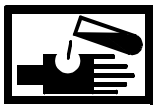


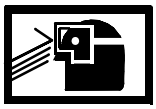
2. Remove air vent plug (2) from top of the pump-jet expansion tank (3).



3. Position drain pan beneath expansion tank elbow (4).

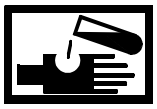
WARNING

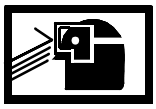

CHEMICAL


EYE PROTECTION

4. Remove hose (5) from elbow (4) under expansion tank (3) and drain oil into drain pan.

WARNING


CHEMICAL

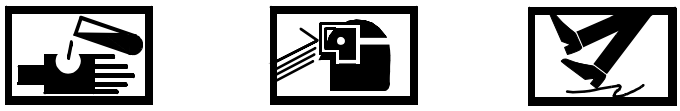

EYE PROTECTION

5. Remove drain pan and dispose of contents in accordance with local procedures.

6. Remove four hex head cap screws (6) securing cover (7) to top of expansion tank (3).

7. Remove cover (7) and preformed gasket (8).
8. Discard gasket (8).
9. Clean the interior of the expansion tank (3) with a lint free cloth.
10. Replace hose (5) on elbow (4).
11. Position new gasket (8) on top of expansion tank.
12. Position cover (7) on expansion tank (3).
13. Install four hex head cap screws (6).
14. Tighten four hex head cap screws (6).
15. Install the air vent plug (2).

WARNING



16. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUMP-JET EXPANSION TANK
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Expansion Tank Assembly
(34712)
PN E27113
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

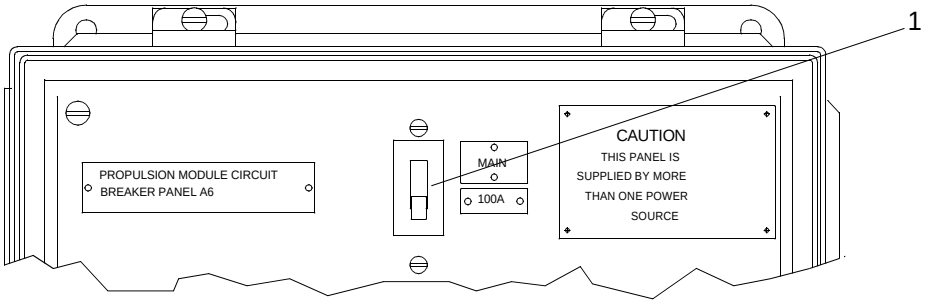
TM 55-1945-205-10-1

REMOVE THE PUMP-JET EXPANSION TANK

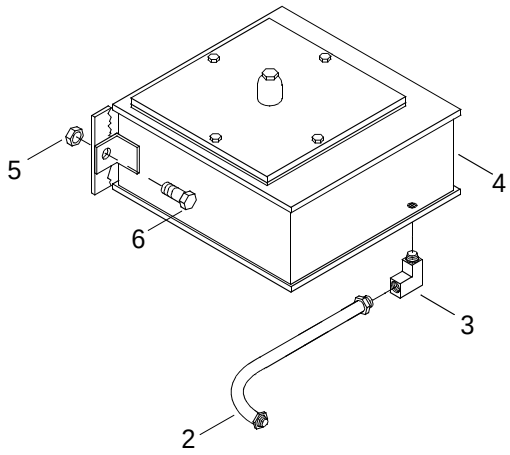
NOTE

The following procedure is typical for removal and installation of pump-jet expansion tanks.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Position drain pan beneath hydraulic hose (2).



WARNING



EYE PROTECTION **CHEMICAL**

3. Disconnect hydraulic hose (2) and elbow (3) from underside of tank (4).
4. Drain oil from hose (2) and tank (4) into drain pan.
5. Supporting tank (4), remove two hex nuts (5) and cap screws (6).
6. Remove expansion tank (4).

WARNING



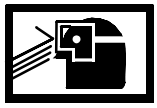
EYE PROTECTION **CHEMICAL**

7. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL THE PUMP-JET EXPANSION TANK

1. Position new expansion tank (4) on mounts and attach with two cap screws (6) and hex nuts (5).
2. Tighten nuts (5)
3. Install elbow (3) on underside of tank (4).
4. Tighten elbow (3).
5. Install hose (2) on elbow (3).
6. Tighten hose (2).

WARNING



EYE PROTECTION



CHEMICAL



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

8. Perform operational check of pump-jet. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM
VENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

VENT AIR FROM HYDRAULIC SYSTEM

NOTE

The following procedure is typical for venting air and pressure from both port and starboard hydraulic systems.

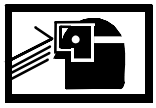
1. Start the engine. (TM 55-1945-205-10-1)

2. Place drain pan under the way-valve (1).

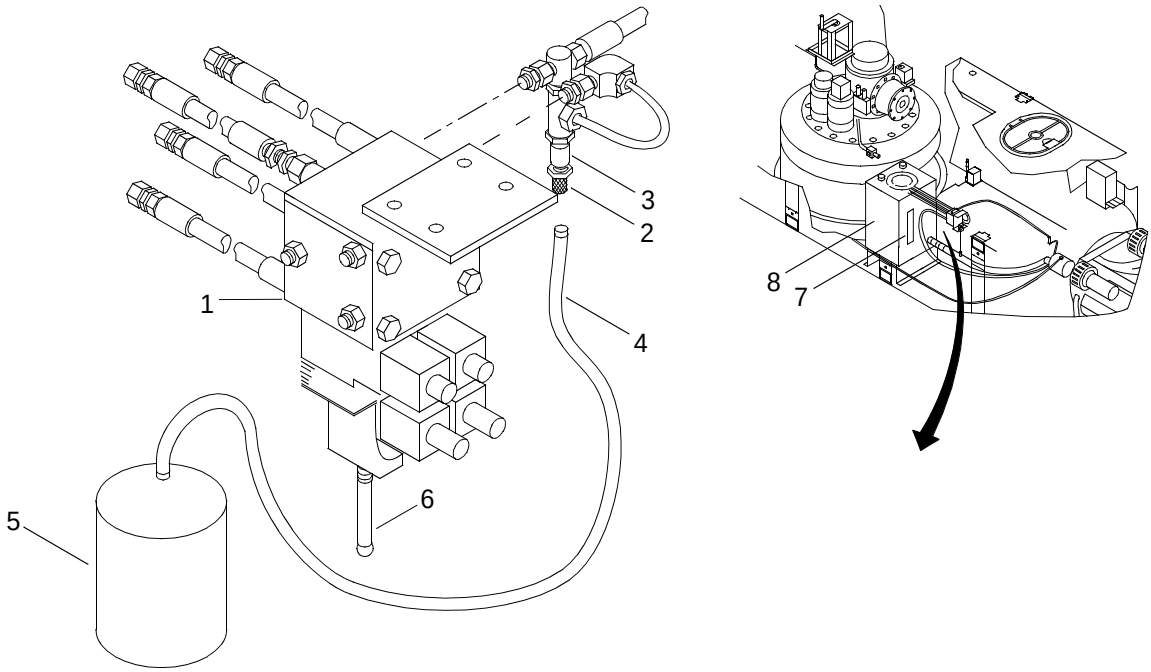
WARNING


EAR PROTECTION


VAPOR

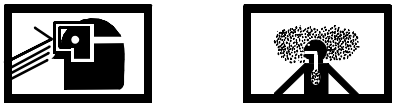

EYE PROTECTION

3. On the way-valve (1), remove the test port cap (2) from the test port (3).



4. Connect one end of a hose (4) to test port (3).
5. Place other end of test hose (4) in a drain pan (5).

WARNING



EYE PROTECTION **VAPOR**

6. Slowly loosen the test port's connection (3) to allow oil to drain.
7. Manually operate the way-valve handle (6) and monitor the oil flowing out of the hose.
8. When air bubbles are no longer visible in the oil, release the way-valve handle (6).
9. Tighten the test port connection (3).
10. Remove test hose (4).
11. Install the test port cap (2).
12. Remove drain pan and dispose of contents in accordance with local procedures.
13. Check oil level on the level gauge (7) on the reservoir (8).
14. Fill the hydraulic reservoir with oil as required. (WP 0143 00)
15. Shut the engine off. (TM 55-1945-205-10-1)

WARNING

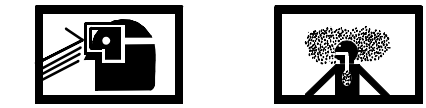


16. Clean up any spilled fluid with spill kit and dispose of spill kit waste in accordance with local procedures.

VENT PRESSURE FROM HYDRAULIC SYSTEM

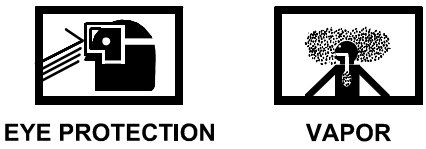
1. Place drain pan under the way-valve (1).
2. On the way-valve (1), remove the test port cap (2) from the test port (3).
3. Connect one end of a test hose (4) to test port (3).
4. Place other end of test hose (4) in a drain pan (5).

WARNING



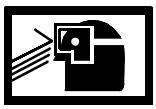
5. Slowly loosen the test port's connection (3) to allow oil to drain under pressure.
6. When the oil pressure is relieved, close the test port (3).
7. Remove test hose (4).
8. Install the test port cap (2).

WARNING



9. Remove drain pan and dispose of contents in accordance with local procedures.
10. Check oil level on the level gauge (7) on the reservoir (8).
11. Fill the hydraulic reservoir with oil as required. (WP 0143 00)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

12. Clean up any spilled fluid with spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM PRESSURE ADJUSTMENT

INITIAL SETUP:

Test Equipment
Gage, Pressure, Dial Indicating (Item 11, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Wrench, Torque (0-175 ft lb) (Item 47, WP 0383 00)

Materials/Parts
Packing, Preformed
(D1572)
PN BH00114774
Qty 2
Cloth, Cleaning (Item 6, WP 0382 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

Equipment Condition
Hydraulic System Pressure Vented. (WP 0136 00)

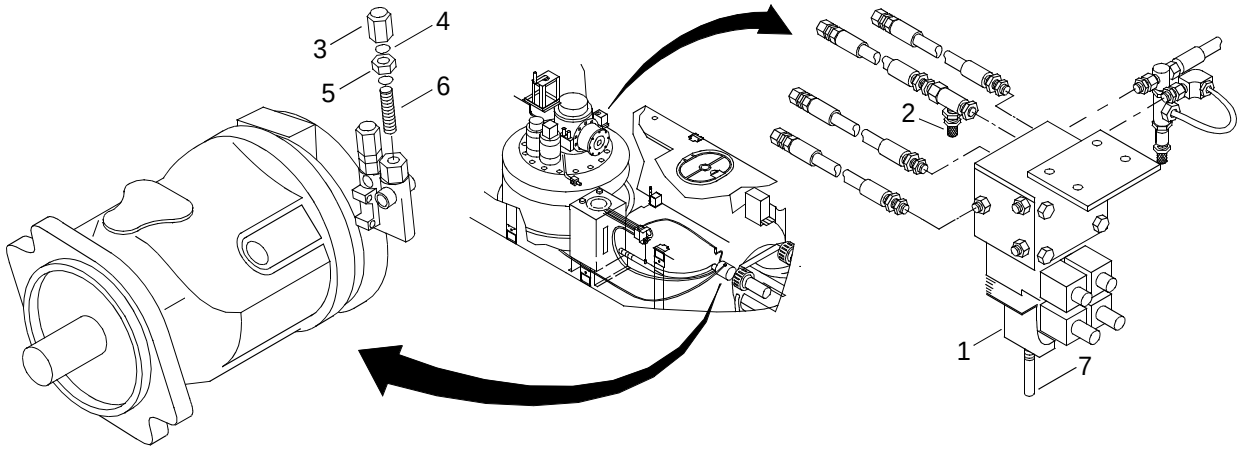
SET PRESSURE REGULATION

NOTE

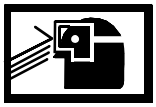
The following procedure is typical for adjusting pressure both port and starboard hydraulic systems.

Pressure gage assemblies are stowed in the operators cab.

1. Tag and disconnect wiring to solenoids on way-valve (1).



WARNING



EYE PROTECTION



VAPOR

2. Open test port (2) of way-valve (1) and connect pressure gage.
3. Start the engine. (TM 55-1945-205-10-1)
4. Remove acorn nut (3) and preformed packing (4). Discard packing (4).
5. Loosen hex nut (5).
6. Turn set screw (6) by turning with hex socket head wrench.
7. Set pressure to 3046 PSI (210 bar).
8. Fully open way- valve (1) by moving handle (7) as far aft as possible to obtain proper reading on pressure gage.

NOTE

One turn of set screw corresponds to 725 PSI (50 bar) within a pressure range of 290-3625 PSI (20-250 bar).

9. Increase pressure by turning set screw (6) clockwise and decrease pressure by turning set screw (6) counterclockwise.
10. Holding set screw (6) in position with socket head wrench, secure set screw (6) in position using hex nut (5).
11. Install new preformed packing (4) and acorn nut (3).
12. Tighten nut to a torque value of 15.4 ft lb.
13. Stop the engine. (TM 55-1945-205-10-1)
14. Remove the pressure gage and close the test port (2).
15. Connect wiring to solenoids on way-valve (1).
16. Remove tags on wiring.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM FLOW ADJUSTMENT

INITIAL SETUP:

Test Equipment
Gage, Pressure, Dial Indicating (Item 11, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Wrench, Torque (0-175 ft lb) (Item 47, WP 0383 00)

Materials/Parts
Ring
(D1572)
PN BH00114774
Cloth, Cleaning (Item 6, WP 0382 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

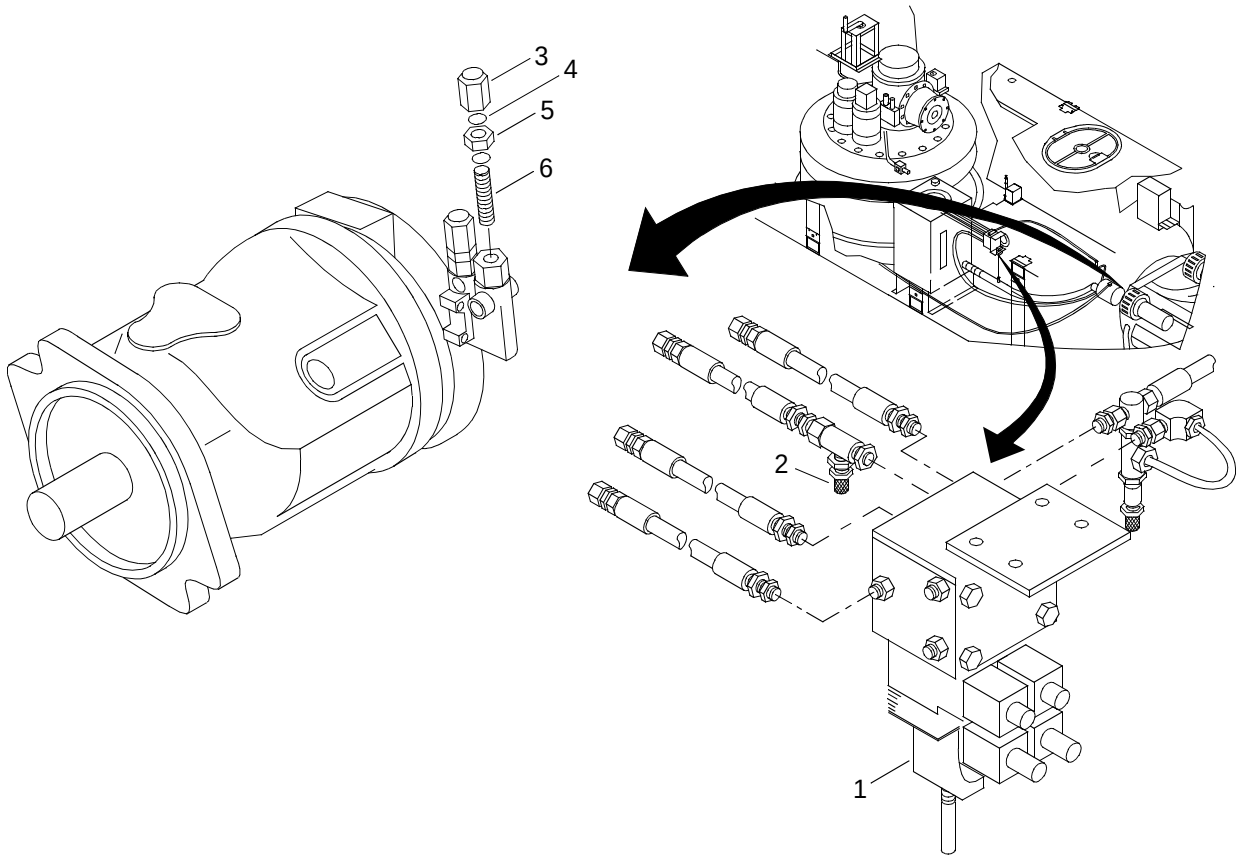
SET FLOW REGULATION

NOTE

The following procedure is typical for adjusting flow both port and starboard hydraulic systems.

Pressure gage assemblies are stowed in the operators cab.

1. Open test port (2) of way valve (1) and connect pressure gage.



2. Start the engine. (TM 55-1945-205-10-1)

3. Ensure hydraulic pressure reading on pressure gage is 275 PSI (19 bar). If necessary, adjust the flow rate as follows:

    a. Remove acorn nut (3) and ring (4). Discard ring (4).

    b. Loosen hex nut (5).

    c. Set flow range by turning flow set screw (6) with socket wrench. Proper reading should be 19 bar (275 PSI). Increase flow by turning screw clockwise. Decrease flow by turning screw counterclockwise.

    d. Holding set screw (6) in position with socket head wrench, secure set screw (6) in position using hex nut (5).

    e. Install new ring (4) and acorn nut (3).

    f. Tighten nut to a torque value of 15.4 ft lb.

4. Stop the engine. (TM 55-1945-205-10-1)

5. Remove the pressure gage and close the test port (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC STEERING SYSTEM
ADJUSTMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

Equipment Condition
Propulsion Module Dry-Docked.
Hydraulic System Pressure Vented. (WP 0136 00)
Hydraulic System Pressure Adjusted. (WP 0137 00)
Hydraulic System Flow Adjusted. (WP 0138 00)

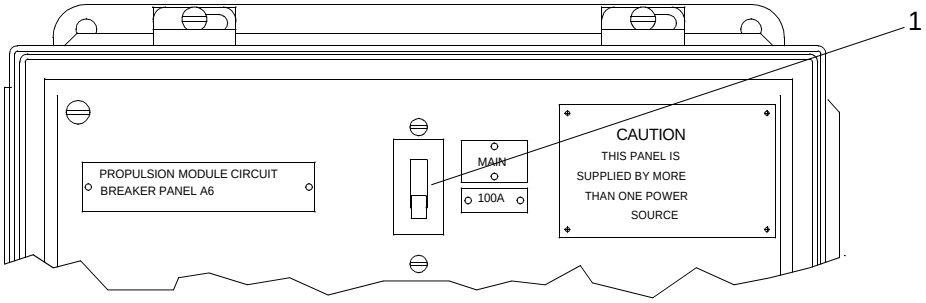
ADJUST HYDRAULIC STEERING SYSTEM

NOTE

The propulsion module should be elevated and placed on blocks to allow visual inspection of the pump-jet position from beneath.

The following procedure is typical for adjusting the steering in both propulsion modules.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to on.

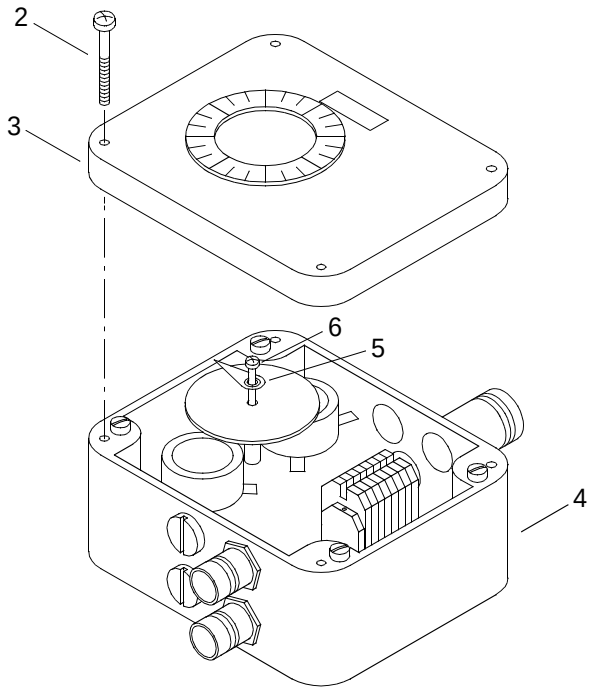


2. Position the pump-jet to the amidships position, as indicated on the thrust direction indicator on the middle control panel A1.

3. Check the pump-jet discharge ports beneath the propulsion module to verify amidships position.

4. Check the pump-jet feedback unit dial indicator for amidships position. If the dial is off center, proceed as follows.

a. Remove four cap screws (2) securing housing cover (3) to the feedback unit (4).



b. Remove the housing cover (3) to gain access to the dial indicator (5).

c. Loosen slotted cheese head screw (6) and move indicator (5) into proper alignment.

d. Tighten cheese head screw (6).

e. Position housing cover (3) on the feedback unit (4) and secure in place with four cap screws (2).

f. Tighten cap screws (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR FLUID LEVEL SENSOR SUBASSEMBLY
REMOVAL, TESTING AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Personnel Required

Engineer 88L

References

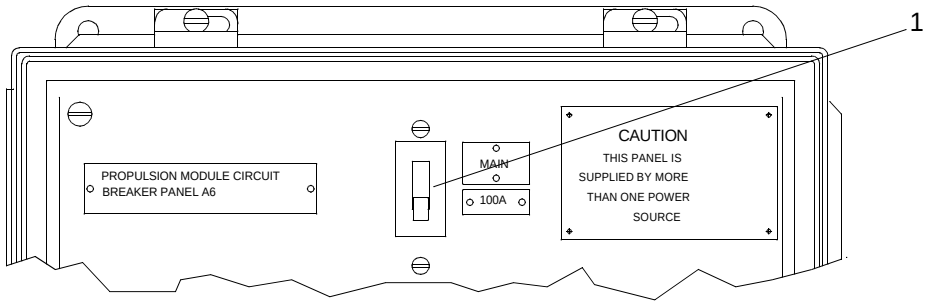
TM 55-1945-205-10-1

REMOVE HYDRAULIC SYSTEM RESERVOIR FLUID LEVEL SENSOR SUBASSEMBLY

NOTE

The following procedure is typical for the removal, testing and installation of sensor subassemblies.

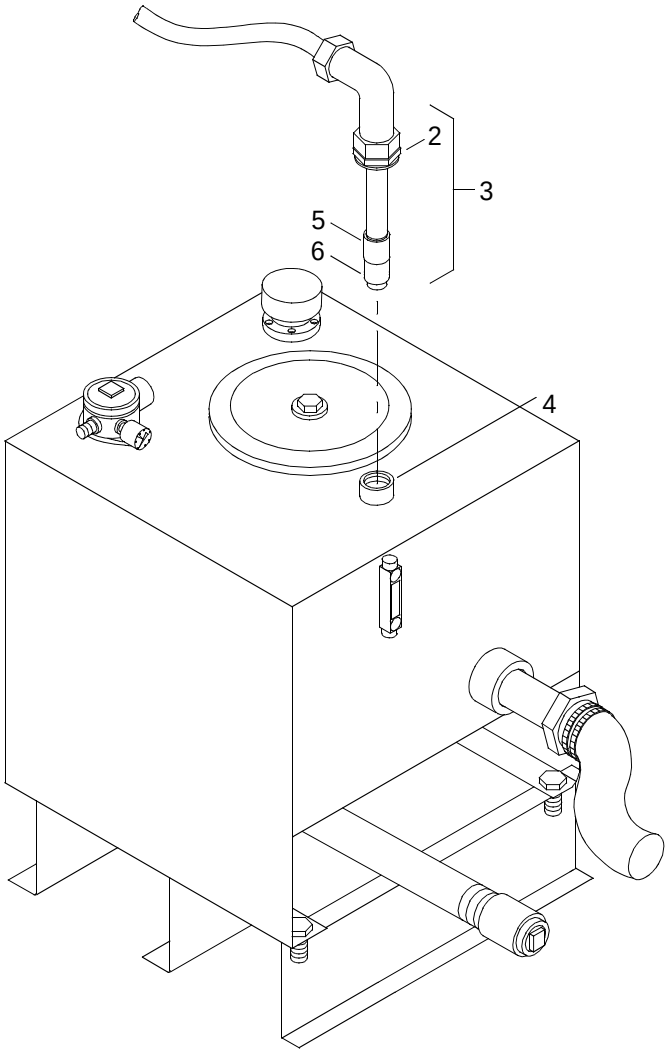
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



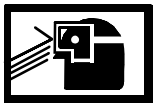
CAUTION

During sensor removal, precaution shall be taken to prevent damage to electrical connection.

2. Turn adaptor (2) of the fluid level sensor subassembly (3) counterclockwise on top of hydraulic reservoir (4).



WARNING



EYE PROTECTION



VAPOR

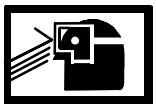
3. Carefully remove the fluid level sensor subassembly (3) from the hydraulic reservoir (4).

TEST HYDRAULIC SYSTEM RESERVOIR FLUID LEVEL SENSOR SUBASSEMBLY

1. Position MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to on.
2. Move sensor float (5) to the lower limit of travel.
3. On the lower control panel A2 in the operators cab, check that HPU OIL LEVEL LOW red indicator light on.
4. If no indicator light on, replace fluid level sensor (6).
5. Move sensor float (5) to its upper limit of travel.
6. On the lower control panel A2 in the operators cab, check that HPU OIL LEVEL LOW red indicator light off.
7. If indicator light on, replace fluid level sensor (6).
8. Position MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to off.

INSTALL HYDRAULIC SYSTEM RESERVOIR FLUID LEVEL SENSOR SUBASSEMBLY

WARNING



EYE PROTECTION



VAPOR

1. Install fluid level sensor subassembly (3) into the top of the reservoir (4).
2. Turn adaptor (2) clockwise and tighten.
3. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR TANK STRAINER
REMOVAL, CLEANING AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Brush, Stencil (Soft Bristle) (Item 3, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Cloth, Cleaning (Item 6, WP 0382 00)
Lubricating Oil, General Purpose (Item 15, WP 0382 00)
Antiseize Compound (Item 3, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

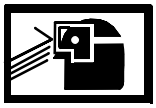
TM 55-1945-205-10-1

Equipment Condition

Hydraulic System Reservoir Drained. (WP 0142 00)

REMOVE HYDRAULIC SYSTEM RESERVOIR TANK STRAINER

WARNING



EYE PROTECTION

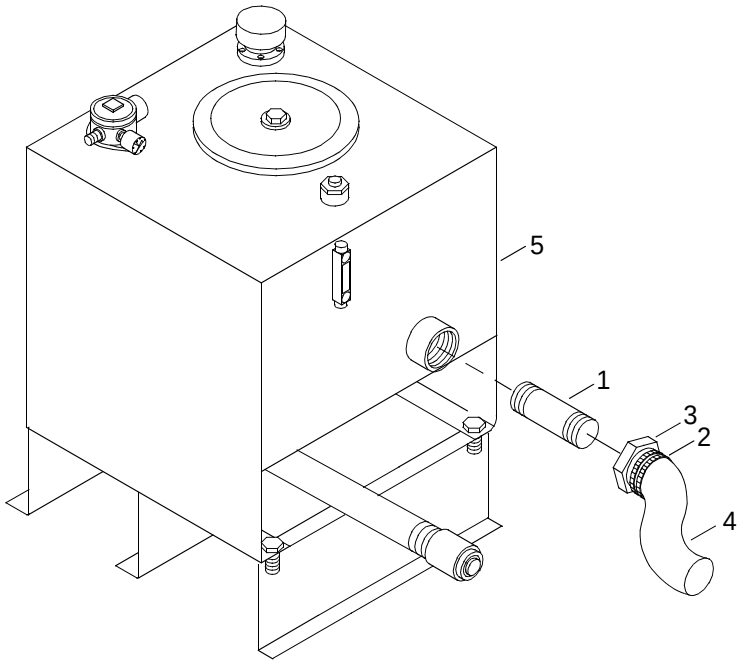


VAPOR

NOTE

The following procedure is typical for both port and starboard hydraulic reservoirs.

1. Position a drain pan beneath the strainer (1).



2. Remove two hose clamps (2) from the strainer coupling (3).
3. Remove hose (4) from strainer coupling (3).
4. Remove the strainer coupling (3) from the strainer (1).
5. Remove the strainer (1) from the reservoir (5) by turning counterclockwise.

WARNING



EYE PROTECTION **VAPOR**

6. Remove drain pan and dispose of contents in accordance with local procedures.

CLEAN HYDRAULIC SYSTEM RESERVOIR TANK STRAINER

1. Using lint free cloth and brush, clean strainer (1) of all accumulations of dirt and debris.

WARNING

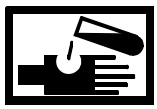


EYE PROTECTION **VAPOR**

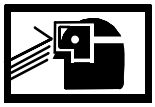
2. Rinse strainer (1) in clean oil.

INSTALL HYDRAULIC SYSTEM RESERVOIR TANK STRAINER

WARNING



CHEMICAL



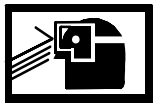
EYE PROTECTION



VAPOR

1. Apply antiseize compound to the threads of the strainer (1).
2. Install strainer (1) into side of reservoir (5).
3. Tighten strainer (1).
4. Install strainer coupling (3) on the strainer (1).
5. Tighten strainer coupling (3).
6. Place hose (4) over the strainer coupling (3).
7. Tighten the hose clamps (2)
8. Service hydraulic system reservoir (5). (WP 0143 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR
DRAINING AND CLEANING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Brush, Stencil (Soft Bristle) (Item 3, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Cloth, Cleaning (Item 6, WP 0382 00)
Lubricating Oil, General Purpose (Item 15, WP 0382 00)
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

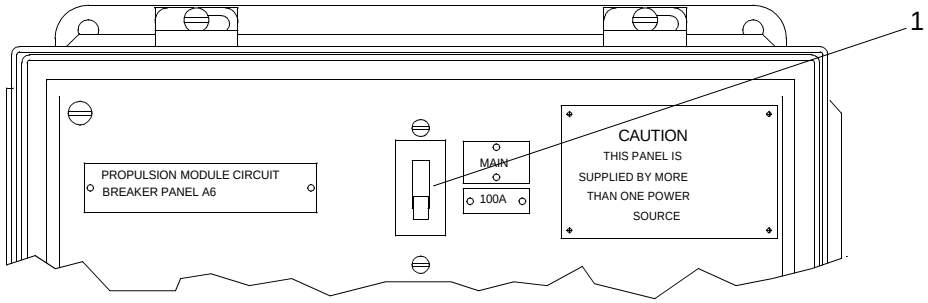
TM 55-1945-205-10-1

DRAIN HYDRAULIC SYSTEM RESERVOIR

NOTE

The following procedure is typical for servicing both port and starboard hydraulic reservoirs.

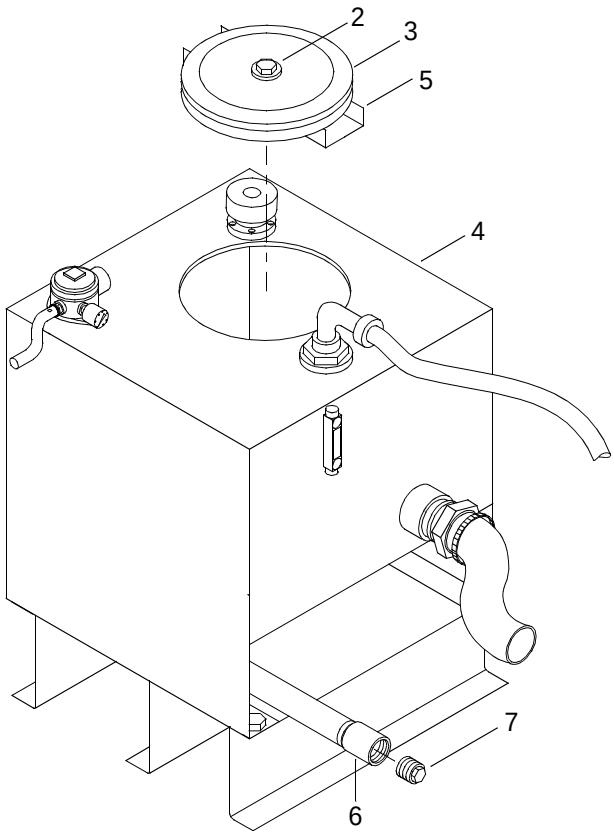
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



NOTE

Do not loosen too much or the inspection cover bar will fall into reservoir.

2. Loosen hex head cap screw (2) securing the inspection cover (3) to reservoir (4).



3. Slide inspection cover (3) to one side of reservoir opening until bar (5) is freed from the edge.
4. Remove inspection cover (3).
5. Position drain pan beneath drain pipe (6).
6. Remove drain plug (7) from end of drain pipe (6).

WARNING



EYE PROTECTION **VAPOR**

7. Drain oil out of the reservoir (4) into drain pan.

WARNING



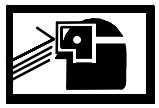
EYE PROTECTION **VAPOR**

8. Remove drain pan and dispose of contents in accordance with local procedures.

CLEAN HYDRAULIC SYSTEM RESERVOIR

1. Using lint free cloth and a soft bristle brush, clean hydraulic reservoir (4) interior to loosen sludge.

WARNING



EYE PROTECTION



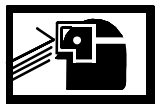
VAPOR

2. Rinse the reservoir (4) with clean oil.

3. Clean the underside of the inspection cover (3) using lint free cloth.

FILL HYDRAULIC SYSTEM RESERVOIR

WARNING



EYE PROTECTION



VAPOR

1. Apply sealing compound to drain plug (7).

2. Install drain plug (7) in drain pipe 6).

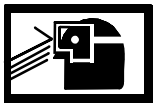
3. Service hydraulic system reservoir. (WP 0143 00)

4. Position the inspection cover (3) in top of the reservoir (4).

5. Tighten cap screw (2).

6. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR
SERVICING

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts
Lubricating Oil, General Purpose (Item 15, WP 0382 00)

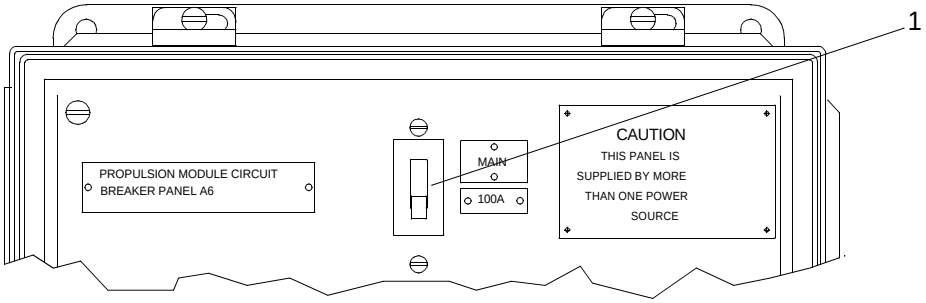
Personnel Required
Engineer 88L

SERVICE HYDRAULIC SYSTEM RESERVOIR

NOTE

The following procedure is typical for servicing both port and starboard hydraulic reservoirs.

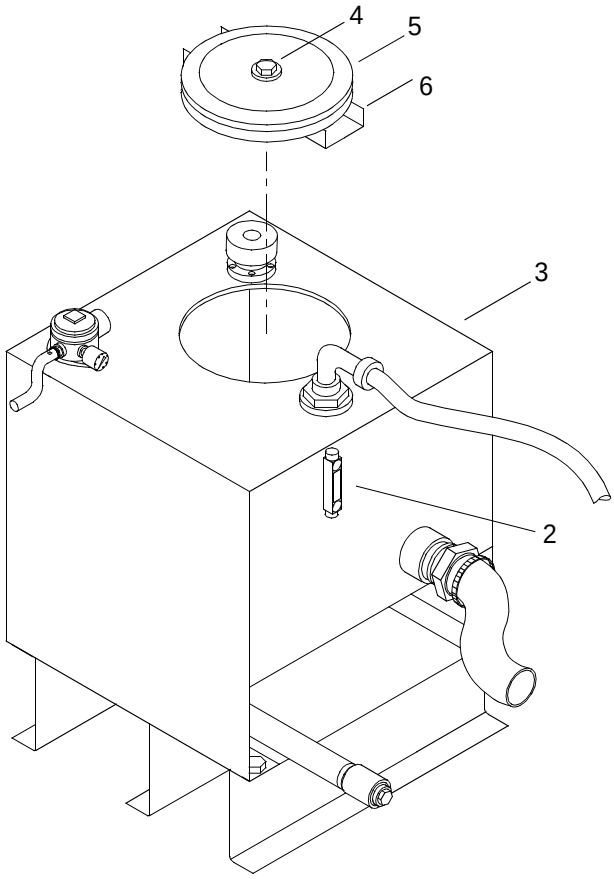
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



NOTE

If fluid level in the sight glass does not indicate full, the reservoir must be serviced.

2. Inspect the lubricating oil level through the sight glass (2) on the side of the reservoir (3).



NOTE

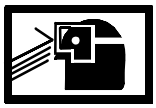
Do not loosen too much or the inspection cover bar will fall into reservoir.

3. Loosen hex head cap screw (4) securing the inspection cover (5) to reservoir (3).
4. Slide inspection cover (5) to one side of reservoir (3) until bar (6) is free from the edge.
5. Remove inspection cover (5).

WARNING



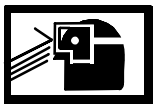
VAPOR



EYE PROTECTION

6. Fill the reservoir (3) with lubricating oil.
7. Verify fluid level in sight gauge (2) indicates full.
8. Position the inspection cover (5) on top of the reservoir (3).
9. Tighten cap screw (4).

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM FILTER ELEMENTS REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Element, Return Filter
(1572X)
PN GT4G10Y6
Element, Pressure Filter
(1572X)
PN N10
Spill Clean-up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

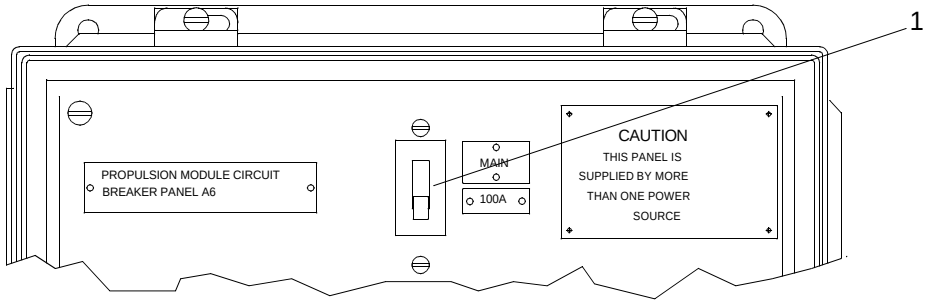
TM 55-1945-205-10-1

REMOVE HYDRAULIC SYSTEM RESERVOIR RETURN FILTER ELEMENT

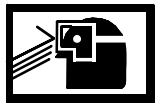
NOTE

The following procedure is typical for the removal and installation of return filter elements.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

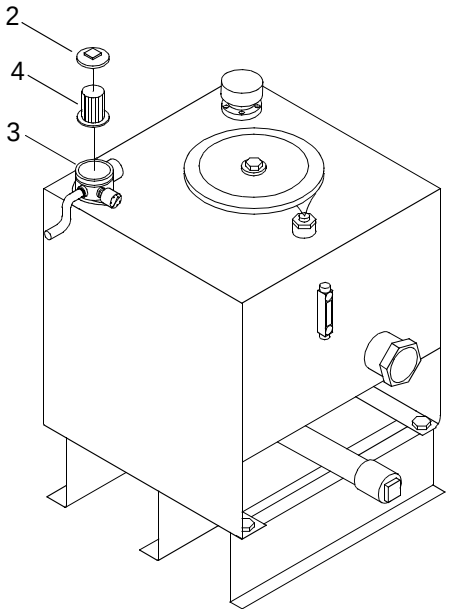


WARNING


EYE PROTECTION


VAPOR

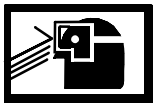
2. Turn cap (2) counterclockwise and remove from return filter housing (3).



3. Remove the element (4) from the return filter housing (3) by turning clockwise and discard.

INSTALL HYDRAULIC SYSTEM RESERVOIR RETURN FILTER ELEMENT

WARNING



EYE PROTECTION



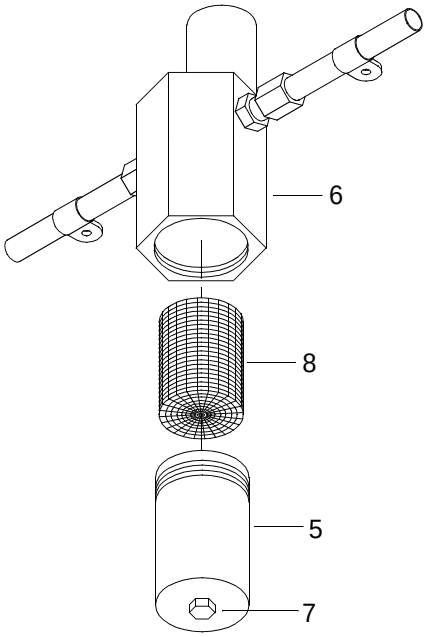
VAPOR

1. Insert new return filter element (4) into return filter housing (3).

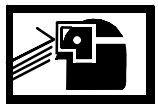
2. Install cap (2), turn clockwise to tighten.

REMOVE HYDRAULIC SYSTEM HYDRAULIC PRESSURE FILTER

1. Position drain pan beneath the hydraulic pressure filter (5).



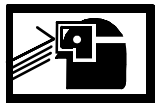
WARNING


EYE PROTECTION


VAPOR

2. Remove the hydraulic pressure filter (5) from the hydraulic manifold (6) by turning the nut (7) on the bottom of the hydraulic pressure filter (5) counterclockwise.

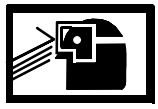
WARNING


EYE PROTECTION


VAPOR

3. Remove the hydraulic pressure filter element (8) from inside the hydraulic pressure filter (5).

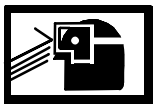
WARNING


EYE PROTECTION


VAPOR

4. Discard the hydraulic pressure filter element (8).

WARNING

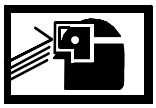

EYE PROTECTION


VAPOR

5. Remove drain pan and dispose of contents and in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM HYDRAULIC PRESSURE FILTER

WARNING


EYE PROTECTION


VAPOR

1. Lubricate the integral seal of the new hydraulic pressure filter element (8) with hydraulic oil.
2. Install the new hydraulic pressure filter element (8) into the hydraulic pressure filter (5).
3. Position the hydraulic pressure filter (5) on the hydraulic manifold (6).
4. Tighten hydraulic pressure filter (5) on the hydraulic manifold (6) using the nut (7) on the bottom of the hydraulic pressure filter (5) and turning clockwise.
5. Service hydraulic system reservoir. (WP 0143 00).
6. Vent air from the hydraulic system. (WP 0136 00)

WARNING


EYE PROTECTION


VAPOR


SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
8. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Sling, 8400 lb 20 ft (Yellow) (Item 39, WP 0383 00)
Qty 2

Materials/Parts

Hydraulic Reservoir
(34712)
PN E26592

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

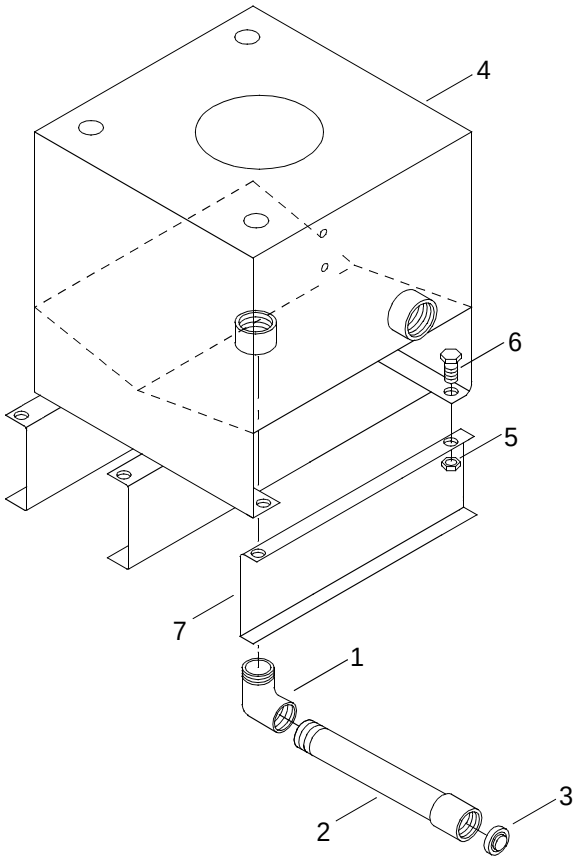
Powered Section Exhaust Plenum Removed. (WP 0092 00)
Powered Section Thruster Hatch Removed. (WP 0100 00)
Hydraulic System Pressure Vented. (WP 0136 00)
Hydraulic System Reservoir Fluid Level Sensor Subassembly Removed. (WP 0140 00)
Hydraulic System Reservoir Tank Strainer Removed. (WP 0141 00)
Hydraulic System Reservoir Drained. (WP 0142 00)
Hydraulic System Reservoir Filter Element Removed. (WP 0144 00)
Hydraulic System Reservoir Breather/Filler Removed. (WP 0147 00)
Hydraulic System Reservoir Sight Gauge Removed. (WP 0148 00)

REMOVE HYDRAULIC SYSTEM RESERVOIR

NOTE

The following procedure is typical for removal and installation of port or starboard hydraulic reservoirs.

1. Remove elbow (1), drain pipe (2) and drain plug (3) from beneath hydraulic reservoir (4).



2. Remove six hex nuts (5) and hex head cap screws (6) securing hydraulic reservoir (4) to the base supports (7).

WARNING



HEAVY PARTS

3. Using crane and sling, remove the hydraulic reservoir (4).

INSTALL HYDRAULIC SYSTEM RESERVOIR

WARNING



HEAVY PARTS

1. Using crane and sling, position new hydraulic reservoir (4) on the base supports (7).
2. Install six hex head cap screws (6) and hex nuts (5) to secure reservoir (3) on the base supports (7).
3. Tighten hex nuts (5).
4. Install elbow (1), drain pipe (2) and drain plug (3) on bottom of reservoir (4).
5. Install hydraulic system reservoir sight gauge. (WP 0148 00)
6. Install hydraulic system reservoir breather/filler. (WP 0147 00)
7. Install hydraulic system reservoir filter element. (WP 0144 00)
8. Service hydraulic system reservoir. (WP 0143 00)
9. Install hydraulic system reservoir tank strainer. (WP 0141 00)
10. Install hydraulic system reservoir fluid level sensor subassembly. (WP 0140 00)
11. Vent air from hydraulic system. (WP 0136 00)
12. Install powered section thruster hatch. (WP 0100 00)
13. Install powered section exhaust plenum. (WP 0092 00)
14. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RETURN FILTER REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Pump, Oil Suction (Item 29, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Filter, Return
(34712)
PN GT4G10Y6
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

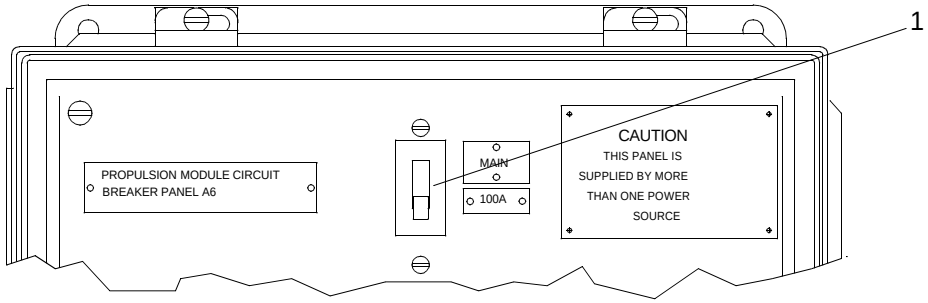
TM 55-1945-205-10-1

REMOVE HYDRAULIC SYSTEM HYDRAULIC RETURN FILTER ASSEMBLY

NOTE

The following procedure is typical for replacement of both port and starboard hydraulic return filter assemblies.

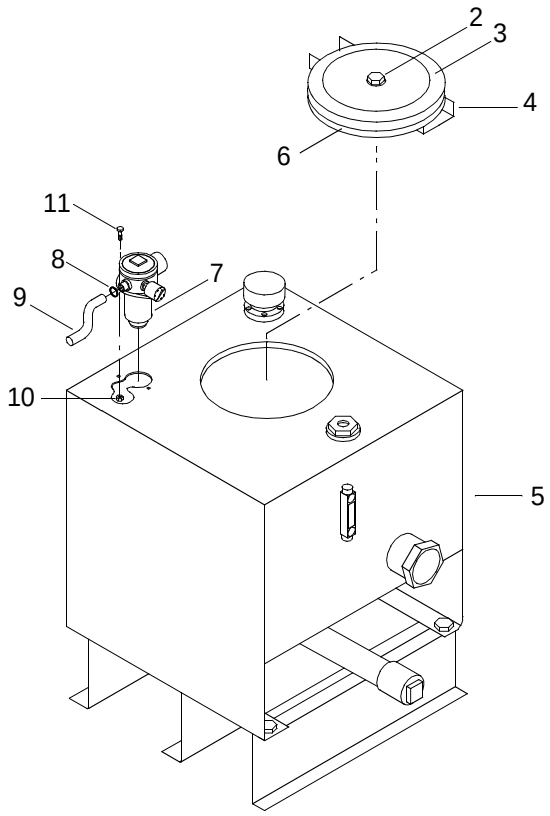
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



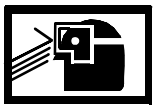
NOTE

Complete removal of cap screw will result in inspection cover bar falling into reservoir.

2. Loosen hex head cap screw (2).



WARNING


EYE PROTECTION

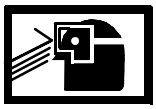

VAPOR

3. Slide inspection cover (3) to one side of reservoir opening until inspection cover bar (4) is freed from edge of opening of reservoir (5).

4. Remove inspection cover (3), gasket (6) and bar (4) as a unit.

5. Position drain pan beneath return filter assembly (7).

WARNING


EYE PROTECTION


VAPOR

6. Loosen hose clamp (8).

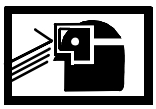
WARNING


EYE PROTECTION


VAPOR

7. Remove hose (9) from return filter assembly (7).

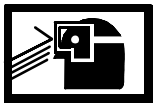
WARNING


EYE PROTECTION


VAPOR

8. Drain hydraulic fluid from hose (9) into drain pan.

WARNING


EYE PROTECTION

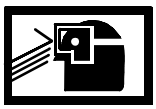

VAPOR

9. Using the oil suction pump, pump sufficient hydraulic fluid from reservoir (5) into drain pan to permit access to nuts (10).

10. Remove two nuts (10) and cap screws (11) from return filter assembly (7).

11. Remove return filter assembly (7) from reservoir (5) and discard.

WARNING


EYE PROTECTION


VAPOR

12. Remove drain pan and dispose of contents in accordance with local procedures.

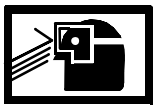
INSTALL HYDRAULIC SYSTEM HYDRAULIC RETURN FILTER ASSEMBLY

1. Position new return filter assembly (7) on reservoir (5).
2. Install two cap screws (11) and nuts (10) on return filter assembly (7) and tighten.
3. Position hose (9) on return filter assembly (7).
4. Tighten hose clamp (8).
5. Service hydraulic system reservoir. (WP 0143 00).
6. Position bar (4), gasket (6) and inspection cover (3) on reservoir (5).
7. Tighten cap screw (2).
8. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



VAPOR



EYE PROTECTION



SLICK FLOOR

9. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR BREATHER/FILLER REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts

Breather/Filler
(34712)
PN NAB-1010-4

Personnel Required

Engineer 88L

References

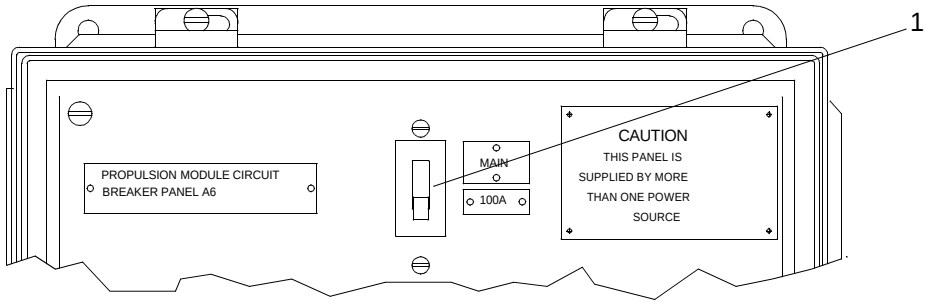
TM 55-1945-205-10-1

REMOVE HYDRAULIC SYSTEM RESERVOIR BREATHER/FILLER

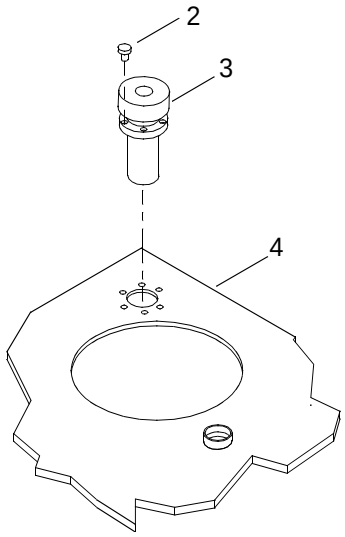
NOTE

The following procedure is typical for the removal and installation of hydraulic reservoir breather/fillers.

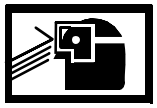
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove six cap screws (2) securing breather/filler (3) to top of hydraulic reservoir (4).



WARNING

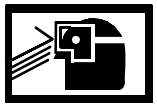

EYE PROTECTION


VAPOR

3. Remove breather/filler (3) from reservoir (4) and discard.

INSTALL HYDRAULIC SYSTEM RESERVOIR BREATHER/FILLER

WARNING


EYE PROTECTION


VAPOR

1. Position new breather/filler (3) on the top of the hydraulic reservoir (4).
2. Secure the breather/filler (3) to hydraulic reservoir (4) with six cap screws (2).
3. Tighten cap screws (2).
4. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR SIGHT GAUGE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts

Gauge, Level
(24364)
PN G605-06-Y-1

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

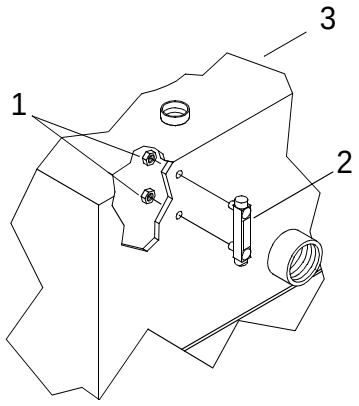
Hydraulic System Reservoir Drained. (WP 0142 00)

REMOVE HYDRAULIC SYSTEM RESERVOIR SIGHT GAUGE

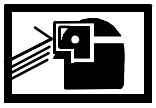
NOTE

The following procedure is typical for the removal and installation of hydraulic reservoir sight gauges.

1. Remove two hex nuts (1) securing sight gauge (2) to the side of hydraulic reservoir (3).



WARNING



EYE PROTECTION

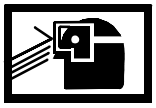


VAPOR

2. Remove sight gauge (2) from reservoir (3) and discard.

INSTALL HYDRAULIC SYSTEM RESERVOIR SIGHT GAUGE

WARNING



EYE PROTECTION



VAPOR

1. Position new sight gauge (2) on the top of the hydraulic reservoir (3).
2. Secure the sight gauge (2) to hydraulic reservoir (3) with two hex nuts (1).
3. Tighten hex nuts (1).
4. Service hydraulic system reservoir. (WP 0143 00)
5. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR TO HYDRAULIC PUMP SUCTION HOSE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Hose, 1¼ ID
(34712)
PN 18FT-881-20
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

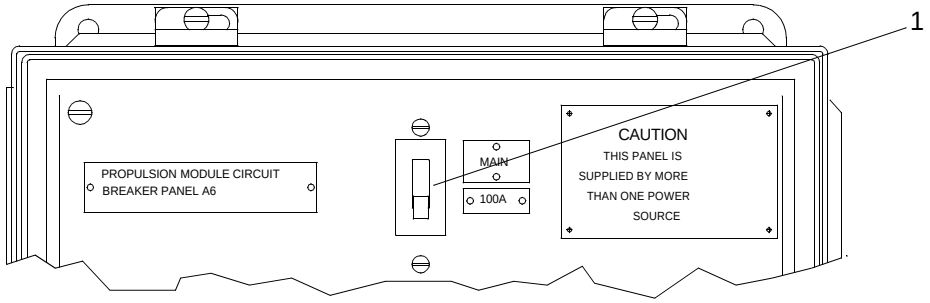
Hydraulic System Pressure Vented. (WP 0136 00)

HYDRAULIC SYSTEM RESERVOIR TO HYDRAULIC PUMP SUCTION HOSE

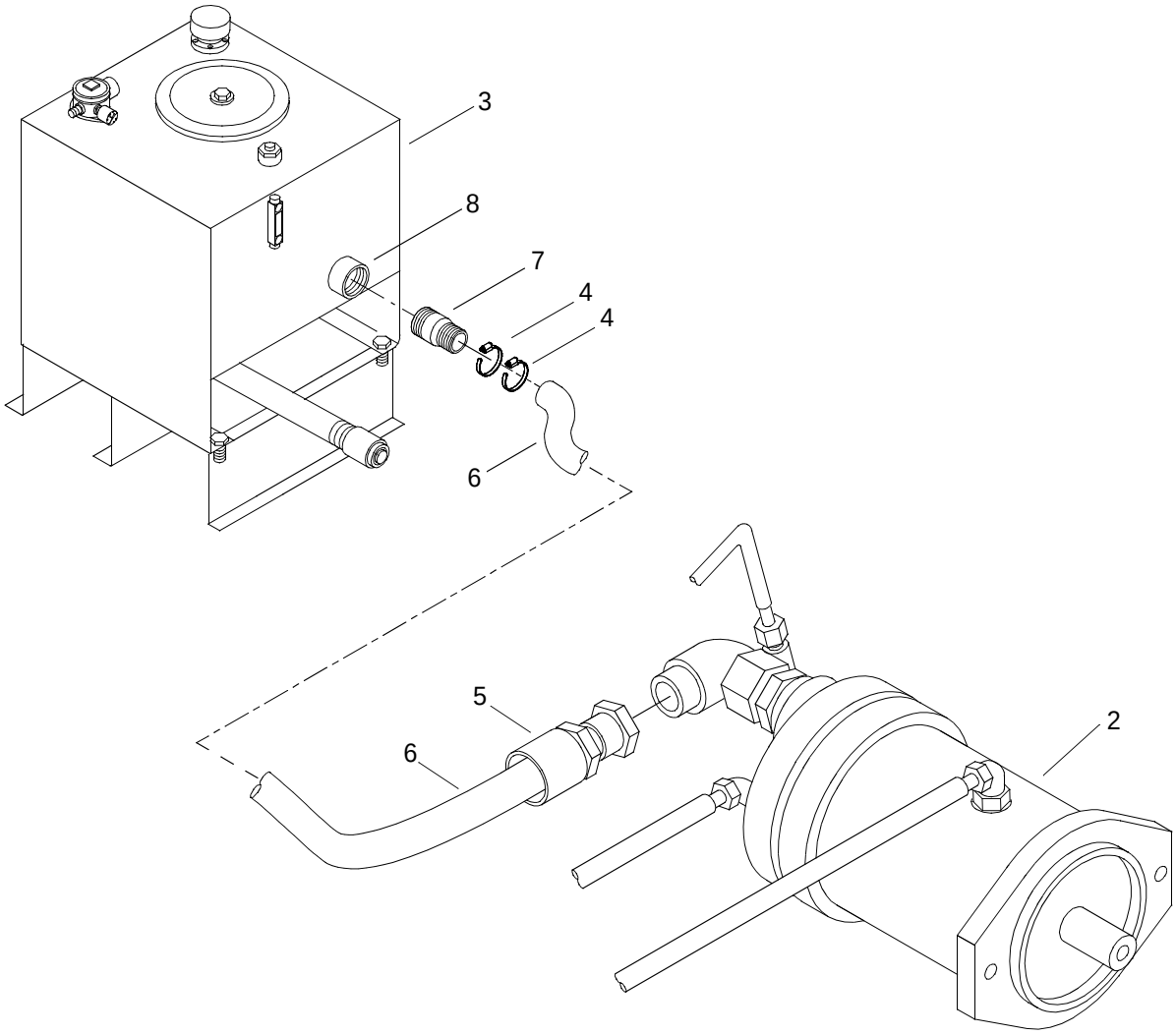
NOTE

The following procedure is typical for both port and starboard hydraulic reservoir to hydraulic pump section hoses.

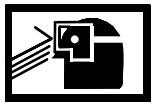
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



2. Place drain pans beneath hydraulic pump (2) and hydraulic reservoir (3).



WARNING


EYE PROTECTION


VAPOR

3. Loosen hose clamps (4).

WARNING


EYE PROTECTION


VAPOR

4. Remove hose adaptor (5) from hydraulic pump (2).

WARNING



5. Remove hose (6).

WARNING



6. Tilt hose (6) and drain hydraulic fluid into drain pan.

WARNING



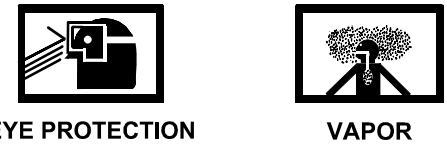
7. Remove filter tank adaptor (7) from strainer (8).

WARNING



8. Remove filter tank adaptor (7) from hose (6).
9. Remove hose clamps (4) from hose (6).
10. Discard hose (6).

WARNING



11. Remove drain pans and dispose of contents in accordance with local procedures.

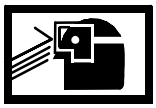
INSTALL HYDRAULIC SYSTEM RESERVOIR TO HYDRAULIC PUMP SUCTION HOSE

1. Position hose clamps (4) on new hose (6).
2. Install filter tank adaptor (7) in hose (6).
3. Position hose (6) between hydraulic pump (2) and hydraulic reservoir (3).
4. Install filter tank adaptor (7) in strainer (8) and tighten.
5. Install hose adaptor (5) on hydraulic pump (2) and tighten.
6. Tighten hose clamps (4).
7. Service hydraulic system reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



VAPOR



EYE PROTECTION



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM PUMP TO PRESSURE FILTER TUBE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(0XS19)
PN 1008088
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

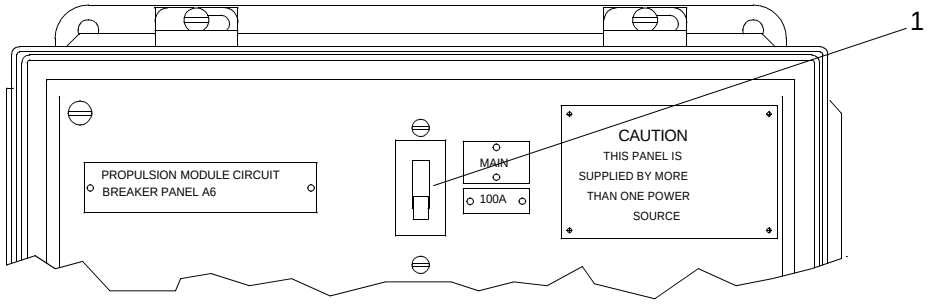
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM PUMP TO PRESSURE FILTER TUBE

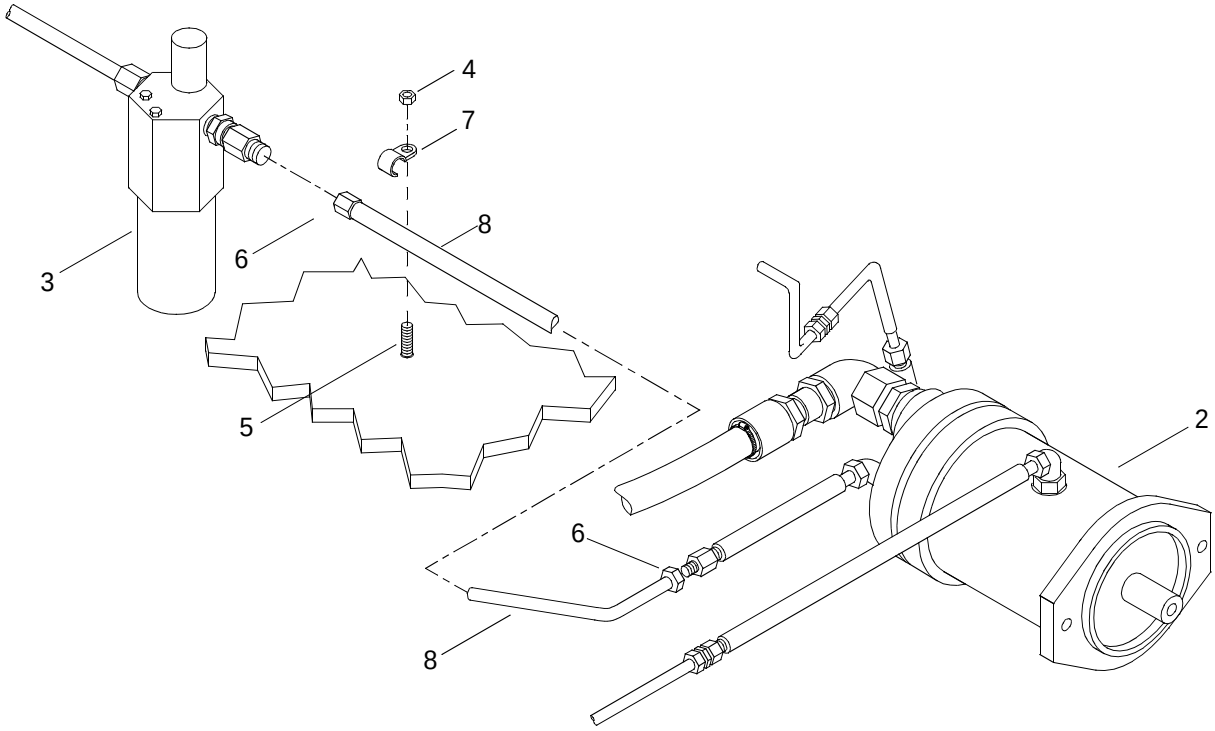
NOTE

The following procedure is typical for replacing both port and starboard hydraulic pump to pressure filter tubes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.

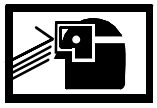


2. Position drain pans beneath hydraulic pump (2) and pressure filter (3).



3. Remove self-locking nut (4) from stud (5).

WARNING


EYE PROTECTION

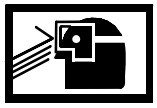

VAPOR

4. Disconnect fittings (6) from hydraulic pump (2) and pressure filter (3).

5. Remove clamp (7) from stud (5).

6. Remove clamp (7) from tube (8).

WARNING

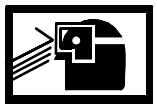

EYE PROTECTION


VAPOR

7. Tilt tube (8) and drain hydraulic fluid into drain pan.

8. Discard tube (8).

WARNING



EYE PROTECTION

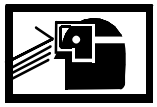


VAPOR

9. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM PUMP TO PRESSURE FILTER TUBE

WARNING



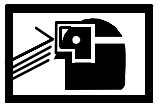
EYE PROTECTION



VAPOR

1. Apply sealing compound to male threads of hydraulic pump (2) and pressure filter (3).
2. Position new tube (8) between hydraulic pump (2) and pressure filter (3).
3. Connect fittings (6) to hydraulic pump (2) and pressure filter (3) and tighten.
4. Position clamp (7) on tube (8).
5. Position clamp (7) on stud (5).
6. Install self-locking nut (4) on stud (5) and tighten.
7. Service hydraulic system reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM WAY-VALVE PORT N TO PUMP-JET MANIFOLD PORT H HYDRAULIC LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(0XS19)
PN 1008088
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

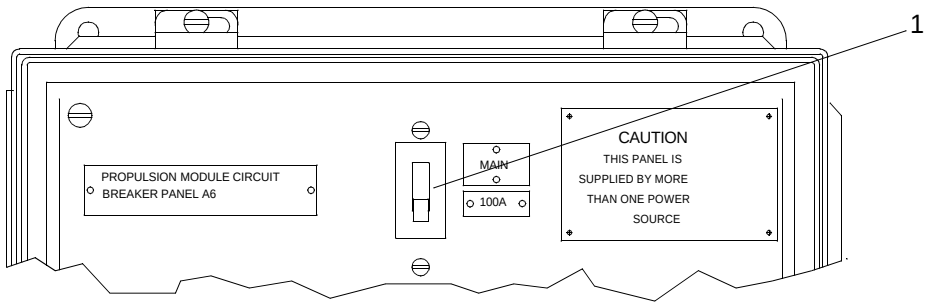
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM WAY-VALVE PORT N TO PUMP-JET MANIFOLD PORT H HYDRAULIC LINE

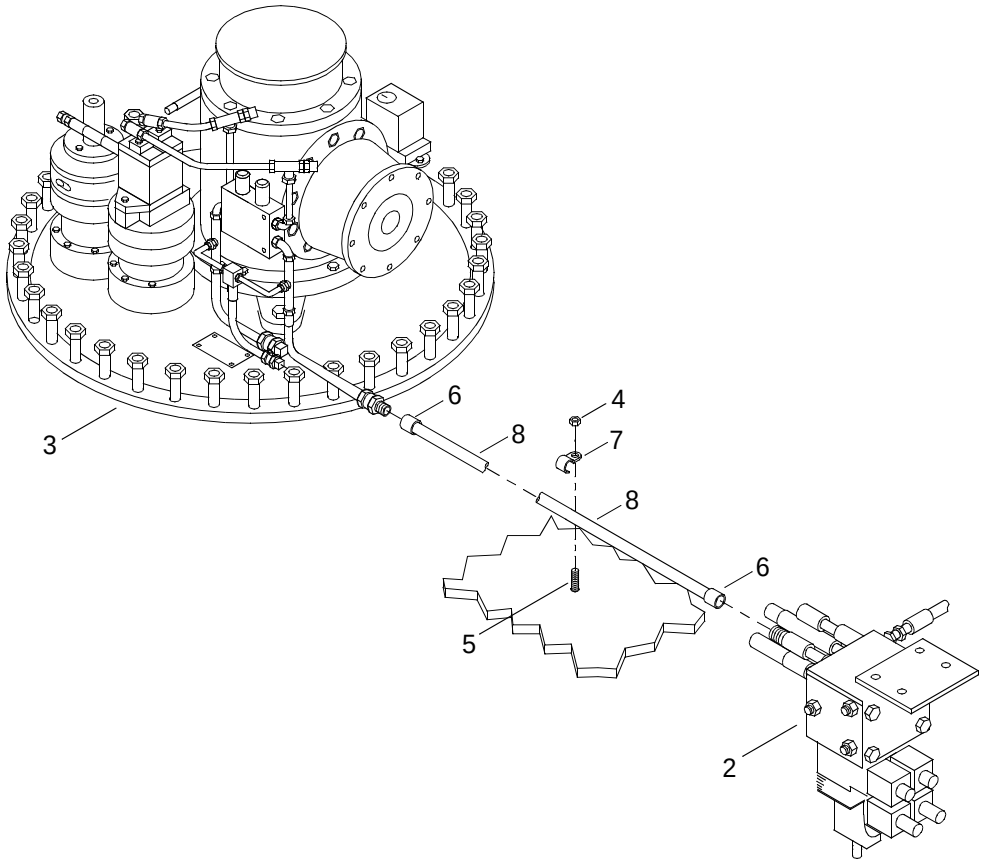
NOTE

The following procedure is typical for replacing both port and starboard way-valve port N to pump-jet manifold port H hydraulic line.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.

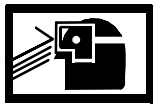


2. Position drain pans beneath way-valve (2) and pump-jet manifold (3).



3. Remove self-locking nut (4) from stud (5).

WARNING


EYE PROTECTION

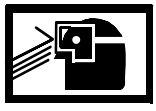

VAPOR

4. Disconnect fittings (6) from way-valve (2) and pump-jet manifold (3).

5. Remove clamp (7) from stud (5).

6. Remove clamp (7) from tube (8).

WARNING

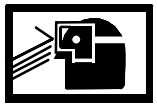

EYE PROTECTION


VAPOR

7. Tilt tube (8) and drain hydraulic fluid into drain pan.

8. Discard tube (8).

WARNING



EYE PROTECTION

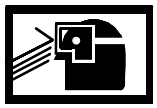


VAPOR

9. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM WAY-VALVE PORT N TO PUMP-JET MANIFOLD PORT H HYDRAULIC LINE

WARNING



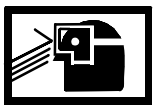
EYE PROTECTION



VAPOR

1. Apply sealing compound to male threads on way-valve (2) and pump-jet manifold (3).
2. Position new tube (8) between way-valve (2) and pump-jet manifold (3).
3. Connect fittings (6) to way-valve (2) and pump-jet manifold (3) and tighten.
4. Position clamp (7) on tube (8).
5. Position clamp (7) on stud (5).
6. Install self-locking nut (4) on stud (5) and tighten.
7. Service hydraulic system reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM WAY-VALVE PORT N TO PUMP-JET MANIFOLD PORT J HYDRAULIC LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Tube Assembly
(0XS19)
PN 1008088
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

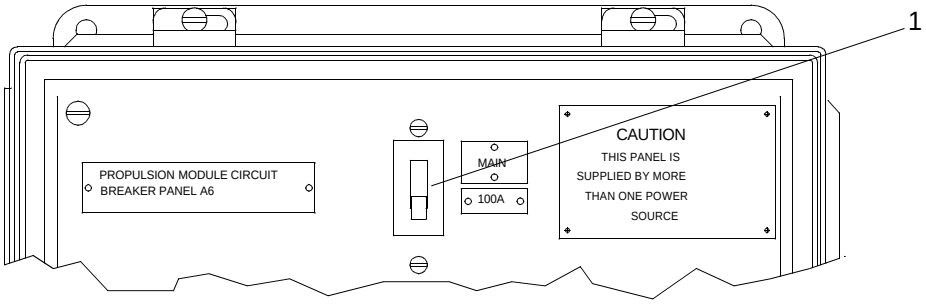
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM WAY-VALVE PORT N TO PUMP-JET MANIFOLD PORT J HYDRAULIC LINE

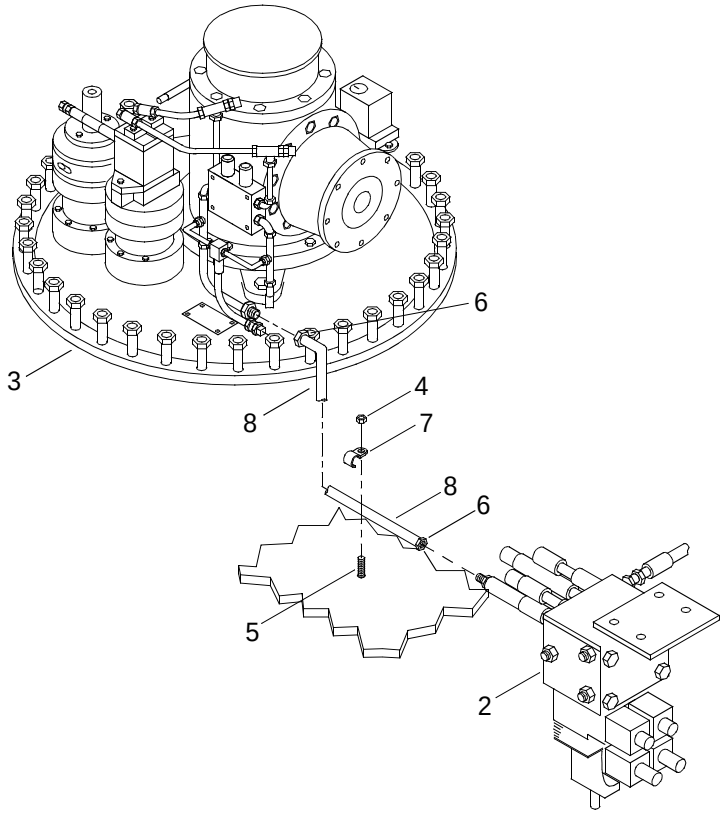
NOTE

The following procedure is typical for replacing both port and starboard way-valve port N to pump-jet manifold port J hydraulic line.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.

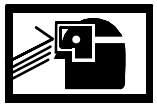


2. Position drain pan beneath way-valve (2) and pump-jet manifold (3).



3. Remove self-locking nuts (4) from stud (5).

WARNING


EYE PROTECTION

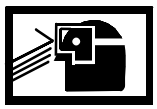

VAPOR

4. Disconnect fittings (6) from way-valve (2) and pump-jet manifold (3).

5. Remove clamps (7) from studs (5).

6. Remove clamps (7) from tube (8).

WARNING

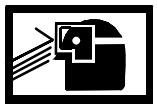

EYE PROTECTION


VAPOR

7. Tilt tube (8) and drain hydraulic fluid into drain pan.

8. Discard tube (8).

WARNING

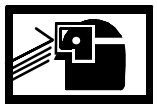

EYE PROTECTION


VAPOR

9. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM WAY-VALVE PORT N TO PUMP-JET MANIFOLD PORT J HYDRAULIC LINE

WARNING


EYE PROTECTION


VAPOR

1. Apply sealing compound to male threads on way-valve (2) and pump-jet manifold (3).
2. Position new tube (8) between way-valve (2) and pump-jet manifold (3).
3. Connect fittings (6) on way-valve (2) and pump-jet manifold (3).
4. Position clamps (7) on tube (8).
5. Position clamps (7) on studs (5).
6. Install self-locking nuts (4) on studs (5) and tighten.
7. Service hydraulic system reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING


EYE PROTECTION


VAPOR


SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM PUMP-JET MANIFOLD TO 3/2 BALL VALVE LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(0XS19)
PN 1008082
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

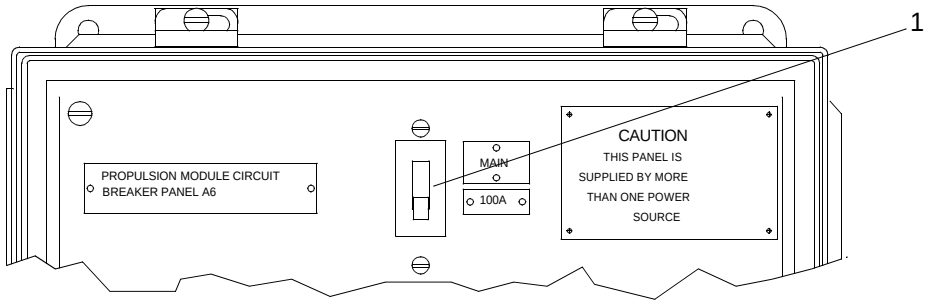
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM PUMP-JET MANIFOLD TO 3/2 BALL VALVE LINE

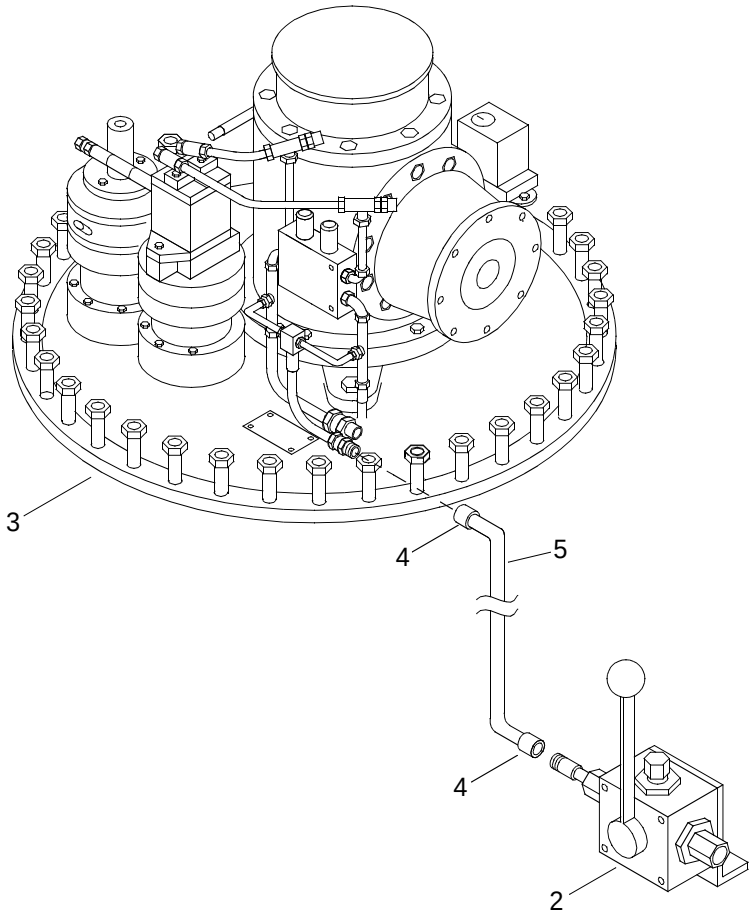
NOTE

The following procedure is typical for replacing both port and starboard hydraulic pump-jet to 3/2 ball valve hoses.

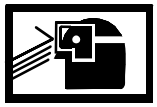
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



2. Position drain pans beneath ball valve (2) and pump-jet manifold (3).



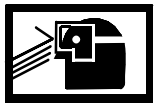
WARNING


EYE PROTECTION


VAPOR

3. Disconnect fittings (4) from ball valve (2) and pump-jet manifold (3).

WARNING

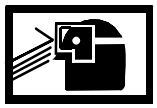

EYE PROTECTION


VAPOR

4. Tilt end of tube (5) and drain hydraulic fluid into drain pan.

5. Discard tube (5).

WARNING



EYE PROTECTION

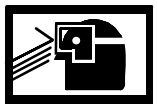


VAPOR

6. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM PUMP-JET MANIFOLD TO 3/2 BALL VALVE LINE

WARNING



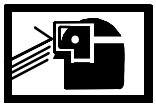
EYE PROTECTION



VAPOR

1. Apply sealing compound to male threads on ball valve (2) and pump-jet manifold (3)
2. Position new tube (5) between ball valve (2) and pump-jet manifold (3).
3. Connect fittings (4) to ball valve (2) and pump-jet manifold (3) and tighten.
4. Service hydraulic system reservoir. (WP 0143 00)
5. Vent air from hydraulic system. (WP 0136 00)
6. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM 3/2 BALL VALVE TO HAND PUMP HYDRAULIC LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(34712)
PN 0007211
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

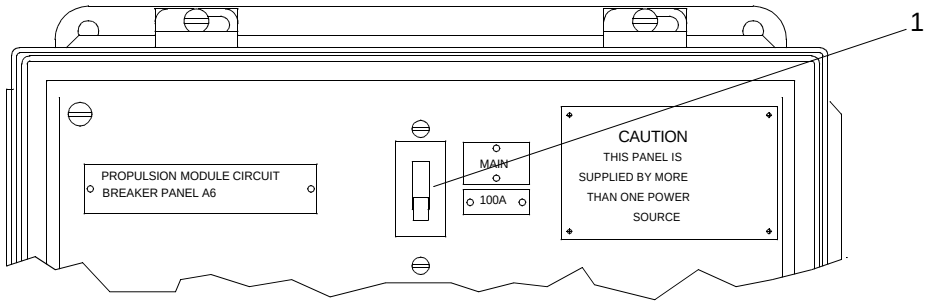
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM 3/2 BALL VALVE TO HAND PUMP HYDRAULIC LINE

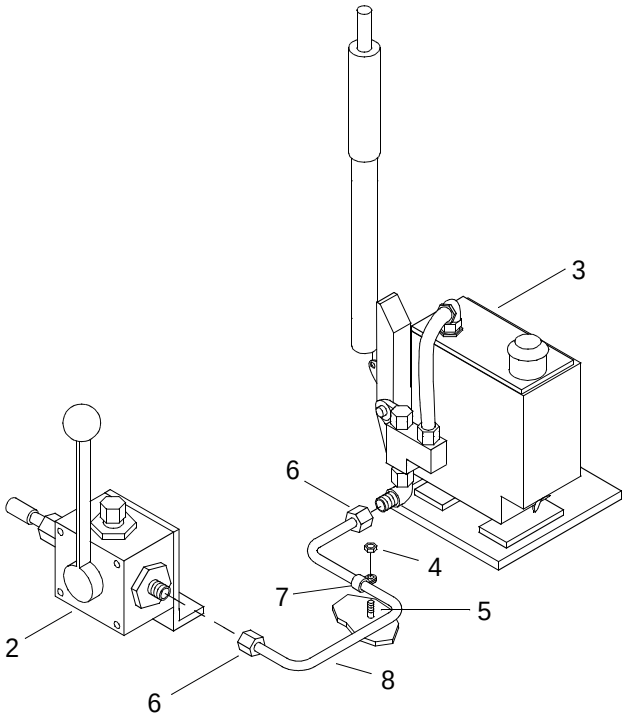
NOTE

The following procedure is typical for replacing both port and starboard 3/2 ball valve to hand pump hydraulic lines.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.

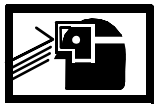


2. Position drain pans beneath ball valve (2) and hand pump (3).



3. Remove self-locking nut (4) from stud (5).

WARNING


EYE PROTECTION

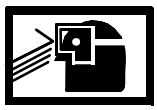

VAPOR

4. Disconnect fittings (6) from ball valve (2) and hand pump (3).

5. Remove clamp (7) from stud (5).

6. Remove clamp (7) from tube (8).

WARNING

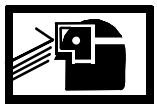

EYE PROTECTION


VAPOR

7. Tilt tube (8) and drain hydraulic fluid into drain pan.

8. Discard tube (8).

WARNING



EYE PROTECTION



VAPOR

9. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM 3/2 BALL VALVE TO HAND PUMP HYDRAULIC LINE

WARNING



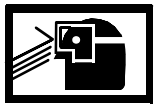
EYE PROTECTION



VAPOR

1. Apply sealing compound to male fitting threads of ball valve (2) and hand pump (3).
2. Position new tube (8) between ball valve (2) and hand pump (3).
3. Install fittings (6) on ball valve (2) and hand pump (3) and tighten.
4. Install clamp (7) on tube (8).
5. Position clamp (7) on stud (5).
6. Install self-locking nut (4) on stud (5) and tighten.
7. Service hydraulic system reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM 3/2 BALL VALVE TO PUMP-JET BRAKE
HYDRAULIC LINE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(0XS19)
PN 1008084
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

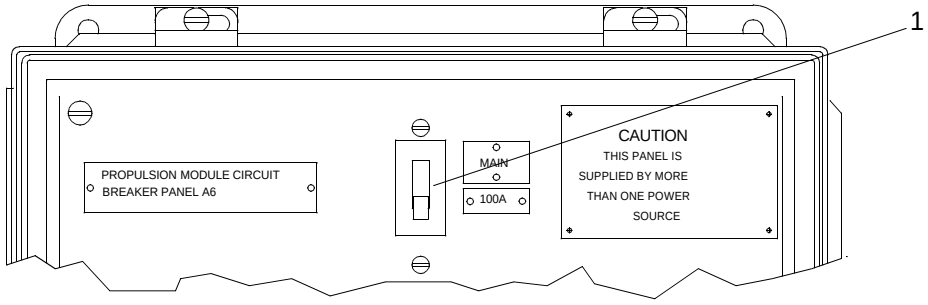
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM 3/2 BALL VALVE TO PUMP-JET BRAKE HYDRAULIC LINE

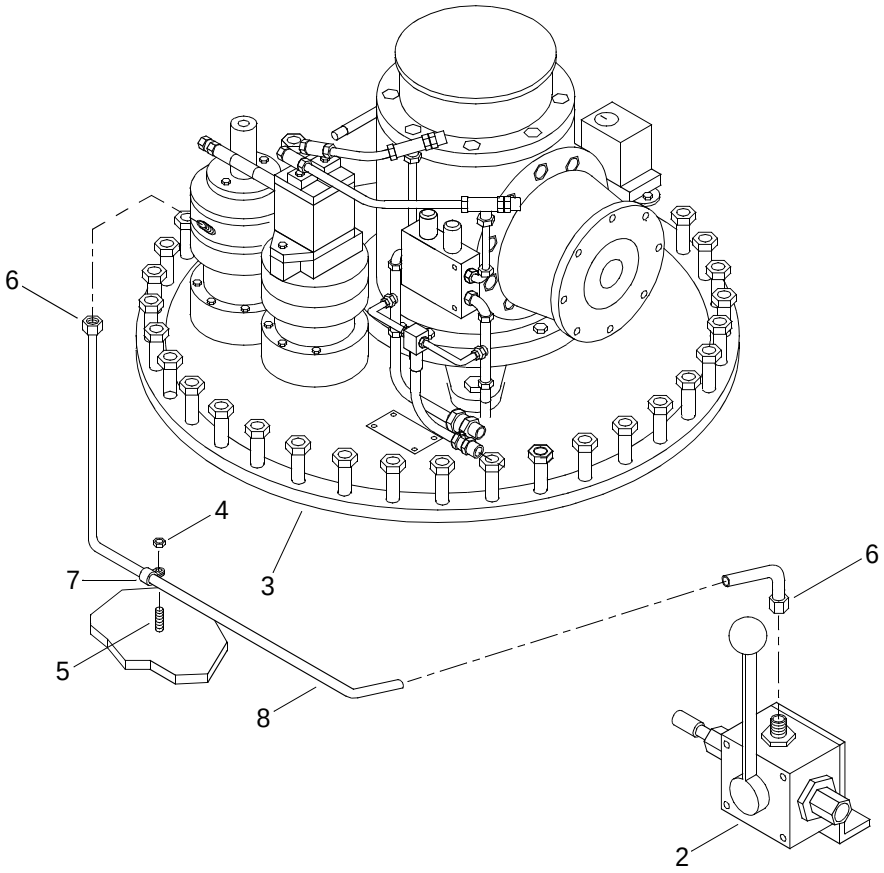
NOTE

The following procedure is typical for replacing both port and starboard 3/2 ball valve to pump-jet brake hydraulic line.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



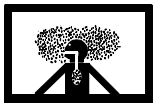
2. Position drain pans beneath ball valve (2) and pump-jet (3).



3. Remove self-locking nut (4) from stud (5).

WARNING


EYE PROTECTION

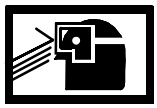

VAPOR

4. Disconnect fittings (6) from ball valve (2) and pump-jet (3).

5. Remove clamp (7) from stud (5).

6. Remove clamp (7) from tube (8).

WARNING

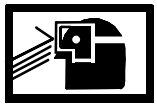

EYE PROTECTION


VAPOR

7. Tilt tube (8) and drain hydraulic fluid into drain pan.

8. Discard tube (8).

WARNING



EYE PROTECTION

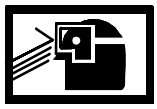


VAPOR

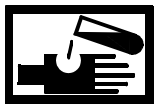
9. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL 3/2 BALL VALVE TO PUMP-JET BRAKE HYDRAULIC LINE

WARNING



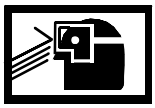
EYE PROTECTION



CHEMICAL

1. Apply sealing compound to male threads of ball valve (2) and pump-jet (3).
2. Position new tube (8) between ball valve (2) and pump-jet (3).
3. Connect fittings (6) on ball valve (2) and pump-jet (3) and tighten.
4. Install clamp (7) on tube (8).
5. Position clamp (7) on stud (5).
6. Install self-locking nut (4) on stud (5) and tighten.
7. Service hydraulic system reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM PUMP-JET HYDRAULIC MOTOR TO RESERVOIR RETURN LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Tube, Assembly
(34712)
PN 0007213
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

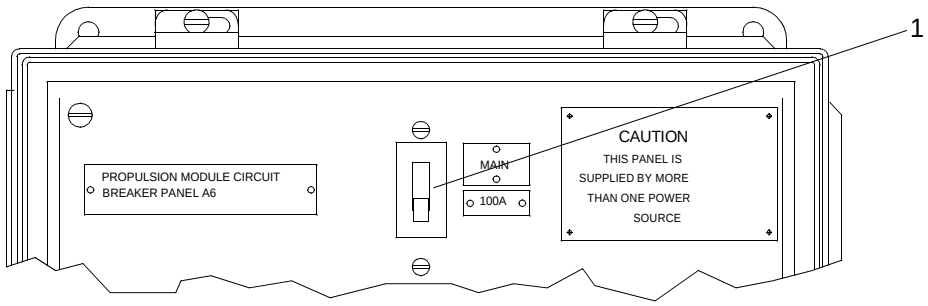
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM PUMP-JET HYDRAULIC MOTOR TO RESERVOIR RETURN LINE

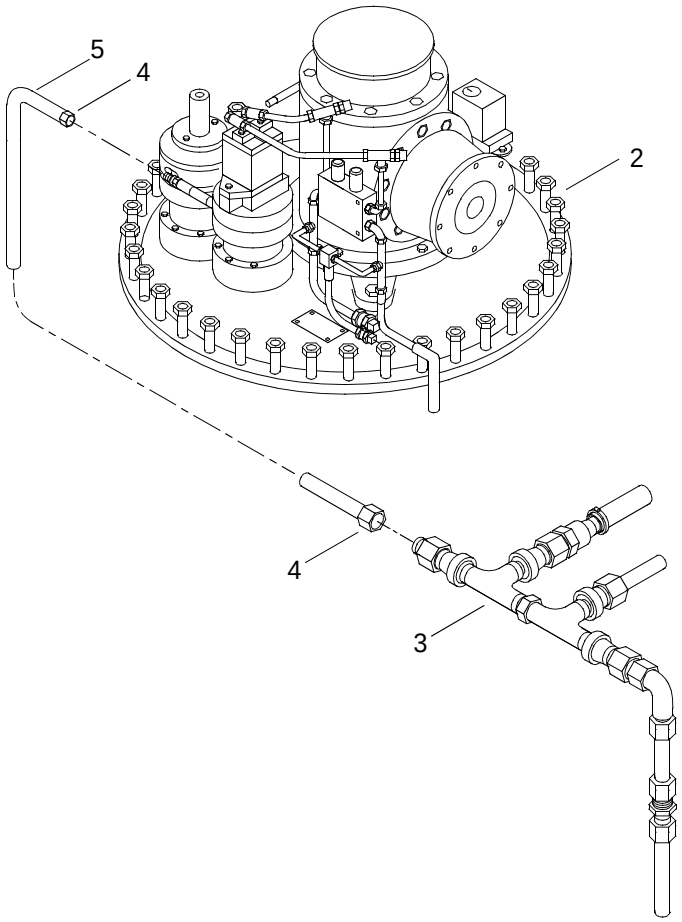
NOTE

The following procedure is typical for replacing both port and starboard pump-jet hydraulic motor to reservoir return lines.

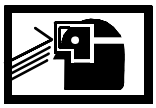
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



2. Position drain pans beneath pump-jet (2) and return line (3).



WARNING


EYE PROTECTION


VAPOR

3. Disconnect fittings (4) from pump-jet (2) and return line (3).

WARNING


EYE PROTECTION


VAPOR

4. Tilt tube (5) and drain hydraulic fluid into drain pans.

5. Discard tube (5).

WARNING



EYE PROTECTION

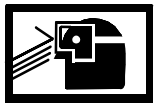


VAPOR

6. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM PUMP-JET HYDRAULIC MOTOR TO RESERVOIR RETURN LINE

WARNING



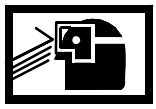
EYE PROTECTION



CHEMICAL

1. Apply sealing compound to male threads of pump-jet (2) and return line (3).
2. Position new tube (5) between pump-jet (2) and return line (3).
3. Connect fittings (4) to pump-jet (2) and return line (3) and tighten.
4. Service hydraulic system reservoir. (WP 0143 00)
5. Vent air from hydraulic system. (WP 0136 00)
6. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM WAY-VALVE TO RESERVOIR RETURN LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(34712)
PN 0007214
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

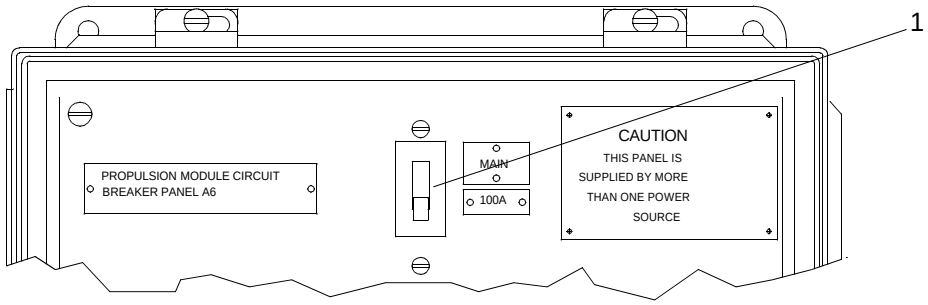
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM WAY-VALVE TO RESERVOIR RETURN LINE

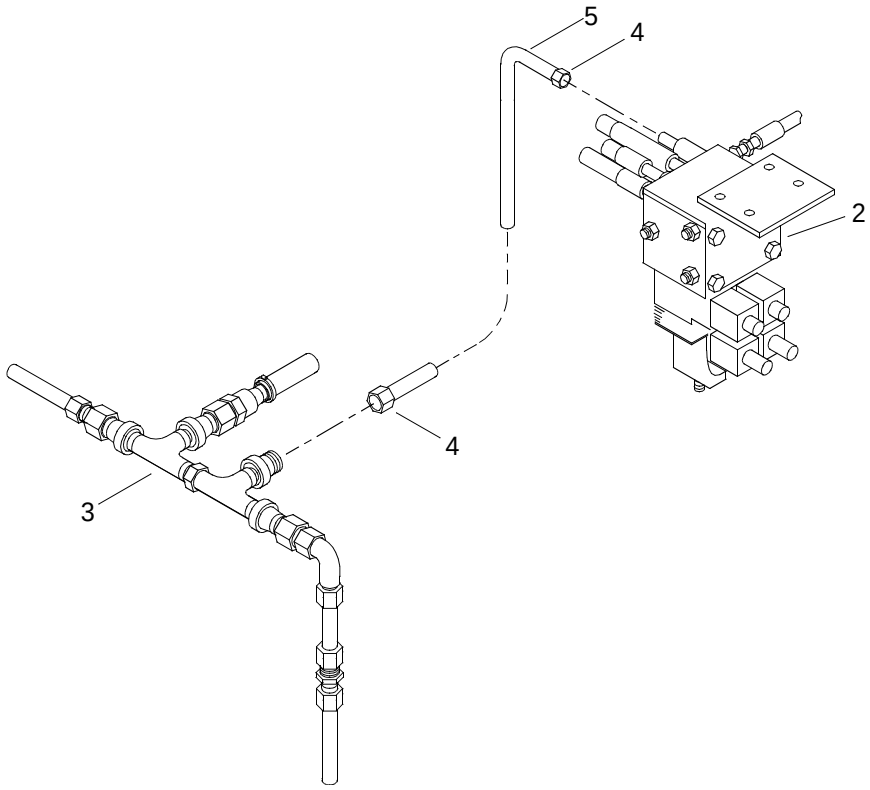
NOTE

The following procedure is typical for replacing both port and starboard way-valve to reservoir return lines.

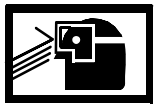
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



2. Position drain pans beneath way-valve (2) and return line (3).



WARNING



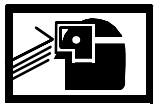
EYE PROTECTION



VAPOR

3. Disconnect fittings (4) from way-valve (2) and return line (3).

WARNING



EYE PROTECTION

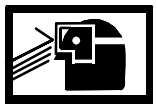


VAPOR

4. Tilt tube (5) and drain hydraulic fluid into drain pan.

5. Discard tube (5).

WARNING



EYE PROTECTION

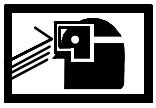


VAPOR

6. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM WAY-VALVE TO RESERVOIR RETURN LINE

WARNING



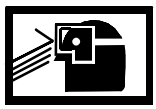
EYE PROTECTION



CHEMICAL

1. Apply sealing compound to male threads of way-valve (2) and return line (3).
2. Position new tube (5) between way-valve (2) and return line (3).
3. Install fittings (4) on way-valve (2) and return line (3) and tighten.
4. Service hydraulic system reservoir. (WP 0143 00)
5. Vent air from hydraulic system. (WP 0136 00)
6. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM PUMP TO RESERVOIR RETURN LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (ItemWP 0383 00 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(34712)
PN 0007213
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

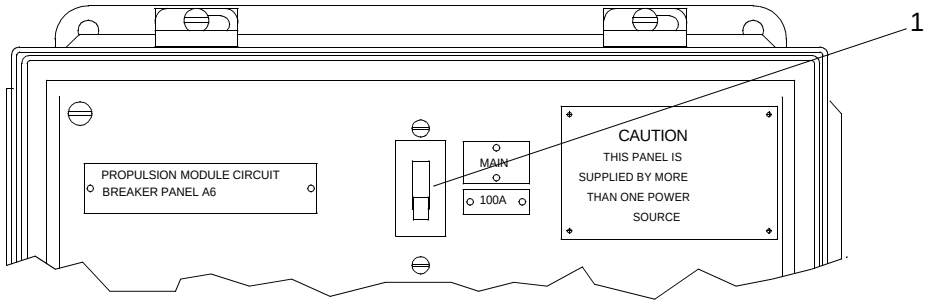
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM PUMP TO RESERVOIR RETURN LINE

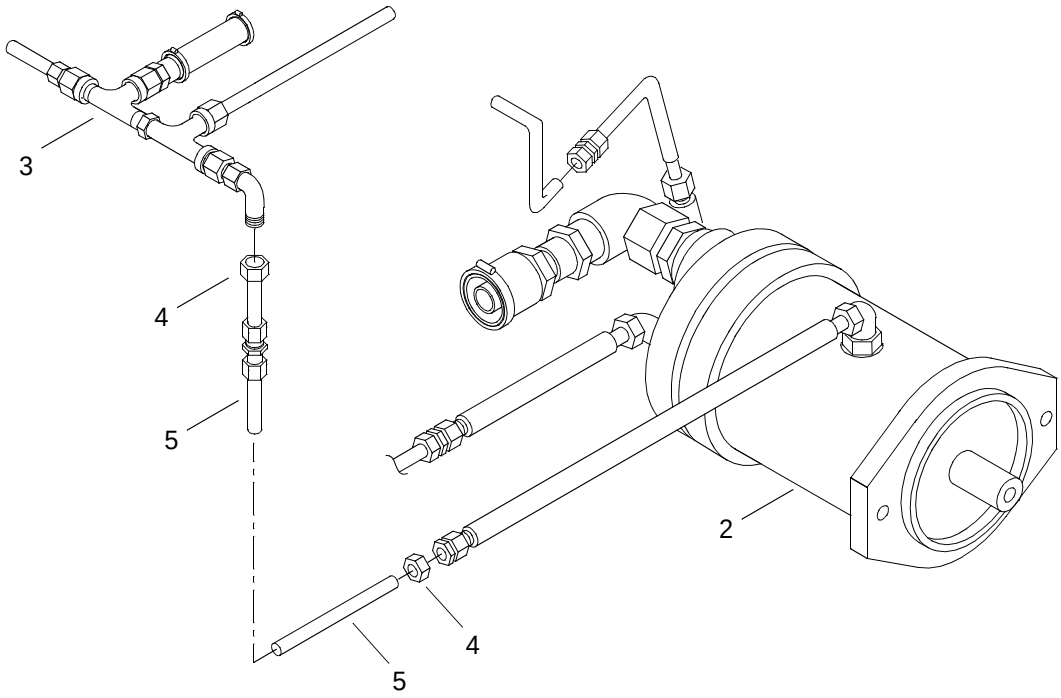
NOTE

The following procedure is typical for replacing both port and starboard way valve to reservoir return lines.

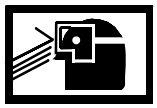
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



2. Position drain pans beneath hydraulic pump (2) and return line (3).



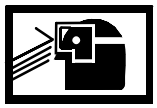
WARNING


EYE PROTECTION


VAPOR

3. Disconnect fittings (4) from hydraulic pump (2) and return line (3).

WARNING

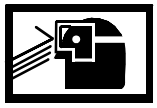

EYE PROTECTION


VAPOR

4. Tilt tube (5) and drain hydraulic fluid into drain pan.

5. Discard tube (5).

WARNING


EYE PROTECTION


VAPOR

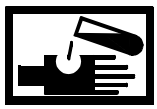
6. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM PUMP TO RESERVOIR RETURN LINE

WARNING



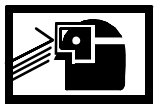
EYE PROTECTION



CHEMICAL

1. Apply sealing compound to male threads of hydraulic pump (3) and return line (3).
2. Position new tube (5) between hydraulic pump (2) and return line (3).
3. Install fittings (4) on hydraulic pump (2) and return line (3) and tighten.
4. Service hydraulic system reservoir. (WP 0143 00)
5. Vent air from hydraulic system. (WP 0136 00)
6. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM WAY-VALVE TO HYDRAULIC PUMP LINE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(34712)
PN 0007212
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

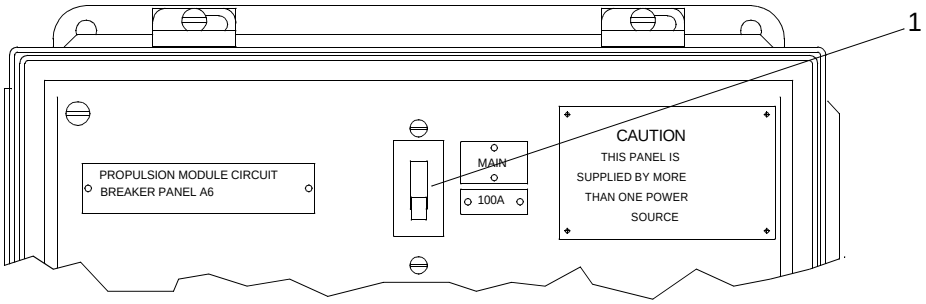
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM WAY-VALVE TO HYDRAULIC PUMP LINE

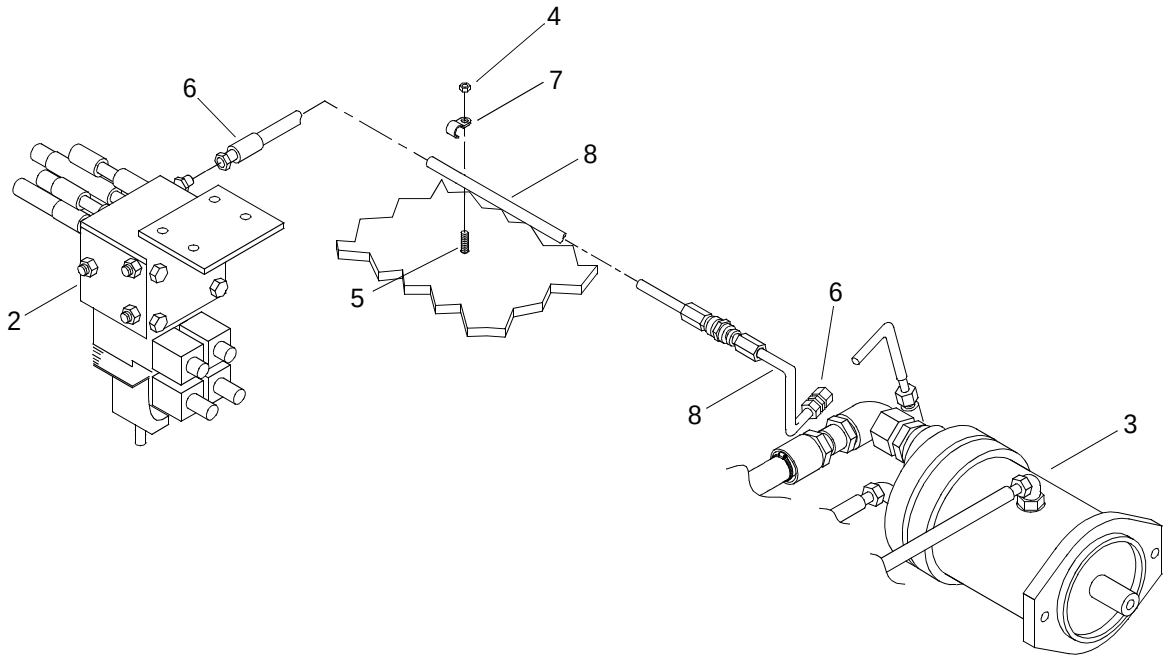
NOTE

The following procedure is typical for replacing both port and starboard 3/2 ball valve to pump-jet brake hydraulic line.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.

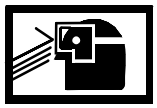


2. Position drain pans beneath way-valve (2) and hydraulic pump (3).



3. Remove self-locking nut (4) from stud (5).

WARNING


EYE PROTECTION

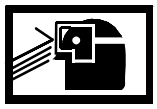

VAPOR

4. Disconnect fittings (6) from way-valve (2) and hydraulic pump (3).

5. Remove clamp (7) from stud (5).

6. Remove clamp (7) from tube (8).

WARNING

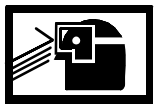

EYE PROTECTION


VAPOR

7. Tilt tube (8) and drain hydraulic fluid into drain pan.

8. Discard tube (8).

WARNING



EYE PROTECTION

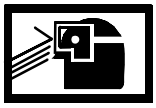


VAPOR

9. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM WAY-VALVE TO HYDRAULIC PUMP LINE

WARNING



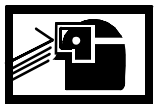
EYE PROTECTION



CHEMICAL

1. Apply sealing compound to male threads of way-valve (2) and hydraulic pump (3).
2. Position new tube (8) between way-valve (2) and hydraulic pump (3).
3. Install fittings (6) on way-valve (2) and hydraulic pump (3) and tighten.
4. Install clamp (7) on tube (8).
5. Position clamp (7) on stud (5).
6. Install self-locking nut (4) on stud (5) and tighten.
7. Service hydraulic system reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM PRESSURE FILTER TO WAY-VALVE LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Qty 2

Materials/Parts

Assembly, Tube
(0XS19)
PN 1007322
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

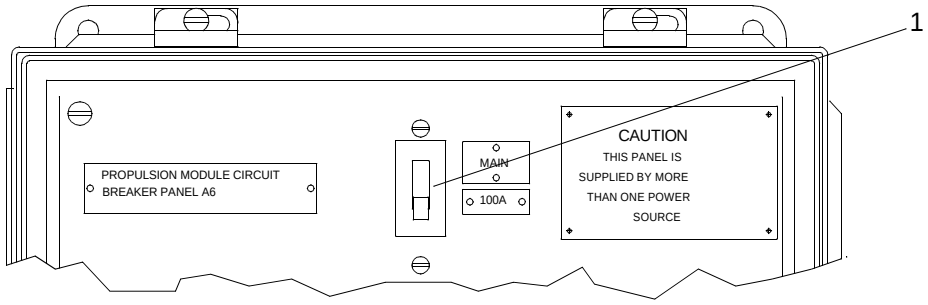
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM PRESSURE FILTER TO WAY-VALVE LINE

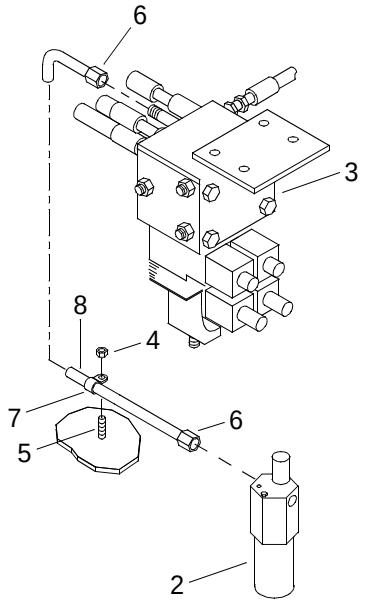
NOTE

The following procedure is typical for replacing both port and starboard pressure filter to way-valve hydraulic lines.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.

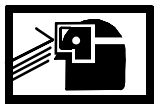


2. Position drain pans beneath pressure filter (2) and way-valve (3).



3. Remove self-locking nut (4) from stud (5).

WARNING


EYE PROTECTION


VAPOR

4. Disconnect fittings (6) from pressure filter (2) and way-valve (3).

5. Remove clamp (7) from stud (5).

6. Remove clamp (7) from tube (8).

WARNING

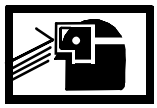

EYE PROTECTION


VAPOR

7. Tilt tube (8) and drain hydraulic fluid into drain pan.

8. Discard tube (8).

WARNING



EYE PROTECTION

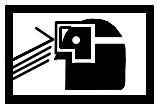


VAPOR

9. Remove drain pans and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM PRESSURE FILTER TO WAY-VALVE LINE

WARNING



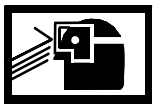
EYE PROTECTION



CHEMICAL

1. Apply sealant to male threads of pressure filter (2) and way-valve (3).
2. Position new tube (8) between pressure filter (2) and way-valve (3).
3. Install fittings (6) on pressure filter (2) and way-valve (3) and tighten.
4. Install clamp (7) on tube (8).
5. Position clamp (7) on studs (8).
6. Install self-locking nut (4) on stud (5) and tighten.
7. Service hydraulic system reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM NEEDLE VALVE TO JET-PUMP MOTOR HYDRAULIC LINE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Assembly, Tube
(0XS19)
PN 1012396
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

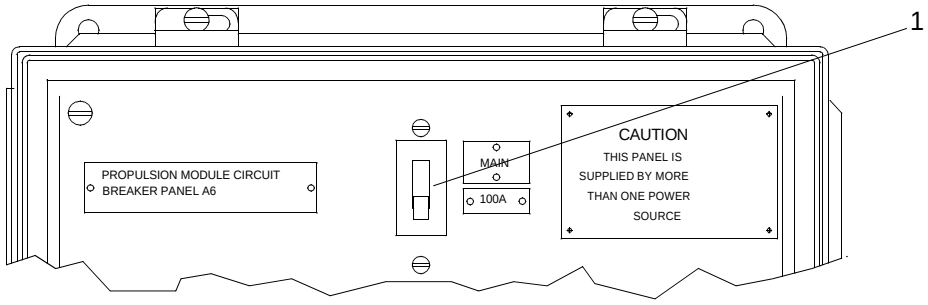
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM NEEDLE VALVE TO JET-PUMP MOTOR HYDRAULIC LINE

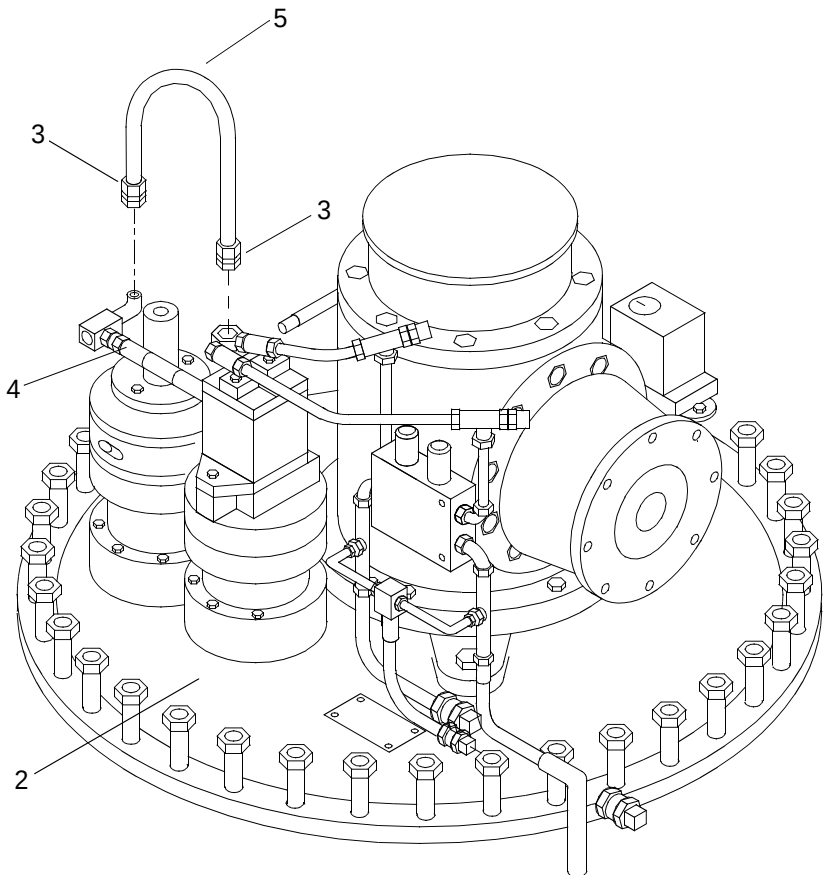
NOTE

The following procedure is typical for replacing both port and starboard jet-pump installations.

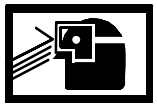
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



2. Position drain pan beneath jet-pump motor (2).



WARNING



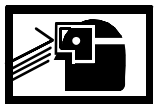
EYE PROTECTION



VAPOR

3. Disconnect fittings (3) from needle valve (4) and jet-pump motor (2).

WARNING



EYE PROTECTION

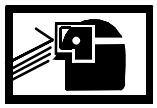


VAPOR

4. Tilt tube (5) and drain hydraulic fluid into drain pan.

5. Discard tube (5).

WARNING



EYE PROTECTION

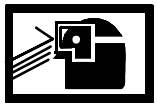


VAPOR

6. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM NEEDLE VALVE TO JET-PUMP MOTOR HYDRAULIC LINE

WARNING



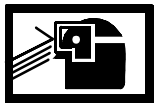
EYE PROTECTION



CHEMICAL

1. Apply sealing compound to male threads of needle valve (4) and jut-pump motor (2).
2. Position new tube (5) between needle valve (4) and jet-pump motor (2).
3. Install fittings (4) on needle valve (4) and jet-pump motor (2) and tighten.
4. Service hydraulic system reservoir. (WP 0143 00)
5. Vent air from hydraulic system. (WP 0136 00)
6. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM RESERVOIR RETURN LINE FILTER HOSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical (Item 14, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Hose, 5/8 ID
(87373)
PN 801-10
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

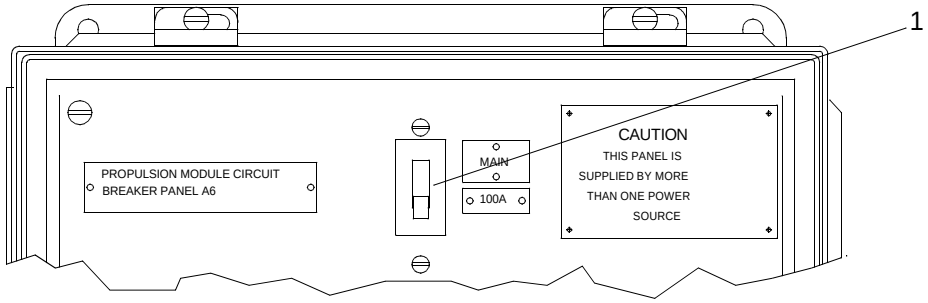
TM 55-1945-205-10-1

Equipment Condition

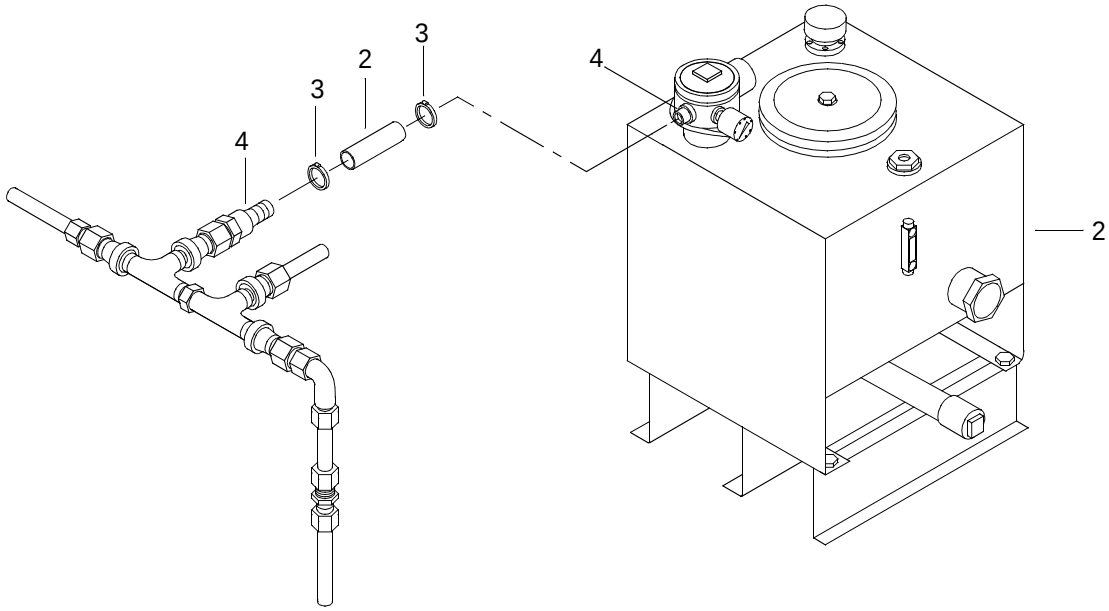
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM RESERVOIR RETURN LINE FILTER HOSE

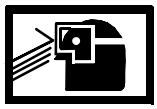
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



2. Position drain pan beneath return hose (2).



WARNING


EYE PROTECTION


VAPOR

3. Loosen two hose clamps (3) and slide over nipples (4).

WARNING


EYE PROTECTION


VAPOR

4. Remove hose (2) from nipples (4).

WARNING

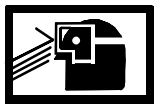

EYE PROTECTION


VAPOR

5. Drain hydraulic fluid into drain pan from hose (2).

6. Discard hose (2).

WARNING



EYE PROTECTION



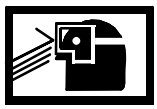
VAPOR

7. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM RESERVOIR RETURN LINE FILTER HOSE

1. Position new hose (2) on nipples (4).
2. Position hose clamps (3) on hose (2).
3. Tighten hose clamps (3).
4. Service hydraulic system reservoir. (WP 0143 00)
5. Vent air from hydraulic system. (WP 0136 00)
6. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

7. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC PUMP
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Hydraulic Pump
(0XS19)
PN 1085331
Gasket
(34712)
PN E28301
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

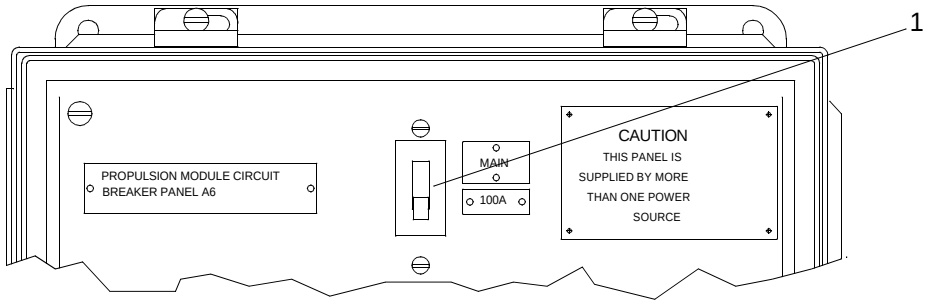
TM 55-1945-205-10-1

Equipment Condition

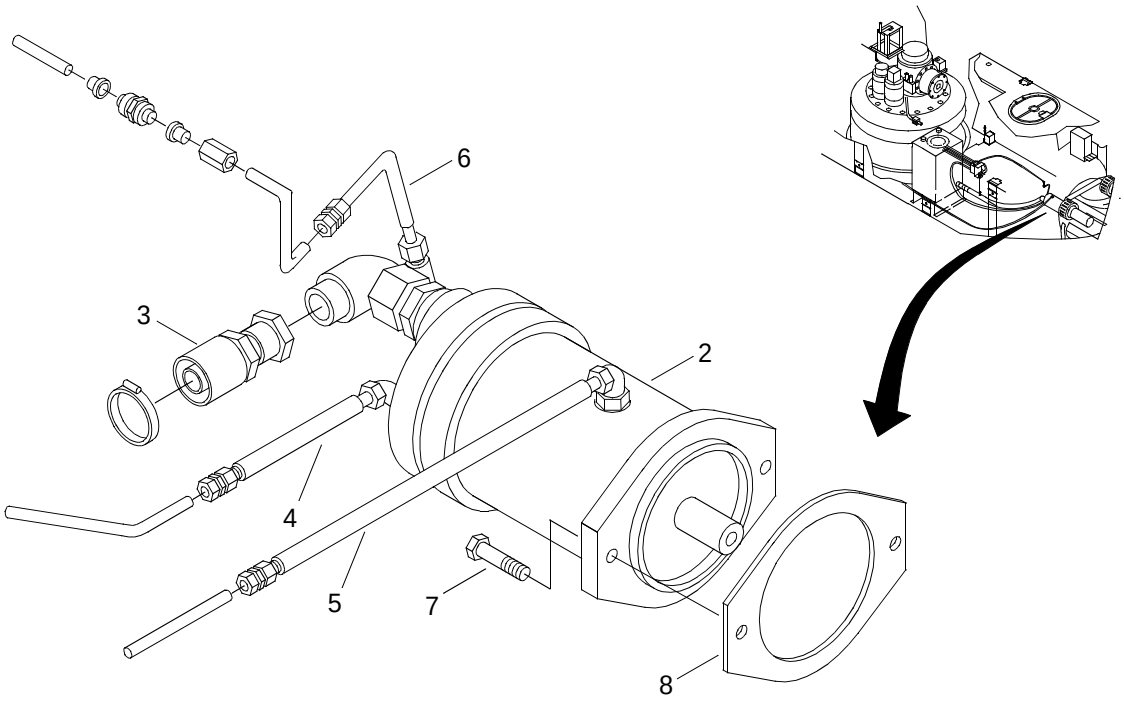
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC PUMP

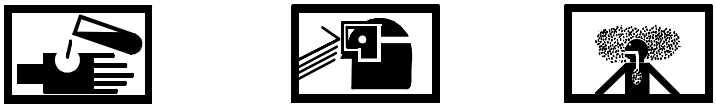
1. Verify that MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is in off position.



2. Position drain pan below hydraulic pump (2) to catch excess oil drained from hoses.



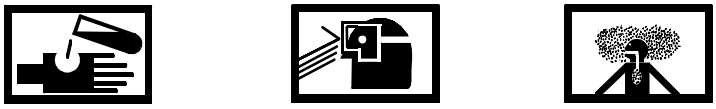
WARNING



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

3. Disconnect hose L1 (3), from hydraulic pump (2) suction to reservoir suction.
4. Disconnect tube L2 (4), from hydraulic pump (2) pressure to pressure filter.
5. Disconnect tube L8B (5), from hydraulic pump (2) return line to reservoir return line.
6. Disconnect tube L9 (6), from hydraulic pump (2) to way-valve.
7. Remove two cap screws (7) securing the hydraulic pump (2) to the marine gear.
8. Remove hydraulic pump (2) and gasket (8).
9. Discard gasket (8).

WARNING



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

10. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC PUMP

1. Install new gasket (8) onto hydraulic pump (2).
2. Position and secure hydraulic pump (2) to the marine gear with two cap screws (7). Tighten cap screws.

WARNING



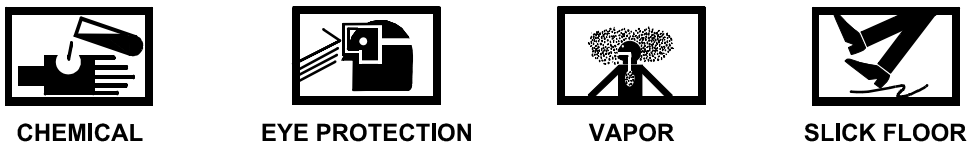
3. Uncap and connect the following hoses to the hydraulic pump (2).
4. Connect tube L9 (6), from hydraulic pump (2) to way-valve.
5. Connect tube L8B (5), from hydraulic pump (2) return line to reservoir return line.
6. Connect tube L2 (4), from hydraulic pump (2) pressure to pressure filter.
7. Connect hose L1 (3), from the hydraulic pump (2) suction to reservoir suction.

WARNING



8. Service hydraulic system reservoir. (WP 0143 00)
9. Vent air from hydraulic system. (WP 0136 00)
10. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



11. Clean up spilled fluid with spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC PUMP
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Press, Arbor, Hand Operated (Item 26, WP 0383 00)

Materials/Parts

Preformed Packing
(D15272)
PN 68104-011
Qty 2
Preformed Packing
(D15272)
PN 68105-908
V-Ring
(D15272)
PN BH00791407
Shaft Seal
(D15272)
PN BH00794325
Plugs
(D15272)
PN 76116-004
Preformed Packing
(D15272)
PN 68111-040
Qty 4
Dowel Pin
(D15272)
PN 69116-006
Washer
(D15272)
PN BH00744158
Bearing
(D15272)
PN 70109-002
Adjusting Disc
(D15272)
PN BH00939013
Piston Guide
(D15272)
PN BH00737283
Spring
(D15272)
PN BH00799041
Counter Piston
(D15272)
PN BH00908999
Preformed Packing
(D15272)
PN 68101-013
Piston Guide
(D15272)
PN BH00911166
Control Piston
(D15272)
PN BH00910645
Preformed Packing
(D15272)
PN 68111-041
Cradle Bearing
(D15272)
PN BH 00902778
Qty 2
Bearing
(D15272)
PN 70109-001
Pistons
(D15272)
PN BH00925459
Qty 9
Retaining Ring
(D15272)
PN BH00918933
Spring
(D15272)
PN BH00924891
Disc-Retaining Clip
(D15272)
PN BH00939048
Pressure Pin
(D15272)
PN BH00785407
Qty 3
Retaining Ball
(D15272)
PN BH00944743

Personnel Required

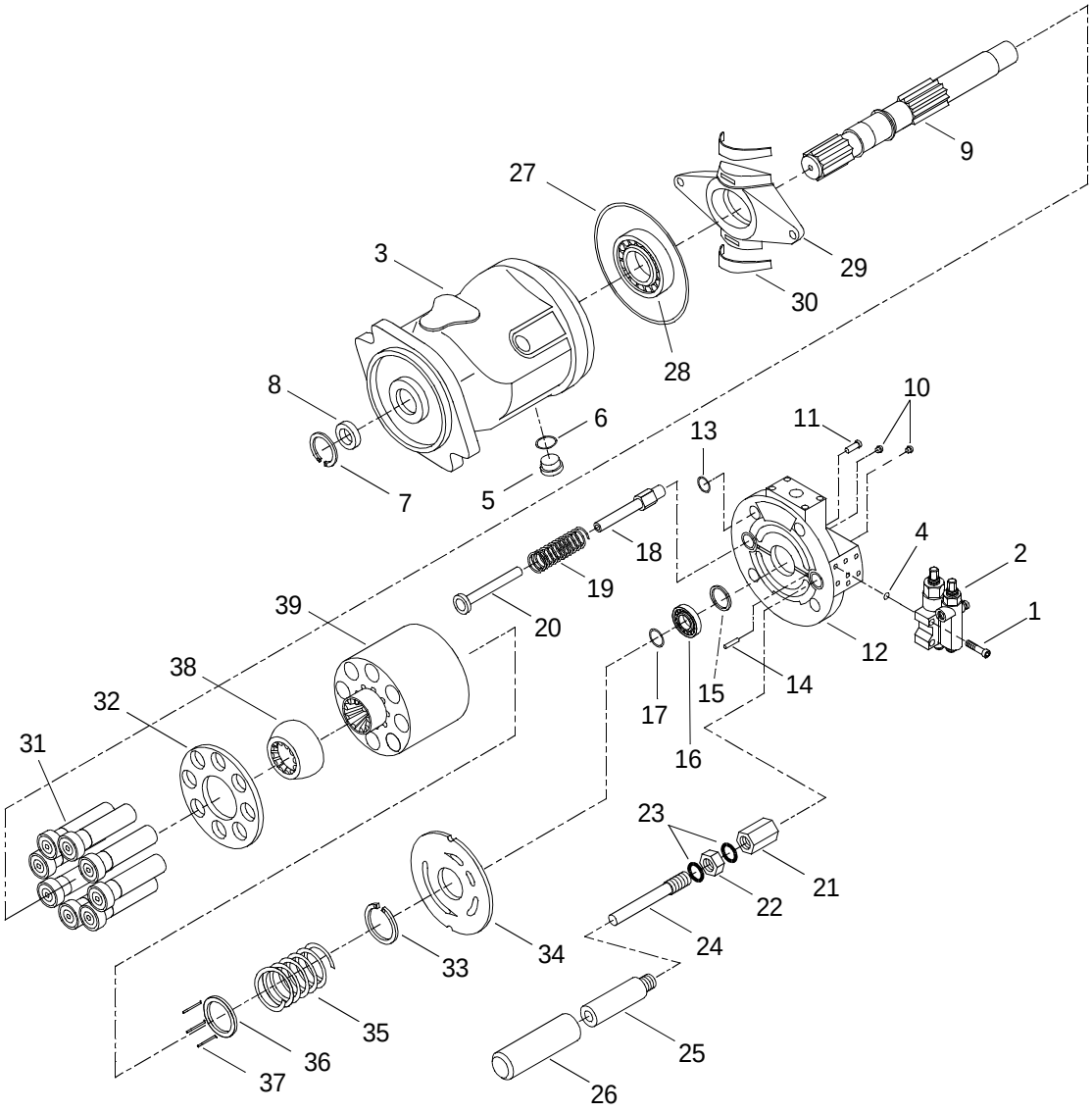
Engineer 88L

DISASSEMBLE HYDRAULIC PUMP

NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the repair of hydraulic pumps.

1. Remove four cap screws (1) securing the pressure adjustment valve assembly (2) to the pump housing (3).



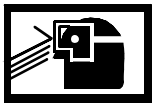
2. Remove pressure adjustment valve assembly (2) and three preformed packings (4). Discard packings.

3. Remove plug (5) and preformed packing (6). Discard packing.

4. Remove v-ring (7) and shaft seal (8) from drive shaft (9).

5. Remove two plugs (10) and four cap screws (11) securing block-port (12) to the pump housing (3). Discard plugs.

WARNING

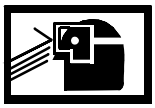


EYE PROTECTION

Components held between block-port and pump housing are spring loaded. Failure to restrain spring loaded components from flying out can cause injury to personnel.

6. Remove block-port (12) from drive shaft (9).
7. Remove and discard four preformed packings (13) and one dowel pin (14) from block-port (12).
8. Remove and discard washer (15), bearing (16) and adjusting disc (17) from drive shaft (9).
9. Remove piston guide (18), spring (19) and counter piston (20) from pump housing (3).
10. Remove acorn nut (21), lock nut (22), two preformed packings (23), adjustment screw (24), piston guide (25) and control piston (26) from pump housing (3). Discard packings.
11. Remove pump housing (3) from drive shaft (9).
12. Remove and discard preformed packing (27) from pump housing (3).
13. Remove bearing (28), cradle assembly (29) and two cradle bearings (30) from drive shaft (9). Discard bearings.
14. Remove nine pistons (31) and retaining plate (32) from drive shaft (9). Discard pistons (31).

WARNING



EYE PROTECTION

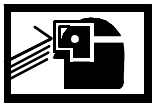
Components held beneath lens plate are spring loaded. Failure to restrain spring loaded components from flying out can cause injury to personnel.

15. Remove retaining ring (33), lens plate (34), spring (35), disc-retaining clip (36) and three pressure pins (37) from drive shaft (9). Discard retaining ring (33), spring (35), disc-retaining clip (36) and pressure pins (37).
16. Use an arbor press to remove the retaining ball (38) and barrel (39) from the drive shaft (9). Discard retaining ball (38).

ASSEMBLE HYDRAULIC PUMP

1. Use an arbor press to install new retaining ball (38) and barrel (39) on the drive shaft (9).
2. Install three new pressure pins (37), new disc-retaining clip (36), new spring (35) and lens plate (34) on the drive shaft (9).

WARNING

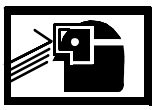


EYE PROTECTION

Components held beneath lens plate are spring loaded. Failure to restrain spring loaded components from flying out can cause injury to personnel.

3. Press down on the lens plate (34) to compress the new spring (35) and install new retaining ring (33) on the drive shaft (9).
4. Position new retaining plate (32) on drive shaft (9).
5. Install nine new pistons (31) into retaining plate (32) and barrel (39).
6. Install new preformed packing (27) in pump housing (3).
7. Install cradle assembly (29), two new cradle bearings (30) and new bearing (28) on drive shaft (9).
8. Install pump housing (3) on drive shaft (9).
9. Install acorn nut (21), lock nut (22), two new preformed packings (23), adjustment screw (24), new piston guide (25) and new control piston (26) in barrel (39).
10. Install piston guide (18), new spring (19) and new counter piston (20) in barrel (39).
11. Install new adjusting disc (17), new bearing (16) and new washer (15) on drive shaft (9).
12. Install four new preformed packings (13) and one new dowel pin (14) in block-port (12).

WARNING



EYE PROTECTION

Components held between block-port and pump housing are spring loaded. Failure to restrain spring loaded components from flying out can cause injury to personnel

13. Position block-port (12) on drive shaft (9) and secure with four cap screws (11).
14. Tighten cap screws (11).
15. Install two new plugs (10) in block-port (12).
16. Install new shaft seal (8) and new v-ring (7) on drive shaft (11).
17. Install plug (5) and new preformed packing (6) in pump housing (3).
18. Position pressure adjustment valve assembly (2) on pump housing (3), securing with four cap screws (1) and new preformed packings (4).
19. Tighten cap screws (1).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC HAND PUMP
SERVICING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Air Filter
(0XS19)
PN 1009814
Lubricating Oil, General Purpose (Item 15, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

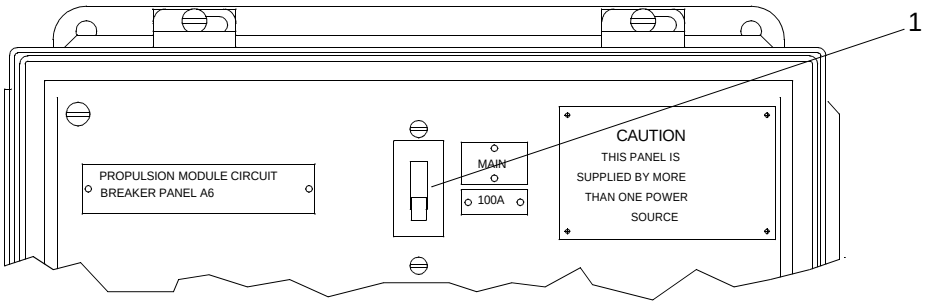
Engineer 88L

SERVICE HYDRAULIC HAND PUMP

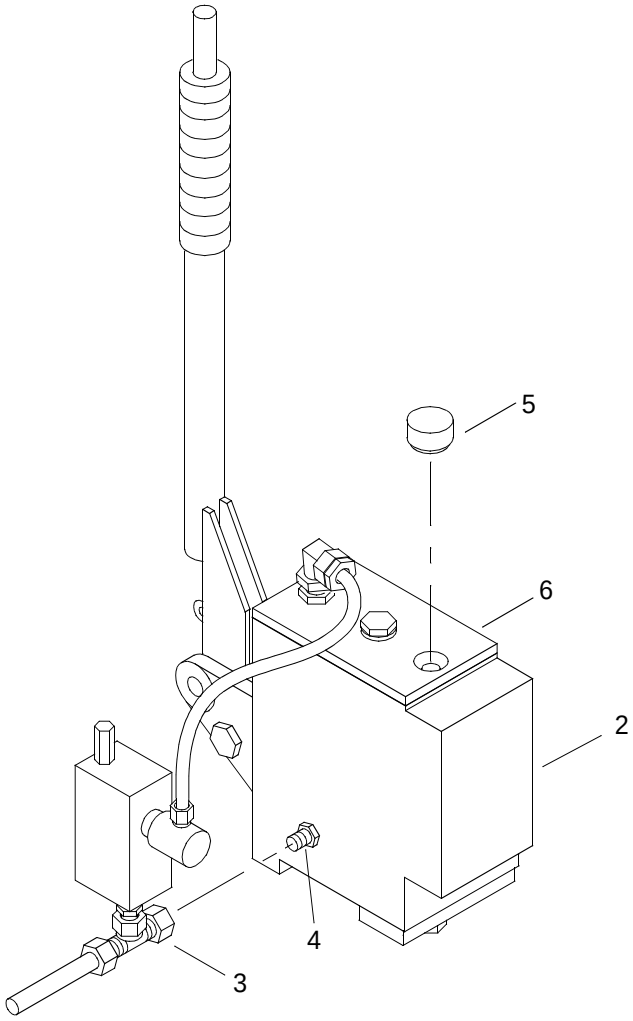
NOTE

The following procedure is typical for servicing both port and starboard hydraulic hand pumps.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

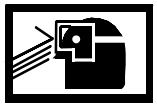


2. Position drain pan under hydraulic hand pump (2).



3. Disconnect fitting (3) from fitting (4).

WARNING



EYE PROTECTION



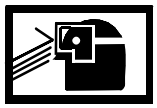
VAPOR

4. Allow hydraulic fluid to drain into drain pan from fitting (4).

5. Remove air filter (5) from cover (6).

6. Discard air filter (5).

WARNING



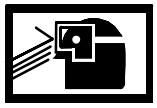
EYE PROTECTION



VAPOR

7. Fill hydraulic hand pump with lubricating oil, through hole in cover (6).

WARNING



EYE PROTECTION



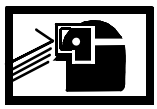
VAPOR

8. Remove drain pan and dispose of contents in accordance with local procedures.
9. Install new air filter(5) in cover (6) and tighten.
10. Install tee (3) on fitting (4) and tighten.

WARNING



VAPOR



EYE PROTECTION



SLICK FLOOR

11. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC HAND PUMP
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Hydraulic Hand Pump
(0XS19)
PN 1060694
Lubricating Oil, General Purpose (Item 15, WP 0382 00)
Adhesive (Item 1, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

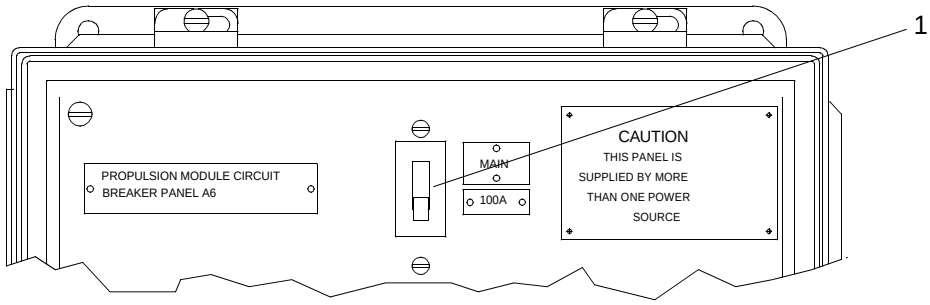
TM 55-1945-205-10-1

REMOVE HYDRAULIC HAND PUMP

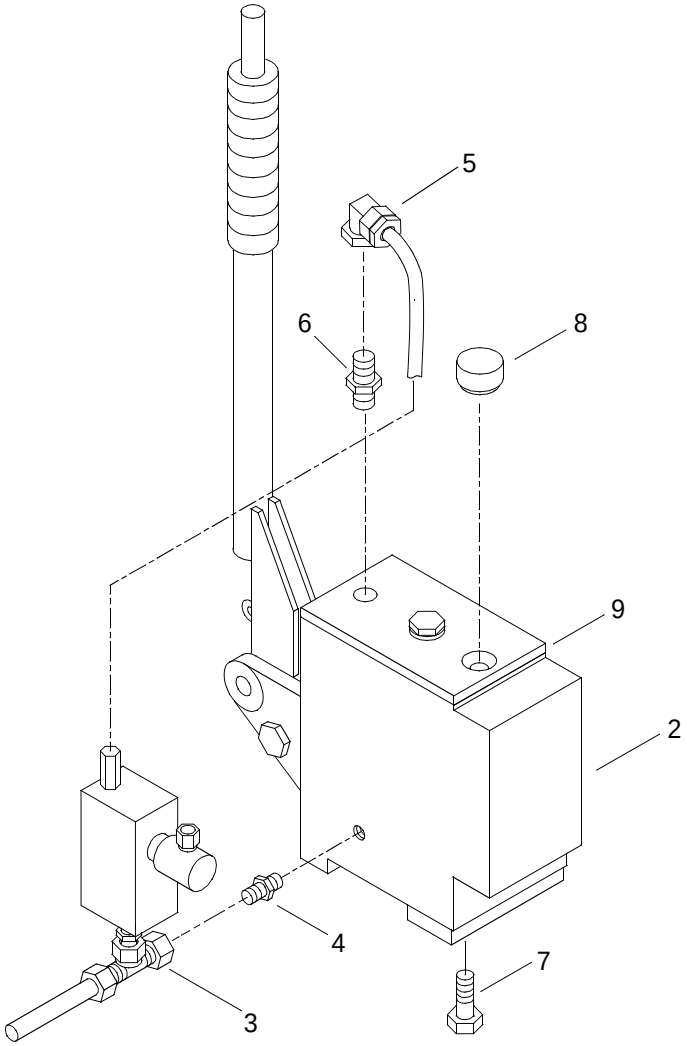
NOTE

The following procedure is typical for the removal and installation of port and starboard hydraulic hand pumps.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

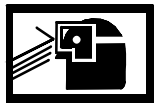


2. Place drain pan under hydraulic hand pump assembly (2) to catch hydraulic fluid.



3. Disconnect adjustable tee fitting (3) from straight stud standpipe fitting (4).

WARNING


EYE PROTECTION


VAPOR

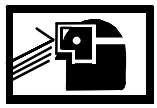
4. Allow hydraulic fluid to drain into drain pan.

5. Disconnect elbow fitting (5) from straight stud standpipe fitting (6).

6. Remove two mounting bolts (7) from hydraulic hand pump (2) and compartment structure.

7. Remove hydraulic hand pump (2) from compartment structure.

WARNING



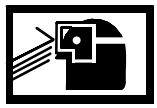
EYE PROTECTION



VAPOR

8. Drain residual hydraulic fluid into drain pan.
9. Remove straight stud standpipe fitting (4) from hydraulic hand pump (2).
10. Retain straight stud standpipe fitting (4).
11. Remove straight stud standpipe fitting (6) from hydraulic hand pump cover (8).
12. Retain straight stud standpipe fitting (6).

WARNING



EYE PROTECTION



VAPOR

13. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC HAND PUMP

1. Install straight stud standpipe fitting (6) on new hydraulic hand pump cover (8).
2. Install straight stud standpipe fitting (4) on new hydraulic hand pump (2).
3. Position new hydraulic hand pump (2) on compartment structure.

WARNING



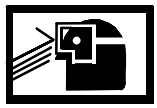
CHEMICAL



EYE PROTECTION

4. Apply adhesive to the threads of the two mounting bolts (7).
5. Install two mounting bolts (7) and secure new hydraulic hand pump (2) to compartment structure.
6. Install elbow fitting (5) on straight stud standpipe fitting (6).
7. Connect adjustable tee fitting (3) to straight stud standpipe fitting (4).
8. Turn air filter (8) counterclockwise and remove from hydraulic hand pump cover (9).

WARNING



EYE PROTECTION



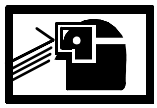
VAPOR

9. Fill hydraulic hand pump with lubricating oil.

10. Install air filter (8) on hydraulic hand pump cover (9) by inserting in hydraulic hand pump cover (9) and turning in a clockwise direction.

11. Perform operational check of hydraulic hand pump. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

12. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC HAND PUMP
BLEEDING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

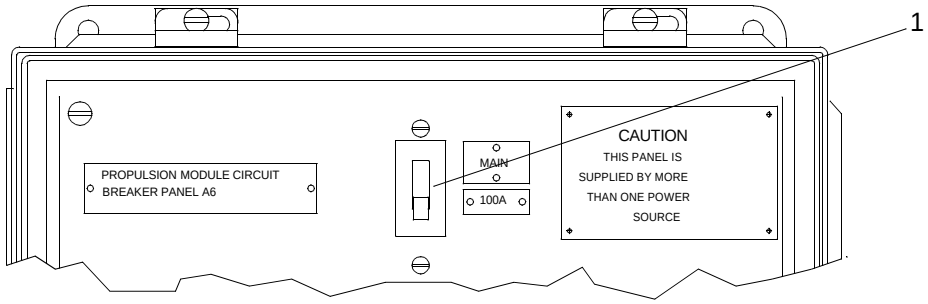
Engineer 88L (2)

BLEED HYDRAULIC HAND PUMP

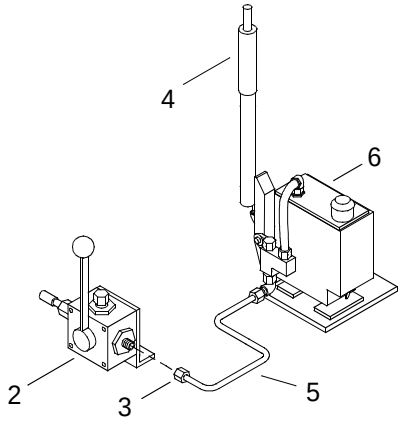
NOTE

The following procedure is typical for bleeding both port and starboard hydraulic hand pumps.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Position drain pan below 3/2 ball valve (2).



WARNING



EYE PROTECTION VAPOR

3. Disconnect fitting (3) from 3/2 ball valve (2).

4. Begin pumping hydraulic hand pump handle (4).

WARNING



EYE PROTECTION VAPOR

5. When fluid coming out of line (5) is free of air bubbles, connect fitting (3) to 3/2 ball valve (2) and tighten.

6. Service hydraulic hand pump (6). (WP 0165 00)

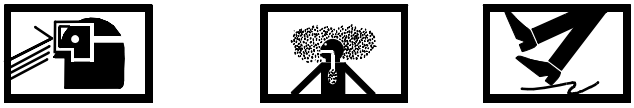
WARNING



EYE PROTECTION VAPOR

7. Remove drain pan and dispose of contents in accordance with local procedures.

WARNING



EYE PROTECTION VAPOR SLICK FLOOR

8. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC WAY-VALVE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Way-Valve
(0XS19)
PN 1088210
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC WAY-VALVE

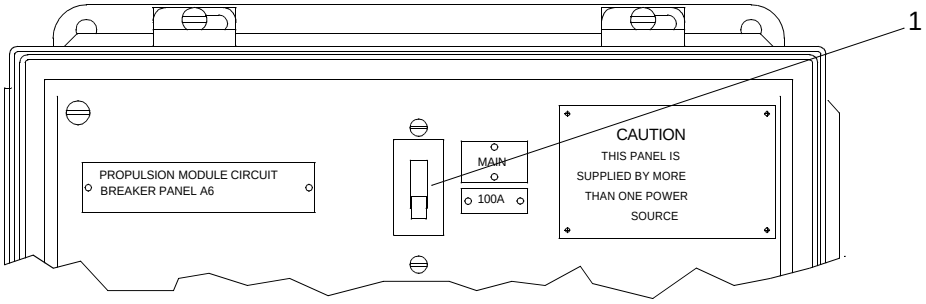
CAUTION

Before removing any hydraulic piping, tag all connections to way-valve. Failure to comply could result in damage to system.

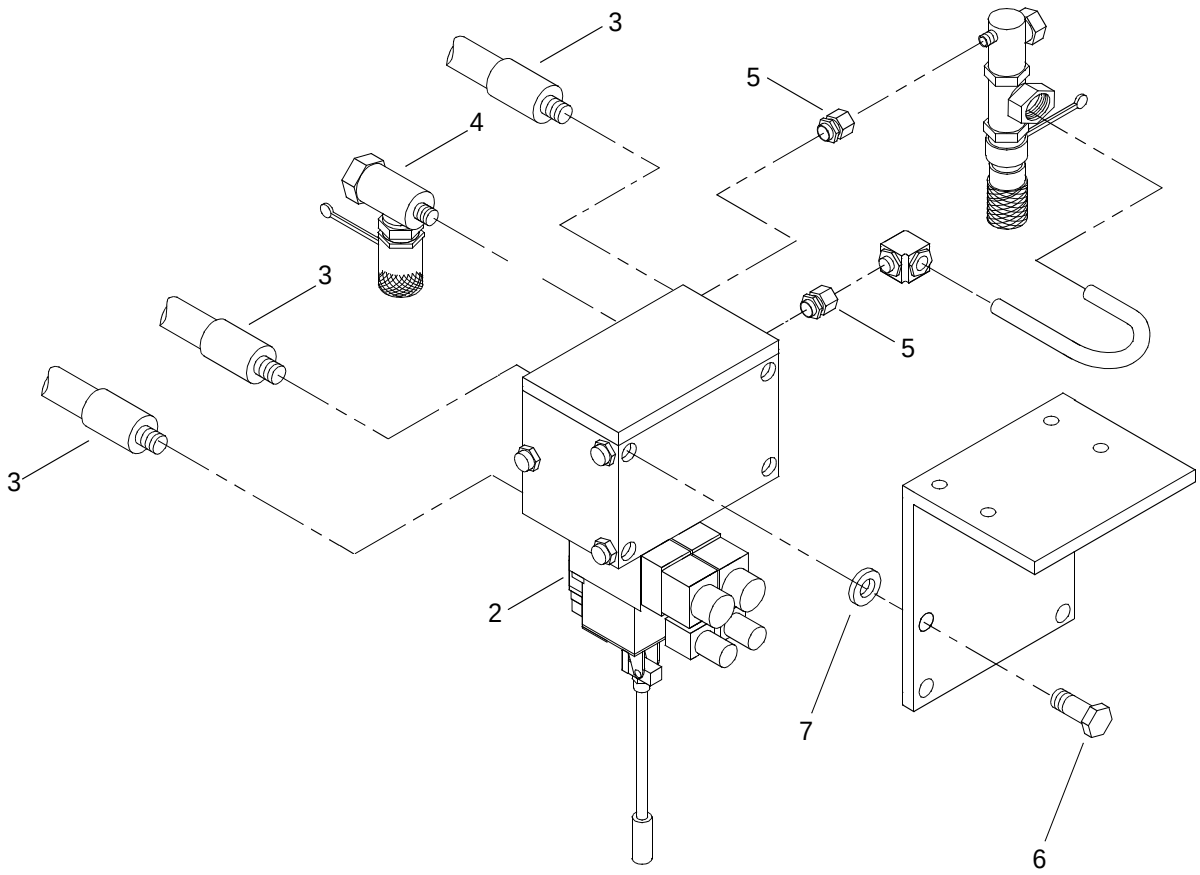
NOTE

The following procedure is typical for the removal and installation of way-valves.

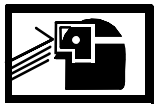
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Position a drain pan beneath the way-valve (2).



WARNING



EYE PROTECTION

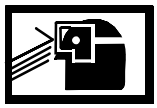


VAPOR

3. Remove three straight thread connectors (3), one nut run swivel tee (4) and two tube end reducers (5) from the way-valve (2).

4. Remove four cap screws (6), four washers (7) and way-valve (2).

WARNING



EYE PROTECTION



VAPOR

5. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC WAY-VALVE

1. Align new way-valve (2) with mounting holes and install four cap screws (6) and four washers (7).
2. Connect two tube end reducers (5), one nut run swivel tee (4) and three straight connectors (3) to way-valve (2).
3. Service hydraulic system reservoir. (WP 0143 00)
4. Vent air from hydraulic system. (WP 0136 00)
5. Perform operational check of hydraulic system. (TM 55-1945-205-10-1)

WARNING



EYE PROTECTION VAPOR SLICK FLOOR

6. Clean up spilled fluid with spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC WAY-VALVE
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

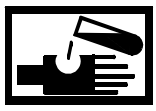
Packing, Preformed
(0XS19)
PN 1088210-2
Packing, Preformed
(0XS19)
PN 1088210-4
Packing, Preformed
(0XS19)
PN 1088210-5
Packing, Preformed
(0XS19)
PN 1088210-7.2
Packing, Preformed
(0XS19)
PN 1088210-8
Packing, Preformed
(0XS19)
PN 1088210-20
Packing, Preformed
(0XS19)
PN 1088210-25
Packing, Preformed
(0XS19)
PN 1088210-40
Seal
(0XS19)
PN 1088210-9
Seal
(0XS19)
PN 1088210-16
Seal
(0XS19)
PN 1088210-26

Personnel Required

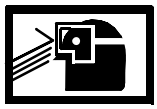
Engineer 88L

REPAIR HYDRAULIC WAY-VALVE

WARNING

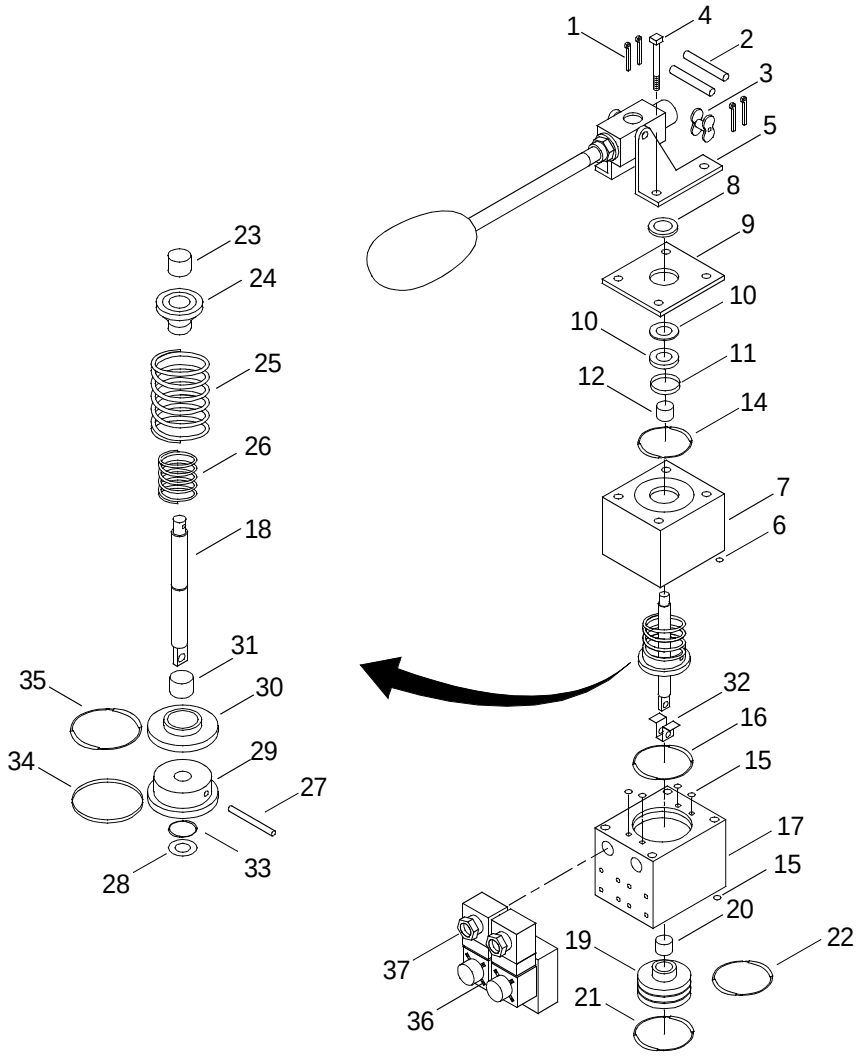


CHEMICAL



EYE PROTECTION

1. Remove four circlips (1), two pins (2) and collecting link (3).



2. Remove four bolts (4) from free block (5) with control rod.

3. Discard preformed packing (6).

4. Pull block (5) out of housing (7) and collect dust ring (8), cover (8), ring (10), ring (11), bushing (12) and housing (7).

5. Discard seal (13) and preformed packing (14).

6. Remove and discard five preformed packings (15) and one preformed packing (16) from block valve (17).

7. Remove push-pull rod assembly (18) from block valve (17). Collect bushings (19 and 20). Discard preformed packing (21 and 22).

8. Remove and retain bushing (23), support (24), spring (25) and spring (26) from push-pull rod assembly (18).

9. Remove pin (27) and collect disc (28), piston (29), support (30), bushing (31) and clamp (32) from push-pull rod (18). Discard preformed packings (33, 34 and 35).

10. Remove eight screws (36) and remove electric control valve (37) from block valve (17).

11. Inspect all components for burrs, foreign matter, dirt, rust, corrosion and loose or broken parts.

NOTE

Repair is limited to replacement of defective parts as necessary or identified for mandatory replacement in the following steps.

12. Replace electric control valve (37) on block valve (17).
13. Secure electric control valve (37) to block valve (17) with eight screws (36).
14. Replace clamp (32), bushing (31), support (30), piston (29), new preformed packings (33, 34, 35) and disc (28) on push-pull rod (18) and secure with pin (27).
15. Replace springs (25, 26) and install support (24) and bushing (23) on push-pull rod (18).
16. Replace bushing (20), new preformed packing (22), bushing (19) and new preformed packing (21) into block valve (17).
17. Install new preformed packings (15, 16) on block valve (17).
18. Position new preformed packing (6) and housing (7) on block valve (17).
19. Position new preformed packing (14), bushing (12), ring (11), new seal (13) and ring (10) on housing (7).
20. Position new preformed packing (6) and housing (7) on block valve (17).
21. Position cover (9) and dust ring (8) on housing (7).
22. Position block (5) with control rod over end of push-pull rod (18) and secure with four bolts (4).
23. Position connecting link (3) on push-pull rod (18) and insert pins (2). Secure with circlips (1).
24. Install hydraulic way-valve. (WP 0168 00)
25. Service hydraulic system reservoir. (WP 0143 00)
26. Vent air from hydraulic system. (WP 0136 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HYDRAULIC SYSTEM 3/2 BALL VALVE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

3/2 Ball Valve
(78286)
PN 386245
Lubricating Oil, General Purpose (Item 15, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

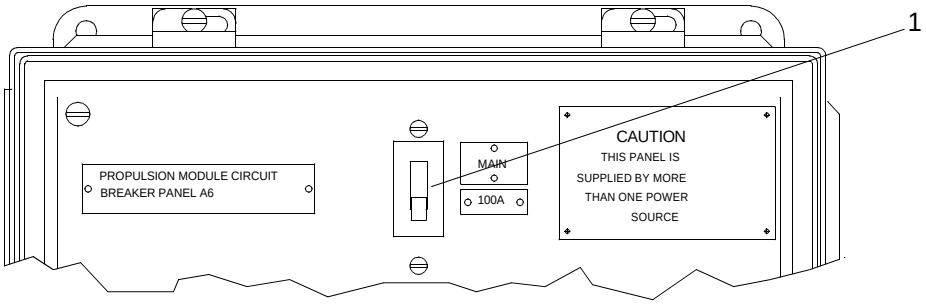
Hydraulic System Pressure Vented. (WP 0136 00)

REMOVE HYDRAULIC SYSTEM 3/2 BALL VALVE

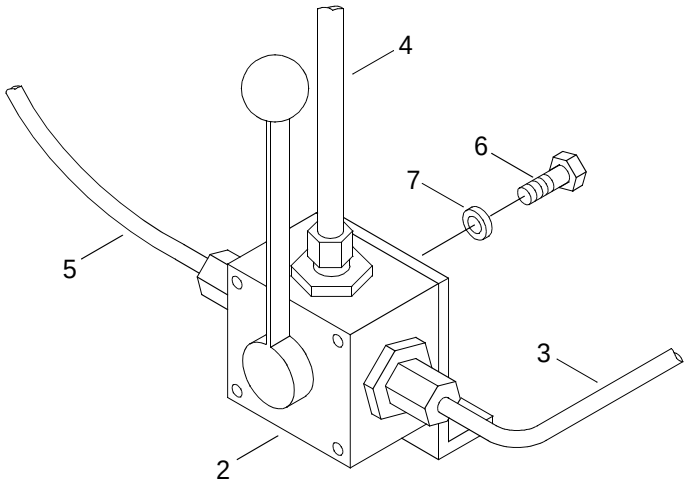
NOTE

The following procedure is typical for the removal and installation of 3/2 ball valves.

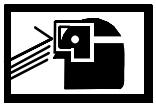
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Position drain pan beneath ball valve (2).



WARNING


EYE PROTECTION


VAPOR

3. Disconnect tube (3) from ball valve (2).

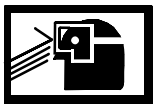
4. Disconnect tube (4) from ball valve (2).

5. Disconnect hose (5) from ball valve (2).

6. Remove cap screws (6) and washers (7) attaching ball valve to bulkhead.

7. Remove ball valve (2) from bulkhead.

WARNING


EYE PROTECTION


VAPOR

8. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL HYDRAULIC SYSTEM 3/2 BALL VALVE

1. Position new ball valve (2) on bulkhead.

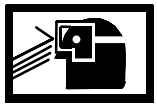
2. Install cap screws (6) and washers (7).

3. Tighten cap screws (6).

4. Connect tube (3) to the ball valve (2).

5. Connect tube (4) to ball valve (2).
6. Connect hose (5) to ball valve (2).
7. Service hydraulic reservoir. (WP 0143 00)
8. Vent air from hydraulic system. (WP 0136 00)
9. Start engine. (TM 55-1945-205-10-1)
10. Energize hydraulic system and functionally test ball valve (2).
11. Shut engine down. (TM 55-1945-205-10-1)
12. Service hydraulic hand pump. (WP 0165 00)

WARNING



EYE PROTECTION



VAPOR



SLICK FLOOR

13. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
PUMP-JET PLANETARY GEARING FEEDBACK UNIT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Brush, Stencil (Soft Bristle) (Item 3, WP 0383 00)

Materials/Parts

Feedback Unit
(0XS19)
PN 1109134
Preformed Packing
(0XS19)
PN 1001402
Cleaner (Item 5, WP 0382 00)
Grease, Automotive and Artillery (Item 8, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

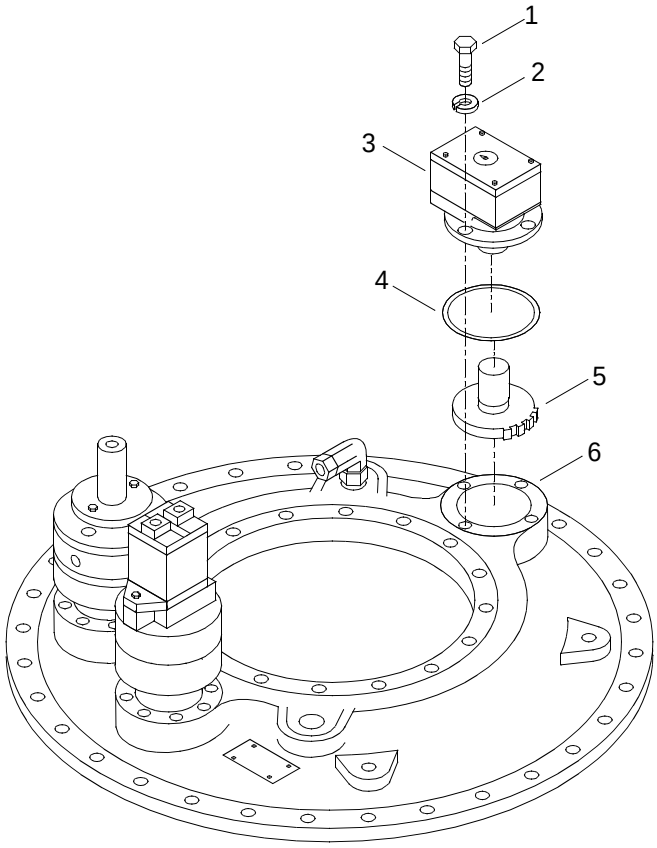
Pump-Jet Gearcase Drained. (WP 0128 00)

REMOVE PLANETARY GEARING FEEDBACK UNIT

NOTE

The following procedure is typical for both port and starboard feedback units.

1. Remove four hexagon cap screws (1) and spring washers (2) from feedback unit (3).



WARNING

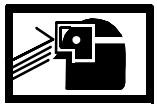

CHEMICAL


EYE PROTECTION

2. Remove the feedback unit (3) and discard preformed packing (4).

WARNING


CHEMICAL


EYE PROTECTION

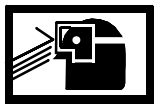
3. Lift feedback unit gear (5) out of pump-jet mounting base (6).

INSTALL PLANETARY GEARING FEEDBACK UNIT

WARNING



CHEMICAL



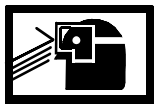
EYE PROTECTION

1. Clean gear (6) and mounting area with cleaner and brush.
2. Ensure all surfaces are free of dirt or rust.

WARNING



CHEMICAL



EYE PROTECTION

3. Install gear (5) in pump-jet mounting base (6).

WARNING



CHEMICAL



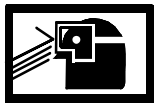
EYE PROTECTION

4. Apply grease to preformed packing groove and install new preformed gasket (4) on gearbox mounting base (6).

WARNING



CHEMICAL



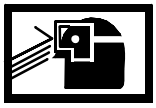
EYE PROTECTION

5. Position new feedback unit (5) on the pump-jet mounting base (6).
6. Install four hexagon cap screws (1) and spring washers (2) to secure feedback unit (3) to the pump-jet (7).
7. Service pump-jet gearcase. (WP 0128 00)
8. Adjust hydraulic steering system as required. (WP 0139 00)
9. Perform operational check of pump-jet. (TM 55-1945-205-10-1)

WARNING



CHEMICAL



EYE PROTECTION



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ALTERNATOR BELT GUARD
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)

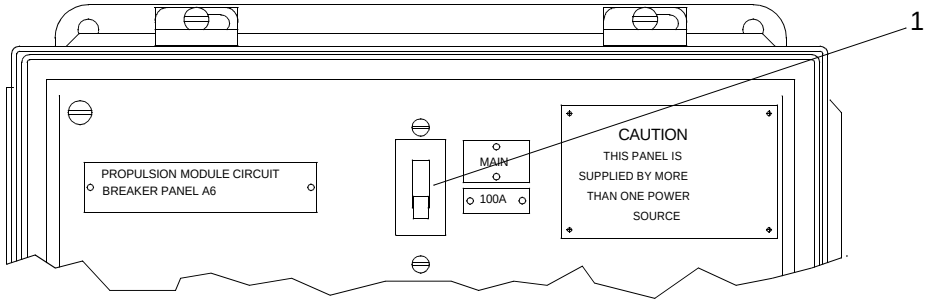
Personnel Required
Engineer 88L

REMOVE ALTERNATOR BELT GUARD

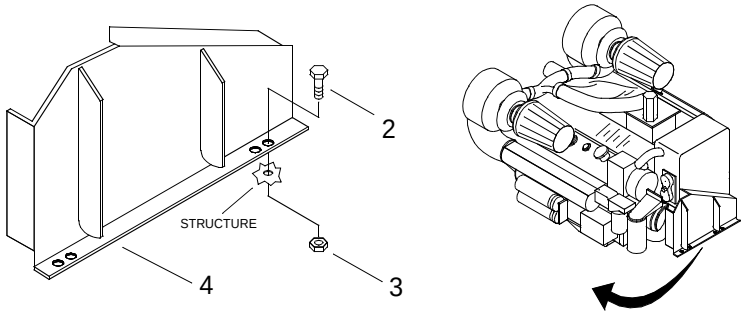
NOTE

The following procedure is typical for the removal and installation of alternator belt guards.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove four hex head cap screws (2) and hex head nuts (3) securing alternator belt guard (4).



3. Remove alternator belt guard (4).

INSTALL ALTERNATOR BELT GUARD

1. Position belt guard (4) over alternator belt.
2. Install four hex head cap screws (2) and hex head nuts (3).
3. Tighten nuts (3).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ALTERNATOR DRIVE BELTS
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)

Materials/Parts

Alternator Drive Belts
(71176)
PN A43
Qty 2

Personnel Required

Engineer 88L

Equipment Condition

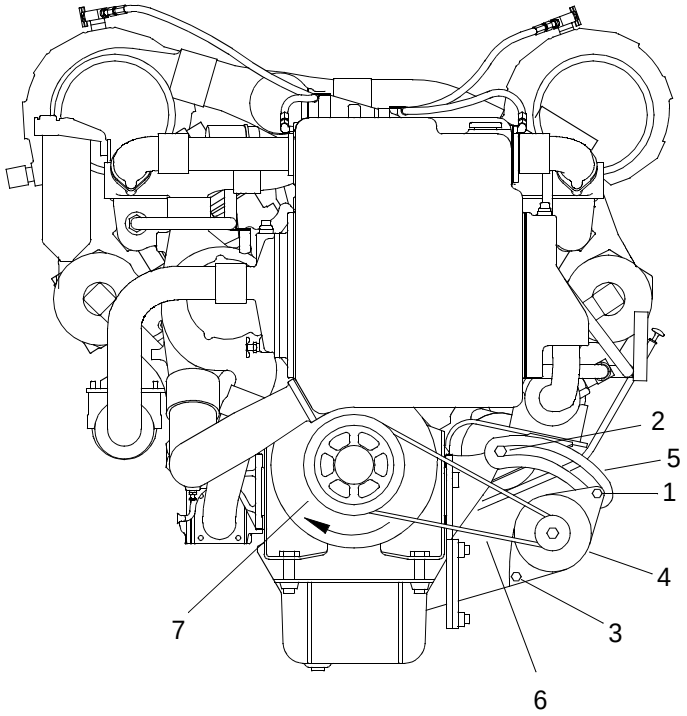
Powered Section Main Batteries Negative Lead Terminals Removed. (WP 0198 00)
Alternator Belt Guard Removed. (WP 0172 00)

REMOVE ALTERNATOR DRIVE BELTS

NOTE

The following procedure is typical for the removal and installation of alternator drive belts.

1. Loosen hex head cap screws (1, 2 and 3) until alternator (4) moves freely in the adjustable alternator link (5).



2. Remove the two alternator belts (6).

INSTALL ALTERNATOR DRIVE BELTS

1. Install the two new alternator belts (6) over the alternator (4) and the engine pulley (7).
2. Adjust the alternator belt tension. (WP 0175 00)
3. Install alternator belt guard. (WP 0172 00)
4. Install powered section main batteries negative lead terminals. (WP 0198 00)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ALTERNATOR
REPLACEMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)

Materials/Parts
Alternator
(72582)
PN 7.1000A

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

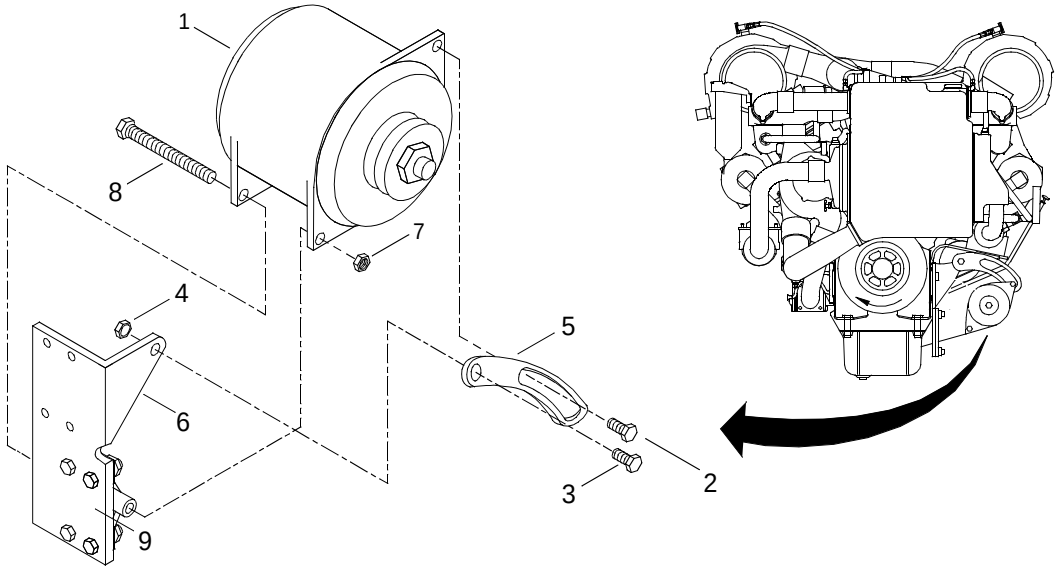
Equipment Condition
Powered Section Main Batteries Negative Lead Terminals Removed. (WP 0198 00)
Alternator Belt Guard Removed. (WP 0172 00)
Alternator Belts Removed. (WP 0173 00)

REMOVE ALTERNATOR

NOTE

The following procedure is typical for the removal and installation of alternators.

1. Disconnect and tag all wiring attached to the alternator (1).



2. Remove hex head cap screw (2).

3. Loosen hex head cap screw (3) and nut (4) and raise the adjustable alternator link (5) up and out of the way.

4. Tighten hex head cap screw (3) and nut (4) on the alternator mounting plate (6). The link does not have to be removed.

5. Supporting the alternator (1), remove self-locking hex nut (7) and hex head cap screw (8).

6. Remove alternator (1) from bracket (9).

INSTALL ALTERNATOR

1. Supporting the new alternator (1), position alternator (1) on bracket (9) and install hex head cap screw (8) and self-locking hex nut (7). Tighten sufficiently to hold alternator (1) in place.

2. Loosen hex head cap screw (3) and nut (4) and reposition adjustable alternator link (5) on alternator (1).

3. Install hex head cap screw (2) loosely.

4. Install the alternator belts. (WP 0173 00)

5. Adjust alternator belt tension. (WP 0175 00)

6. Connect alternator wiring.

7. Remove electrical wiring tags.

8. Install alternator belt guard. (WP 0172 00)

9. Install powered section main batteries negative lead terminals. (WP 0198 00)

10. Perform operational check of diesel engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ALTERNATOR DRIVE BELTS
ADJUSTMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Crowbar (Item 9, WP 0383 00)
Scale, Tension (Item 31, WP 0383 00)

Personnel Required

Engineer 88L

Equipment Condition

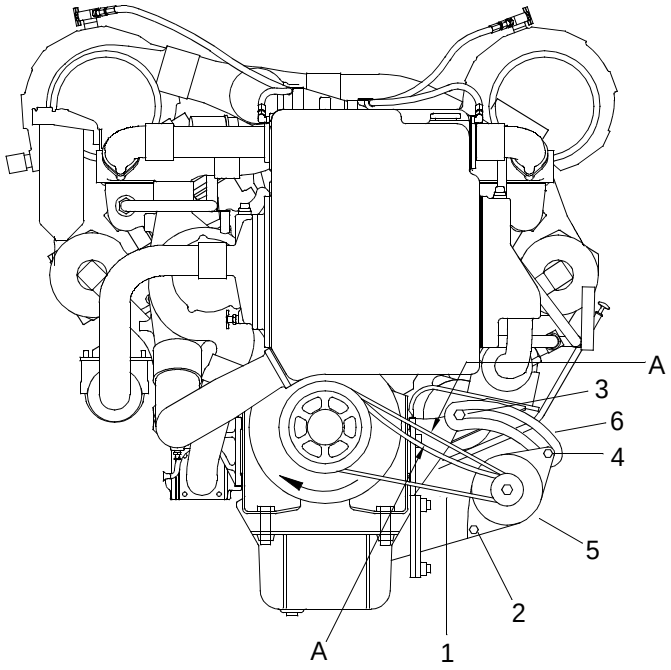
Alternator Belt Guard Removed. (WP 0172 00)

ADJUST ALTERNATOR DRIVE BELTS

NOTE

The following procedure is typical for the adjustment of alternator drive belts.

1. Use tension scale to apply 22.1 lb (10 kg) inward pull pressure on the alternator drive belts (1).



2. Measure belt deflection to ensure dimension "A" is between 0.28 in. to 0.35 in. (7 to 9 mm). If the measurement is not within limits, proceed as follows:

   a. Loosen hex head cap screws (2, 3 and 4) just enough to allow the alternator (5) to move slightly in the adjustable alternator link (6).

   b. Using a crowbar, apply pressure against the alternator (5) housing to increase the tension on the belts (1).

c. Tighten hex head cap screws (2, 3 and 4).

d. Measure the belt deflection (Step 2).

e. Repeat steps (a, b, c and d) until belt deflection is within limits.

3. Install alternator belt guard. (WP 0172 00)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ENGINE EXHAUST SYSTEM
REMOVAL, INSPECTION AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Sling, 5300 lb 6 ft (Green) (Item 37, WP 0383 00)
Qty 2

Materials/Parts

Gasket, Exhaust Port
(34712)
PN E26698-7
Gasket
(34712)
PN E26698-17

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

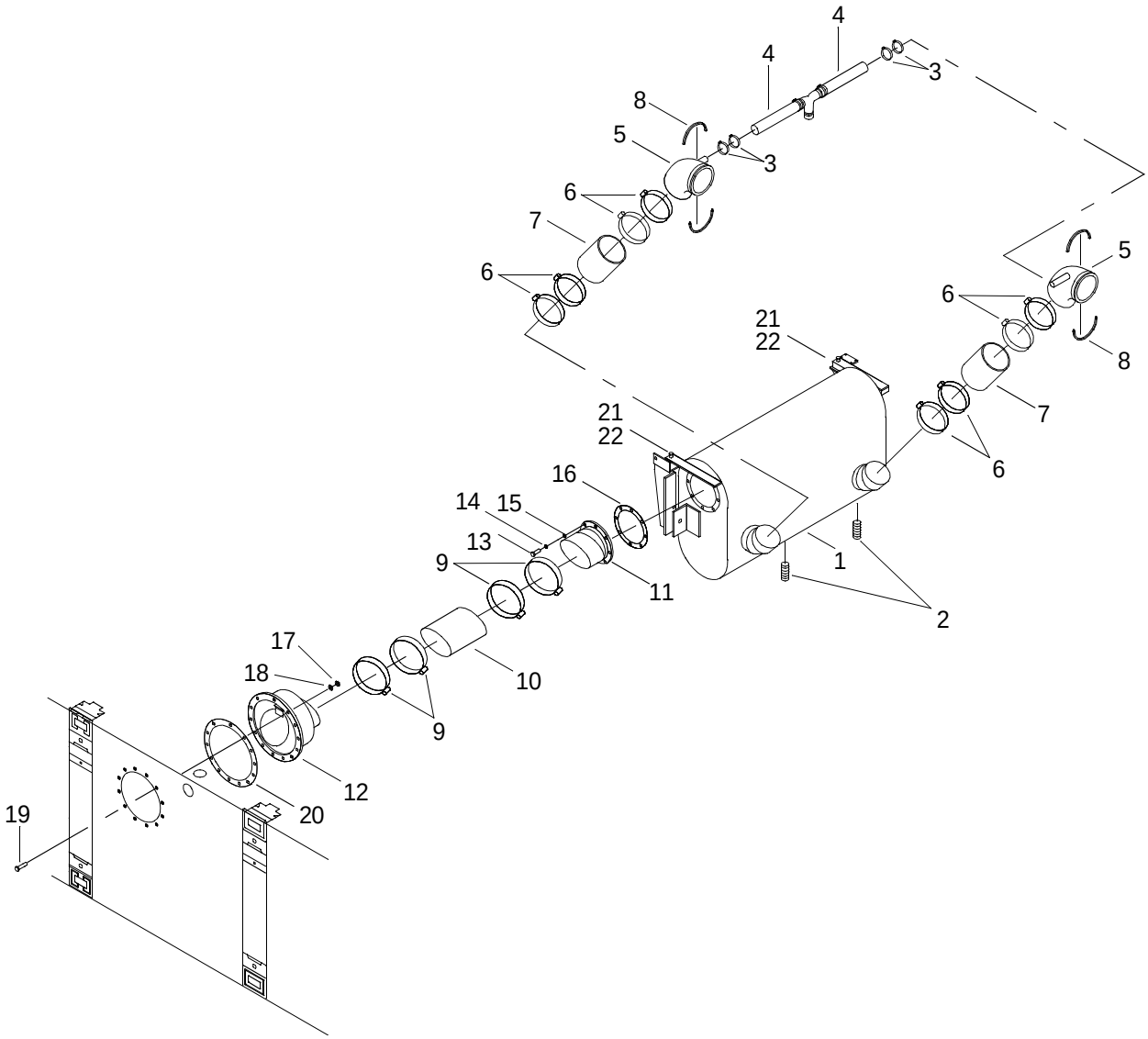
Propulsion Module Dry-Docked.
Engine and Exhaust System Cool To Touch.
Main Mast Navigation Assembly Removed. (WP 0328 00)
SINCGARS Antenna Removed. (TM 11-5820-890-10-8)
Powered Section Exhaust Plenum Removed. (WP 0092 00)
Powered Section Operators Cab Removed. (WP 0098 00)
Powered Section Intake Plenum Assembly Removed. (WP 0097 00)
Powered Section Engine Hatch Removed. (WP 0099 00)

REMOVE ENGINE EXHAUST SYSTEM

NOTE

The following procedure is typical for the removal and installation of both port and starboard engine exhaust systems.

1. On bottom of muffler (1), remove two drain plugs (2) and drain raw water from muffler (1) into bilge.



2. Loosen two hose clamps (3) at both ends of both hoses (4) between the elbow exhausts (5).
3. Disconnect hoses (4) and clamps (3) from elbow exhausts (5).
4. Loosen eight T-bolt clamps (6) securing two hump hoses (7).
5. Remove two turbo install kits (8) from left hand and right hand elbow exhausts (5).
6. Remove elbow exhausts (5) and retain hoses (7) and T-bolt clamps (6).
7. Remove four T-bolt clamps (9) securing hose (10) between muffler adaptor (11) and thru-hull housing (12).
8. Remove cap screws (13), lock washers (14) and flat washers (15) from muffler adaptor (11).
9. Remove muffler adaptor (11) and discard gasket (16).
10. Remove hex nuts (17), flat washers (18) and cap screws (19) from thru-hull housing (12).

11. Remove thru-hull housing (12) and discard gasket (20).

12. Attach crane and sling to muffler (1).

13. Remove nuts (21) and bolts (22) securing muffler body (1) to vessel structure bracket.

WARNING



HEAVY PARTS

14. Using crane and sling, remove engine exhaust muffler (1).

15. Remove sling from engine exhaust muffler (1).

INSPECT ENGINE EXHAUST SYSTEM

1. Inspect muffler body (1), thru-hull housing assembly (12) and elbows (5) for corrosion, cracks or other damage. Replace if damaged.

2. Inspect hoses (4, 7, 10) for punctures, cracks or deterioration. Replace if damaged.

INSTALL ENGINE EXHAUST SYSTEM

WARNING



HEAVY PARTS

NOTE

Replace all seals and gaskets when installing muffler system.

1. Using crane and sling, position muffler body (1) to vessel structure brackets and secure with nuts (21) and bolts (22).

2. Tighten nuts (21).

3. Position new gasket (20) and thru-hull housing (12) on side of vessel structure and secure with hex nuts (17), flat washers (18) and cap screws (19).

4. Tighten nuts (17).

5. Position muffler adaptor (11) and new gasket (16) on muffler (1) and secure with cap screws (13), lock washers (14) and flat washers (15).

6. Tighten cap screws (15).

7. Install hose (10) between muffler adaptor (15) and thru-hull housing (12) and secure with four T-bolt clamps (9).

8. Tighten clamps (9).
9. Position two hump hoses (7) and elbow exhausts (5) and secure with eight T-bolt clamps (6).
10. Tighten clamps (6).
11. Install two turbo install kits (8) on left hand and right hand elbow exhausts (5).
12. Position hoses (4) on both elbow exhausts (5) and secure with four clamps (3).
13. Tighten clamps (3).
14. Install two drain plugs (2) on bottom of muffler (1).
15. Tighten drain plugs (2).
16. Remove sling from engine exhaust muffler (1).
17. Install powered section engine hatch. (WP 0099 00)
18. Install powered section operators cab. (WP 0098 00)
19. Install powered section exhaust plenum. (WP 0092 00)
20. Install SINCGARS antenna. (TM 11-5820-890-10-8)
21. Install main mast navigation assembly. (WP 0328 00)
22. Start the engine to activate the bilge pumps. (TM 55-1945-205-10-1)
23. Shut down the engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ENGINE EXHAUST MUFFLER
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Sling, 5300 lb 6 ft (Green) (Item 37, WP 0383 00)
Qty 2

Materials/Parts

Gasket, Exhaust Port
(34712)
PN E26698-7
Gasket
(34712)
PN E26698-17

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

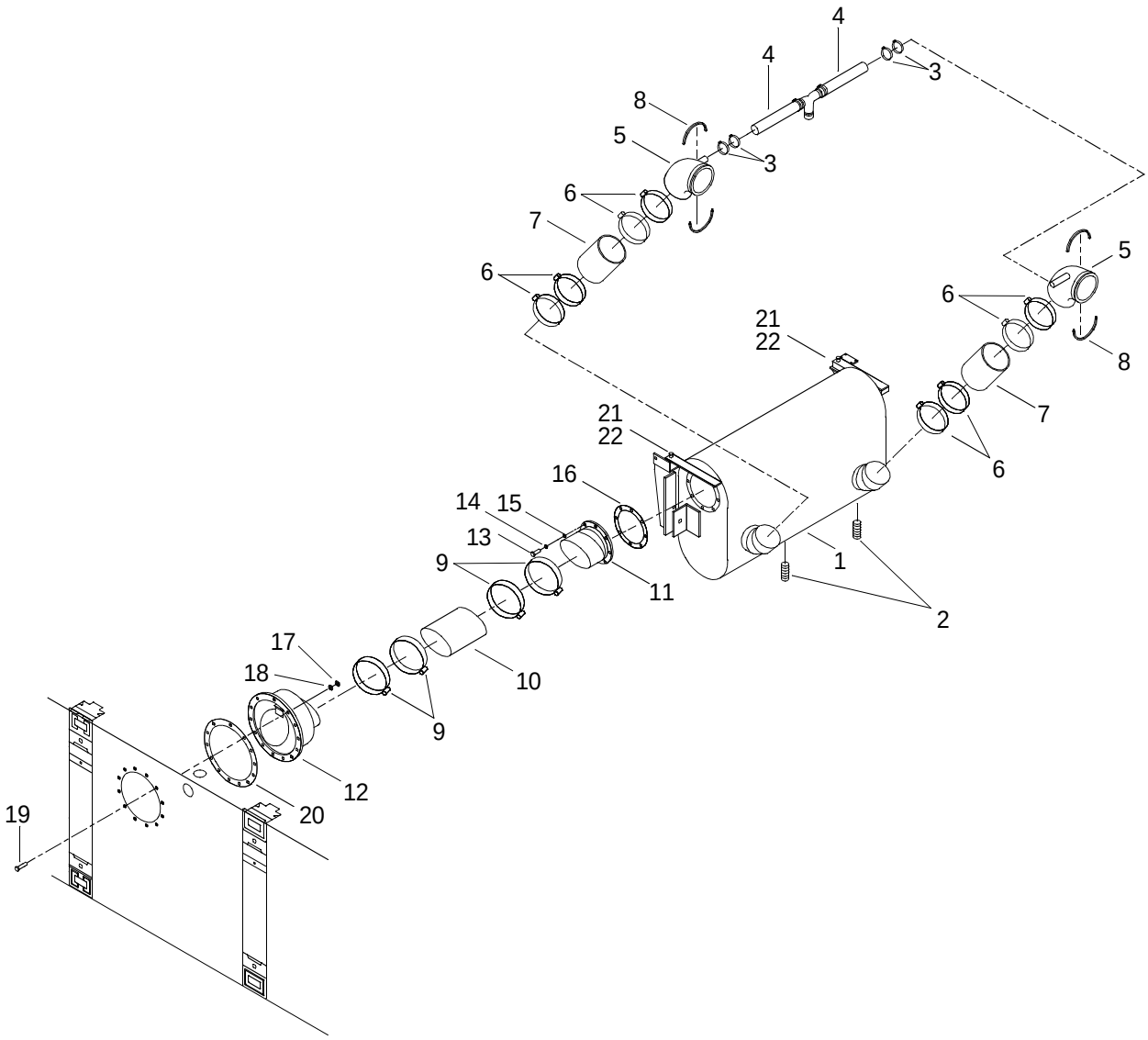
Main Mast Navigation Assembly Removed. (WP 0328 00)
SINCGARS Antenna Removed. (TM 11-5820-890-10-8)
Powered Section Operators Cab Removed. (WP 0098 00)
Powered Section Intake Plenum Assembly Removed. (WP 0087 00)
Powered Section Engine Hatch Removed. (WP 0099 00)

REMOVE ENGINE EXHAUST MUFFLER

NOTE

The following procedure is typical for the removal and installation of both port and starboard engine exhaust systems.

1. On bottom of muffler (1), remove two drain plugs (2) and drain raw water from muffler (1). into the bilge.



2. Loosen two hose clamps (3) at both ends of both hoses (4) between the elbow exhausts (5).
3. Disconnect hoses (4) and clamps (3) from elbow exhausts (5).
4. Loosen eight T-bolt clamps (6) securing two hump hoses (7).
5. Remove two turbo install kits (8) from left hand and right hand elbow exhausts (5).
6. Remove elbow exhausts (5) and retain hoses (7) and T-bolt clamps (6).
7. Remove four T-bolt clamps (9) securing hose (10) between muffler adaptor (11) and thru-hull housing (12).
8. Remove cap screws (13), lock washers (14) and flat washers (15) from muffler adaptor (11).
9. Remove muffler adaptor (11) and discard gasket (16).
10. Remove hex nuts (17), flat washers (18), and cap screws (19) from thru-hull housing (12).

11. Remove thru-hull housing (12) and discard gasket (20).

12. Attach crane and sling to muffler (1).

13. Remove nuts (21) and bolts (22) securing muffler body (1) to vessel structure bracket.

WARNING



HEAVY PARTS

14. Using crane and sling, remove engine exhaust muffler (1).

15. Remove sling from engine exhaust muffler (1).

INSTALL ENGINE EXHAUST MUFFLER

WARNING



HEAVY PARTS

NOTE

Replace all seals and gaskets when installing muffler system.

1. Using crane and sling, position new muffler body (1) to vessel structure bracket and secure with nuts (21) and bolts (22).

2. Tighten nuts (21).

3. Position new gasket (20) and thru-hull housing (12) and secure with hex nuts (17), flat washers (18) and cap screws (19).

4. Tighten nuts (17).

5. Position muffler adaptor (11) and new gasket (16) on muffler (1) and secure with cap screws (13), lock washers (15) and flat washers (15).

6. Tighten cap screws (15).

7. Install hose (10) between muffler adaptor (15) and thru-hull housing (12) and secure with four T-bolt clamps (9).

8. Tighten clamps (9).

9. Position two hump hoses (7) and elbow exhausts (5) and secure with eight T-bolt clamps (6).

10. Tighten clamps (6).

11. Install two turbo install kits (8) on left hand and right hand elbow exhausts (5).

12. Position hoses (4) on both elbow exhausts (5) and secure with four clamps (3).
13. Tighten clamps (3).
14. Install two drain plugs (2) on bottom of muffler (1).
15. Tighten drain plugs (2).
16. Remove sling from engine exhaust muffler (1).
17. Install powered section engine hatch. (WP 0099 00)
18. Install powered section intake plenum assembly. (WP 0087 00)
19. Install powered section operators cab. (WP 0098 00)
20. Install SINCGARS antenna. (TM 11-5820-890-10-8)
21. Install main mast navigation assembly. (WP 0328 00)
22. Start the engine to activate the bilge pumps. (TM 55-1945-205-10-1)
23. Shut down the engine. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP FLOAT SWITCH
CLEANING AND TESTING

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts
Cloth, Cleaning (Item 6, WP 0382 00)

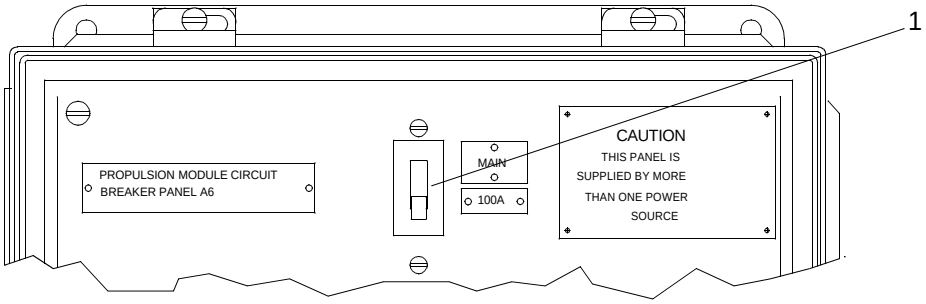
Personnel Required
Engineer 88L

CLEAN BILGE PUMP FLOAT SWITCH

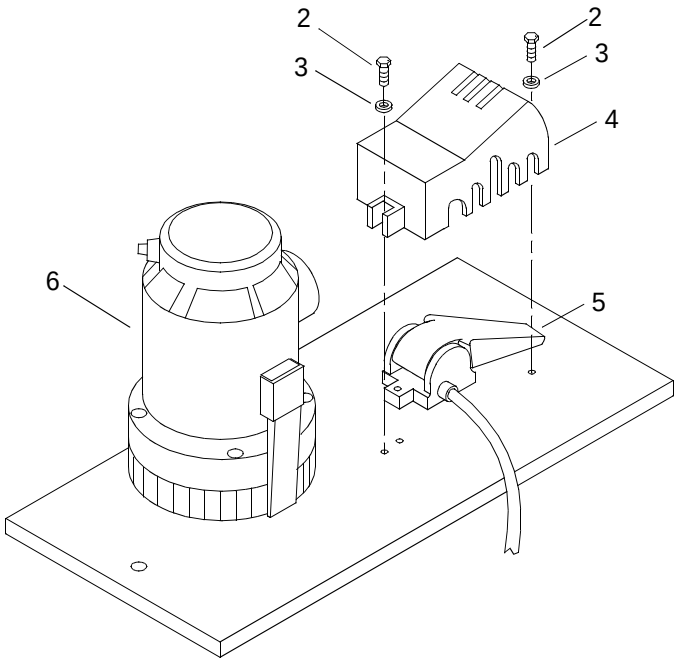
NOTE

The following procedure is typical for all bilge pump float switches.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



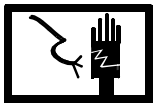
2. Remove two screws (2) and two washers (3) from float switch cover (4).



3. Remove the float switch cover (4).

4. Using clean, lint free cloth, clean debris and obstructions from the float switch (5).

WARNING



ELECTRICAL

5. Position MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to on.

TEST BILGE PUMP FLOAT SWITCH

CAUTION

Do not operate the pump for an excessive amount of time if no water is present in the bilge. Failure to comply could cause damage to equipment.

1. Temporarily hold the float switch (5) in the on position by raising the float.

2. Verify bilge pump (6) operates.

3. Release the float switch (5).

4. Verify bilge pump (6) shuts off.

5. Position the float switch cover (4) over float switch (5).

6. Install two screws (2) and two washers (3).

7. Tighten screws (2).

8. Position MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to off.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP CHECK VALVE AND DISCHARGE HOSE
REMOVAL, CLEANING, INSPECTION AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Cloth, Cleaning (Item 6, WP 0382 00)
Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

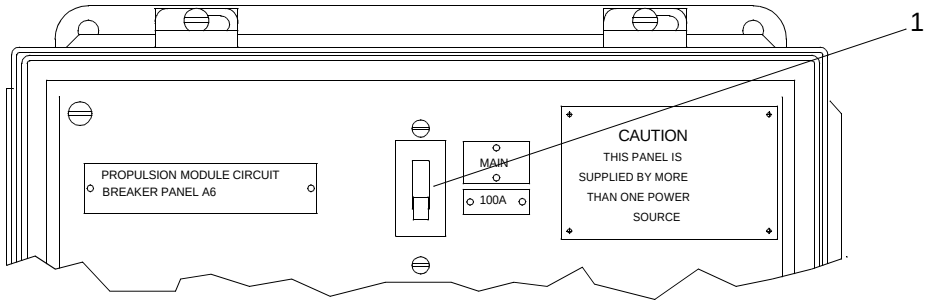
TM 55-1945-205-10-1

REMOVE BILGE PUMP CHECK VALVE AND DISCHARGE HOSE

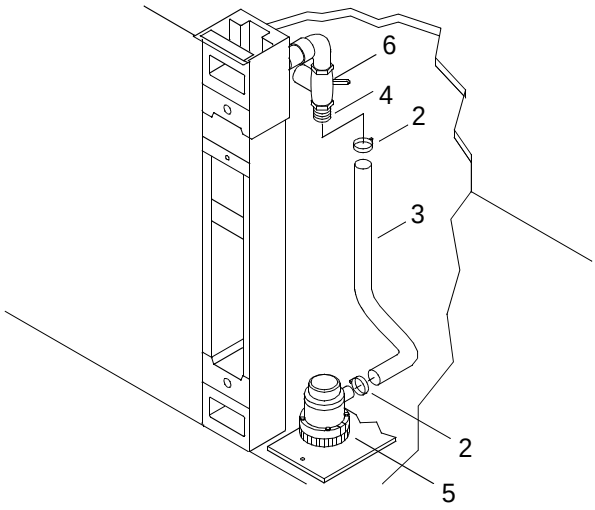
NOTE

The following procedure is typical for all bilge pump check valves.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove clamps (2) from discharge hose (3).



3. Remove discharge hose (3) from nipple (4).
4. Remove discharge hose (3) from bilge
5. Remove nipple (4) from check valve (6).
6. Remove check valve (6).

CLEAN BILGE PUMP CHECK VALVE AND DISCHARGE HOSE

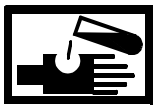
1. Using water, rinse check valve (6) and discharge hose (3) clear of debris.
2. Using cloth, wipe check valve (6) and discharge hose (3) clean.

INSPECT CHECK VALVE AND DISCHARGE HOSE

1. Inspect check valve (6) and discharge hose (3) for blockage.
2. Inspect for rust or decay on or in check valve (6). Replace damaged parts.

INSTALL BILGE PUMP CHECK VALVE AND DISCHARGE HOSE

WARNING


CHEMICAL


EYE PROTECTION

1. Apply adhesive to pipe threads on check valve (6) and nipple (4).
2. Install nipple (4) on check valve (6).

CAUTION

Failure to install the check valve properly will result in pump malfunctioning and could cause damage to equipment.

3. Install check valve (6). Ensure check valve arrow is correctly orientated to prevent malfunction of bilge pump.
4. Connect discharge hose (3) to bilge pump (5) and secure with hose clamp (2).
5. Connect discharge hose (3) to nipple (4) and secure with hose clamp (2).
6. Perform operational check of bilge pump. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BILGE FLOAT SWITCH WITH GUARD
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Float Switch with Guard
(50068)
PN 35WG
Adhesive (Item 1, WP 0382 00)

Personnel Required

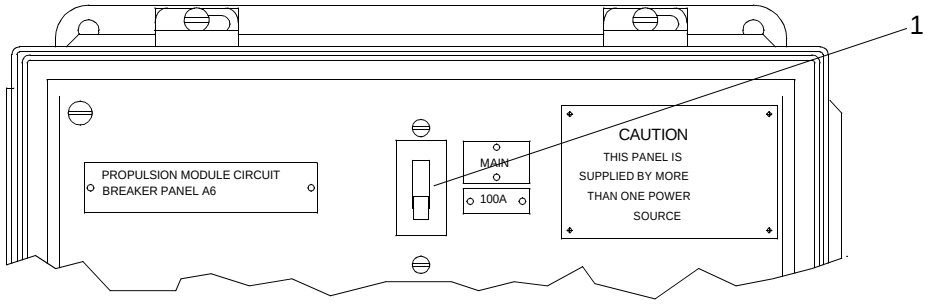
Engineer 88L

REMOVE BILGE FLOAT SWITCH AND GUARD

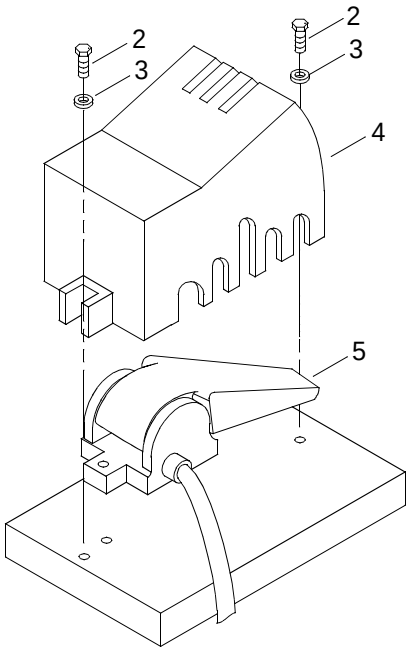
NOTE

The following procedure is typical for removal and installation of bilge pump float switches.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove two hex head machine screws (2) and two flat washers (3) securing float switch cover (4) to foundation.

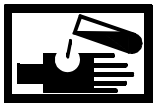


3. Remove float switch cover (4).
4. Tag and disconnect electrical wires to float switch (5).
5. Remove float switch (5) and discard.

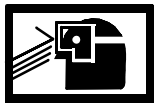
INSTALL BILGE FLOAT SWITCH AND GUARD

1. Install new float switch (5) and connect wires, as tagged, to float switch (5).
2. Remove tags from wiring.

WARNING



CHEMICAL



EYE PROTECTION

3. Apply adhesive to threads of two hex head machine screws (2).
4. Install new float switch cover (4) on foundation over float switch (5).
5. Secure cover (4) with two flat washers (3) and two hex head machine screws (2).
6. Tighten screws (2).
7. Test operation of float switch (5). (WP 0178 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BILGE CHECK VALVE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Wrench, Pipe (10 in.) (Item 46, WP 0383 00)

Materials/Parts

Valve, Check
(37239)
PN 2144
Sealing Compound (Item 26, WP 0382 00)

Personnel Required

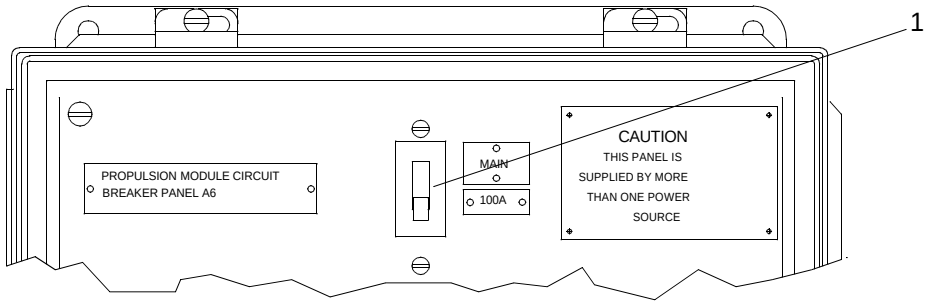
Engineer 88L

REPLACE BILGE CHECK VALVE

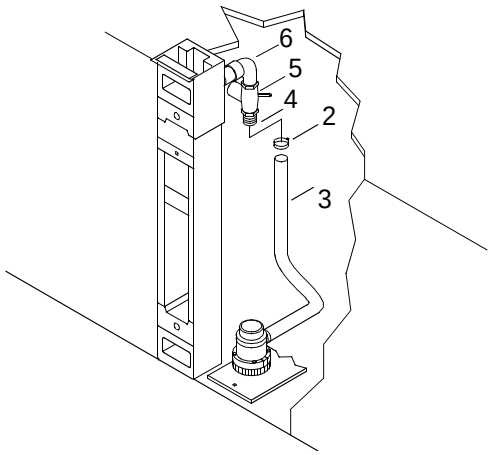
NOTE

The following procedure is typical for the removal and installation of bilge pump check valves.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove hose clamp (2) securing hose (3) to nipple (4).



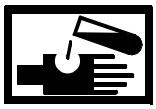
3. Remove hose (3) from nipple (4).

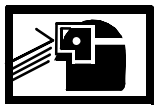
4. Remove nipple (4) from check valve (5).

5. Remove check valve (5) from elbow (6).

INSTALL BILGE CHECK VALVE

WARNING


CHEMICAL


EYE PROTECTION

CAUTION

Failure to install the check valve properly will result in the pump malfunctioning and can result in damage to equipment.

1. Apply sealing compound to pipe threads on check valve (5) and nipple (4).

2. Ensure check valve arrow is correctly orientated to prevent malfunction of bilge pump.

3. Install new check valve (5) on elbow (6).

4. Install nipple (4) on check valve (5).

5. Connect hose (3) to nipple (4) and secure with hose clamp (2).

6. Tighten hose clamp (2).

7. Test bilge pump by operating pump with water to check for leaks in hose or at locations of clamp and pipe joints. (WP 0178 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BILGE PUMP
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Pump, Bilge
(50068)
PN 16A
Sealant, RTV Silicone, Tube (Item 23, WP 0382 00)

Personnel Required

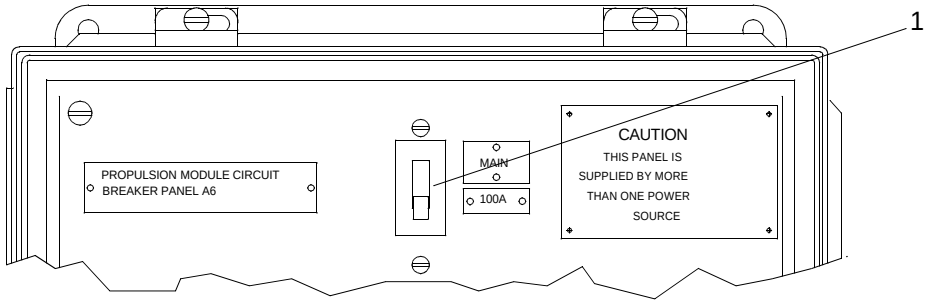
Engineer 88L

REMOVE BILGE PUMP

NOTE

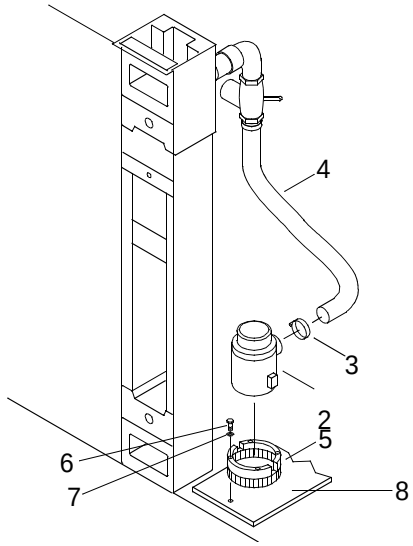
The following procedure is typical for the removal and installation of bilge pumps.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Tag and disconnect electrical wires from bilge pump (2).

3. Remove hose clamp (3) connecting hose (4) to bilge pump (2).



4. Remove pump (2) from strainer (5) by depressing the lock tabs on either sides of the pump (2).
5. Remove four hex head screws (6) and flat washers (7) securing bilge pump strainer (5) to the foundation (8).
6. Discard bilge pump (2) and strainer (5).

INSTALL BILGE PUMPS

WARNING



CHEMICAL **EYE PROTECTION**

1. Apply sealant to threads on four hex head machine screws (6).
2. Position bilge pump strainer (5) on foundation (8).
3. Install bilge pump strainer (5) on foundation (8) with four flat washers (7) and four hex head screws (6).
4. Tighten screws (6).
5. Install new bilge pump (2) on strainer (5) and lock in place with lock tabs.
6. Install hose (4) on pump (2) and secure with hose clamp (3).
7. Tighten clamp (3).
8. Connect electrical wiring to bilge pump (2) and remove tags.
9. Test bilge pump operation. (WP 0178 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM FILLER NECK STRAINER
REMOVAL, CLEANING AND INSTALLATION

INITIAL SETUP:

Tools

Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Diesel Fuel (Item 7, WP 0382 00)
Cloth, Cleaning (Item 6, WP 0382 00)

Personnel Required

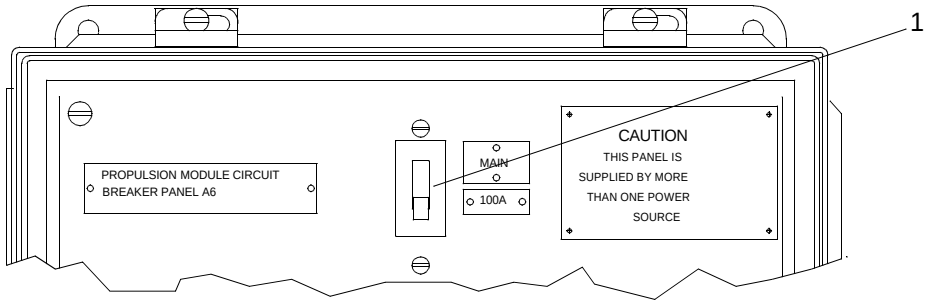
Engineer 88L

REMOVE FUEL SYSTEM FILLER NECK STRAINER

NOTE

The following procedure is typical for all fuel system filler neck strainers.

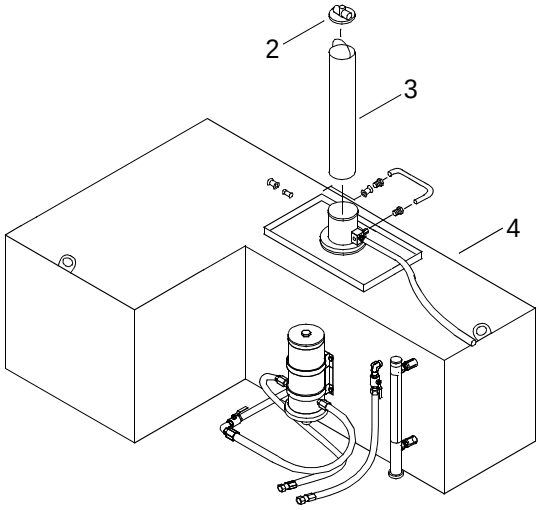
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



WARNING



2. Remove cover (2) from deck access by turning T-bar counterclockwise.



3. Lift filler neck strainer (3) out of the fuel tank (4) filler neck using bail bar.

CLEAN FUEL SYSTEM FILLER NECK STRAINER

1. Clean strainer (3) using clean, lint free cloth to free contaminants from screen.

WARNING



CHEMICAL **EYE PROTECTION**

2. Rinse strainer (3) with clean diesel fuel.

INSTALL FUEL SYSTEM FILLER NECK STRAINER

WARNING



CHEMICAL **EYE PROTECTION**

1. Install filler neck strainer (3) into tank (4) filler neck.

2. Install cover (2) by turning T-bar clockwise.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM TANK
INSPECTION

INITIAL SETUP:

Tools

Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gage Stick, Petroleum (Item 10, WP 0383 00)

Materials/Parts

Water Indicating Paste (Item 35, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

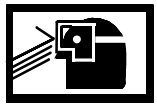
Fuel System Filler Neck Strainer Removed. (WP 0183 00)

INSPECT FUEL SYSTEM TANK FOR WATER

WARNING



CHEMICAL



EYE PROTECTION

NOTE

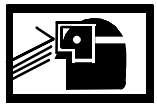
The following procedure is typical for inspecting for water in fuel tanks.

1. Apply water indicating paste to end of gage stick.

WARNING



CHEMICAL



EYE PROTECTION

2. Insert gage stick into fuel tank until it reaches the bottom of the tank.

WARNING



CHEMICAL



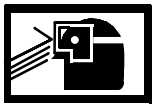
EYE PROTECTION

3. Remove gage stick from fuel tank.

WARNING



CHEMICAL



EYE PROTECTION

4. Inspect water indicating paste on end of gage stick for color change.

NOTE

No change in color indicates no water in the fuel tank. A change in color to pink indicates water in the fuel tank.

5. If water indicating paste changes in color to pink, drain the fuel system tank. (WP 0185 00)

6. Install fuel system filler neck strainer. (WP 0183 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM TANK
DRAINING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Siphon Assembly Fuel (Item 35, WP 0383 00)

Personnel Required

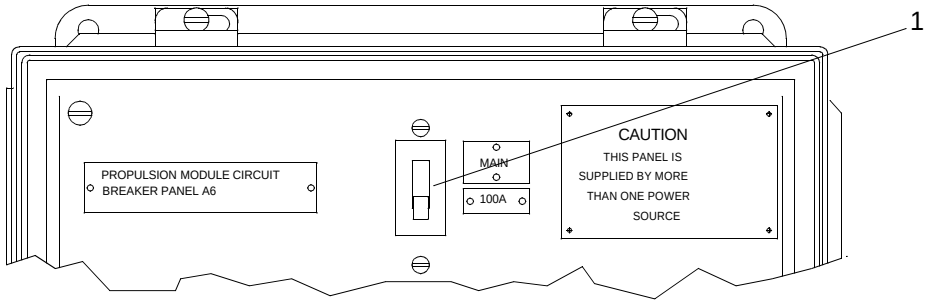
Engineer 88L

DRAIN FUEL SYSTEM TANK

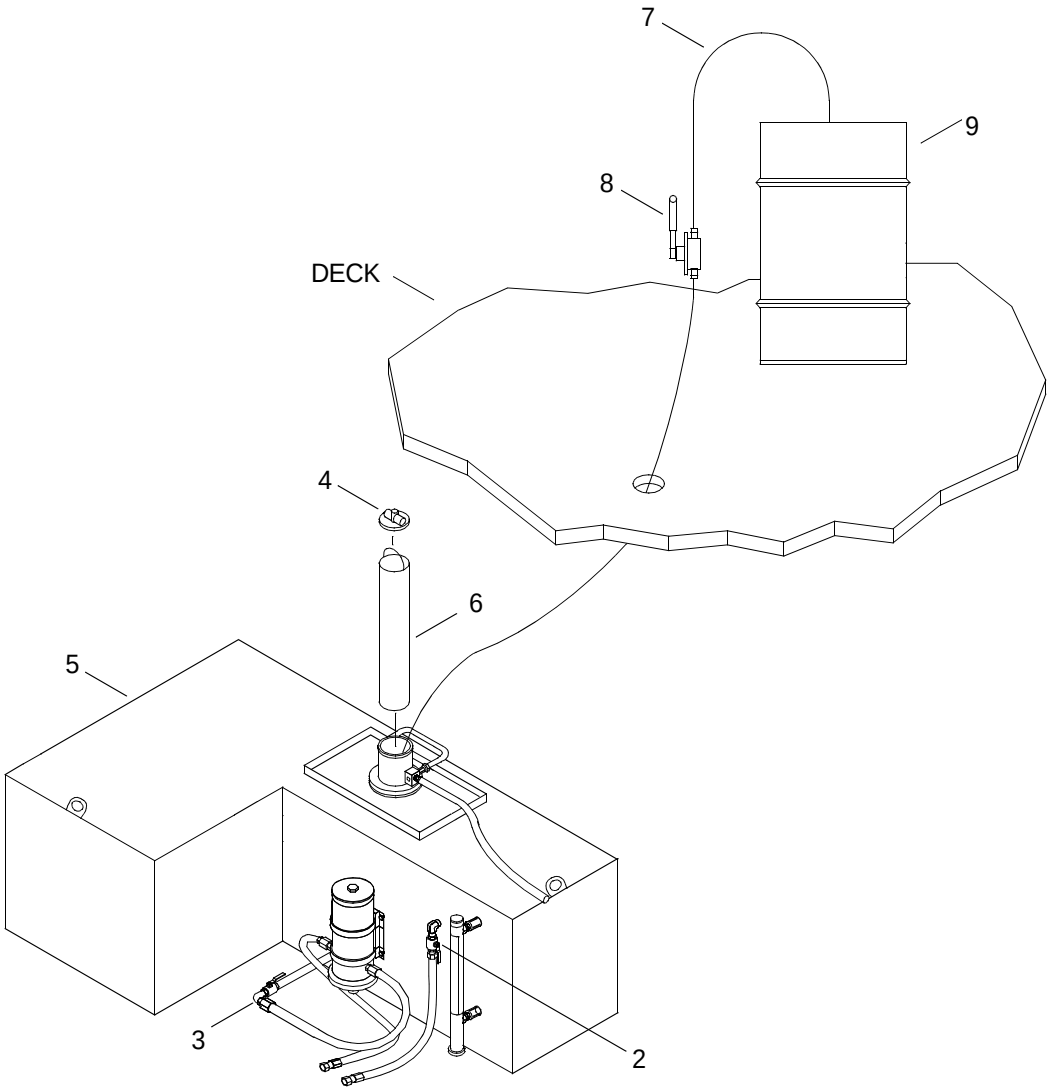
NOTE

The following procedure is typical for defueling both port and starboard fuel tanks.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Close the fuel supply line (2) and fuel return line (3) valves.



WARNING



3. Remove cover (4) from tank (5).

4. Lift out filler neck strainer (6).

5. Insert the siphon hose (7) into the filler neck opening until hose reaches bottom of tank (5).

6. Remove fuel from tank using siphon pump (8) and store fuel in approved container (9).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM INSPECTION COVERS
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Gasket
(23619)
PN HC-EC-S-18

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

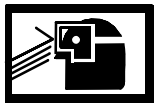
Fuel System Tank Drained. (WP 0185 00)

REMOVE FUEL SYSTEM INSPECTION COVERS

WARNING



CHEMICAL



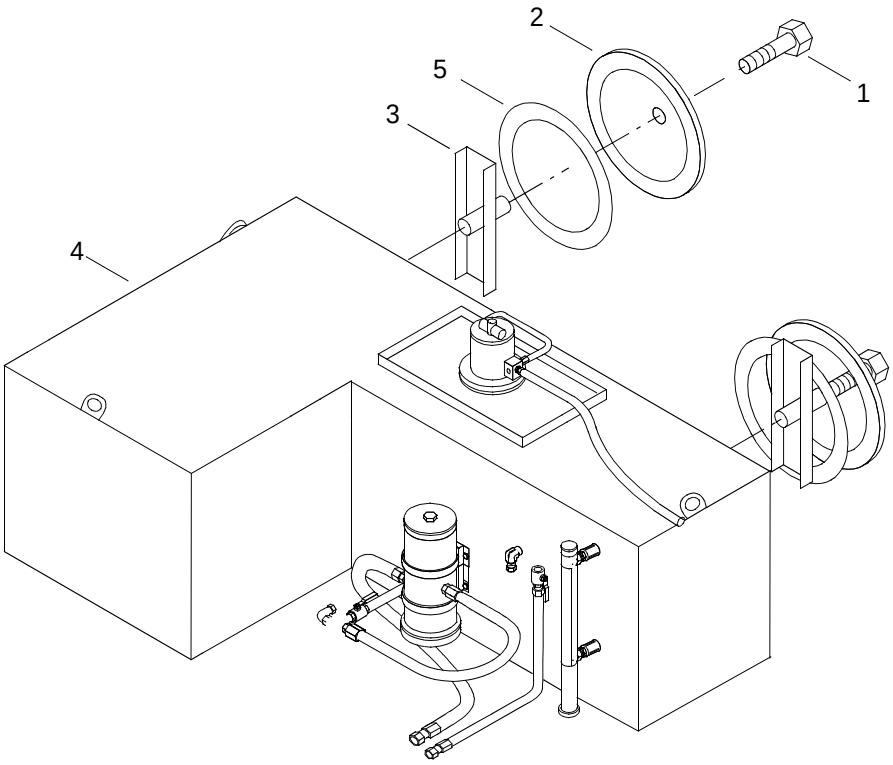
EYE PROTECTION

NOTE

The following procedure is typical for removal and installation of fuel tank inspection covers.

Loosen the cap screw securing bar of the inspection cover only enough to remove cover or bar will fall inside tank.

1. Loosen cap screw (1) securing the inspection cover (2) and bar (3) on fuel tank (4).



2. Slide cover (4) to one side until bar (2) is free.
3. Remove cover (4), gasket (3) and bar (2).
4. Discard gasket (5).

INSTALL FUEL SYSTEM INSPECTION COVERS

1. Position new gasket (5) on cover (2).

WARNING


CHEMICAL


EYE PROTECTION

2. Tilt inspection cover (2), gasket (5) and slide bar (3).
3. Place slide bar (3) in fuel tank (4) opening.
4. Position inspection cover (2) and gasket (5) over fuel tank (4) opening.
5. Tighten inspection cover (2) cap screw (1).
6. Fill fuel system tank. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM TANK
INSPECTION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

Equipment Condition
Fuel System Tank Drained. (WP 0185 00)
Fuel System Inspection Covers Removed. (WP 0186 00)

INSPECT FUEL SYSTEM TANK INTERNALLY

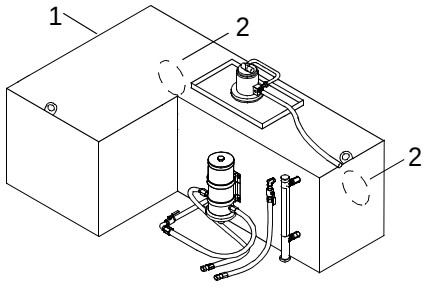
WARNING



NOTE

The following procedure is typical for port and starboard fuel tanks.

1. Inspect the interior of the drained fuel tank (1) through the two inspection ports (2) for signs of debris and loose or broken components.



2. Remove any debris, loose or broken components from fuel tank.
3. Install fuel system inspection covers. (WP 0186 00)
4. Fill fuel system tank. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM TANK
CLEANING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts

Cloth, Cleaning (Item 6, WP 0382 00)
Diesel Fuel (Item 7, WP 0382 00)

Personnel Required

Engineer 88L

References

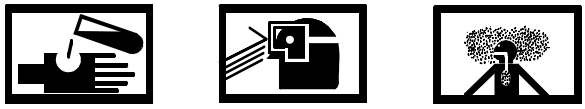
TM 55-1945-205-10-1

Equipment Condition

Fuel System Filler Neck Strainer Removed. (WP 0183 00)
Fuel System Tank Sight Level Removed. (WP 0191 00)
Fuel System Tank Drained. (WP 0185 00)
Fuel System Inspection Covers Removed. (WP 0186 00)

CLEAN FUEL SYSTEM TANK

WARNING

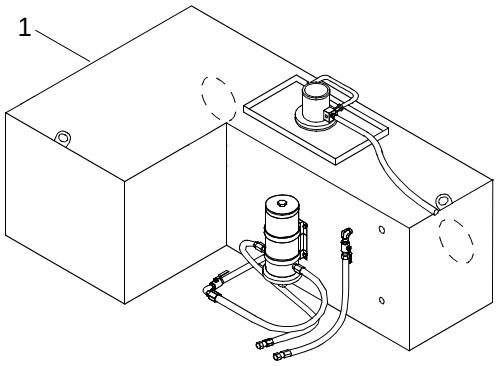


CHEMICAL EYE PROTECTION VAPOR

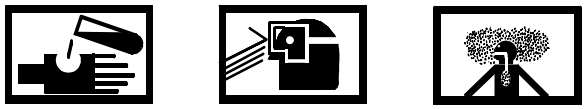
NOTE

The following procedure is typical for port and starboard fuel tanks.

1. Remove any residual fuel from the interior of the fuel tank (1) using lint-free cloth.



WARNING



CHEMICAL EYE PROTECTION VAPOR

2. Clean the entire interior of the tank (1) using lint-free cloth dampened with diesel fuel.
3. Install fuel system tank sight level. (WP 0191 00)
4. Install fuel system inspection covers. (WP 0186 00)
5. Install fuel system filler neck strainer. (WP 0183 00)
6. Fill fuel tank with fuel. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM FILLER NECK CHECK VALVE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Check Valve
(91816)
PN 232T1-4PP
Qty 2
Sealing Compound (Item 24, WP 0382 00)

Personnel Required

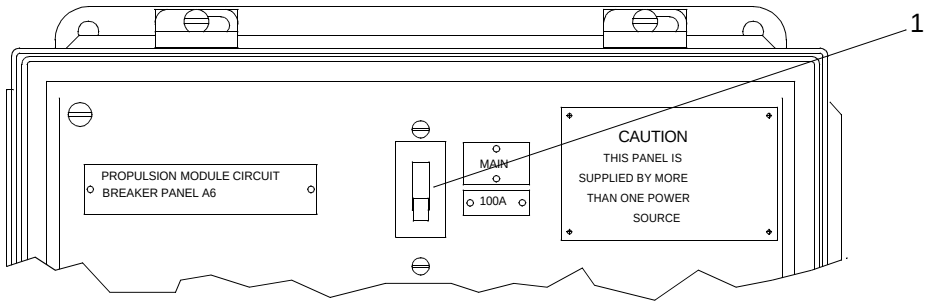
Engineer 88L

REMOVE FUEL SYSTEM FILLER NECK CHECK VALVES

NOTE

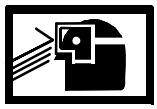
The following procedure is typical for both port and starboard fuel tanks.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

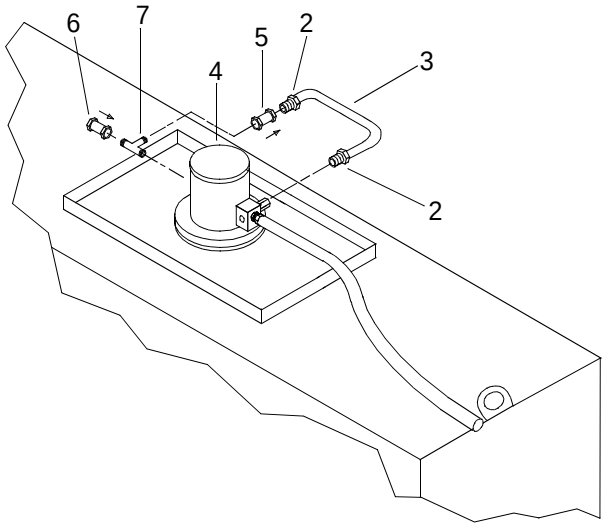


WARNING


CHEMICAL


EYE PROTECTION

2. Loosen male connectors (2) of rigid fuel line (3) at filler neck (4) and check valve (5).



3. Remove rigid fuel line (3) from check valve (5) and filler neck (4).
4. Retain rigid fuel line (3).
5. Remove two check valves (5 and 6) from male pipe tee (7).
6. Discard check valves (5 and 6).

INSTALL FUEL SYSTEM FILLER NECK CHECK VALVES

WARNING

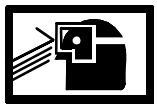

CHEMICAL


EYE PROTECTION

1. Using a wire brush, remove old sealing compound from pipe threads on male connectors (2) of rigid fuel line (3) and male pipe tee (7).

WARNING


CHEMICAL


EYE PROTECTION

2. Apply sealing compound to pipe threads on male connectors (3) and male pipe tee (7).
3. Install new check valve (6) on male pipe tee (7) with direction of flow toward filler neck and tighten.
4. Install new check valve (5) on male pipe tee (7) with direction of flow away from tee and tighten.
5. Install male connectors (2) of rigid fuel line (3) on check valve (5) and the filler neck (4).
6. Tighten both connectors (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM BALL VALVES
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Ball Valve, Supply
(01029)
PN 1-A-3600-TT
Ball Valve, Return
(01029)
PN ¾-A-3600-TT
Sealing Compound (Item 24, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

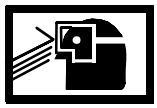
Fuel System Tank Drained. (WP 0185 00)
Fuel System Fuel/Water Separator Drained. (WP 0195 00)

REMOVE FUEL SYSTEM SUPPLY LINE BALL VALVE

WARNING



CHEMICAL



EYE PROTECTION

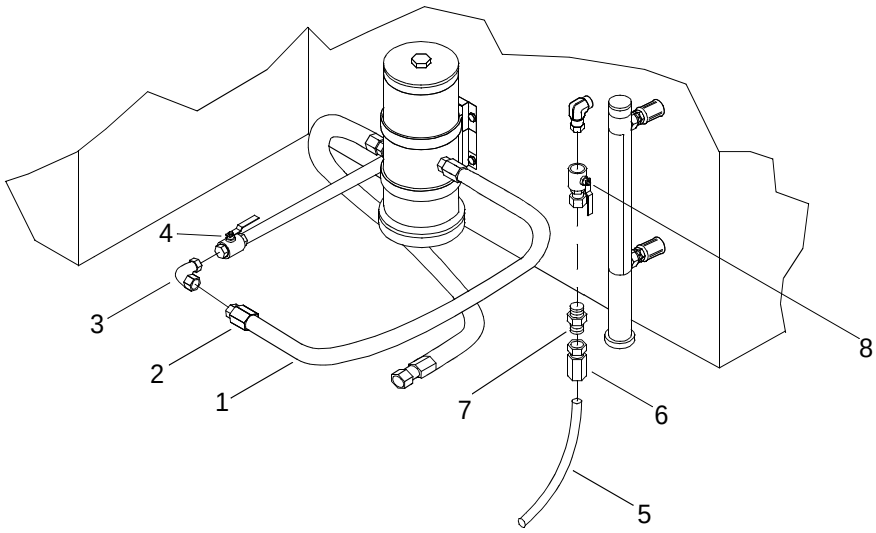
NOTE

The following procedure is typical for removal and installation of fuel systems supply and return ball valves.

After draining the fuel tank, residual fuel will be in both the supply and return lines.

1. Position drain pan beneath fuel tank supply hose (1).

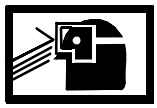
2. Remove supply hose (1), hose fitting (2) and 90° elbow (3).



3. Remove fuel supply line ball valve (4).

WARNING


CHEMICAL

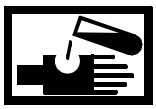

EYE PROTECTION

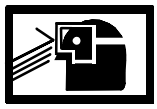
4. Remove drain pan and dispose of contents in accordance with local procedures.

REMOVE FUEL SYSTEM RETURN LINE BALL VALVE

1. Position drain pan beneath fuel return hose (5).

WARNING

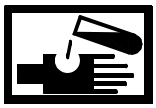

CHEMICAL

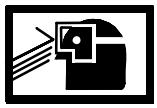

EYE PROTECTION

2. Remove hose (5), hose fitting (6) and straight adaptor (7).

3. Remove fuel return line ball valve (8).

WARNING


CHEMICAL

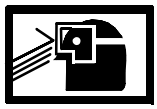

EYE PROTECTION

4. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL FUEL SYSTEM SUPPLY LINE BALL VALVE

WARNING

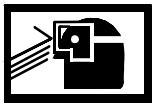

CHEMICAL


EYE PROTECTION

1. Apply sealing compound to pipe threads on the 90 degree elbow (3) and supply line ball valve (4).
2. Install new supply line ball valve (4), 90° elbow (3), hose fitting (2) and hose (1).
3. Tighten fittings.

WARNING


CHEMICAL


EYE PROTECTION

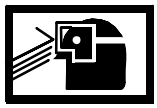

SLICK FLOOR

4. Clean up any spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

INSTALL FUEL SYSTEM RETURN LINE BALL VALVE

WARNING


CHEMICAL

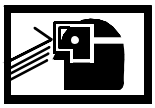

EYE PROTECTION

1. Apply sealing compound to pipe threads on the straight adaptor (7) and return line ball valve (8).
2. Install new return line ball valve (8), straight adaptor (7), hose fitting (6) and hose (5).
3. Tighten fittings.
4. Fill the fuel system tank. (TM 55-1945-205-10-1)
5. Perform operational check on fuel system. (TM 55-1945-205-10-1)

WARNING



CHEMICAL



EYE PROTECTION



SLICK FLOOR

6. Clean up any spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM TANK SIGHT LEVEL
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Level, Sight
(34712)
PN E30208
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

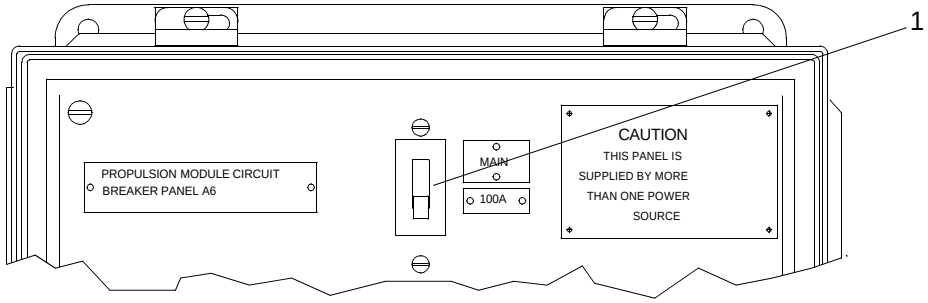
Engineer 88L

REMOVE FUEL SYSTEM TANK SIGHT LEVEL

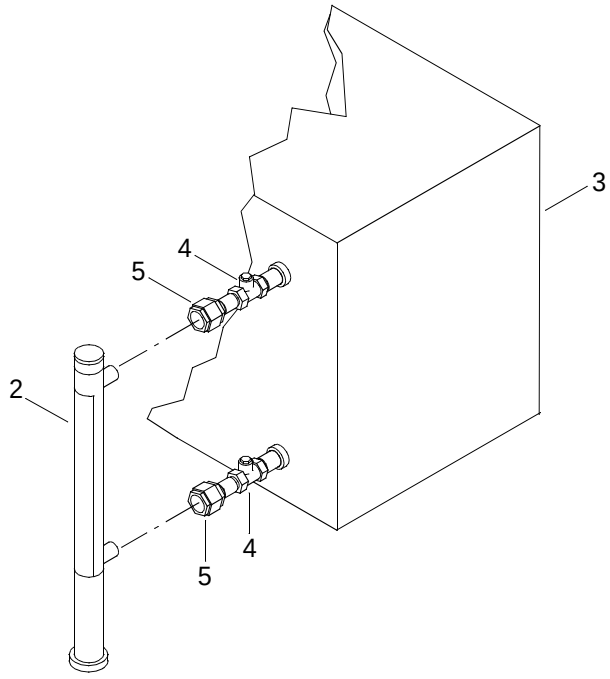
NOTE

The following procedure is typical for removal of both port and starboard fuel tank sight levels.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Position drain pan below sight level (2) on fuel tank (3).



3. Close top and bottom shutoff cocks (4) by turning clockwise.

4. Loosen top and bottom close nipples (5) until sight level (2) is free.

WARNING



CHEMICAL **EYE PROTECTION**

5. Remove sight level (2), and drain residual fuel into drain pan.

6. Discard sight level (2).

WARNING



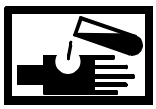
CHEMICAL **EYE PROTECTION**

7. Remove drain pan and dispose of contents in accordance with local procedures.

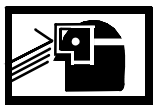
INSTALL FUEL SYSTEM TANK SIGHT LEVEL

1. Position new sight level (2) on top and bottom close nipples (5)
2. Tighten top and bottom close nipples (5).
3. Open top and bottom shutoff cocks (4) by turning counterclockwise.

WARNING



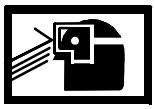
CHEMICAL



EYE PROTECTION

4. Check for leaks. Repair as required.

WARNING



EYE PROTECTION



CHEMICAL



SLICK FLOOR

5. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM TANK SIGHT LEVEL SHUTOFF COCK REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Shutoff, Cock
(39428)
PN 48535k75
Qty 2
Adhesive (Item 1, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

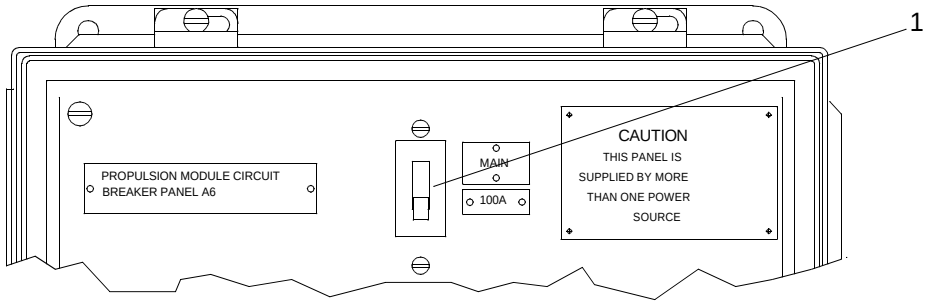
Fuel System Tank Drained. (WP 0185 00)

REMOVE FUEL SYSTEM TANK SIGHT LEVEL SHUTOFF COCK

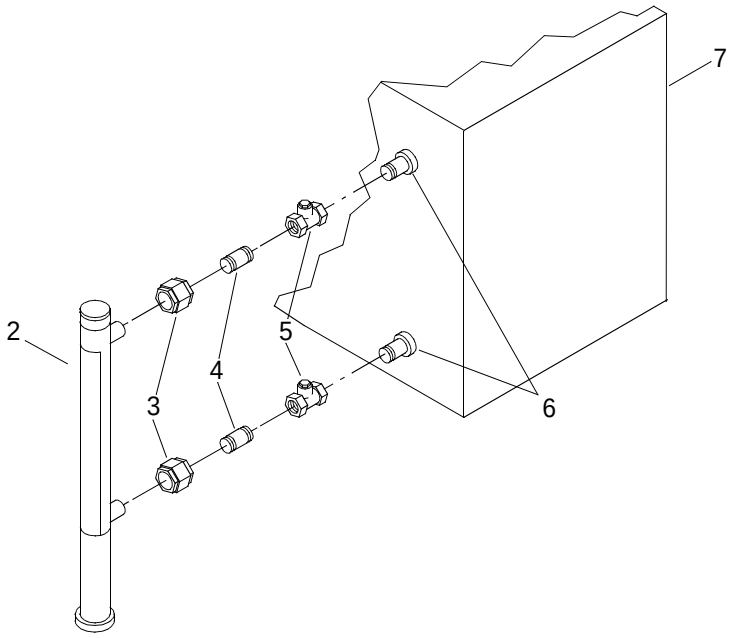
NOTE

The following procedure is typical for both port and starboard fuel tanks.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



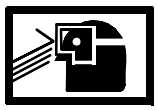
2. Position drain pan below sight level (2).



3. Loosen top and bottom close nipples (3) until sight level (2) is free.
4. Remove sight level (2).

WARNING


CHEMICAL


EYE PROTECTION

5. Drain residual fuel into drain pan.
6. Retain sight level (2).
7. Remove top and bottom close nipples (3) and retain.
8. Remove pipes (4) and retain.
9. Remove shutoff cocks (5) from pipes (6).
10. Discard shutoff cocks (5).

WARNING


CHEMICAL


EYE PROTECTION

11. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL FUEL SYSTEM SIGHT LEVEL SHUTOFF COCK

WARNING



CHEMICAL



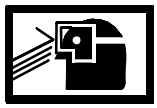
EYE PROTECTION

1. Using a wire brush, remove old sealing compound from pipes (4) and exposed end of pipe (6) attached to tank (7).

WARNING



CHEMICAL



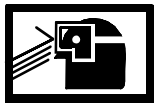
EYE PROTECTION

2. Apply adhesive to threads of pipes (4) and on exposed end of pipes (6).
3. Install new shutoff cocks (5) on pipes (6) and tighten.
4. Install pipes (4), retained for installation, on shutoff cocks (5) and tighten.
5. Install close nipples (3) on union pipes (4) and tighten.
6. Install retained site level (2) on top and bottom close nipples (3).
7. Fill fuel system tank. (TM 55-1945-205-10-1)
8. Open both shutoff cocks (13) by turning counterclockwise.
9. Check for leaks.

WARNING



CHEMICAL



EYE PROTECTION



SLICK FLOOR

10. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM RUBBER HOSES
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Hose, Fuel
(87373)
PN E11488
Hose, Fuel
(87373)
PN E11508-1
Hose, Fuel
(87373)
PN E11508-2
Hose, Fuel
(87373)
PN E11508-3
Hose, Fuel
(87373)
PN E11518-1
Hose, Fuel
(87373)
PN E11518-2
Hose, Fuel
(87373)
PN E11518-3
Hose, Fuel
(87373)
PN E1151814
Adhesive (Item 1, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material
(Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Fuel System Tank Drained. (WP 0185 00)

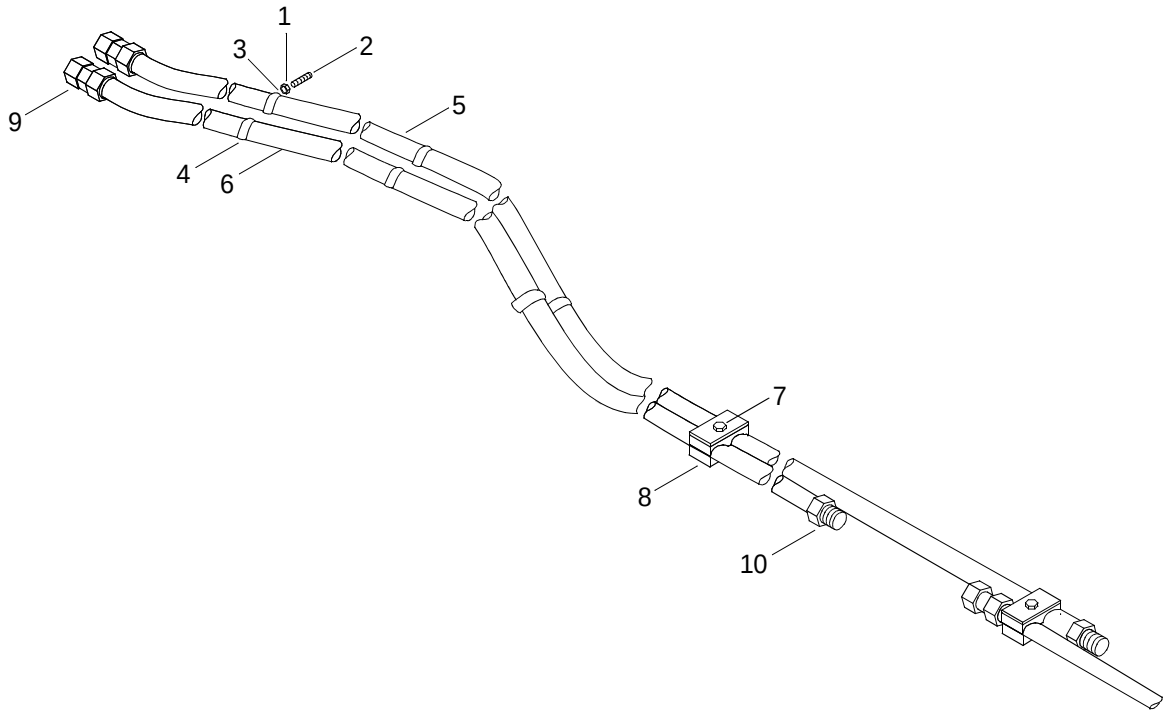
REMOVE FUEL SYSTEM RUBBER HOSES

NOTE

The following procedure is typical for all fuel system rubber hoses for port and starboard fuel systems.

1. Place drain pan under hose being removed for draining residual fuel from hose.

2. Remove nut (1) from stud (2) connecting clamps (3 and 4).



3. Separate clamp (3) from clamp (4).
4. Replace nut (1) on stud (2) of clamp (3), leaving attached to hose (5).
5. Remove clamp (4) from hose (6) and retain clamp (4).
6. Loosen screw (7) from clamp (8) enough to remove hose (6).
7. Loosen adaptor (9) and male fitting (10).
8. Remove hose (6).

WARNING

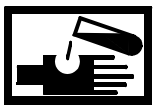

CHEMICAL

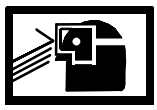

EYE PROTECTION

9. Drain residual fuel into drain pan.

10. Discard hose (6).

WARNING


CHEMICAL


EYE PROTECTION

11. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL FUEL SYSTEM RUBBER HOSES

WARNING


CHEMICAL


EYE PROTECTION

1. Apply adhesive to threads of male fitting (10) of new hose (6).
2. Install male fitting (10) and tighten.
3. Install adaptor (9) and tighten.

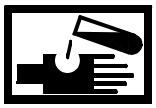
WARNING


CHEMICAL


EYE PROTECTION

4. Remove screw (7) from clamp (8) and apply sealing compound to screw threads.
5. Position hose (6) in clamp (8).
6. Install screw (7) and tighten.
7. Install retained clamp (4) on new hose (6).
8. Remove nut (1) from stud (2) on clamp (3) attached to hose (5).
9. Install clamp (4) on stud (2) with clamp (3).

WARNING


CHEMICAL


EYE PROTECTION

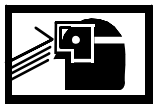
10. Apply adhesive to threads of stud (2).

11. Install nut (1) on stud (2) and tighten.

12. Fill fuel system tank. (TM 55-1945-205-10-1)

WARNING


CHEMICAL


EYE PROTECTION


SLICK FLOOR

13. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM TANK RIGID FUEL LINE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Rigid Fuel Line Assembly
(34712)
PN E12798-3
Adhesive (Item 1, WP 0382 00)

Personnel Required

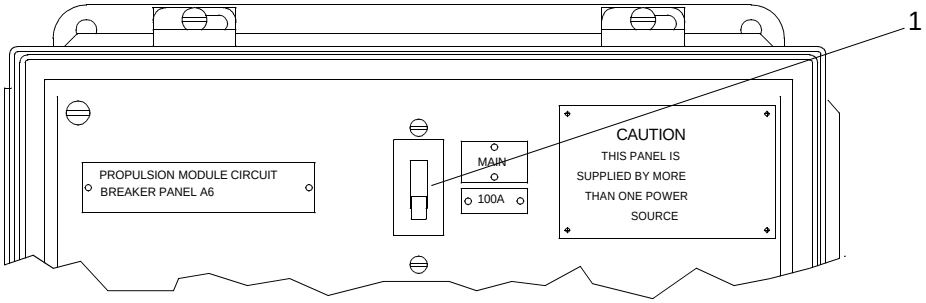
Engineer 88L

REMOVE FUEL SYSTEM TANK RIGID FUEL LINE

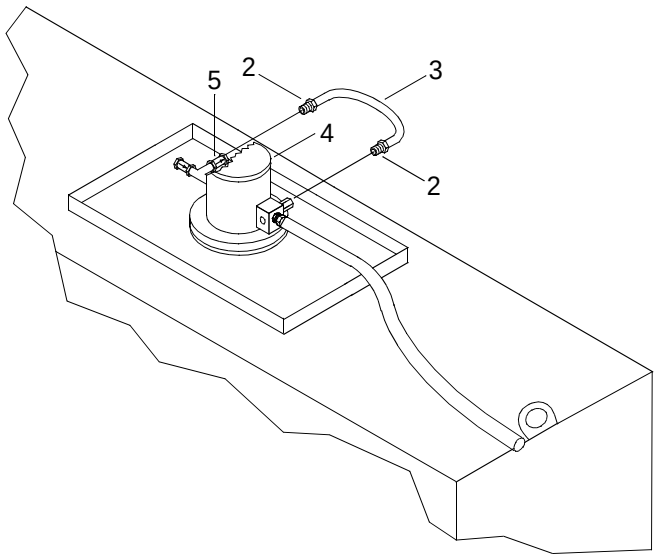
NOTE

The following procedure is typical for both port and starboard fuel tanks.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen male connectors (2) of rigid fuel line (3) at filler neck (4) and check valve (5).



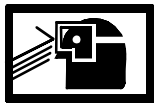
3. Remove rigid fuel line (3) from check valve (5) and filler neck (4).

4. Discard rigid fuel line (3).

INSTALL FUEL SYSTEM RIGID FUEL LINE

WARNING


CHEMICAL


EYE PROTECTION

1. Apply adhesive to pipe threads on male connectors (2) of new rigid fuel line (3).

2. Install male connectors (2) of new rigid fuel line (3) on check valve (5) and the filler neck (4).

3. Tighten both connectors (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM FUEL/WATER SEPARATOR
DRAINING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

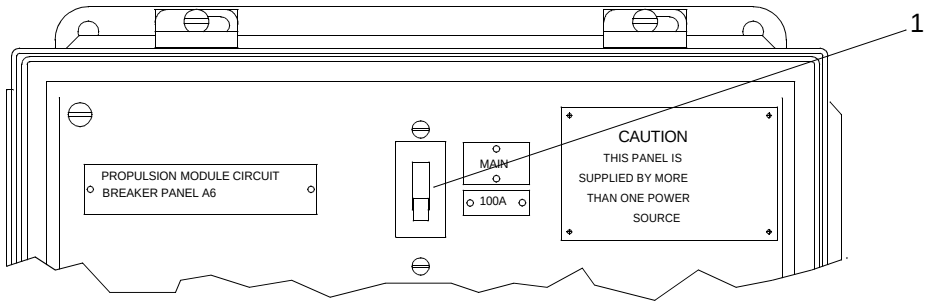
Engineer 88L

DRAIN FUEL SYSTEM FUEL/WATER SEPARATOR

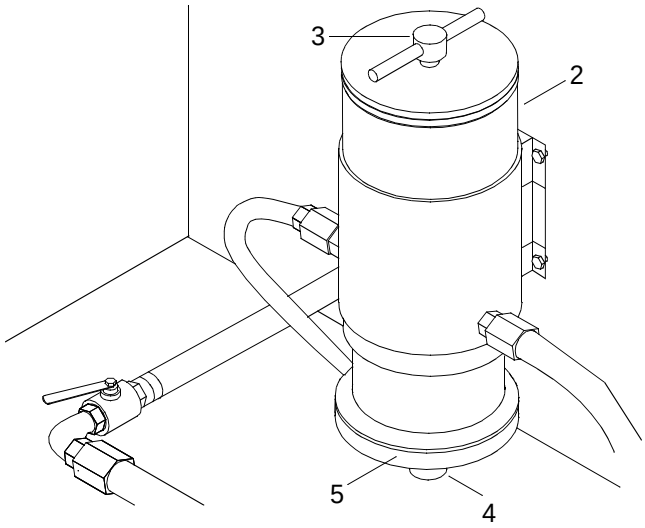
NOTE

This task is typical for port and starboard fuel systems.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Position drain pan under the fuel/water separator (2).



3. Loosen the handle (3) to break the vacuum within the fuel/water separator (2).

WARNING



4. Remove drain plug (4) to drain water and contaminants from the collection bowl (5).

WARNING



5. Remove drain pan and dispose of contents in accordance with local procedures.

6. Install drain plug (4).

7. Tighten plug (4).

8. Tighten the handle (3) on the fuel/water separator (2).

WARNING



9. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM FUEL/WATER SEPARATOR FILTER ELEMENT REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Filter Element
(55752)
PN 2020TMOR
Gasket
(55752)
PN 11007
Diesel Fuel (Item 7, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

Engine Shut Down. (TM 55-1945-205-10-1)
Fuel System Fuel/Water Separator Drained. (WP 0195 00)

REMOVE FUEL SYSTEM FUEL/WATER SEPARATOR FILTER ELEMENT

WARNING



CHEMICAL

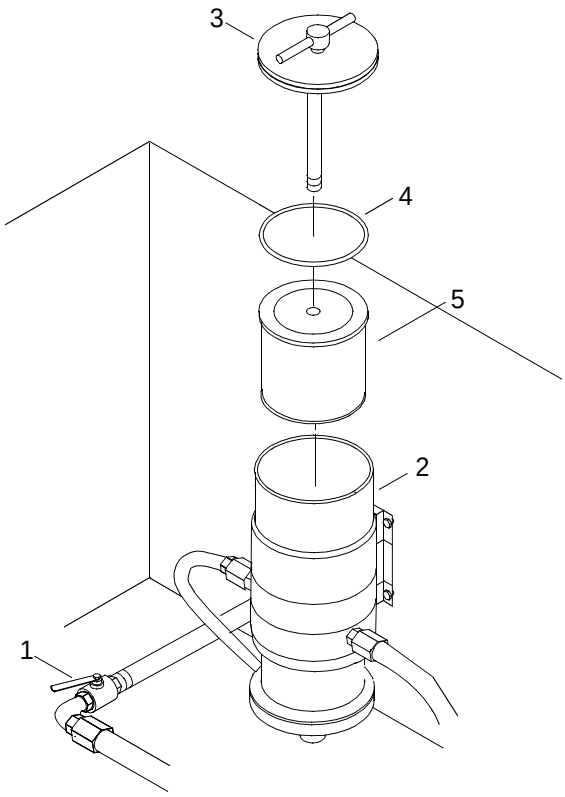


EYE PROTECTION

NOTE

The following procedure is typical for port and starboard fuel systems.

1. Close ball valve (1) in fuel supply line to fuel/water separator (2).



2. Remove cover (3) and lid gasket (4) from fuel/water separator (2) by turning T-bar counterclockwise.
3. Discard gasket (4).
4. Remove filter element (5) by slowly pulling upwards with a twisting motion.
5. Discard filter element (5) in accordance with local procedures.

INSTALL FUEL SYSTEM FUEL/WATER SEPARATOR FILTER ELEMENT

1. Install new filter element (5) in fuel/water separator (2).

WARNING



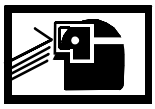
CHEMICAL **EYE PROTECTION**

2. Fill the fuel/water separator with clean fuel.

WARNING



CHEMICAL



EYE PROTECTION

3. Apply a coating of clean fuel to seal of the new lid gasket (4).
4. Install lid gasket (4) and cover (3) on fuel/water separator (2).
5. Tighten cover (3) by turning T-bar clockwise.
6. Open ball valve (1) in fuel supply line to fuel/water separator (2).
7. Perform operational check of fuel system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
FUEL SYSTEM FUEL/WATER SEPARATOR ASSEMBLY
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Fuel/Water Separator
(55752)
PN 1000 MA

Personnel Required

Engineer 88L

Equipment Condition

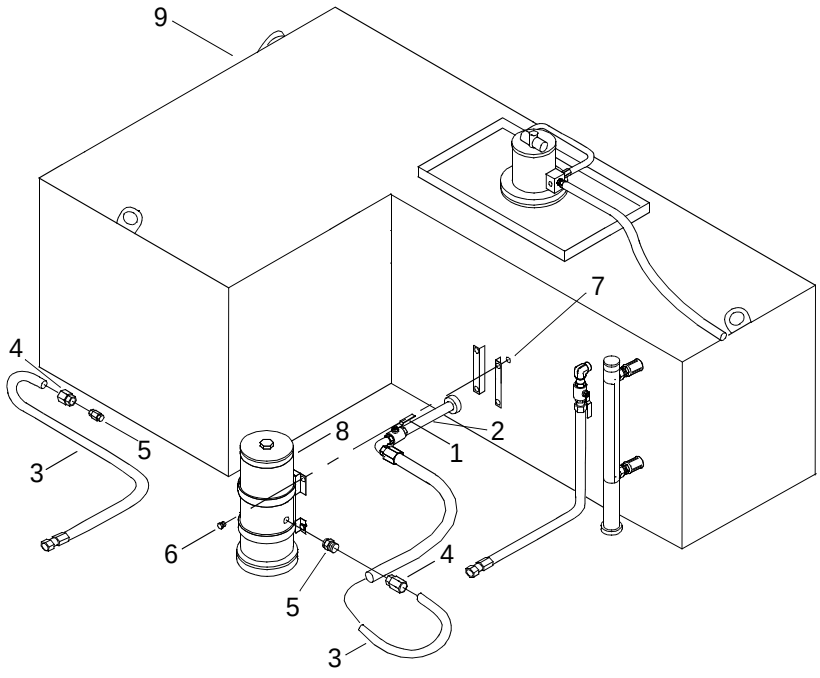
Engine Shut Down. (TM 55-1945-205-10-1)
Fuel System Fuel/Water Separator Drained. (WP 0195 00)

REMOVE FUEL SYSTEM FUEL/WATER SEPARATOR ASSEMBLY

NOTE

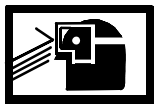
The following procedure is typical for the removal and installation of fuel water separators.

1. Close ball valve (1) in fuel inlet line (2).



WARNING


CHEMICAL


EYE PROTECTION


EXPLOSION

2. Remove two hoses (3), two hose fittings (4) and two external thread reducers (5).
3. Remove four hex head cap screws (6) and four hex nuts (7) securing fuel/water separator (8) to fuel tank (9).
4. Remove the fuel/water separator (8) and discard.

INSTALL FUEL SYSTEM FUEL/WATER SEPARATOR ASSEMBLY

1. Position new fuel/water separator (8) on side of fuel tank (9).
2. Secure fuel/water separator (8) with four hex head cap screws (6) and four hex nuts (7).
3. Tighten nuts (7).
4. Install two external thread reducers (5), two hose fittings (4) and two hoses (3).
5. Tighten fittings (4).
6. Open ball valve (1) in fuel inlet line to fuel/water separator (8) and check for leaks.
7. Perform operational check of fuel system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED SECTION MAIN BATTERIES NEGATIVE LEAD TERMINALS
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Puller, Battery Terminal (Item 27, WP 0383 00)

Personnel Required

Engineer 88L

REMOVE POWERED SECTION MAIN BATTERIES NEGATIVE LEAD TERMINALS

WARNING



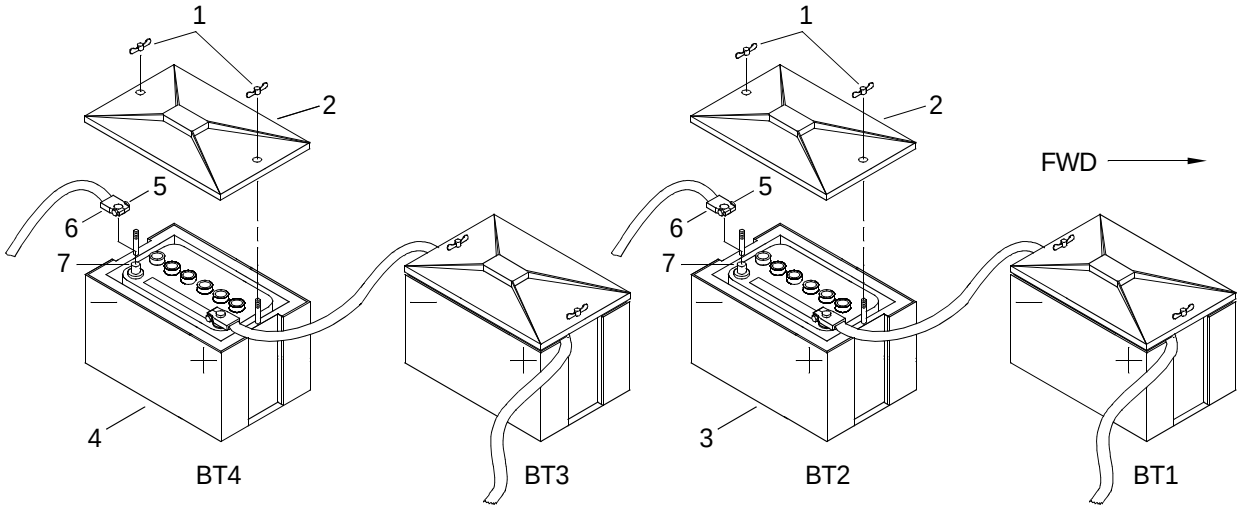
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The battery negative posts are identified by a raised negative sign stamped on the battery.

Battery BT1 is located forward and BT4 is located aft in the portside four battery bank.

1. Remove two associated wing nuts (1) from the battery box covers (2) of batteries BT2 (3) and BT4 (4).



2. Remove battery box covers (2) from batteries BT2 (3) and BT4 (4).

3. Loosen the hex nuts (5) on the negative lead terminals (6) of batteries BT2 (3) and BT4 (4).

4. Using a battery terminal puller, remove the negative lead terminals (6) from the negative posts (7) of batteries BT2 (3) and BT4 (4).

5. Position the negative lead terminals (6) out of the way to prevent contact between the negative lead terminals (6) and the negative posts (7) of batteries BT2 (3) and BT4 (4).

INSTALL POWERED SECTION MAIN BATTERIES NEGATIVE LEAD TERMINALS

1. Position the negative lead terminals (6) over the negative posts (7) of batteries BT2 (3) and BT4 (4).

2. Carefully press the negative lead terminals (6) down on the negative posts (7) of batteries BT2 (3) and BT4 (4).

3. Tighten the negative lead terminal hex nuts (5) of batteries BT2 (3) and BT4 (4).

4. Position the battery box covers (2) on BT4 (4) and BT2 (3) and secure each with the two wing nuts (1).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM BATTERIES
TESTING AND SERVICING

INITIAL SETUP:

Test Equipment
Tester, Antifreeze Solutions (Hydrometer) (Item 42, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Charger, Battery (Item 5, WP 0383 00)

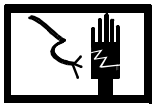
Materials/Parts
Water Reagent Distilled (Item 36, WP 0382 00)
Sodium Bicarbonate Injection (Item 27, WP 0382 00)
Grease, Automotive and Artillery (Item 8, WP 0382 00)

Personnel Required
Engineer 88L

References
TB 9-6140-200-14

TEST ELECTRICAL SYSTEM BATTERIES

WARNING



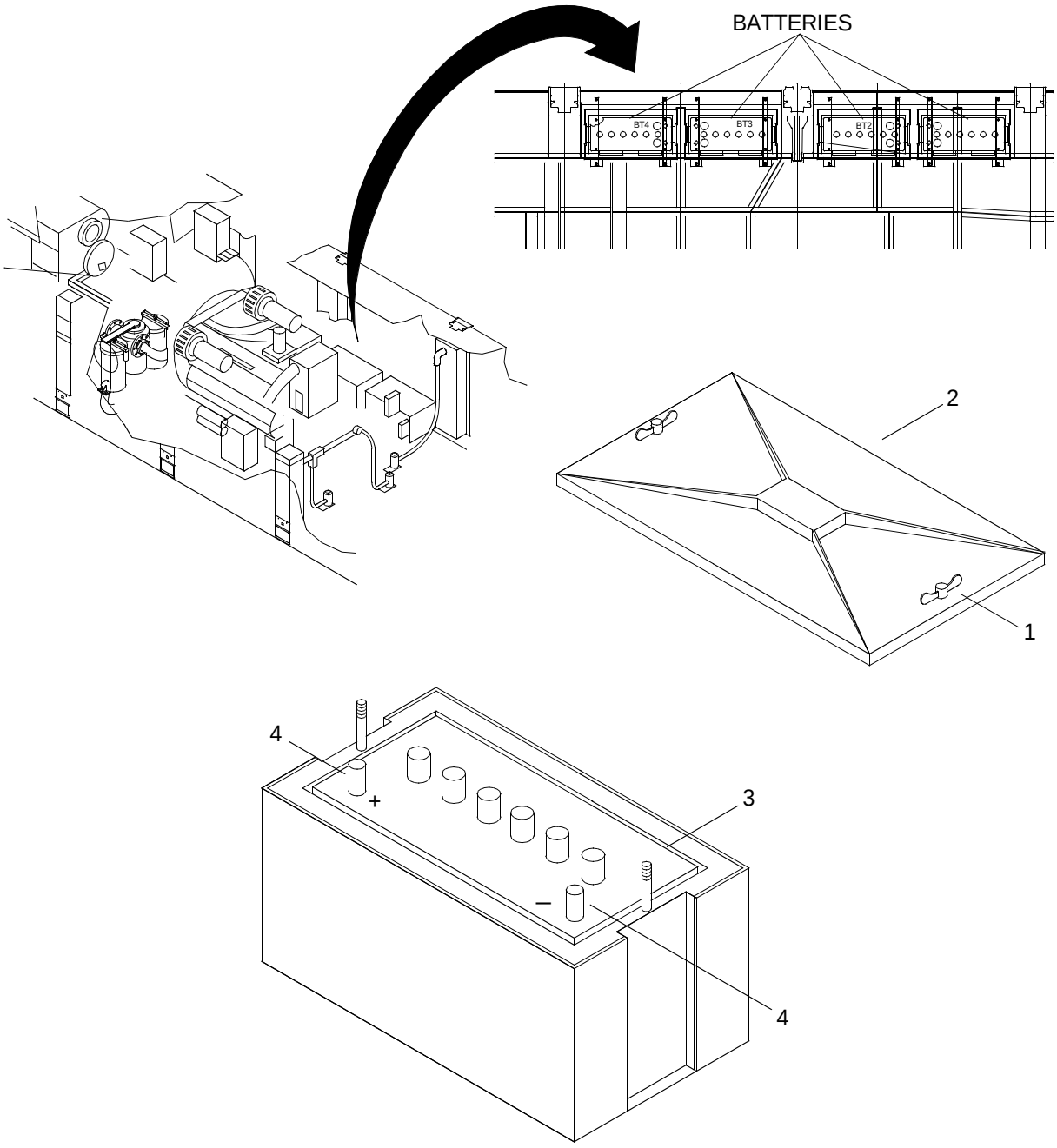
ELECTRICAL

NOTE

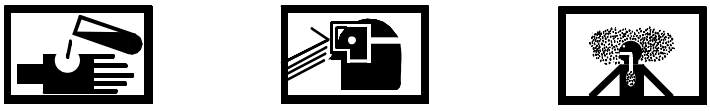
Lead-acid batteries are completely recyclable.

The battery installation consists of four battery boxes, each containing one battery. The following procedure is typical for all four batteries.

1. Loosen wing nuts (1) and remove the top cover (2) of the battery box for access to the battery (3).



WARNING



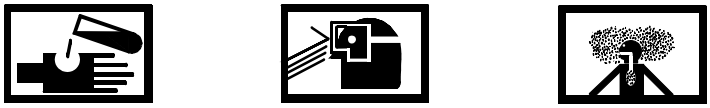
CHEMICAL **EYE PROTECTION** **VAPOR**

2. Perform hydrometer test on all battery cells. (TB 9-6140-200-14)

3. Log results in vessel logbook.

SERVICE ELECTRICAL SYSTEM BATTERIES

WARNING



1. Remove negative and positive leads from terminals (4) and clean using wire brush, baking soda and water to remove any corrosion.

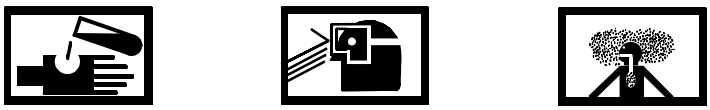
WARNING



2. Apply a coat of grease to the battery terminals (4).

3. Ensure clamps and connections at the battery terminal (4) are secure.

WARNING



4. Bring the level of the electrolyte in each cell of the battery (1) to at least cover the top of the plates. Add distilled water as necessary.

5. Batteries should be tested and charged (TM 9-6140-200-14).

6. Position top cover (2) on battery box and tighten wing nuts (1).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM BATTERIES
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts

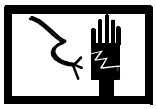
Battery
(04055)
PN 804D

Personnel Required

Engineer 88L

REMOVE ELECTRICAL SYSTEM BATTERY

WARNING



ELECTRICAL

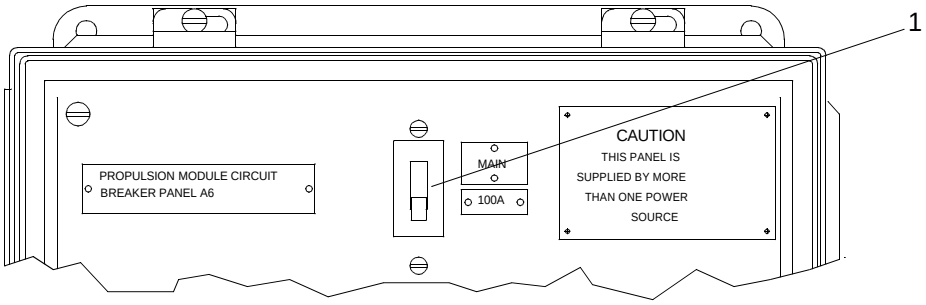
NOTE

Lead-acid batteries are completely recyclable.

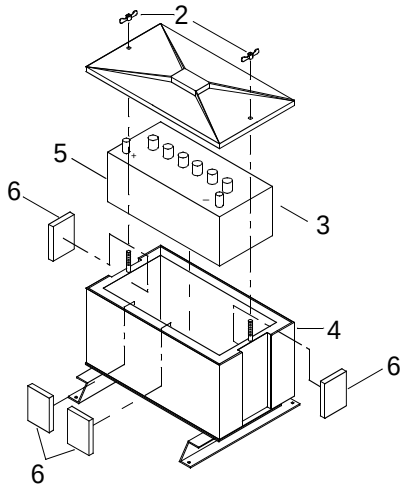
The battery installation consists of four battery boxes, each containing one battery.

The following procedure is typical for all four batteries.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove two wing nuts (2) from cover (3) and battery box (4).



3. Remove cover (3).
4. Tag and disconnect battery cables from battery (5).
5. Remove four wooden blocks (6) from battery box (4).

WARNING



6. Remove battery (5) from battery box (4).
7. Discard battery (5) in accordance with local procedures.

INSTALL ELECTRICAL SYSTEM BATTERY

WARNING



1. Install new battery (5) in battery box (4).
2. Install four wooden blocks (6) in battery box (4).
3. Connect wiring to battery (5) and remove tags.
4. Position cover (3) on battery box (4).
5. Install two wing nuts (2) through cover (3) and battery box (4).
6. Tighten two wing nuts (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM BATTERY BOX
REPLACEMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts
Box, Battery
(2P430)
PN 90-2138

Personnel Required
Engineer 88L

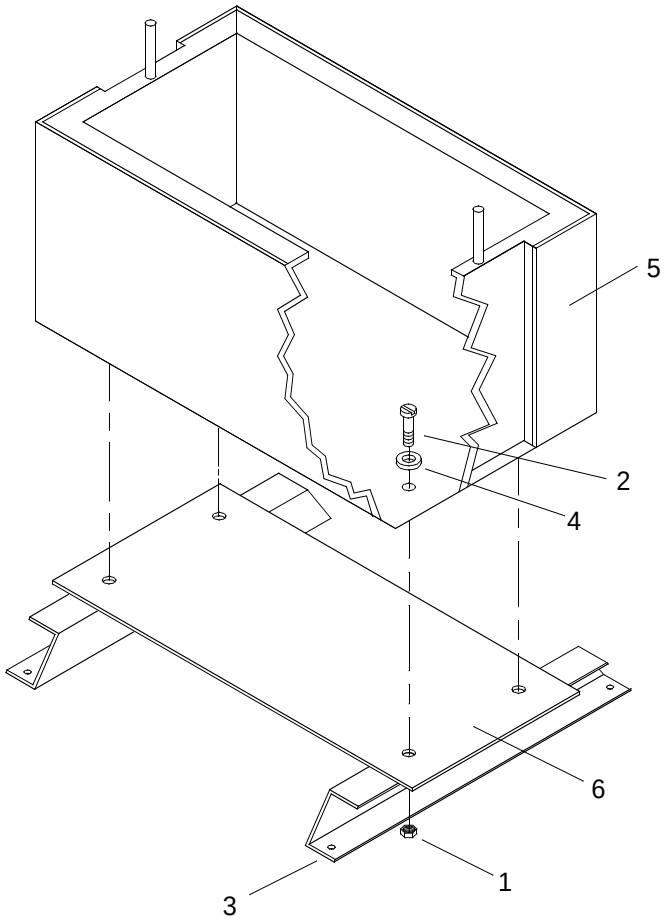
Equipment Condition
Electrical System Batteries Removed. (WP 0200 00)

REMOVE ELECTRICAL SYSTEM BATTERY BOX

NOTE

The following procedure is typical for all four battery boxes.

1. Remove four nuts (1) from four hex head cap screws (2) under battery box bracket (3).



2. Remove four hex head cap screws (2) and flat washers (4) from inside battery box (5).

3. Remove battery box (5) from mounting plate (6).

4. Discard battery box (5).

INSTALL ELECTRICAL SYSTEM BATTERY BOX

1. Position new battery box (5) on mounting plate (6).

2. Position four flat washers (4) on battery box (5).

3. Install four hex head cap screws (2) into flat washers (4), battery box (5), mounting plate (6) and battery box bracket (3).

4. Install four nuts (1) on four hex head cap screws (2) under battery box bracket (3).

5. Tighten four nuts (1).

6. Install electrical system batteries. (WP 0200 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM JUNCTION BOX JB1 FUSE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Fuse
(34712)
PN AGC-10 JB1F1

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

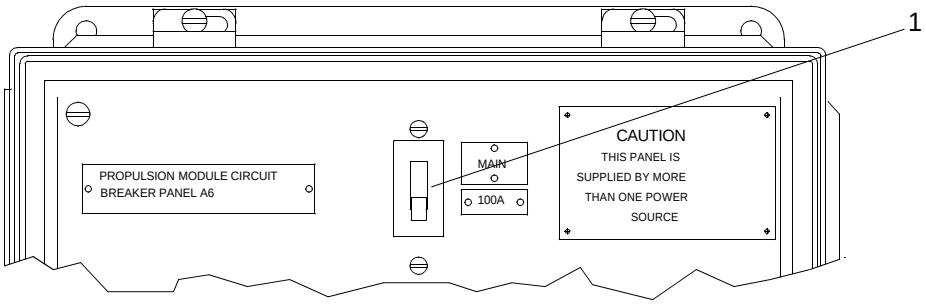
REMOVE ELECTRICAL SYSTEM JUNCTION BOX JB1 FUSE

WARNING

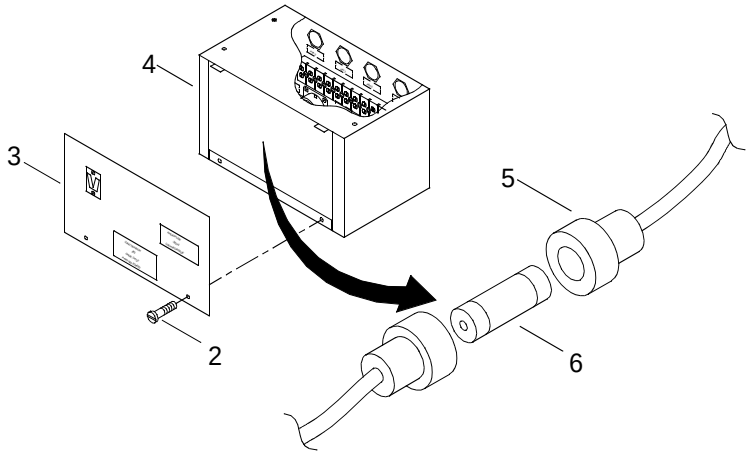


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen two door screws (2) securing junction box cover (3) to junction box (4).



3. Remove junction box cover (3).
4. Locate fuse holder (5) inside of JB1.
5. Twist two parts of fuse holder (5) in opposite directions and slide apart.
6. Remove and discard fuse (6).

INSTALL ELECTRICAL SYSTEM JUNCTION BOX JB1 FUSE

1. Position new fuse (6) in fuse holder (5).
2. Slide two parts of fuse holder (5) together and twist to secure.
3. Position junction box cover (3) on front of junction box (4).
4. Install two screws (2) to secure junction box cover (3) to the junction box (4). Tighten screws (2).
5. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM MODULE INTERCONNECT ASSEMBLY
REMOVAL, INSPECTION AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Sling, 8400 lb 20 ft (Yellow) (Item 39, WP 0383 00)
Qty 2

Personnel Required

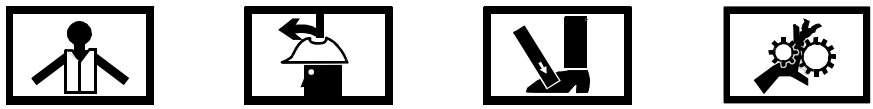
Engineer 88L

References

TM 55-1945-205-10-1

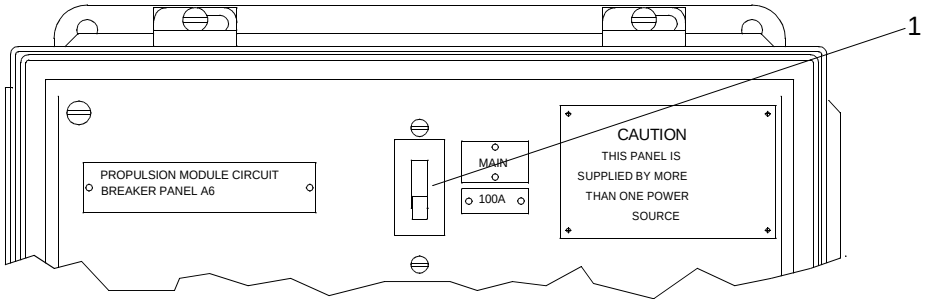
REMOVE ELECTRICAL SYSTEM MODULE ELECTRICAL INTERCONNECT ASSEMBLY

WARNING



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

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



NOTE

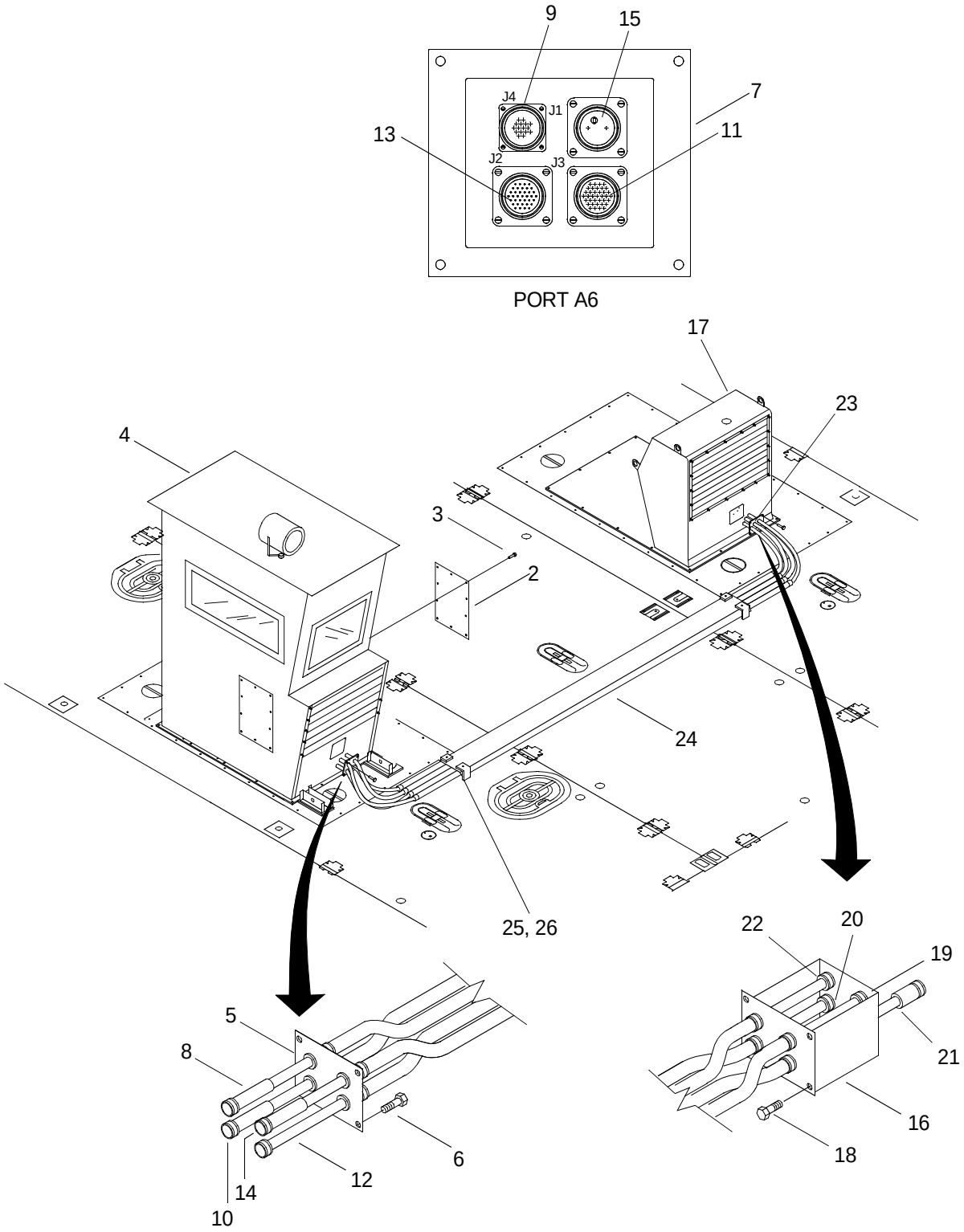
The following procedure provides for the removal of the interconnect assembly when the operators cab is installed on the starboard propulsion module. When the operators cab is mounted on the port side propulsion module, the starboard side operators cab side access panel is removed.

2. Remove operators cab port side access panel (2).

   a. Remove ten bolts (3) securing port side access panel (2) to the operators cab (4).

   b. Remove port side access panel (2).

3. Remove electrical interconnect assembly conduit plate (5) from operators cab (4).



a. Remove four bolts (6) attaching electrical interconnect assembly conduit plate (5) to operators cab (4).

b. Remove electrical interconnect assembly conduit plate (5).

4. Remove cables from operators cab (4) PORT receptacle 3A6 (7).
    a. Remove P4 (8) from J4 (9).
    b. Remove P3 (10) from J3 (11).
    c. Remove P2 (12) from J2 (13).
    d. Remove P1 (14) from J1 (15).
5. Remove electrical interconnect assembly conduit plate (16) from air intake plenum (17).
    a. Remove four bolts (18) attaching electrical interconnect assembly conduit plate (16) to air intake plenum (17).
    b. Remove electrical interconnect assembly conduit plate (16).
6. In the machinery compartment of the port side propulsion module, remove the power cables.
    a. Remove P1 (19) from the propulsion module circuit breaker panel A6.
    b. Remove P2 (20), P3 (21) and P4 (22) from the propulsion module junction box A3.
    c. Feed all cables from below deck through the front panel access (23) in the air intake plenum (17).
7. Remove electrical interconnect assembly (24).
    a. Loosen four allen head bolts (25) and pivot the hold down clamps (26) securing the electrical interconnect assembly (24) to the deck.

WARNING



HEAVY PARTS

NOTE

Care should be given to protect the connectors on both ends of the electrical interconnect assembly from damage.

    b. Using crane and sling, remove interconnect assembly (24) from the deck.

INSPECT ELECTRICAL SYSTEM MODULE ELECTRICAL INTERCONNECT ASSEMBLY

1. Inspect for broken or bent pins. Contact general support maintenance for repair as needed.
2. Inspect for broken contact sockets or corrosion on sockets. Contact general support maintenance for repair as needed.

INSTALL ELECTRICAL SYSTEM MODULE ELECTRICAL INTERCONNECT ASSEMBLY

WARNING



HEAVY PARTS

1. Using crane and sling, install interconnect assembly (24) on the deck.
2. Rotate four hold down clamps (26) into position over the electrical interconnect assembly and secure with four allen head bolts (25).
3. Tight allen head bolts (25).
4. In the machinery compartment of the port side propulsion module, install the power cables.
    a. Feed all cables from above deck through the front panel access (23) in the air intake plenum (17).
    b. Install P1 (19) on the propulsion module circuit breaker panel A6.
    c. Install P2 (20), P3 (21) and P4 (22) on the propulsion module junction box A3.
5. Install the electrical interconnect assembly conduit plate (16) on the air intake plenum (17).
    a. Position the electrical interconnect assembly conduit plate (16) on the front of the air intake plenum (17).
    b. Install four bolts (18) into the electrical interconnect assembly conduit plate (16) to air intake plenum (17).
    c. Tighten bolts (18).
6. Install cables on the operators cab (4) PORT receptacle 3A6 (7).
    a. Install P4 (8) on J4 (9).
    b. Install P3 (10) on J3 (11)
    c. Install P2 (12) on J2 (13).
    d. Install P1 (14) on J1 (15).
7. Install the electrical interconnect assembly conduit plate (5) from operators cab (4)
    a. Install four bolts (6) attaching electrical interconnect assembly conduit plate (5) to operators cab (4).
    b. Tighten bolts (6).
8. Install operators cab port side access panel.
    a. Position operators cab port side access panel (2) on side of operators cab (4) and secure with 10 bolts (3).
    b. Tighten bolts (3).
9. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM MODULE INTERCONNECT CABLE
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Crimping Tool, Terminal Hand (Item 8, WP 0383 00)
Tool Kit, Electrician's (Item 43, WP 0383 00)
Soldering Iron, Electric (Item 40, WP 0383 00)

Materials/Parts

Pins
(00779)
PN 66099-3
Pins
(00779)
PN 66101-3
Connector
(00779)
PN 208488-1
Connector
(00779)
PN 208470-1
Connector
(00779)
PN 208472-1
Connector
(77820)
PN GTC06LCF28-7S

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

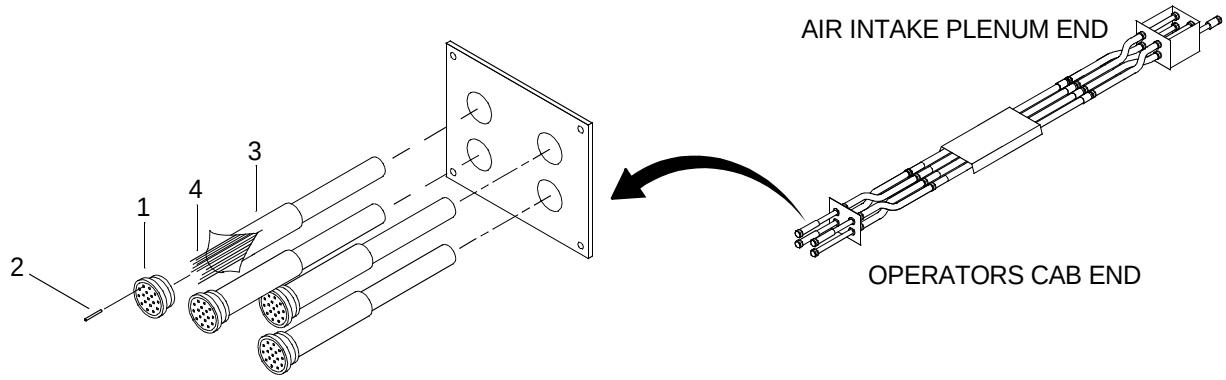
REPAIR ELECTRICAL SYSTEM MODULE INTERCONNECT CABLE

NOTE

Repair is typical for all connectors.

Repair is limited to the replacement of pins and connectors. Care should be given to protect the electrical connectors on both ends of the electrical interconnect assembly to prevent damage to exposed pins.

1. Inspect connectors (1) for bent or broken pins (2). Replace damaged items.



a. Remove damaged pin (2) using an extraction tool.

b. Replace as required using an insertion tool.

3. Inspect connectors (1) for cracks. Replace damaged items.

a. Remove connector (1).

{1} Cut cable housing (3) to expose wires (4) to defective connector (1).

{2} Cut wires (4) to connector (1).

b. Replace damaged connector (1) as required. Use soldering iron or crimping tool.

4. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM PUMP-JET JUNCTION BOX A2JB2
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts
Adhesive (Item 1, WP 0382 00)

Personnel Required
Engineer 88L

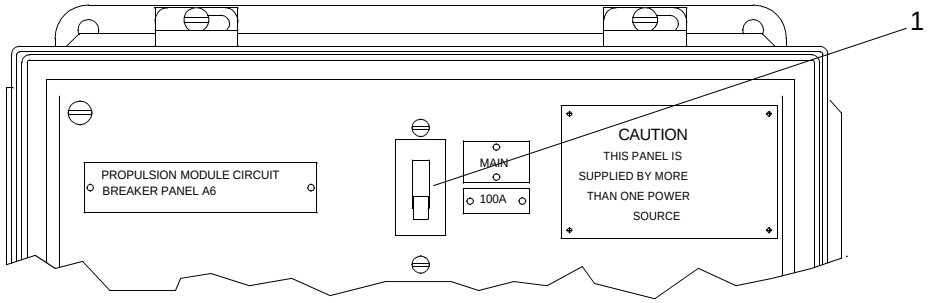
References
TM 55-1945-205-10-1

REMOVE ELECTRICAL SYSTEM PUMP-JET JUNCTION BOX A2JB2

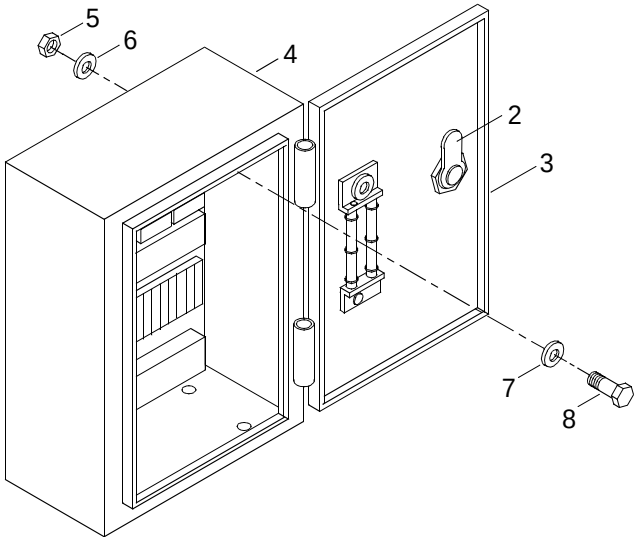
NOTE

This task is typical for port and starboard A2jb2 junction boxes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Rotate door latch (2) 90° clockwise and open enclosure cover (3).



3. Tag all wiring to the pump-jet junction box A2jb2 (4).

4. Remove all external wiring connected to the pump-jet junction box A2jb2 (4).

5. Remove four nuts (5), lock washers (6), flat washers (7), and hex head cap screws (8).

6. Remove pump-jet junction box A2jb2 (4).

INSTALL ELECTRICAL SYSTEM PUMP-JET JUNCTION BOX A2JB2

WARNING



CHEMICAL **EYE PROTECTION**

1. Apply adhesive to cap screws (8).

2. Install four hex head cap screws (8), flat washers (7), lock washers (6) and nuts (5).

3. Tighten nuts (5).

4. Connect wiring and remove tags.

5. Close enclosure cover (3) and rotate door latch (2) 90° counterclockwise.

6. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM PUMP-JET THRUSTER
JUNCTION BOX A2JB2
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

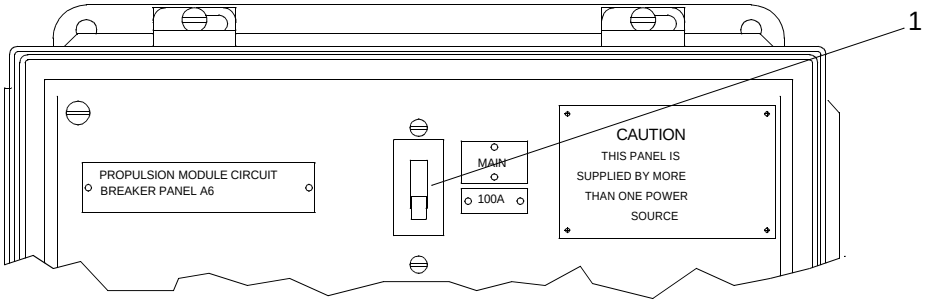
TM 55-1945-205-10-1

REPAIR ELECTRICAL SYSTEM PUMP-JET THRUSTER JUNCTION BOX A2JB2

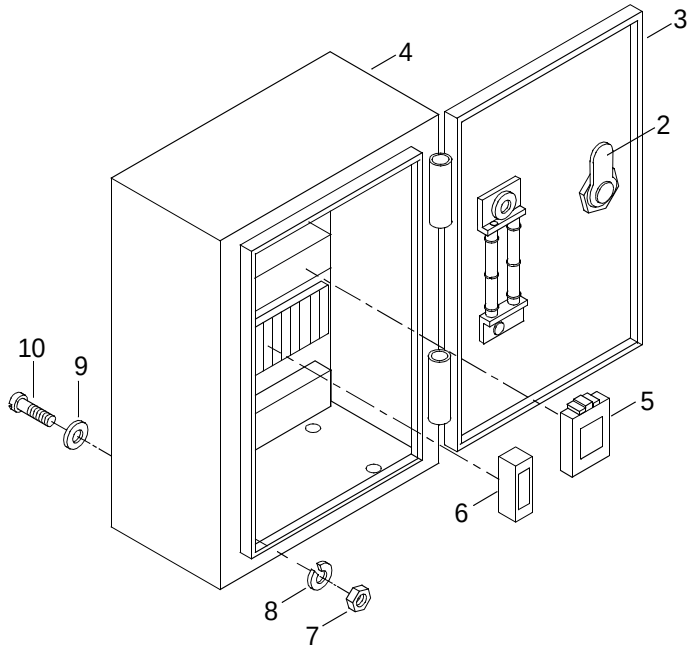
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the repair of pump-jet thruster junction boxes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Turn door latch (2) 90° clockwise and open door (3) to the junction box (4).



3. Remove relay (5) by pulling outward.

4. Remove circuit breaker (6) by pulling outward.

5. Remove thruster junction box (4).

   a. Tag and disconnect electrical wiring from the junction box (4).

   b. Remove four nuts (7), lock washers (8), flat washers (9) and cap screws (10) to secure junction box (4) to hull.

   c. Remove junction box (4).

6. Install thruster junction box (4).

   a. Position thruster junction box (4) on hull.

WARNING



CHEMICAL **EYE PROTECTION**

   b. Apply adhesive to cap screws (10).

   c. Install four cap screws (10), flat washers (9), lock washers (8) and nuts (7) securing junction box (4) to hull.

d. Tighten nuts (7).

e. Connect electrical wiring to the junction box (4).

f. Remove tags.

7. Install relay (5) in junction box (4) by pushing inward.

8. Install circuit breaker (6) in junction box (4) by pushing inward.

9. Close junction box door (3) and turn door latch (2) 90° counterclockwise to secure.

10. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM PROPULSION MODULE JUNCTION BOX A3
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts
Adhesive (Item 1, WP 0382 00)

Personnel Required
Engineer 88L

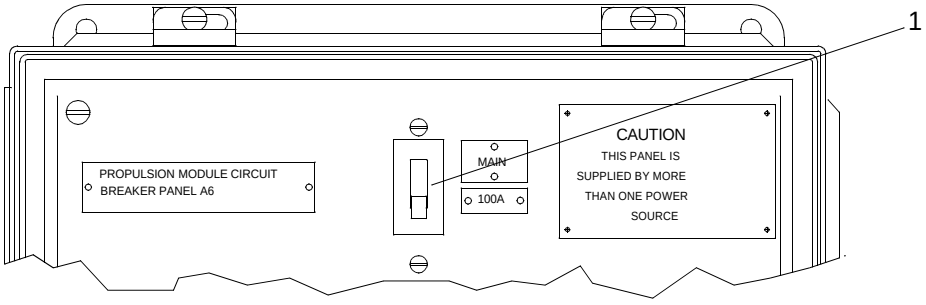
References
TM 55-1945-205-10-1

REMOVE ELECTRICAL SYSTEM PROPULSION MODULE JUNCTION BOX A3

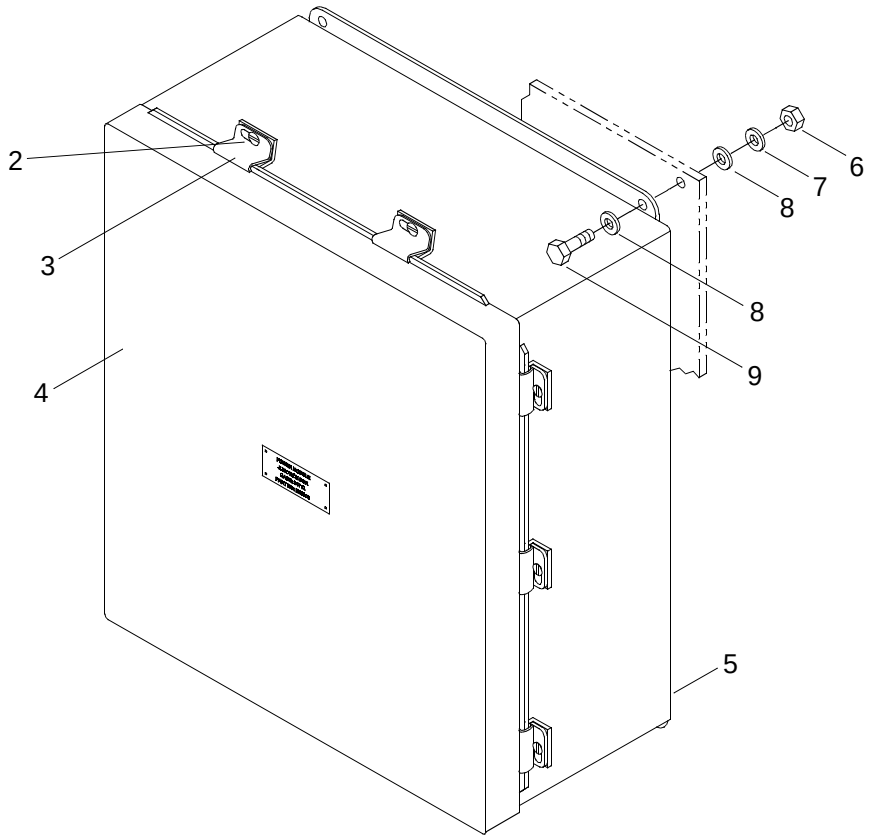
NOTE

The following procedure is typical for the removal and installation of propulsion module junction boxes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).

4. Tag all external electrical wiring.

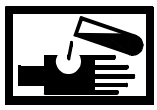
5. Remove all external electrical wiring connected to the propulsion module junction box A3 (5).

6. Remove four hex head four hex nuts (6), four lock washers (7), eight washers (8) and four hex head cap screws (9).

7. Remove propulsion module junction box A3 (5).

INSTALL ELECTRICAL SYSTEM PROPULSION MODULE JUNCTION BOX A3

WARNING



CHEMICAL



EYE PROTECTION

1. Apply adhesive to four hex head cap screws (2).
2. Position propulsion module junction box A3 (5) on mounting structure.
3. Install four hex head cap screws (9), eight flat washers (8), four lock washers (7) and four hex nuts (6).
4. Tighten hex nuts (6).
5. Connect all tagged wiring and remove tags.
6. Close enclosure cover (4) and secure with clamps (3) and screws (2).
7. Tighten screws (2).
8. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM PROPULSION MODULE JUNCTION BOX A3
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

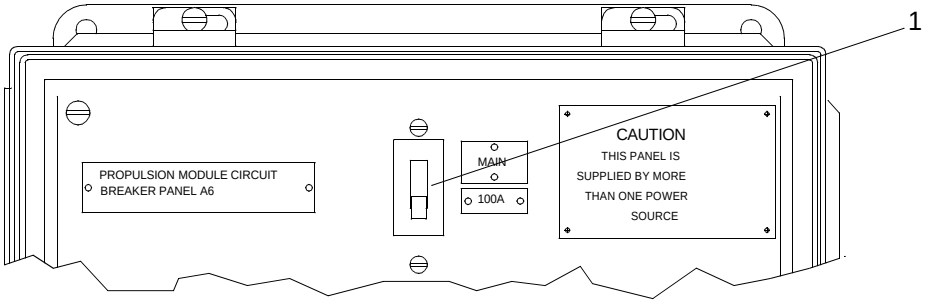
TM 55-1945-205-10-1

REPAIR ELECTRICAL SYSTEM PROPULSION MODULE JUNCTION BOX A3

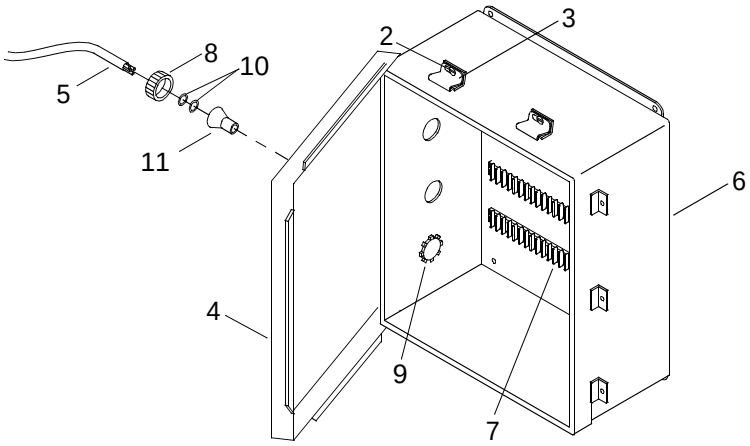
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the repair of pump-jet thruster junction boxes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).

NOTE

The following steps are typical for the removal of all three junction box cables.

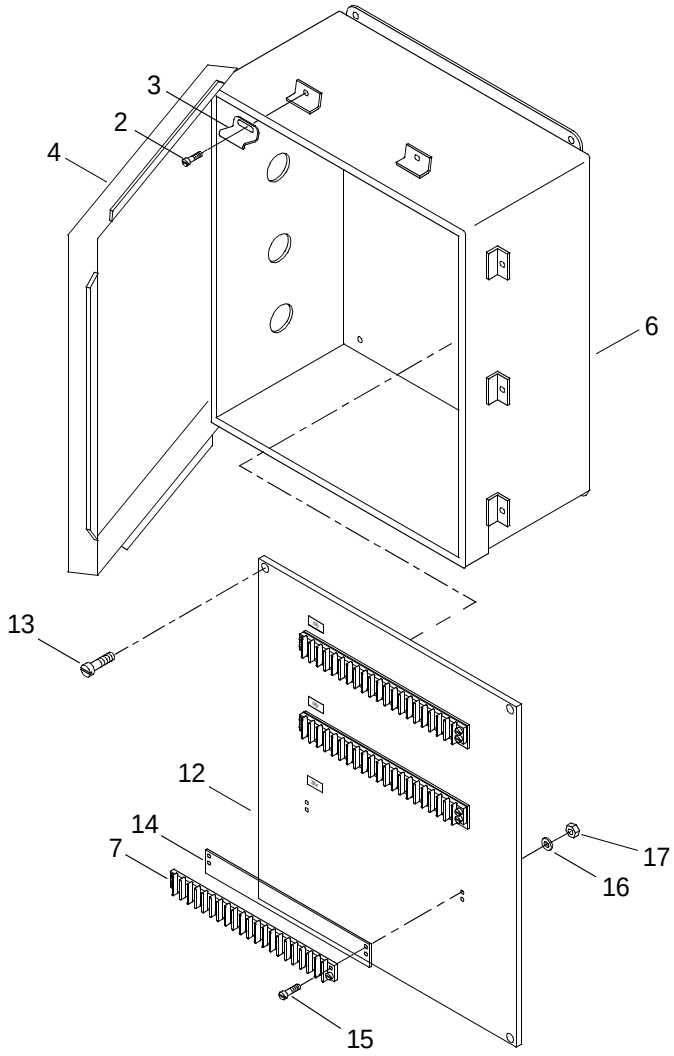
4. Remove cable (5) from propulsion module junction box A3 (6).

   a. Disconnect and tag electrical wiring to terminal block (7).

   b. Unscrew stuffing tube cap (8) from the stuffing tube (9).

   c. Remove cable (5) from the stuffing tube (9) retaining stuffing tube cap (8), plastic washers (10) and preformed packing (11) on the end of the cable (5).

5. Remove panel (12) from propulsion module junction box A3 (6).



a. Remove four screws (13) securing panel (12) to propulsion module junction box A3 (6).

b. Remove panel (12).

NOTE

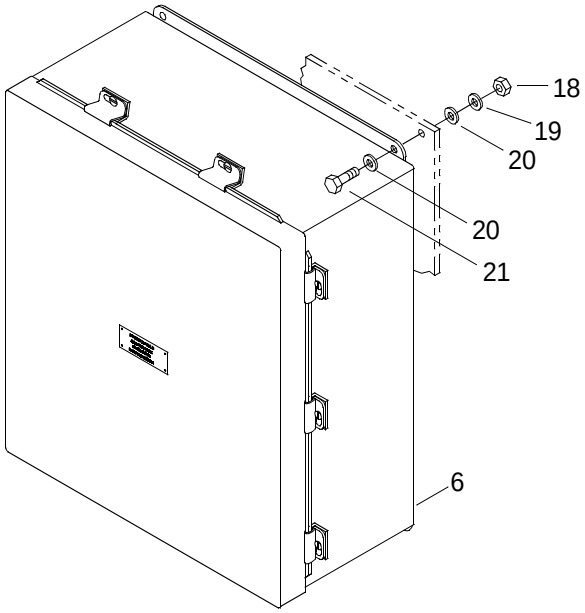
The following steps are typical for the removal of terminal blocks and marker strips.

6. Remove terminal block (7), marker strip (14) from panel (12).

a. Remove four pan head screws (15), lock washers (16) and insert nuts (17) securing terminal block (7) and marker strip (14) to panel (12).

b. Remove terminal block (7) and marker strip (14).

7. Remove propulsion module junction box A3 (6).



   a. Remove four hex head nuts (18), four lock washers (19), eight washers (20) and four hex head cap screws (21).

   b. Remove propulsion module junction box A3 (6).

8. Install propulsion module junction box A3 (6).

WARNING


CHEMICAL


EYE PROTECTION

   a. Apply adhesive to four hex head cap screws (21).

   b. Position propulsion module junction box A3 (6) on mounting structure.

   c. Install four hex head cap screws (21), eight flat washers (20), four lock washers (19) and four hex nuts (18).

   d. Tighten nuts (18).

NOTE

The following steps are typical for the installation of terminal blocks and marker strips.

9. Install terminal block (7), marker strip (12) on panel (12).

   a. Position terminal block (7) and marker strip (14) on panel (12).

   b. Install four pan head screws (15), lock washers (16) and insert nuts (17) securing terminal block (7) and marker strip (14) to panel (12).

c. Tighten insert nuts (17).

10. Install panel (12) in propulsion module junction box A3 (6).

a. Position panel (12) in propulsion module junction box A3 (6).

b. Install four screws (13) securing panel (12) to propulsion module junction box A3 (6).

c. Tighten screws (13).

NOTE

The following procedure is typical for the installation of all three junction box cables.

11. Install cable (5) from propulsion module junction box A3 (6).

a. Slide cable (5) into stuffing tube (9) on propulsion module junction box A3 (6).

b. Tighten stuffing tube cap (8) until secure.

c. Connect electrical wiring to terminal block (7). Remove tags.

12. Close enclosure cover (4) and secure with clamps (3) and screws (2).

13. Tighten screws (2).

14. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM ENGINE JUNCTION BOX A4
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts
Adhesive (Item 1, WP 0382 00)

Personnel Required
Engineer 88L

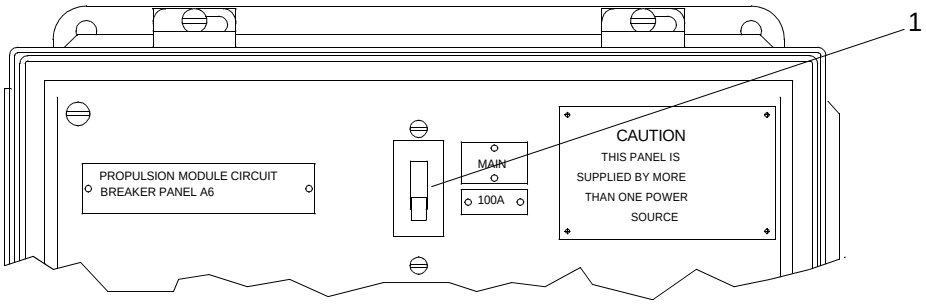
References
TM 55-1945-205-10-1

REMOVE ELECTRICAL SYSTEM ENGINE JUNCTION BOX A4

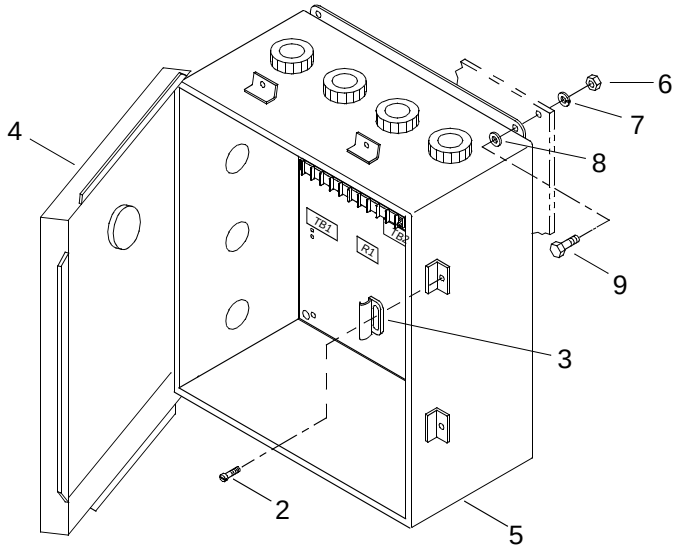
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the removal and installation of propulsion module engine junction boxes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



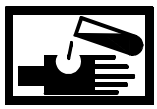
2. Loosen screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).
4. Tag all external electrical wiring.
5. Remove all external electrical wiring connected to the propulsion module engine junction box A4 (5).
6. Remove four hex head nuts (6), four lock washers (7), eight washers (8) and four hex head cap screws (9).
7. Remove propulsion module engine junction box A4 (5).

INSTALL ELECTRICAL SYSTEM ENGINE JUNCTION BOX A4

WARNING



CHEMICAL



EYE PROTECTION

1. Apply adhesive to four hex head cap screws (9).
2. Position propulsion module engine junction box A4 (5) on mounting structure.
3. Install four hex head cap screws (9), eight flat washers (8), four lock washers (7) and four hex nuts (6).
4. Tighten hex nuts (6).
5. Connect all tagged wiring and remove tags.
6. Close enclosure cover (4) and secure with clamps (3) and screws (2).
7. Tighten screws (2).
8. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM ENGINE JUNCTION BOX ASSEMBLY A4
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Engine Junction Box A4
(34712)
PN E08913
Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

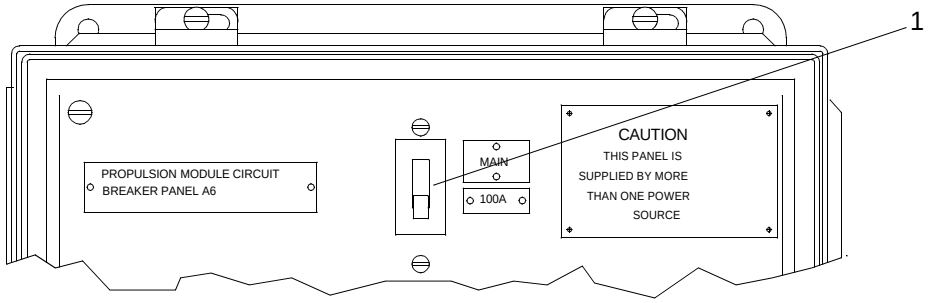
TM 55-1945-205-10-1

REPAIR ELECTRICAL SYSTEM ENGINE JUNCTION BOX ASSEMBLY A4

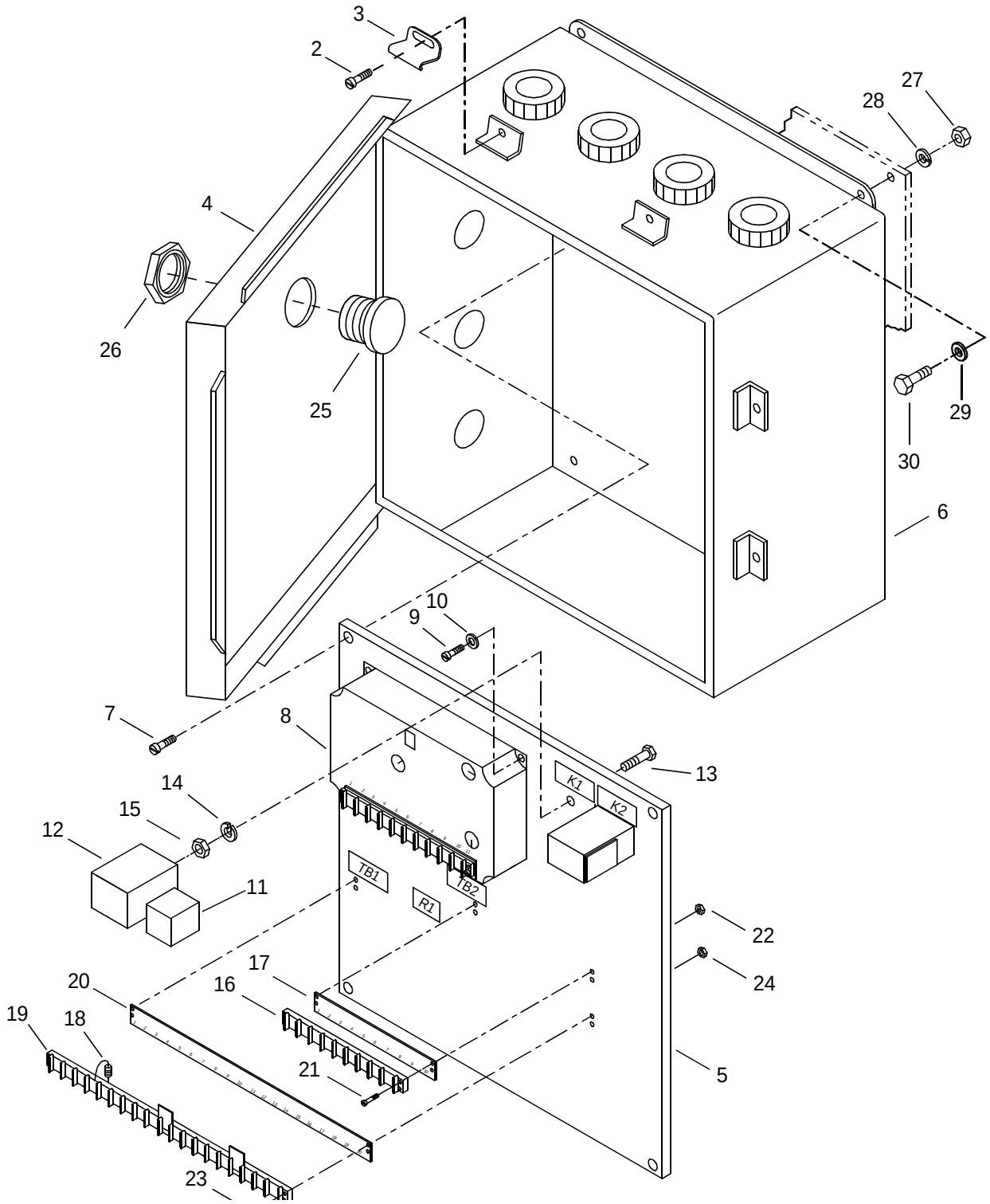
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the removal and installation of the engine junction box A4.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen six screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).

4. Tag and disconnect all internal wiring.

5. Remove panel (5) from propulsion module engine junction box A4 (6).
    a. Remove four screws (7) securing panel (5) to propulsion module engine junction box A4 (6).
    b. Remove panel (5).
6. Remove controller governor (8) from panel (5).
    a. Remove four pan head screws (9) and lock washers (10) securing controller governor (8) to panel (5).
    b. Remove controller governor (8).

NOTE

The following steps are typical for the removal of the K1 and K2 relays.

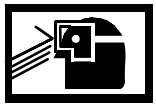
7. Remove relay (11) and relay socket (12) from panel (5).
    a. Remove relay (11) from relay socket (12) by pulling outwards.
    b. Remove pan head screw (13), lock washer (14) and insert nut (15) securing relay socket (12) to panel (5).
    c. Remove relay socket (12).
8. Remove terminal block (16), marker strip (17), resistor (18), terminal block (19) and marker strip (20) from panel (5).
    a. Remove four pan head screws (21) and nuts (22) securing terminal block (16) and marker strip (17) to panel (5).
    b. Remove terminal block (16) and marker strip (17).
    c. Remove resistor (18) from terminal block (19).
    d. Remove four pan head screws (23) and nuts (24) securing terminal block (19) and marker strip (20) to panel (5).
    e. Remove terminal block (19) and marker strip (20).
9. Remove engine emergency stop push button (25) from enclosure cover (4).
    a. Remove large nut (26) from outside of enclosure cover (4).
    b. Remove engine emergency stop button (25) from inside of enclosure cover (4).
10. Remove propulsion module engine junction box A4 (6).
    a. Remove tagged cables from propulsion module engine junction box A4 (6).
    b. Remove four hex nuts (27), lock washers (28), flat washers (29) and hex head cap screws (30) securing propulsion module engine junction box A4 (6) to structure.
    c. Remove propulsion module engine junction box A4 (6).

11. Install propulsion module engine junction box A4 (6).

WARNING



CHEMICAL



EYE PROTECTION

a. Apply adhesive to four hex head cap screws (30).

b. Position propulsion module engine junction box A4 (6) on mounting structure.

c. Install four hex head cap screws (30), flat washers (29), lock washers (28) and hex nuts (27).

d. Tighten nuts (27).

e. Install tagged cables into propulsion module engine junction box A4 (6).

f. Remove cable tags.

12. Install engine emergency stop button (25) on enclosure cover (4).

a. Position engine emergency stop button (25) on enclosure cover (4).

b. Install large nut (26) on engine emergency stop button (25).

c. Tighten large nut (26).

13. Install terminal block (16), marker strip (17), resistor (18), terminal block (19) and marker strip (20) on panel (5).

a. Install resistor (18) on terminal block (19).

b. Position marker strip (20) and terminal block (19) on panel (5).

c. Install four pan head screws (23) and nuts (24) to secure terminal block (19) and marker strip (20) to panel (5).

d. Tighten nuts (24).

e. Position marker strip (17) and terminal block (16) on panel (5).

f. Install four pan head screws (21) and nuts (22) to secure terminal block (16) and marker strip (17) to panel (5).

g. Tighten nuts (22).

NOTE

The following steps are typical for the installation of the K1 and K2 relays.

14. Install relay (11) and relay socket (12) on panel (5).

a. Position relay socket (12) on panel (5).

b. Install pan head screw (13), lock washer (14) and insert nut (15) securing relay socket (12) to panel (5).

c. Tighten insert nut (15).

d. Install relay (11) in relay socket (12) by pushing inwards.

15. Install controller governor (8) on panel (5).

a. Position controller governor (8) on panel (5).

b. Install four pan head screws (9) and lock washers (10) securing controller governor (8) to panel (5).

c. Tighten pan had screws (9).

16. Install panel (5) on propulsion module engine junction box A4 (6).

a. Position panel (5) in propulsion module engine junction box A4 (6).

b. Install four screws (7) securing panel (5) to propulsion module engine junction box A4 (6).

c. Tighten screws (7).

17. Connect all internal wiring and remove tags.

18. Close enclosure cover (4) and secure with six clamps (3) and screws (2).

19. Tighten screws (2).

20. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM BILGE PUMP CONTROL
PANEL ASSEMBLY A5
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

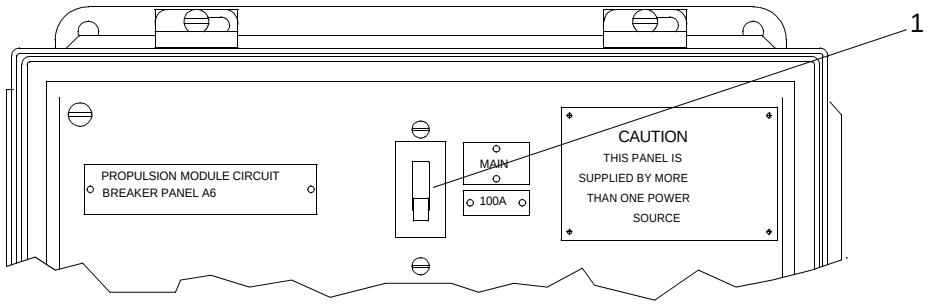
TM 55-1945-205-10-1

REMOVE ELECTRICAL SYSTEM BILGE PUMP CONTROL ASSEMBLY A5

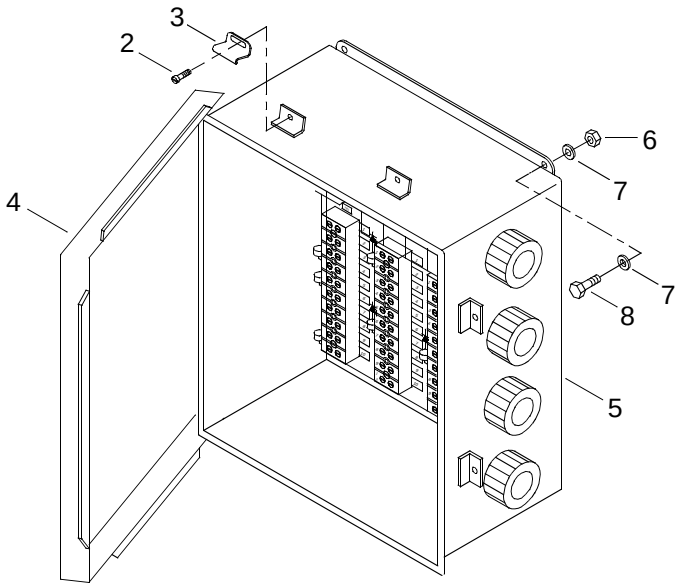
NOTE

The following procedure is typical for the removal and installation of bilge pump control assemblies.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen six screws (2) to pivot cover clamps (3) free.



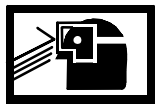
3. Open enclosure cover (4).
4. Tag all external wiring.
5. Remove all external wiring connected to the bilge pump control assembly A5 (5).
6. Remove four nuts (6), eight flat washers (7) and four hex head cap screws (8).
7. Remove bilge pump control assembly (5).

INSTALL ELECTRICAL SYSTEM BILGE PUMP CONTROL ASSEMBLY A5

WARNING



CHEMICAL



EYE PROTECTION

1. Apply adhesive to hex head cap screws (8).
2. Position the bilge pump control assembly A5 (5) on mounting structure.
3. Install four hex head cap screws (8), eight flat washers (7) and four nuts (6).
4. Tighten nuts (6).
5. Connect all tagged wiring and remove tags.
6. Close enclosure cover (4) and secure with six clamps (3) and screws (2).
7. Tighten screws (2).
8. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM BILGE PUMP
CONTROL PANEL ASSEMBLY A5
REPAIR

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts
Adhesive (Item 1, WP 0382 00)

Personnel Required
Engineer 88L

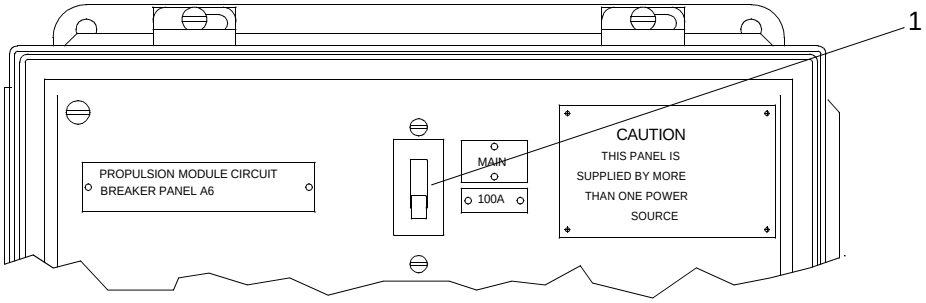
References
TM 55-1945-205-10-1

REPAIR ELECTRICAL SYSTEM BILGE PUMP CONTROL PANEL ASSEMBLY A5

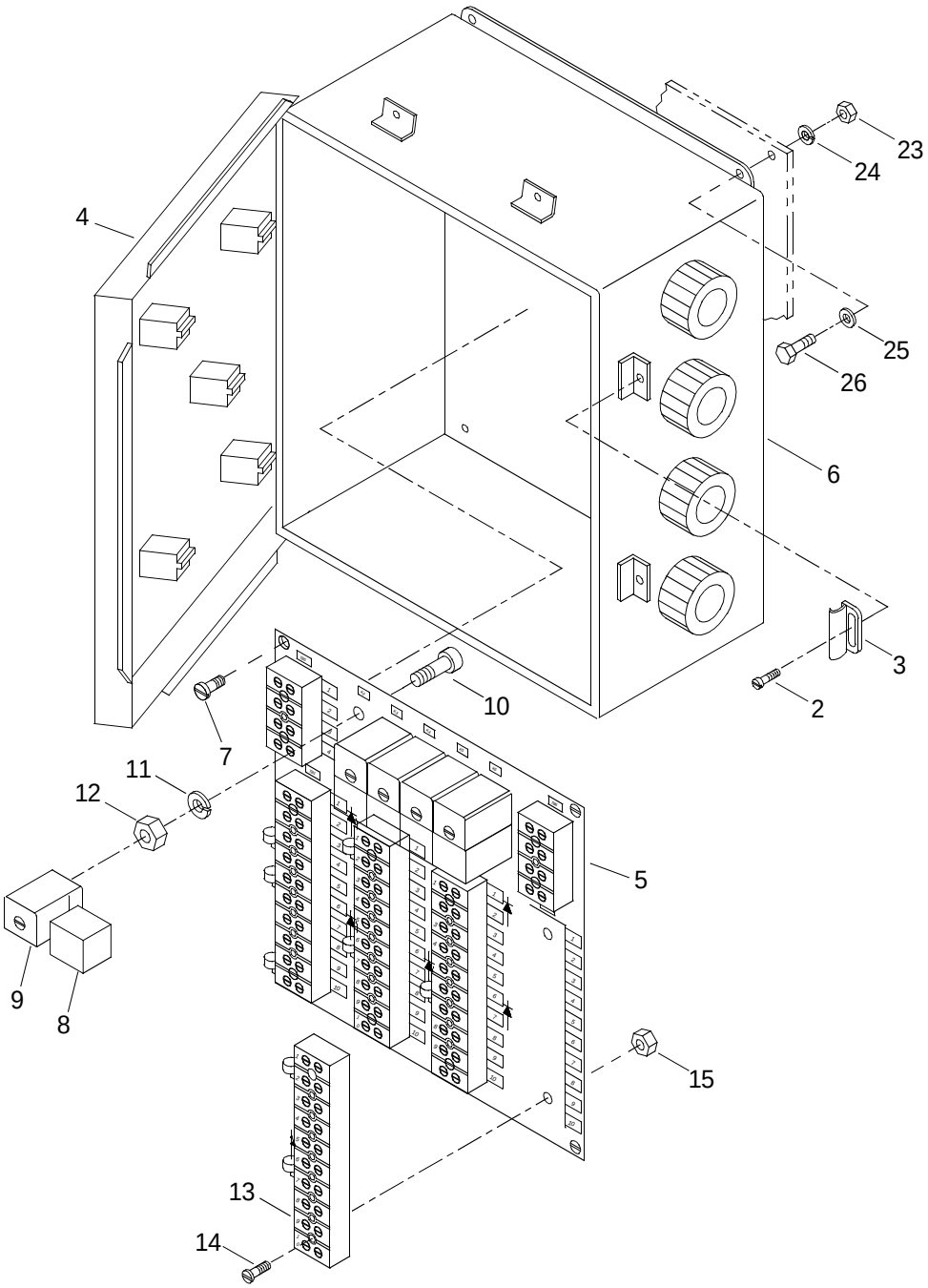
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the removal and installation of the bilge pump control panel assembly A5.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen six screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).

4. Tag and disconnect all internal wiring.

5. Remove panel (5) from propulsion module bilge pump control panel assembly A5 (6).

   a. Remove four screws (7) securing panel (5) to propulsion module bilge pump control panel assembly A5 (6).

   b. Remove panel (5).

NOTE

The following steps are typical for the removal of relays.

6. Remove relay (8) and relay socket (9) from panel (5).

   a. Remove relay (8) from relay socket (9) by pulling outwards.

   b. Remove pan head screw (10), lock washer (11) and insert nut (12) securing relay socket (9) to panel (5).

   c. Remove relay socket (9).

CAUTION

When removing diodes attached to terminal blocks, note the polarity as installed to prevent reversal during installation. Failure to comply will result in damage to equipment.

NOTE

The following steps are typical for the removal of terminal blocks.

7. Remove terminal block (13) from panel (5).

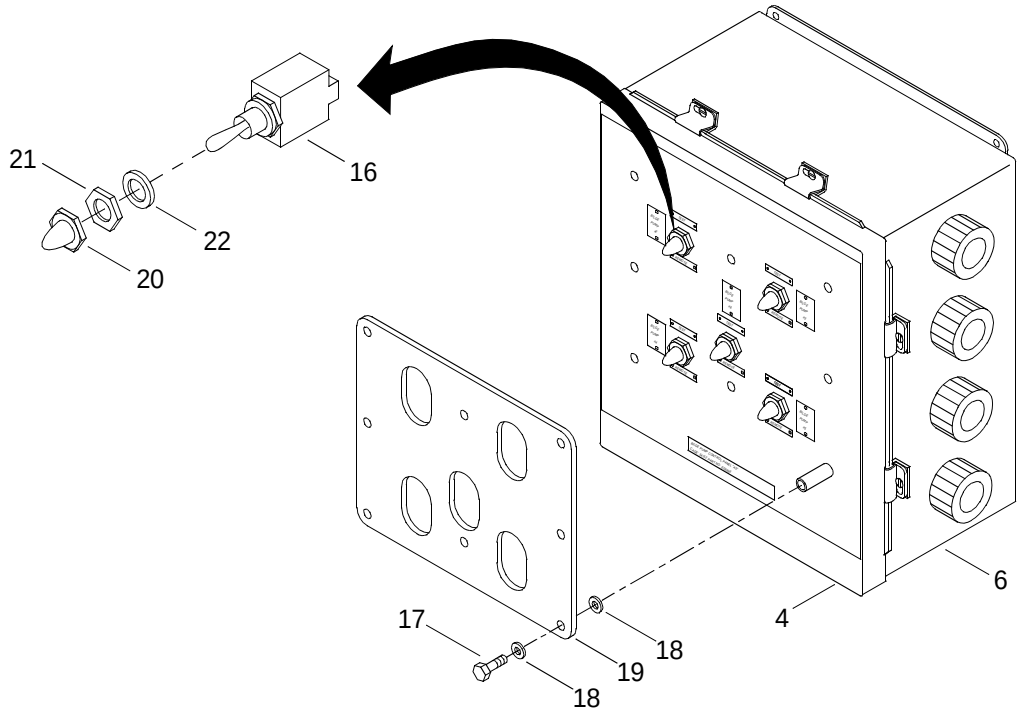
   a. Remove two pan head screws (14) and nuts (15) securing terminal block (13) to panel (5).

   b. Remove terminal block (13).

NOTE

The following steps are typical for the removal of toggle switches.

8. Remove toggle switch (16) from enclosure cover (4).



a. Remove four cap screws (17), eight flat washers (18) and plastic guard (19) from exterior of enclosure cover (4).

b. Remove toggle seal boot (20), attaching hex nut (21) and flat washer (22) from toggle switch (16).

c. Remove toggle switch (16) from interior of enclosure cover (4).

9. Remove bilge pump control panel assembly A5 (6).

a. Remove tagged cables from propulsion module bilge pump control panel assembly A5 (6).

b. Remove four hex nuts (23), lock washers (24), flat washers (25) and hex head cap screws (26) securing propulsion module bilge pump control panel assembly A5 (6) to structure.

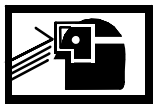
c. Remove propulsion module bilge pump control panel assembly A5 (6).

10. Install propulsion module bilge pump control panel assembly A5 (6).

WARNING



CHEMICAL



EYE PROTECTION

a. Apply adhesive to four hex head cap screws (26).

b. Position propulsion module bilge pump control panel assembly A5 (6) on mounting structure.

c. Install four hex head cap screws (26), flat washers (25), lock washers (24) and hex nuts (23).

d. Tighten nuts (23).

e. Install tagged cables into propulsion module bilge pump control panel assembly A5 (6).

f. Remove cable tags.

NOTE

The following steps are typical for the installation of toggle switches.

11. Install toggle switch (16) on enclosure cover (4).

a. Position toggle switch (16) on enclosure cover (4).

b. Install flat washer (22), attaching hex nut (21) and toggle seal boot (20) on toggle switch (16).

c. Tighten attaching nut (21).

d. Position plastic guard (19) on front of enclosure cover (4).

e. Install four cap screws (17) and eight flat washers (18) securing plastic guard (19) on enclosure cover (4).

NOTE

If diodes were removed during terminal block removal, install with same polarity noted during removal. The following steps are typical for the installation of terminal blocks.

12. Install terminal block (13) on panel (5).
    a. Position terminal block (13) on panel (5).
    b. Install two pan head screws (14) and nuts (15) to secure terminal block (13) to panel (5).
    c. Tighten nuts (15).

NOTE

The following steps are typical for the installation of relays.

13. Install relay (8) and relay socket (9) on panel (5).
    a. Position relay socket (9) on panel (5).
    b. Install pan head screw (10), lock washer (11) and insert nut (12) securing relay socket (9) to panel (5).
    c. Tighten insert nut (12).
    d. Install relay (8) in relay socket (9) by pushing inwards.
14. Install panel (5) on propulsion module bilge pump control panel assembly A5 (6).
    a. Position panel (5) in propulsion module bilge pump control panel assembly A5 (6).
    b. Install four screws (7) securing panel (5) to propulsion module bilge pump control panel assembly A5 (6).
    c. Tighten screws (7).
15. Connect all internal wiring and remove tags.
16. Close enclosure cover (4) and secure with six clamps (3) and screws (2).
17. Tighten screws (2).
18. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM PROPULSION MODULE
CIRCUIT BREAKER PANEL A6
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Puller, Battery Terminal (Item 27, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

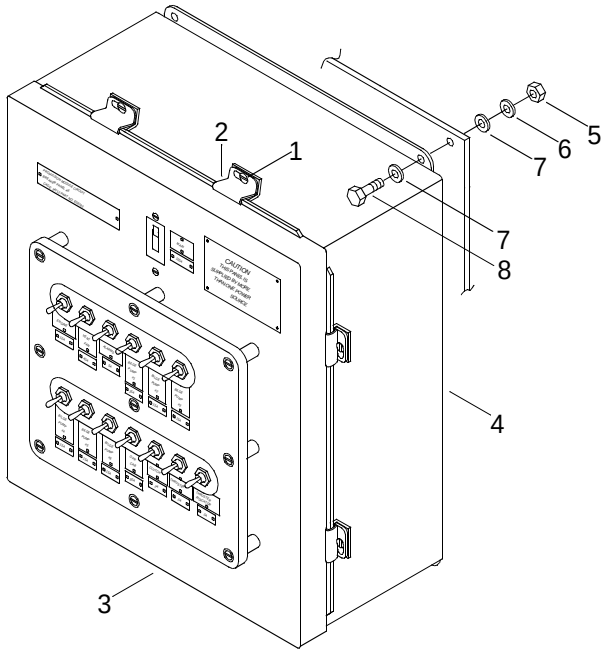
Powered Section Main Batteries Negative Lead Terminals Removed. (WP 0198 00)
Electrical System Pump-Jet Direction/Auxiliary Battery Junction Box A9 Batteries Removed. (WP 0220 00)

REMOVE ELECTRICAL SYSTEM PROPULSION MODULE CIRCUIT BREAKER PANEL A6

NOTE

The following procedure is typical for the removal and installation of propulsion module circuit breaker panels.

1. Loosen six screws (1) and to pivot cover clamps (2) free.



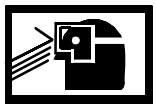
2. Open enclosure cover (3).
3. Tag all external electrical wiring.
4. Remove all external wiring connected to the propulsion module circuit breaker panel A6 (4).
5. Remove four hex nuts (5), four lock washers (6), eight flat washers (7) and four hex head cap screws (8).
6. Remove propulsion module circuit breaker panel A6 (4).

INSTALL ELECTRICAL SYSTEM PROPULSION MODULE CIRCUIT BREAKER PANEL A6

WARNING



CHEMICAL



EYE PROTECTION

1. Apply adhesive to cap screws (8).
2. Position the propulsion circuit breaker panel A6 (4) on mounting structure.
3. Install four hex head cap screws (8), eight flat washers (7), four lock washers (6) and four hex nuts (5).
4. Tighten nuts (5).
5. Connect all tagged wiring and remove tags.
6. Close enclosure cover (3) and secure with six clamps (2) and screws (1).
7. Tighten screws (1).
8. Install electrical system pump-jet direction/auxiliary battery junction box A9 batteries. (WP 0220 00)
9. Install powered section main batteries negative lead terminals. (WP 0198 00)
10. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM PROPULSION MODULE
CIRCUIT BREAKER PANEL A6
REPAIR

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts
Adhesive (Item 1, WP 0382 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

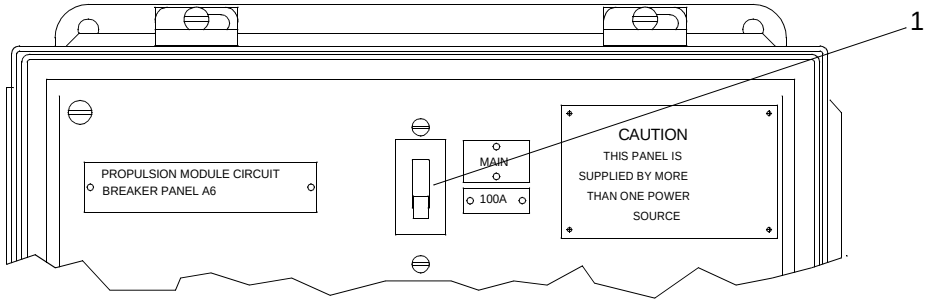
Equipment Condition
Powered Section Main Batteries Negative Lead Terminals Removed. (WP 0198 00)
Electrical System Pump-Jet Direction/Auxiliary Battery Junction Box A9 Batteries Removed. (WP 0220 00)

REPAIR ELECTRICAL SYSTEM PROPULSION MODULE CIRCUIT BREAKER PANEL A6

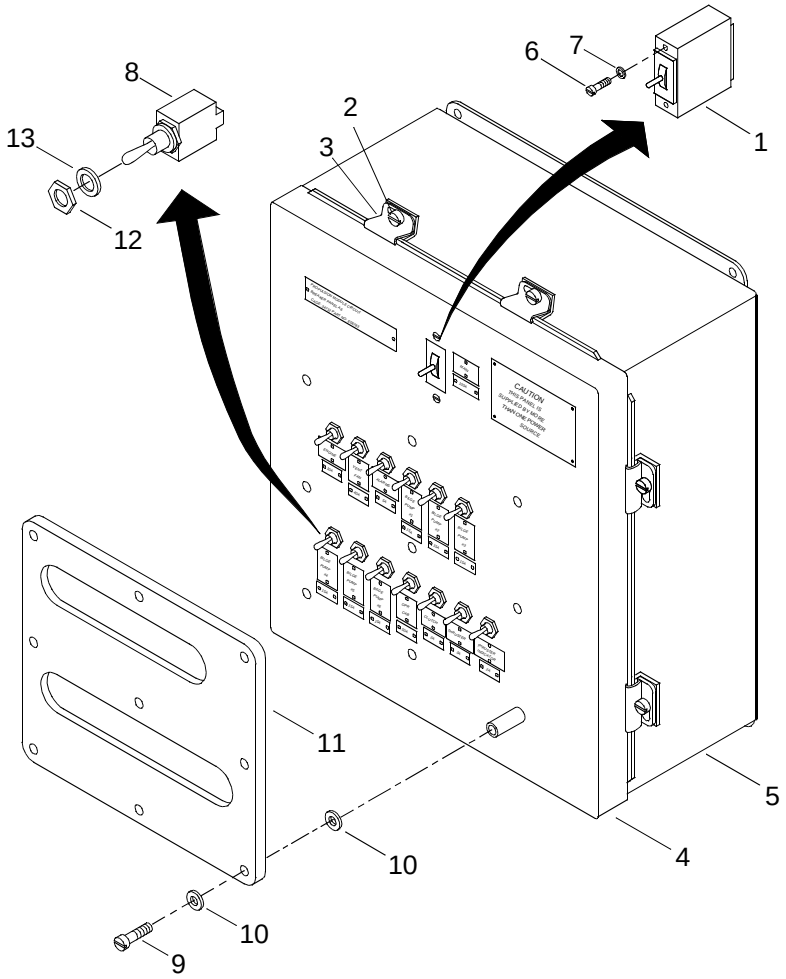
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the removal and installation of propulsion module circuit breaker panel A6.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen six screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).

4. Tag and disconnect all internal wiring.

5. Remove MAIN circuit breaker (1) from the propulsion module circuit breaker panel A6 (5).

   a. Remove two round head screws (6) and lock washers (7) securing MAIN circuit breaker (1) to the interior of enclosure cover (4).

   b. Remove MAIN circuit breaker (1).

NOTE

The following steps are typical for the removal of circuit breakers.

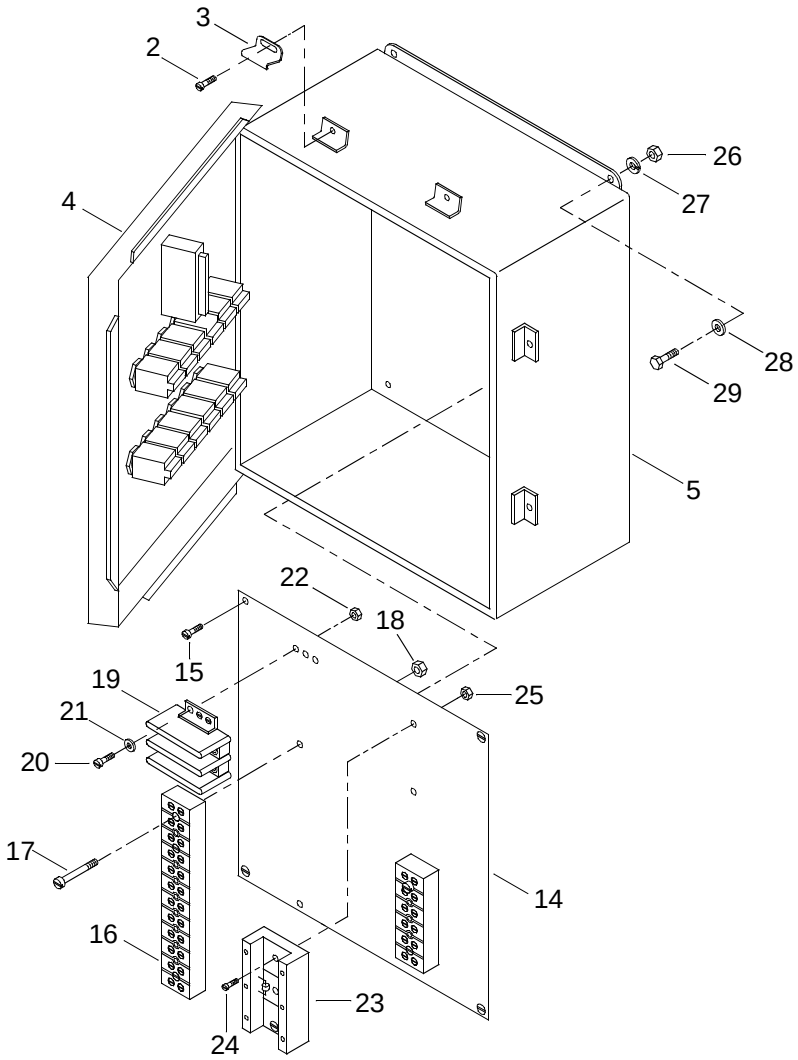
6. Remove circuit breaker (8) from enclosure cover (4).

   a. Remove nine pan head screws (9), eighteen flat washers (10) and plastic guard (11) from exterior of enclosure cover (4).

   b. Remove remove hex nut (12) and flat washer (13) from circuit breaker (8).

   c. Remove circuit breaker (8) from interior of enclosure cover (4).

7. Remove panel (14) from propulsion module circuit breaker panel A6 (5).



a. Remove four screws (15) securing panel (14) to propulsion module circuit breaker panel A6 (5).

b. Remove panel (14).

NOTE

The following steps are typical for the removal of terminal blocks.

8. Remove terminal block (16) from panel (14).

a. Remove two round head screw (17) and insert nuts (18) securing terminal block (16) to panel (14).

b. Remove terminal block (13).

9. Remove power block (19) from panel (14).

a. Remove four round head screws (20), flat washers (21) and insert nuts (22) securing power block (19) to panel (14).

b. Remove power block (19).

10. Remove power distribution block (23) from panel (14).

    a. Remove two round head screws (24) and insert nuts (25) securing power distribution block (23) to panel (14).

    b. Remove power distribution block (23).

11. Remove propulsion module circuit breaker panel A6 (5).

    a. Remove tagged cables from propulsion module circuit breaker panel A6 (5).

    b. Remove four hex nuts (26), lock washers (27), flat washers (28) and hex head cap screws (29) securing propulsion module bilge pump control panel assembly A5 (6) to structure.

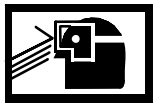
    c. Remove propulsion module circuit breaker panel A6 (5).

12. Install propulsion module circuit breaker panel A6 (5).

WARNING



CHEMICAL



EYE PROTECTION

    a. Apply adhesive to four hex head cap screws (29).

    b. Position propulsion module circuit breaker panel A6 (5) on mounting structure.

    c. Install four hex head cap screws (29), flat washers (28), lock washers (27) and hex nuts (26).

    d. Tighten nuts (26).

    e. Install tagged cables into propulsion module circuit breaker panel A6 (5).

    f. Remove cable tags.

13. Install power distribution block (23) on panel (14).

    a. Position power distribution block (23) on panel (14).

    b. Install two round head screws (24) and insert nuts (25) securing power distribution block (23) to panel (14).

    c. Tighten insert nuts (25).

14. Install power block (19) on panel (14).

    a. Position power block (19) on panel (14).

    b. Install four round head screws (20), flat washers (21) and insert nuts (22) securing power block (19) to panel (14).

    c. Tighten insert nuts (22).

NOTE

The following steps are typical for the installation of terminal blocks.

15. Install terminal block (16) on panel (14).
    a. Position terminal block on panel (14) on panel.
    b. Install two round head screws (17) and insert nut (18) securing terminal block (16) to panel (14).
    c. Tighten insert nuts (18).
16. Install panel (14) on propulsion module circuit breaker panel A6 (5).
    a. Position panel (14) in propulsion module circuit breaker panel A6 (5).
    b. Install four screws (15) securing panel (14) to propulsion module circuit breaker panel A6 (5).
    c. Tighten screws (15).

NOTE

The following steps are typical for installation of circuit breakers.

17. Install circuit breaker (8) on enclosure cover (4).
    a. Position circuit breaker (8) on enclosure cover (4).
    b. Install flat washer (13) and hex nut (12) on circuit breaker (8).
    c. Tighten hex nut (12).
    d. Position plastic guard on exterior of enclosure cover (4).
    e. Install nine pan head screws (9) and eighteen flat washers securing plastic guard to enclosure cover (4).
    f. Tighten pan head screws (9).
18. Install MAIN circuit breaker (1) on enclosure clover (4).
    a. Position MAIN circuit breaker (1) on enclosure cover (4).
    b. Install two round head screws (6) and lock washers (7) securing MAIN circuit breaker to enclosure cover (4).
    c. Tighten round head screws (6).
19. Connect all internal wiring and remove tags.
20. Close enclosure cover (4) and secure with six clamps (3) and screws (2). Tighten screws (2).
21. Install electrical system pump-jet direction/auxiliary battery junction box A9 batteries. (WP 0220 00)
22. Install powered section main batteries negative lead terminals. (WP 0198 00)
23. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM SINGLE BILGE PUMP
CONTROL ASSEMBLY A7
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

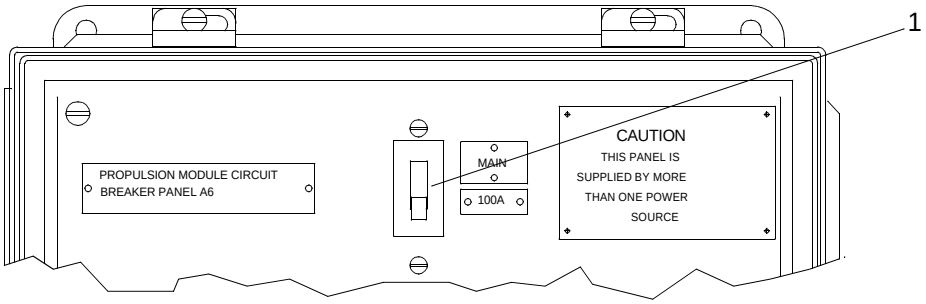
TM 55-1945-205-10-1

REMOVE ELECTRICAL SYSTEM SINGLE BILGE PUMP CONTROL ASSEMBLY A7

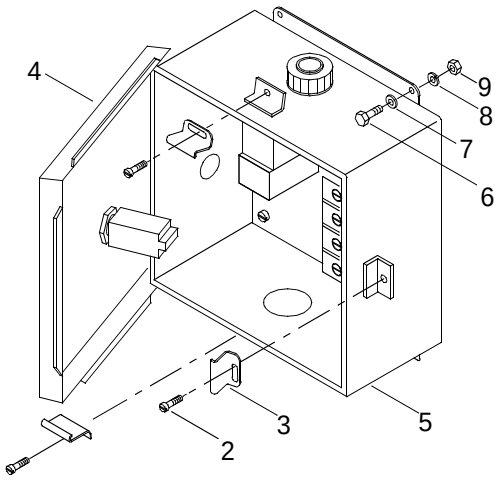
NOTE

The following procedure is typical for the removal and installation of single bilge pump assemblies.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



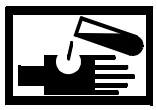
2. Loosen three screws (2) to pivot cover clamps (3) free.

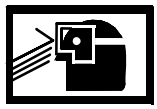


3. Open enclosure cover (4).
4. Tag all external electrical wiring.
5. Remove all external electrical wiring connected to the single bilge pump control assembly A7 (5).
6. Remove four cap screws (6), flat washers (7), lock washers (8) and nuts (9).
7. Remove single bilge pump control assembly A7 (5).

INSTALL ELECTRICAL SYSTEM SINGLE BILGE PUMP CONTROL ASSEMBLY A7

WARNING


CHEMICAL


EYE PROTECTION

1. Apply adhesive to cap screws (6).
2. Position the single bilge pump control assembly A7 (5) on mounting structure.
3. Install four cap screws (6), flat washers (7), lock washers (8) and nuts (9).
4. Tighten nuts (9).
5. Connect all tagged wiring and remove tags.
6. Close enclosure cover (4) and secure with three clamps (3) and screws (2).
7. Tighten screws (2).
8. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM SINGLE BILGE PUMP
CONTROL ASSEMBLY A7
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

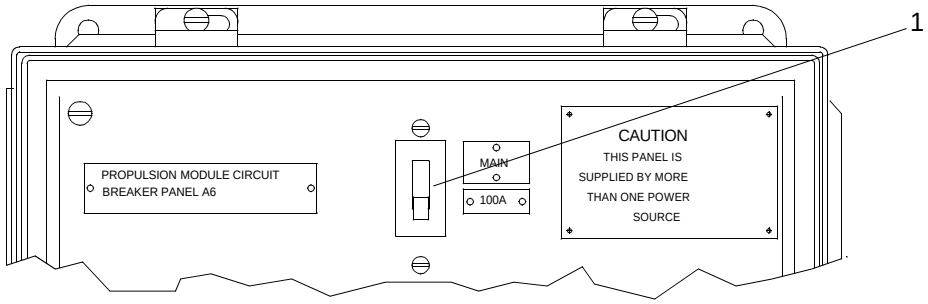
TM 55-1945-205-10-1

REPAIR ELECTRICAL SYSTEM SINGLE BILGE PUMP CONTROL ASSEMBLY A7

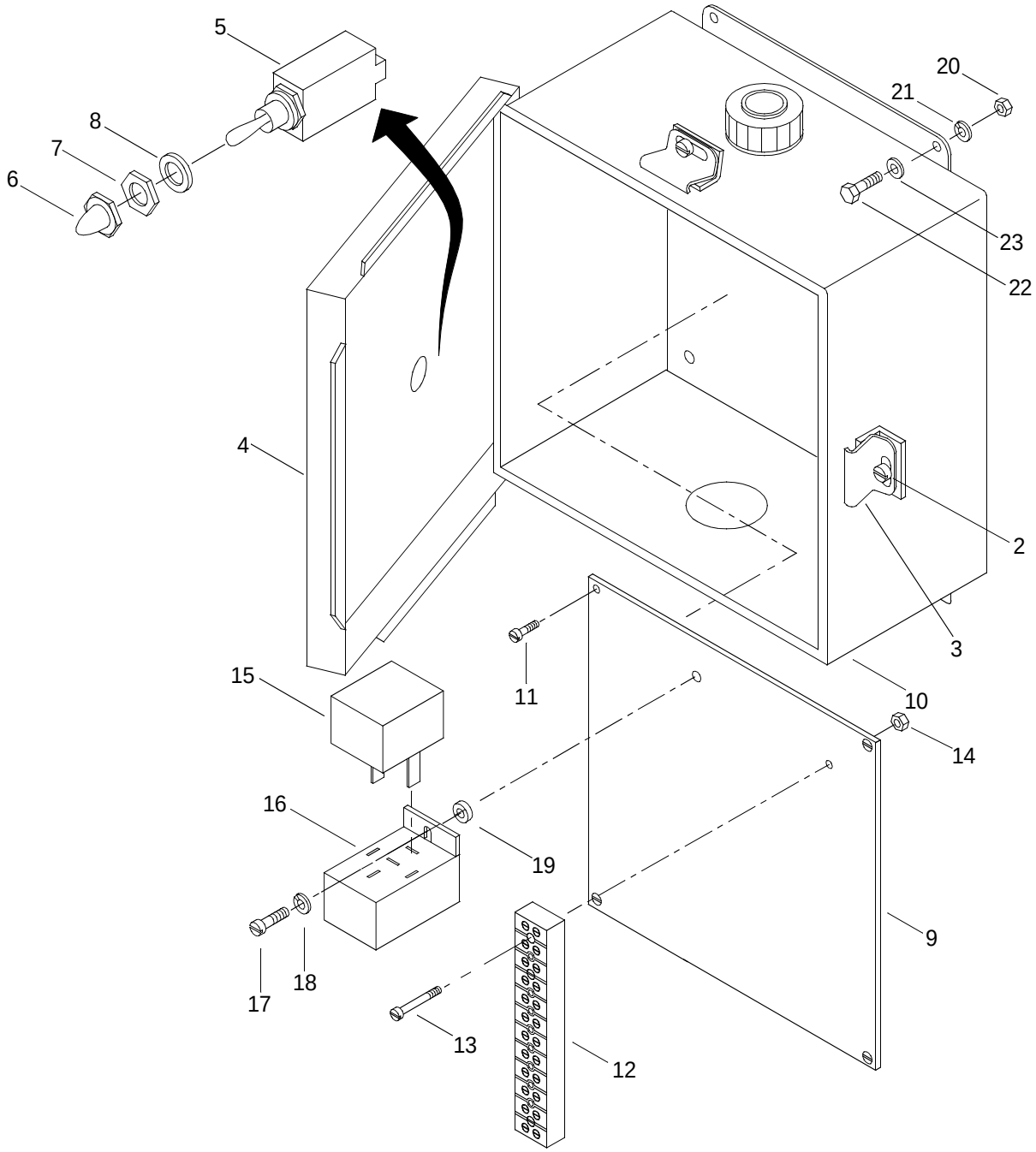
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the removal and installation of the single bilge pump control assembly A7.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen three screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).

4. Tag and disconnect all internal wiring.

5. Remove toggle switch (5) from enclosure cover (4).

   a. Remove remove toggle seal boot (6), attaching hex nut (7) and flat washer (8) from toggle switch (5).

   b. Remove toggle switch (5) from interior of enclosure cover (4).

6. Remove panel (9) from propulsion module single bilge pump control assembly A7 (10).

    a. Remove four screws (11) securing panel (9) to propulsion module single bilge pump control assembly A7 (10).

    b. Remove panel (9).

7. Remove terminal block (12) from panel (9).

    a. Remove two pan head screws (13) and nuts (14) securing terminal block (12) to panel (9).

    b. Remove terminal block (12).

8. Remove relay (15) and relay socket (16) from panel (9).

    a. Remove relay (15) from relay socket (16) by pulling outwards.

    b. Remove pan head screw (17), lock washer (18) and insert nut (19) securing relay socket (16) to panel (9).

    c. Remove relay socket (16).

9. Remove single bilge pump control assembly A7 (10).

    a. Remove tagged cables from propulsion module single bilge pump control assembly A7 (10).

    b. Remove four hex nuts (20), lock washers (21), flat washers (23) and hex head cap screws (22) securing propulsion module single bilge pump control panel assembly A7 (10) to structure.

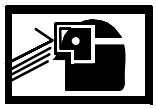
    c. Remove propulsion module single bilge pump control assembly A7 (10).

10. Install propulsion module single bilge pump control assembly A7 (10).

WARNING



CHEMICAL



EYE PROTECTION

    a. Apply adhesive to four hex head cap screws (22).

    b. Position propulsion module single bilge pump control assembly A7 (10) on mounting structure.

    c. Install four hex head cap screws (22), flat washers (23), lock washers (21) and hex nuts (20).

    d. Tighten nuts (20).

    e. Install tagged cables into propulsion module single bilge pump control assembly A7 (10).

    f. Remove cable tags.

11. Install toggle switch (5) on enclosure cover (4).
    a. Position toggle switch (5) on enclosure cover (4).
    b. Install flat washer (8), attaching hex nut (7), and toggle seal boot (6) on toggle switch (5).
    c. Tighten attaching nut (7).
12. Install terminal block (12) on panel (9).
    a. Position terminal block (12) on panel (9).
    b. Install two pan head screws (13) and nuts (14) to secure terminal block (12) to panel (9).
    c. Tighten nuts (14).
13. Install relay (15) and relay socket (16) on panel (9).
    a. Position relay socket (16) on panel (9).
    b. Install pan head screw (17), lock washer (18) and insert nut (19) securing relay socket (16) to panel (9).
    c. Tighten insert nut (19).
    d. Install relay (15) in relay socket (16) by pushing inwards.
14. Install panel (9) on propulsion module single bilge pump control assembly A7 (10).
    a. Position panel (9) in propulsion module single bilge pump control assembly A7 (10).
    b. Install four screws (11) securing panel (9) to propulsion module single bilge pump control assembly A7 (10).
    c. Tighten screws (11)
15. Connect all internal wiring and remove tags.
16. Close enclosure cover (4) and secure with three clamps (3) and screws (2).
17. Tighten screws (2).
18. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM VENT FAN RELAY
ENCLOSURE ASSEMBLY A8
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

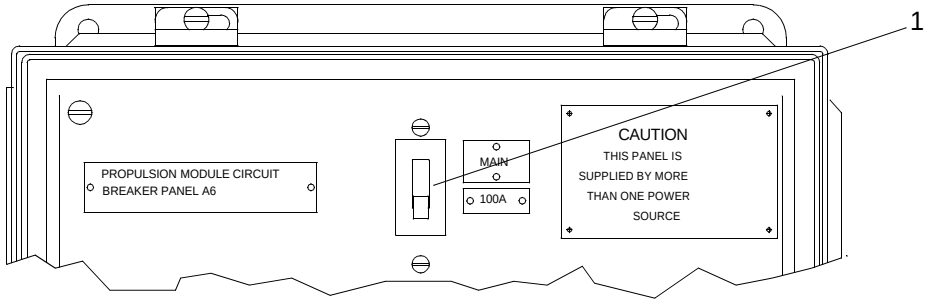
TM 55-1945-205-10-1

REMOVE ELECTRICAL SYSTEM VENT FAN RELAY ENCLOSURE ASSEMBLY A8

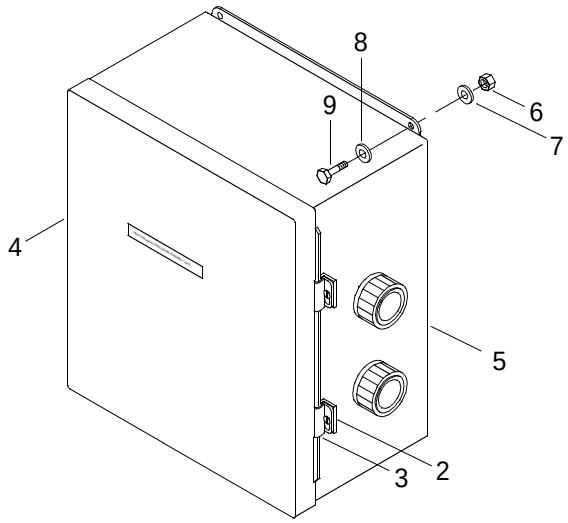
NOTE

The following procedure is typical for the removal and installation of vent fan relay enclosure assemblies.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen two screws (2) to pivot clamps (3) free.



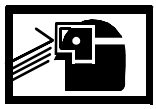
3. Open enclosure cover (4).
4. Tag all external electrical wiring.
5. Remove all external wiring connected to the vent fan relay enclosure assembly A8 (5).
6. Remove four hex nuts (6), lock washers (7), flat washers (8) and hex head cap screws (9).
7. Remove vent fan relay enclosure assembly A8 (5).

INSTALL ELECTRICAL SYSTEM VENT FAN RELAY ENCLOSURE ASSEMBLY A8

WARNING



CHEMICAL



EYE PROTECTION

1. Apply adhesive to cap screws (9).
2. Position vent fan relay enclosure assembly A8 (5) on mounting structure.
3. Install four hex head cap screws (9), flat washers (8), lock washers (7) and hex nuts (6).
4. Tighten nuts (6).
5. Connect all tagged wiring and remove tags.
6. Close enclosure cover (4) and secure with the two clamps (3) and screws (2).
7. Tighten screws (2).
8. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM VENT FAN RELAY
ENCLOSURE ASSEMBLY A8
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

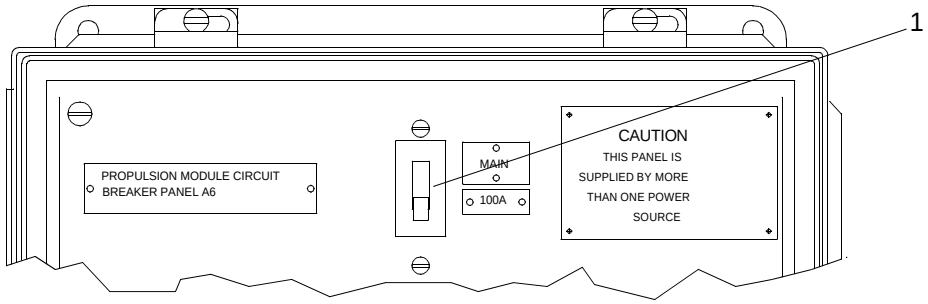
TM 55-1945-205-10-1

REPAIR ELECTRICAL SYSTEM VENT FAN RELAY ENCLOSURE ASSEMBLY A8

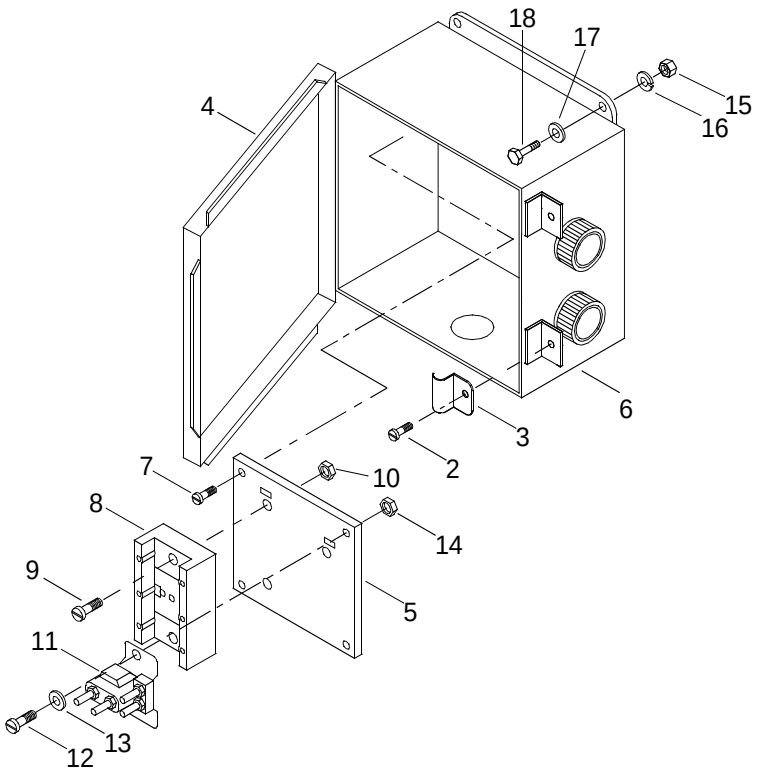
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the removal and installation of propulsion module vent fan relay panel assemblies A8.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen two screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).

4. Tag and disconnect all internal wiring.

5. Remove panel (5) from propulsion module vent fan relay panel assembly A8 (6).

   a. Remove four screws (7) securing panel (5) to propulsion module vent fan relay panel assembly A8 (6).

   b. Remove panel (5).

6. Remove terminal block (8) from panel (5).

   a. Remove two round head screws (9) and insert nuts (10) securing terminal block (8) to panel (5).

   b. Remove terminal block (8).

7. Remove relay (11) from panel (5).

   a. Remove two pan head screws (12), flat washers (13) and insert nuts (14) securing relay to panel (5).

   b. Remove relay (11).

8. Remove vent fan relay panel assembly A8 (6).

   a. Remove tagged cables from propulsion module vent fan relay panel assembly A8 (6).

   b. Remove four hex nuts (15), lock washers (16), flat washers (17) and hex head cap screws (18) securing propulsion module vent fan relay panel assembly A8 (6) to structure.

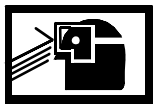
c. Remove propulsion module vent fan relay panel assembly A8 (6).

9. Install propulsion module vent fan relay panel assembly A8 (6).

WARNING



CHEMICAL



EYE PROTECTION

a. Apply adhesive to four hex head cap screws (18).

b. Position propulsion module vent fan relay panel assembly A8 (6) on mounting structure.

c. Install four hex head cap screws (18), flat washers (17), lock washers (16) and hex nuts (15) to secure propulsion module vent fan relay panel assembly A8 (6) on mounting structure.

d. Tighten nuts (15).

e. Install tagged cables into propulsion module vent fan relay panel assembly A8 (6).

f. Remove cable tags.

10. Install terminal block (8) on panel (5).

a. Position terminal block (8) on panel (5).

b. Install two round head screws (9) and insert nuts (10) to secure terminal block (8) to panel (5).

c. Tighten insert nuts (10).

11. Install relay (11) on panel (5).

a. Position relay (11) on panel (5).

b. Install two pan head screws (12), flat washers (13) and insert nuts (14) to secure relay to panel (5).

c. Tighten insert nuts (14).

12. Install panel (5) on propulsion module vent fan relay panel assembly A8 (6).

a. Position panel (5) in propulsion module vent fan relay panel assembly A8 (6).

b. Install four screws (7) to secure panel (5) to propulsion module vent fan relay panel assembly A8 (6).

c. Tighten screws (7).

13. Connect all internal wiring and remove tags.

14. Close enclosure cover (4) and secure with two clamps (3) and screws (2).

15. Tighten screws (2).

16. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM PUMP-JET DIRECTION/AUXILIARY BATTERY JUNCTION BOX A9
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

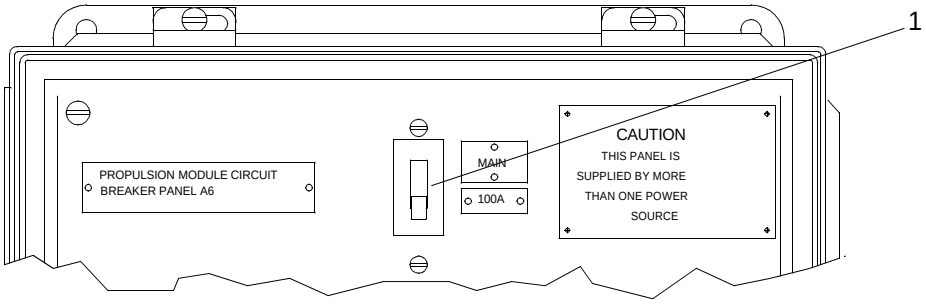
Powered Section Main Batteries Negative Lead Terminals Removed. (WP 0198 00)
Electrical System Pump-Jet Direction/Auxiliary Battery Junction Box A9 Batteries Removed. (WP 0220 00)

REMOVE ELECTRICAL SYSTEM PUMP-JET DIRECTION/AUXILIARY BATTERY JUNCTION BOX A9

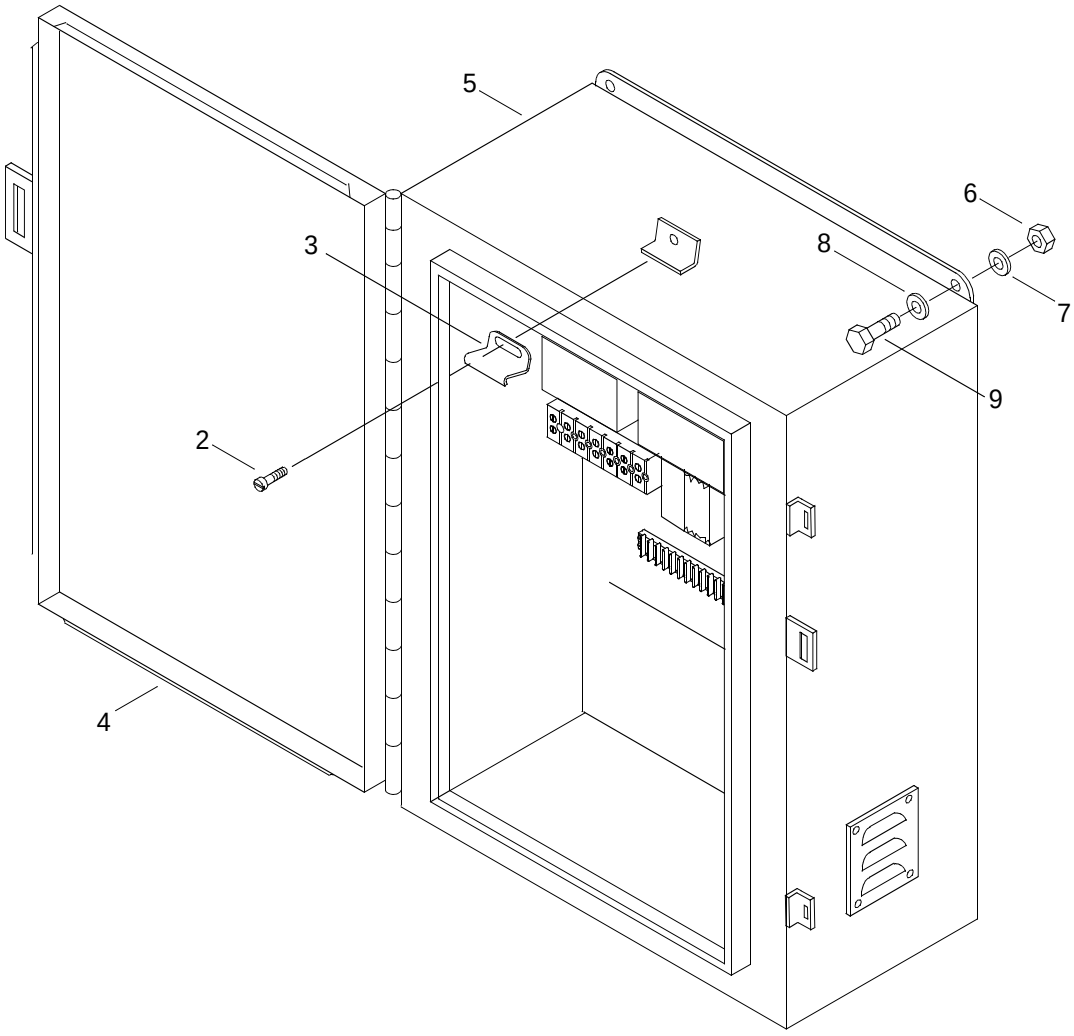
NOTE

The following procedure is typical for the removal and installation of thruster direction/ auxiliary battery junction boxes.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen screws (2) to pivot clamps (3) free.



3. Open enclosure cover (4).

4. Tag all external electrical wiring.

5. Remove all external wiring connected to direction/auxiliary battery junction box A9 (5).

6. Remove four hex nuts (6), lock washers (7), flat washers (8), and hex head cap screws (9).

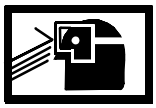
7. Remove direction/auxiliary battery junction box A9 (5).

INSTALL ELECTRICAL SYSTEM PUMP-JET DIRECTION/AUXILIARY BATTERY JUNCTION BOX A9

WARNING



CHEMICAL



EYE PROTECTION

1. Apply adhesive to cap screws (9).
2. Position direction/auxiliary battery junction box A9 (5) on mounting surface.
3. Install four hex head cap screws (9), flat washers (8), lock washers (7) and hex nuts (6).
4. Tighten nuts (6).
5. Connect all tagged wiring and remove tags.
6. Close enclosure cover (4) and secure with clamps (3) and screws (2).
7. Tighten screws (2).
8. Install electrical system pump-jet direction/auxiliary battery junction box A9 batteries. (WP 0220 00)
9. Install powered section main batteries negative lead terminals. (WP 0198 00)
10. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM PUMP-JET DIRECTION/AUXILIARY
BATTERY JUNCTION BOX ASSEMBLY A9
REPAIR

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts
Adhesive (Item 1, WP 0382 00)

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

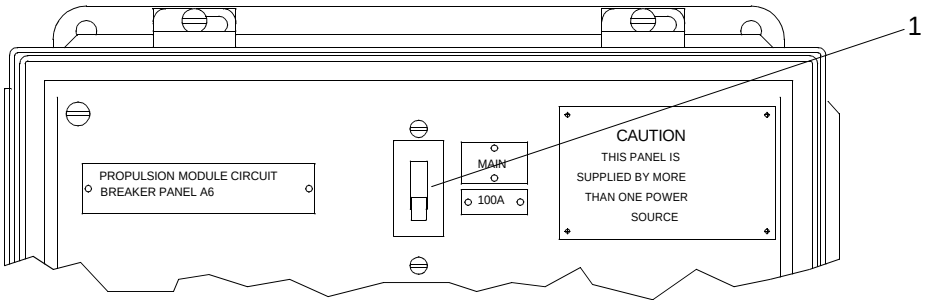
Equipment Condition
Powered Section Main Batteries Negative Lead Terminals Removed. (WP 0198 00)

REPAIR ELECTRICAL SYSTEM PUMP-JET DIRECTION/AUXILIARY BATTERY JUNCTION BOX ASSEMBLY A9

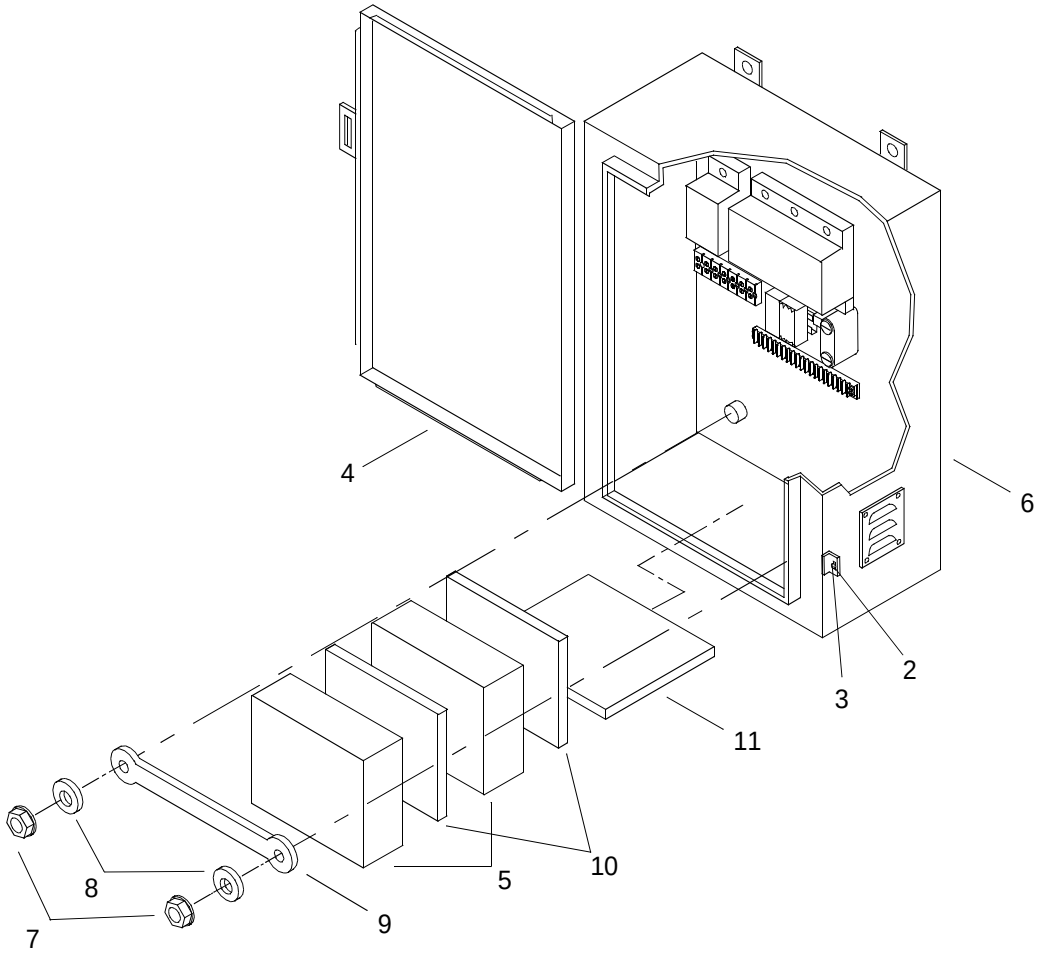
NOTE

Repair is limited to the replacement of damaged components. The following procedure is typical for the removal and installation of the thruster direction/auxiliary battery junction assembly A9.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen screws (2) to pivot cover clamps (3) free.



3. Open enclosure cover (4).

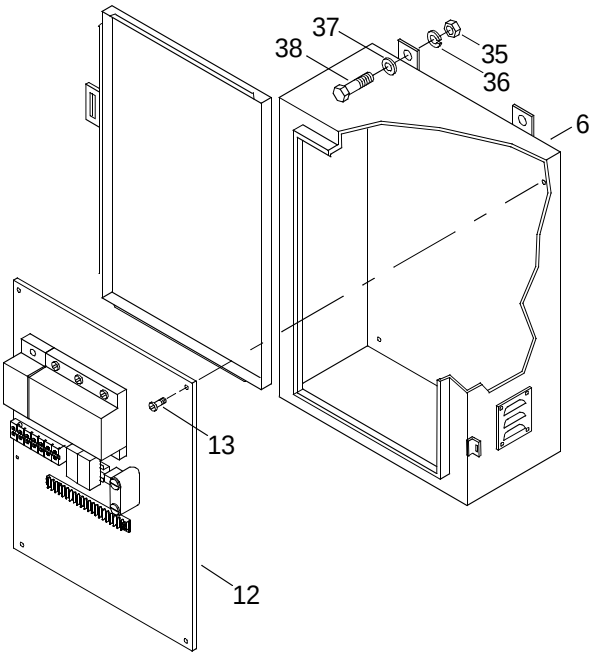
4. Tag and disconnect all internal wiring.

5. Remove auxiliary batteries (5) from propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).

   a. Remove two hex nuts (7), flat washers (8) and battery strap (9) holding auxiliary batteries (5) in propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).

   b. Remove two auxiliary batteries (5), two battery cushions (10) and battery pad (11) from propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).

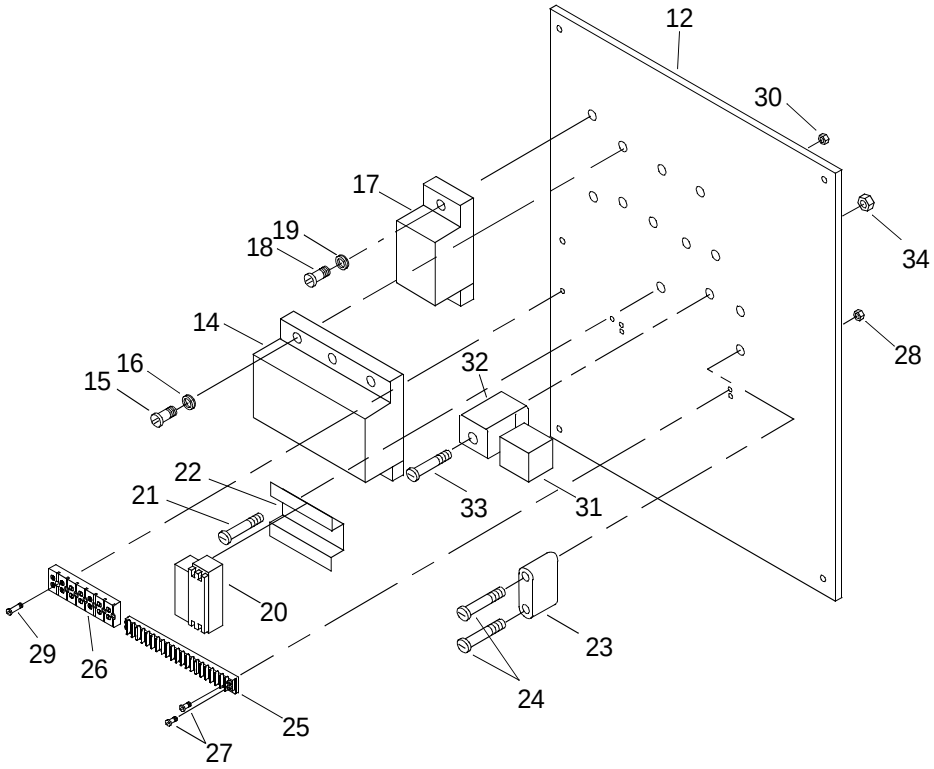
6. Remove panel (12) from propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).



a. Remove two top screws (13) securing panel (12) to propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).

b. Remove panel (12).

7. Remove isolator (14) from panel (12).



a. Remove six pan head screws (15) and flat washers (16) securing isolator (14) to panel (12).

b. Remove isolator (14).

8. Remove voltage regulator (17) from panel (12).

a. Remove two pan head screws (18) and flat washers (19) securing voltage regulator (17) to panel (12).

b. Remove voltage regulator (17).

9. Remove transformer (20) from panel (12).

a. Remove two pan head screws (21) securing transformer (20) to panel (12).

b. Remove voltage regulator (17) and din rail (22).

10. Remove shunt (23) from panel (12).

a. Remove two pan head screws (24) securing shunt (23) to panel (12).

b. Remove shunt (23).

11. Remove terminal block (25) and terminal block (26) from panel (12).

a. Remove four pan head screws (27) and nuts (28) securing terminal block (25) to panel (12).

b. Remove terminal block (25).

c. Remove two pan head screws (29) and nuts (30) securing terminal block (26) to panel (12).

d. Remove terminal block (26).

12. Remove relay (31) and relay socket (32) from panel (12).

a. Remove three pan head screws (33) and insert nuts (34) securing relay (31) and relay socket (32) to panel (12).

b. Remove relay (31) and relay socket (32).

13. Remove thruster direction/auxiliary battery junction box assembly A9 (6).

a. Remove tagged cables from propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).

b. Remove four hex nuts (35), lock washers (36), flat washers (37) and hex head cap screws (38) securing propulsion module thruster direction/auxiliary battery junction box assembly A9 (6) to structure.

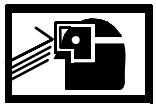
c. Remove propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).

14. Install propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).

WARNING



CHEMICAL



EYE PROTECTION

a. Apply adhesive to four hex head cap screws (38).

b. Position propulsion module thruster direction/auxiliary battery junction box assembly A9 (6) on mounting structure.

c. Install four hex head cap screws (38), flat washers (37), lock washers (36) and hex nuts (35).

d. Tighten nuts (35).

e. Install tagged cables into propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).

f. Remove cable tags.

15. Install relay (31) and relay socket (32) on panel (12).

a. Position relay socket (32) and relay (31) on panel.

b. Install three pan head screws (33) and insert nuts (34) securing relay (31) and relay socket (32) to panel (12).

c. Tighten pan head screws (33).

16. Install terminal block (25) and terminal block (26) on panel (12).

a. Position terminal block (26) on panel (12).

b. Install four pan head screws (29) and nuts (30) to secure terminal block (26) to panel (12).

c. Tighten nuts (30).

d. Position terminal block (25) on panel (12).

e. Install two pan head screws (27) and nuts (28) to secure terminal block (25) to panel (12).

f. Tighten nuts (28).

17. Install shunt (23) on panel (12).

a. Position shunt (23) on panel (12).

b. Install two pan head screws (24) securing shunt (23) to panel (12).

c. Tighten pan head screws (24).

18. Install transformer (20) and din rail (22) on panel (12).
    a. Position transformer (20) and din rail (22) on panel (12).
    b. Install two pan head screws (21) securing transformer (20) and din rail (22) on panel (12).
    c. Tighten pan head screws (21).
19. Install voltage regulator (17) on panel (12).
    a. Position voltage regulator (17) on panel (12).
    b. Install two pan head screws (18) and flat washers (19) securing voltage regulator (17) on panel (12).
    c. Tighten pan head screws (18).
20. Install isolator (14) on panel (12).
    a. Position isolator (14) on panel (12).
    b. Install six pan head screws (15) and flat washers (16) securing isolator (14) on panel (12).
    c. Tighten pan head screws (15).
21. Install panel (12) on propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).
    a. Position panel (12) in propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).
    b. Install two top screws (13) securing upper portion of panel (12) to propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).
    c. Tighten screws (13).
22. Install auxiliary batteries (5) on propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).
    a. Position battery pad (11), battery cushions (10) and auxiliary batteries (5) in propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).
    b. Install battery strap (9) and two hex nuts (7) securing auxiliary batteries (5) and lower portion of panel (12) to propulsion module thruster direction/auxiliary battery junction box assembly A9 (6).
    c. Tighten screws (13).
23. Connect all internal wiring and remove tags.
24. Close enclosure cover (4) and secure with clamps (3) and screws (2).
25. Tighten screws (2).
26. Install powered section main batteries negative lead terminals. (WP 0198 00)
27. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM STARBOARD RECEPTACLE A5/ PORT RECEPTACLE A6 ASSEMBLIES REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Personnel Required

Engineer 88L (2)

References

TM 55-1945-205-10-1

REMOVE ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLIES

WARNING

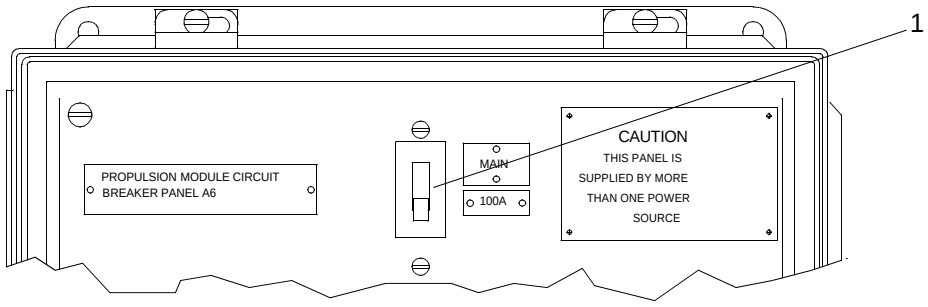


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

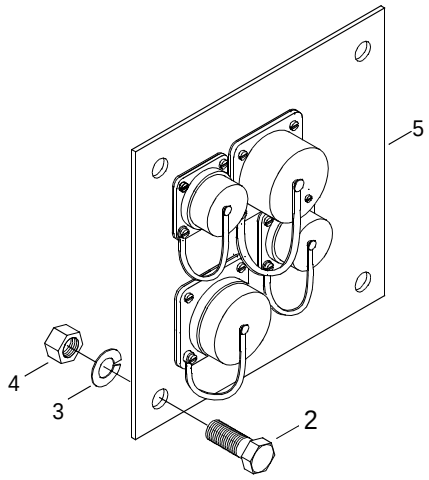
NOTE

The following procedure is typical for the removal and installation of both starboard or port receptacle assemblies.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove four cap screws (2), four lock washers (3) and nuts (4) securing receptacle assembly (5) to mounting surface.



3. Disconnect and tag electrical wiring to the receptacle assembly.

4. Remove receptacle assembly (5).

INSTALL ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLIES

1. Connect electrical wiring and remove tags.

2. Position receptacle assembly (5) on mounting surface.

3. Secure receptacle assembly (5) with four cap screws (2), lock washers (3) and nuts (4).

4. Tighten nuts (4).

5. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J1/3A6J1 REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Receptacle 3A5J1
(77820)
PN GTC020R28-7P
Receptacle 3A6J1
(77820)
PN GTC020R28-7P
Gasket
(34712)
PN E26978-2
Sealing Compound (Item 25, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Electrical System A5 Starboard Receptacle And A6 Port Receptacle Assemblies Removed. (WP 0221 00)

REMOVE ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J1/3A6J1

WARNING

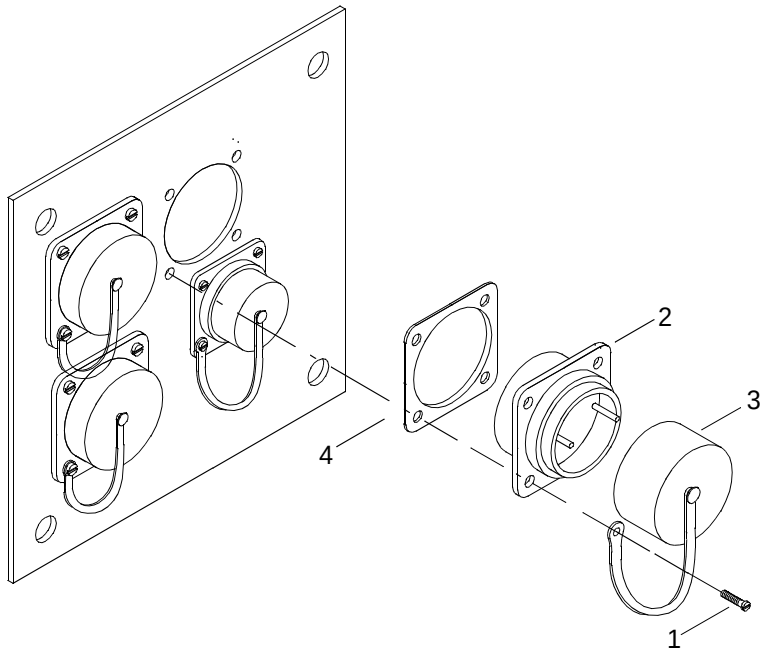


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of the A5 or A6 receptacles.

1. Remove four pan head screws (1).



2. Remove receptacle (2) with cap (3) and gasket (4).

3. Discard receptacle (2) and gasket (4).

INSTALL ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J1/3A6J1

1. Position new receptacle (2), cap (3) and new gasket (4) on the mounting surface.

WARNING



CHEMICAL EYE PROTECTION

2. Apply sealing compound to pan head screws (1).

3. Install four pan head screws (1).

4. Install electrical system A5 starboard receptacle and A6 port receptacle assemblies. (WP 0221 00)

5. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J4/3A6J4 REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Receptacle 3A5J4
(00779)
PN 208489-1
Receptacle 3A6J4
(00779)
PN 208489-1
Gasket
(34712)
PN E26978-1
Sealing Compound (Item 25, WP 0382 00)

Personnel Required

Engineer 88L

References

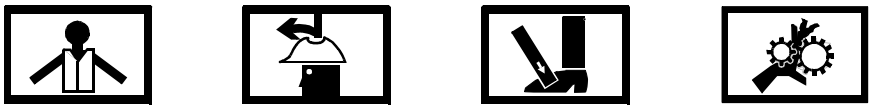
TM 55-1945-205-10-1

Equipment Condition

Electrical System A5 Starboard Receptacle And A6 Port Receptacle Assemblies Removed. (WP 0221 00)

REMOVE ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J4/3A6J4

WARNING

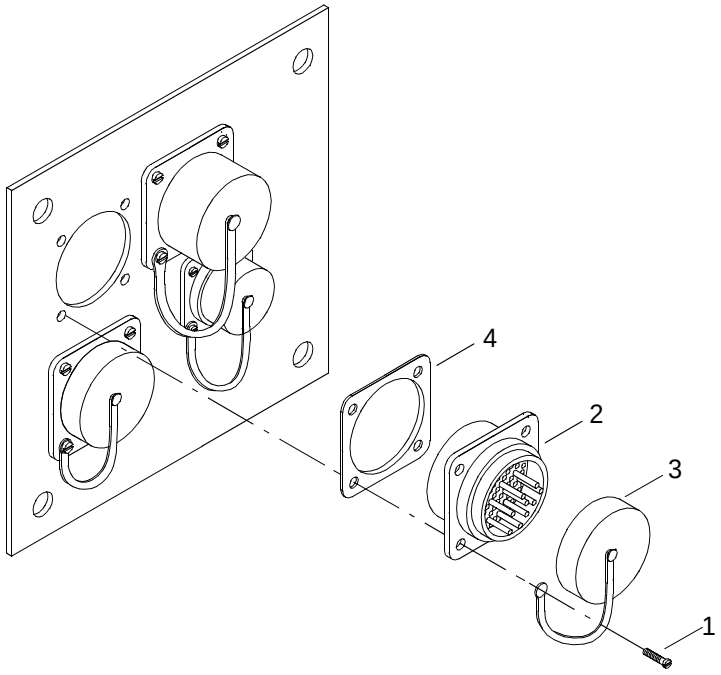


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of the A5 or A6 receptacles.

1. Remove four pan head screws (1).



2. Remove receptacle (2) with cap (3) and gasket (4).

3. Discard receptacle (2) and gasket (4).

INSTALL ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J4/3A6J4

1. Position new receptacle (2) and new gasket (4) on the mounting surface.

WARNING



CHEMICAL EYE PROTECTION

2. Apply sealing compound to pan head screws (1).

3. Install four pan head screws (1).

4. Install electrical system A5 starboard receptacle and A6 port receptacle assemblies. (WP 0221 00)

5. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J2/3A6J2 REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Receptacle 3A5J2
(00779)
PN 208473-1
Receptacle 3A6J2
(00779)
PN 208473-1
Gasket
(34712)
PN E26978-2
Sealing Compound (Item 25, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Electrical System A5 Starboard Receptacle And A6 Port Receptacle Assemblies Removed. (WP 0221 00)

REMOVE ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J2/3A6J2

WARNING

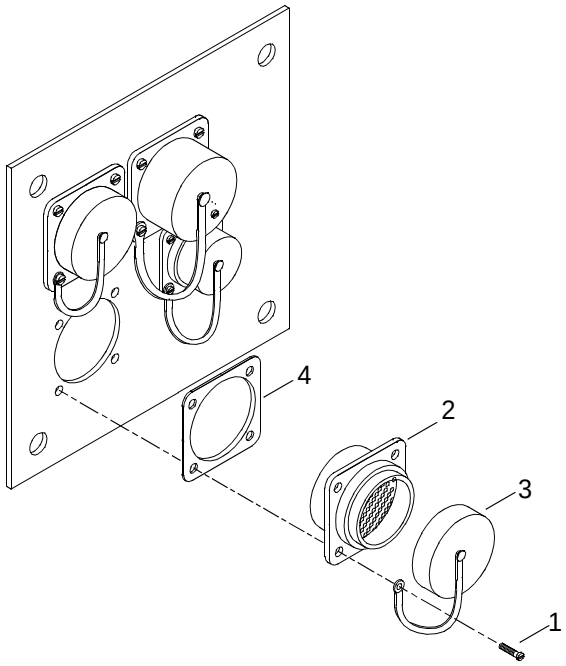


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of the A5 or A6 receptacles.

1. Remove four pan head screws (1).



2. Remove receptacle (2) with cap (3) and gasket (4).

3. Discard receptacle (2) and gasket (4).

INSTALL ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J2/3A6J2

1. Position new receptacle (2) and new gasket (4) on the mounting surface.

WARNING



CHEMICAL **EYE PROTECTION**

2. Apply sealing compound to pan head screws (1).

3. Install four pan head screws (1).

4. Install electrical system A5 starboard receptacle and A6 port receptacle assemblies. (WP 0221 00)

5. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J3/3A6J3 REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Receptacle 3A5J3
(00779)
PN 208471-1
Receptacle 3A6J3
(00779)
PN 208471-1
Gasket
(34712)
PN E26978-2
Sealing Compound (Item 25, WP 0382 00)

Personnel Required

Engineer 88L

References

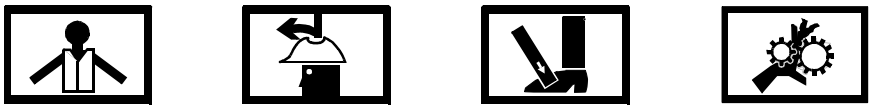
TM 55-1945-205-10-1

Equipment Condition

Electrical System A5 Starboard Receptacle And A6 Port Receptacle Assemblies Removed. (WP 0221 00)

REMOVE ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J3/3A6J3

WARNING

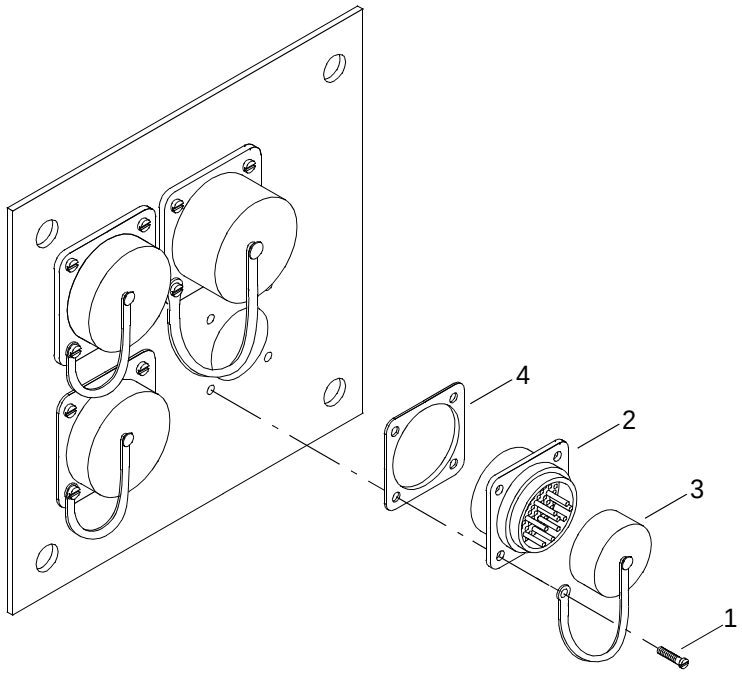


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the replacement of the A5 or A6 receptacles.

1. Remove four pan head screws (1).



2. Remove receptacle (2) with cap (3) and gasket (4).

3. Discard receptacle (2) and gasket (4).

INSTALL ELECTRICAL SYSTEM A5 STARBOARD RECEPTACLE/A6 PORT RECEPTACLE ASSEMBLY RECEPTACLE 3A5J3/3A6J3

1. Position new receptacle (2) and new gasket (4) on the mounting surface.

WARNING



CHEMICAL EYE PROTECTION

2. Apply sealing compound to pan head screws (1).

3. Install four pan head screws (1).

4. Install electrical system A5 starboard receptacle and A6 port receptacle assemblies. (WP 0221 00)

5. Perform operational check of electrical system. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
EMERGENCY STEERING UNIT
REPAIR

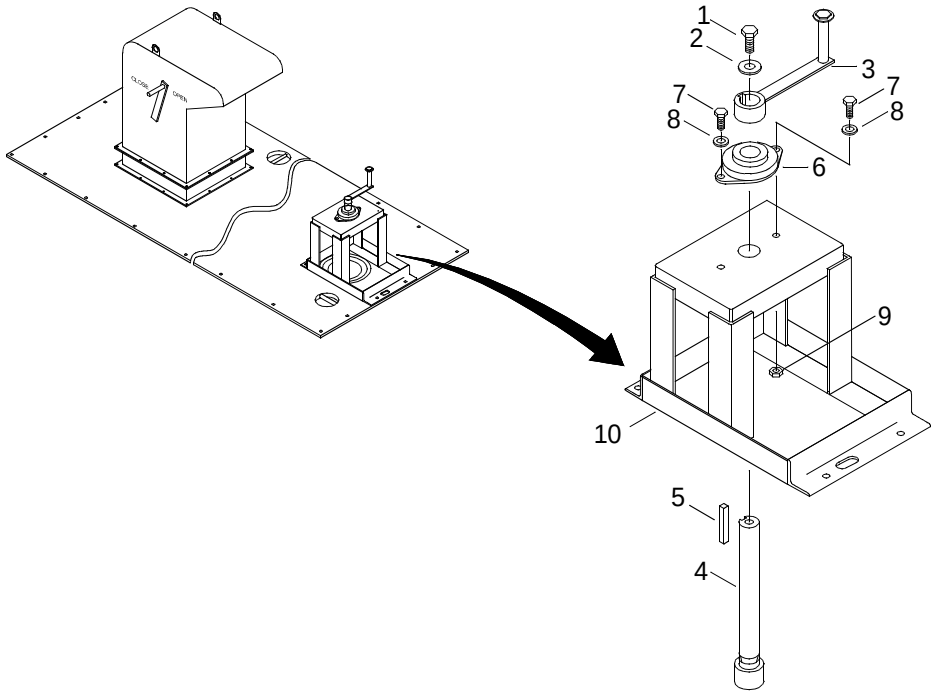
INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

DISASSEMBLE THE EMERGENCY STEERING UNIT

1. Remove hex head bolt (1) and washer (2) from handle assembly (3).



2. Remove handle assembly (3) from shaft (4).

3. Remove woodruff key (5) from shaft (4).

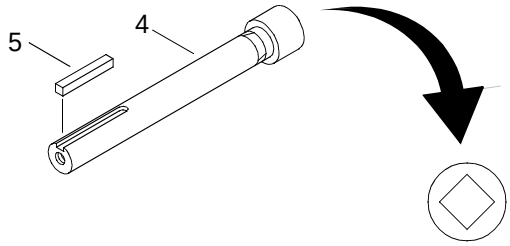
4. Slide shaft (4) from flange bearing (6).

5. Remove two hex head bolts (7), flat washers (8) and hex nut (9) securing flange bearing (6) to support (10).

6. Remove flange bearing (6) from support (10).

INSPECT THE EMERGENCY STEERING UNIT

1. Inspect the flange bearing (6) for looseness or wear. Replace as necessary.
2. Inspect the handle (3) for wear and serviceability. Replace as necessary.
3. Inspect the shaft (4) for cracks and wear on either end that could cause slipping. Replace as necessary.



4. Inspect woodruff key (5) for any wear. Replace as necessary.

ASSEMBLE THE EMERGENCY STEERING UNIT

1. Install flange bearing (6) on support (10).
2. Install two hex head bolts (7), flat washers (8) and hex nuts (9) securing flange bearing (6) to support (10).
3. Tighten nuts (9).
4. Slide shaft (4) through flange bearing (6).
5. Install woodruff key (5) on shaft (4).
6. Install handle assembly (3) on shaft (4).
7. Install hex head bolt (1) and washer (2) on handle assembly (3).
8. Tighten bolt (1).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
EMERGENCY STEERING ADAPTOR
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

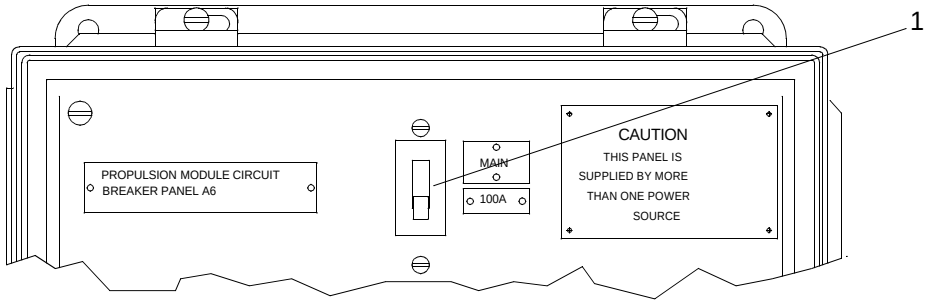
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required

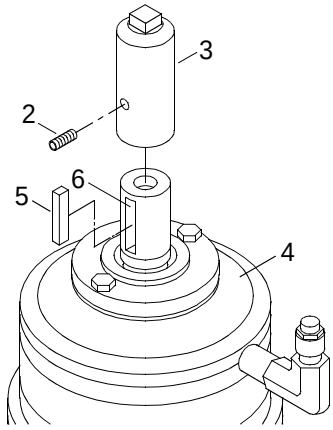
Engineer 88L

REMOVE EMERGENCY STEERING ADAPTOR

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove and retain set screw (2) securing slide adaptor (3) to the auxiliary planetary gearbox (4).



3. Remove slide adaptor (3) from auxiliary planetary gearbox (4).

4. Remove and retain key (5).

INSTALL EMERGENCY STEERING ADAPTOR

1. Position key (5) into auxiliary planetary gearbox reducer shaft (6).

2. Slide adaptor (2) onto shaft (6) and secure with set screw (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED MODULE
MARINE GROWTH REMOVAL

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Hose Assembly, Rubber (Item 19, WP 0383 00)
Cleaner Power Washer (Item 6, WP 0383 00)
Scraper, Ship (Item 32, WP 0383 00)

Personnel Required

Seaman 88K

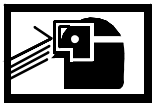
Equipment Condition

Powered Module Dry-Docked.

REMOVE POWERED MODULE MARINE GROWTH

1. Connect hose to power washer.

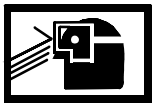
WARNING



EYE PROTECTION

2. Remove marine growth using a scraper.

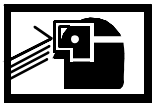
WARNING



EYE PROTECTION

3. Remove marine growth debris from the surface of the module using a hose with directed water spray.

WARNING



EYE PROTECTION

4. Remove marine growth from male and female connectors in both the extended or retracted position using a hose with directed water spray.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED MODULE
CLEANING AND PAINTING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Brush, Paint (Item 4, WP 0382 00)
Cloth, Cleaning (Item 6, WP 0382 00)
Paint, Amercoat 385 #27 Haze Grey (Item 17, WP 0382 00)
Paint, Amercoat 385 AS Mid Graphite Grey (Item 18, WP 0382 00)
Paint, Amercoat 385 PA Oxide Red Primer (Item 19, WP 0382 00)
Paper, Abrasive (Item 20, WP 0382 00)
Roller Kit, Paint (Item 22, WP 0382 00)
Tape, Pressure Sensitive Adhesive (Item 33, WP 0382 00)
Zinc, Inorganic, No. 531 (Item 39, WP 0382 00)

Personnel Required

Seaman 88K

References

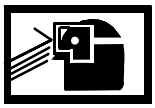
SSPC SP-2
DOD-PRF-24648
MIL-PRF-23236

Equipment Condition

Powered Module Dry-Docked.
Powered Module Marine Growth Removed. (WP 0228 00)

PREPARE AND CLEAN POWERED MODULE FOR PAINTING

WARNING



EYE PROTECTION

NOTE

This task is typical for exterior or interior of modules. Power tools are not authorized for use when preparing modules for spot painting. Preparation procedures are in accordance with Steel Structures Painting Council, SP-2 Hand Tool Cleaning (SSPC SP-2).

Upon completion of rust and paint removal the substrate metal should have a faint metallic sheen and be free of oil, grease, dust, soil, salts and other contaminants.

The following steps will be preformed prior to module surface painting.

1. Remove all rust scale, mill scale, loose rust and loose paint to the degree specified by hand wire brushing, hand sanding, hand scraping, hand chipping or other hand impact tools or a combination of these methods.

2. Using clean, lint-free cloth, wipe area clean in preparation for painting.

PAINT EXTERIOR MODULE STEEL SURFACES

1. Mask off areas to be painted.

WARNING



CHEMICAL EYE PROTECTION FIRE VAPOR

NOTE

Application temperature range limits are 40° - 120°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. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours @ 70°F.

WARNING



NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

WARNING



5. Add total contents of hardener container to total contents of base paint.

WARNING



6. Mix both parts together until uniformly blended.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

7. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

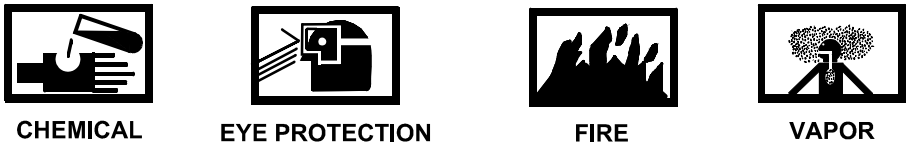
Cold temperatures or high humidity will retard drying time.

8. Allow topcoat to air dry hard, approximately 16 hours @ 70°F.

APPLY DECK GRIP COATING TO EXTERIOR STEEL POWERED MODULE SURFACES

1. Mask off area to coated.

WARNING



NOTE

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

Application temperature range limits are 40° - 120°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. Using nylon roller, paint tray and brush, apply one coat of anti-skid coating (Amercoat 385 AS Mid Graphite Grey) to surface.

WARNING



3. Back roll each coat while wet at a 90° angle to evenly spread the texture.

NOTE

Cold temperatures or high humidity will retard drying time.

4. Allow to dry tack free, approximately 3 hours @ 70°F.

WARNING



NOTE

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

Application temperature range limits are 40° - 120°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.

5. Apply a second coat of anti-skid coating (Amercoat 385 AS Mid Graphite Grey), after the first coat is completely tack free.

NOTE

Cold temperatures or high humidity will retard drying time.

6. Allow anti-skid coating to dry 96 hours before heavy traffic or equipment is used on it.

PAINT INTERIOR POWERED MODULE STEEL SURFACES

1. Mask off areas to be painted.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

Do not apply coatings to interior surfaces of modules other than powered modules.

Do not apply anti-skid to interior of powered modules.

Both coatings (primer and topcoat) shall be applied in accordance with individual painting manufacture requirements.

Do not prime or paint hoses or stainless steel fittings.

2. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours @ 70°F.

WARNING



NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

WARNING



5. Add total contents of hardener container to total contents of base paint.

WARNING



6. Mix both parts together until uniformly blended.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

7. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

Cold temperatures or high humidity will retard drying time.

8. Allow topcoat to air dry hard, approximately 16 hours @ 70°F.

PAINT POWERED MODULE THRUSTER WELL

1. Mask off interior of thruster well (as viewed from underside of the module) to be painted.

WARNING



NOTE

Primer coating shall be applied in accordance with individual painting manufacture requirements.

Application temperature range limits are 40° - 120°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. Using brush, apply one coat of Amercoat inorganic zinc primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow first coat of primer paint to air dry to touch, approximately 3 hours @ 70°F.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

4. Using brush, apply second coat of Amercoat inorganic zinc primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

5. Allow second coat of primer paint to air dry 48 hours @ 70°F prior to immersion.

PAINT POWERED MODULE OPERATORS CAB STEEL STRUCTURES

1. Mask off any areas to be painted.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

Primer and paint coatings shall be applied in accordance with individual painting manufacture requirements.

Areas under the insulation may be coated with Amercoat 385 PA oxide red primer only.

Coat over insulation with one coat of Amercoat 385 #27 haze grey.

Coat floor surface with one coat of Amercoat 385 AS mid graphite grey.

2. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648 to affected areas of the operators cab console, door or other steel surfaces.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 3 hours @ 70°F.

WARNING



NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

WARNING



5. Add total contents of hardener container to total contents of base paint.

WARNING



6. Mix both parts together until uniformly blended.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

7. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

Cold temperatures or high humidity will retard drying time.

8. Allow topcoat to air dry hard, approximately 16 hours @ 70°F.

APPLY DECK GRIP COATING TO POWERED MODULE OPERATORS CAB EXTERIOR ROOF

1. Mask off a two inch border around outer edge of cab roof and around roof mounted equipment.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

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

1. Using nylon roller, paint tray and brush, apply one coat of Amercoat 385 AS anti-skid coating to surface.

WARNING



2. Back roll each coat while wet at a 90° angle to evenly spread the texture.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow to dry tack free, approximately 3 hours @ 70°F.

WARNING



NOTE

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

Application temperature range limits are 40° - 120°F.

4. Apply a second coat of anti-skid coating, after the first coat is completely tack free.

NOTE

Cold temperatures or high humidity will retard drying time.

5. Allow anti-skid coating to dry 96 hours before heavy traffic or equipment is used on it.

PAINT POWERED MODULE MAST, CLEATS, D-RINGS, LIFE RAIL, STANCHIONS, INTAKE AND EXHAUST PLENUMS, GUILLOTINE CONNECTORS AND FLEXOR ASSEMBLIES

NOTE

Both coatings (primer and topcoat) shall be applied in accordance with individual painting manufacture requirements.

Do not prime or paint rubber surfaces of flexor assemblies.

1. Mask off areas to be painted.

WARNING



NOTE

Application temperature range limits are 40° - 120°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. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours @ 70°F.

WARNING



NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

WARNING



5. Add total contents of hardener container to total contents of base paint.

WARNING



6. Mix both parts together until uniformly blended.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

7. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

Cold temperatures or high humidity will retard drying time.

8. Allow topcoat to air dry hard, approximately 16 hours @ 70°F.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
POWERED MODULE MALE AND FEMALE
GUILLOTINE CONNECTORS
INSPECTION, REPAIR, LUBRICATION AND ADJUSTMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical) (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Crowbar (Item 9, WP 0383 00)

Materials/Parts

Grease, Lubriplate (Item 9, WP 0382 00)
Paint, Amercoat 385 #27 Haze Grey (Item 17, WP 0382 00)
Sponge (Item 29, WP 0382 00)

Personnel Required

Seaman 88K

DISASSEMBLY OF POWERED MODULE GUILLOTINE CONNECTORS

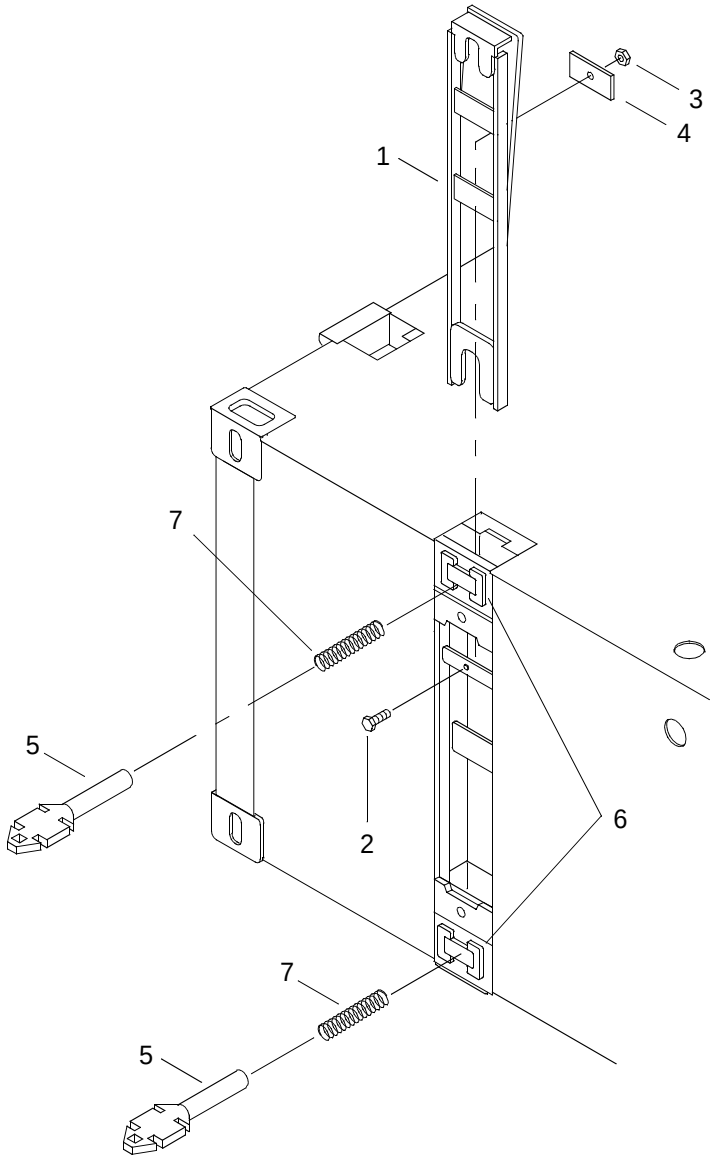
WARNING



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

The guillotine bar should be blocked in the up position while removing the pins and springs. Failure to comply could result in loss of life or limb.

1. Disassemble the male guillotine connector assembly.



a. Remove the guillotine connector bar (1).

{1} Remove the bolt (2), nut (3) and friction plate (4).

{2} Pry up on the guillotine connector bar (1) using a crowbar.

{3} Place a block of wood under the upper “lip” of the guillotine connector bar (1) after it is raised to hold it in the up position.

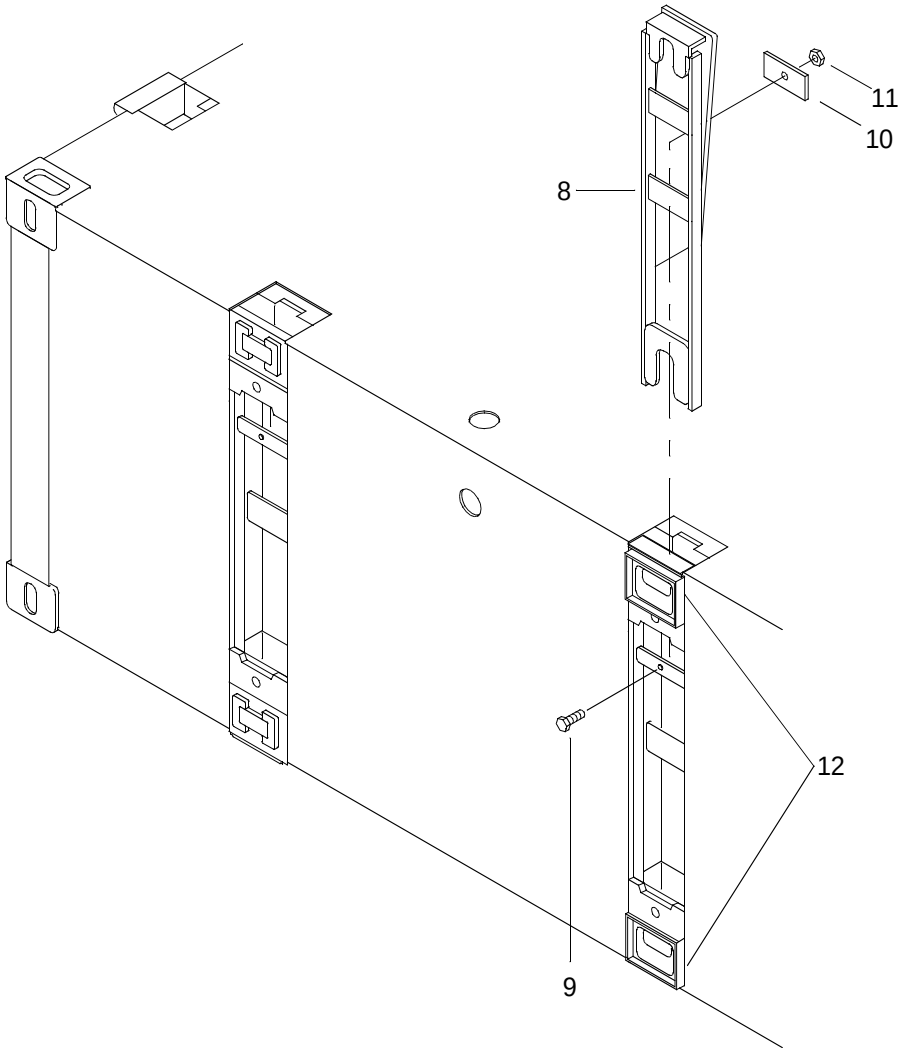
b. Push up on the retainer located on the underside of the male connector pin (5).

c. Remove male connector pin (5) from the guillotine connector lock housing (6).

d. Remove deployment spring (7).

e. Remove guillotine connector bar (1) from guillotine lock housing (6).

2. Disassemble the female guillotine connector assembly.



a. Remove the guillotine connector bar (8).

{1} Remove the bolt (9), nut (10) and friction plate (11).

{2} Pry up on the guillotine connector bar (8) using a crowbar.

{3} Place a block of wood under the upper “lip” of the guillotine connector bar (8) after it is raised to hold it in the up position.

b. Remove guillotine connector bar (8) from guillotine lock housing (12).

INSPECT AND REPAIR/REPLACE POWERED MODULE GUILLOTINE CONNECTORS

1. Inspect male connector pin (5) for cracks and cuts. If damaged, replace connector pin.

2. Inspect male connector pin (5) for corrosion. Replace or repair damaged connector pin as necessary.

3. Inspect deployment spring (7) for cracks and cuts. If damaged, replace deployment spring.

4. Inspect deployment spring (7) for corrosion. Repair or replace damaged deployment spring as necessary.

5. Inspect guillotine connector bar (1, 8) for cracks and cuts. If damaged, replace guillotine connector bar.

6. Inspect guillotine connector bar (1, 8) for rust or corrosion. Repair or replace damaged guillotine connector bar as necessary.

7. Inspect guillotine connector male and female lock housing (6, 12) for cuts or cracks. If damaged, replace guillotine connector lock housing (6, 12). Contact depot level.

8. Inspect guillotine connector lock housing (6, 12) for corrosion. Repair or replace damaged guillotine connector lock housing (6, 12) as necessary. Contact depot level.

9. Inspect guillotine connector assembly friction plate (4, 11) for cracks and cuts. If damaged, replace friction plate.

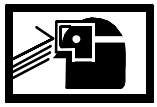
10. Inspect guillotine connector assembly friction plate (4, 11) for corrosion. Replace or repair damaged friction plate as necessary.

LUBRICATE POWERED MODULE GUILLOTINE CONNECTORS

WARNING



CHEMICAL



EYE PROTECTION

NOTE

Lubrication is the same for both male and female connectors except for the connector pin and spring.

1. Lubricate the guillotine connector assemblies.

    a. Lubricate connector bar assemblies.

    b. Lubricate deployment spring (3).

2. Clean and/or paint exposed or rusty surfaces.

    a. Wire brush exposed or rusting surfaces.

    b. Spot paint exposed surfaces with Haze Grey Amercoat 385 #27 paint (WP 0229 00).

3. Remove standing water with a sponge from the guillotine connector assemblies.

ASSEMBLE POWERED MODULE GUILLOTINE CONNECTORS

1. Assemble the female guillotine connector assembly as follows.

    a. Install guillotine connector bar (8) into guillotine lock housing (12).

    b. Install bolt (9) through friction plate (10) and nut (11).

2. Assemble the male guillotine connector assembly as follows:

   a. Install guillotine connector bar (1) into guillotine lock housing (6)

   b. Install deployment spring (7) on male connector pin (5).

   c. Install male connector pin (5) into guillotine connector lock housing (6) by pushing down on the retainer located on the underside of the male connector pin (5) to lock pin in place.

   d. Install bolt (2) through friction plate (4) and nut (3).

ADJUST POWERED MODULE GUILLOTINE CONNECTORS

NOTE

The friction plate applies force against the guillotine to hold it in the up position when raised with a pry bar. Do not over tighten the friction plate. Overtightening friction plate causes difficult operation of the guillotine.

1. Locate the friction plate (4, 11) on the guillotine connector assembly (6, 12).

2. Adjust the tightness of the bolt (2, 9), located at each connector location, using two standard wrenches until the desired friction is achieved.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PROPULSION MODULE FUEL/OIL COMPARTMENT GASKET REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Scraper, Ship (Item 32, WP 0383 00)

Materials/Parts

Gasket
(34712)
PN E13728
Cleaner (Item 5, WP 0382 00)
Rag, Wiping (Item 21, WP 0382 00)

Personnel Required

Engineer 88L

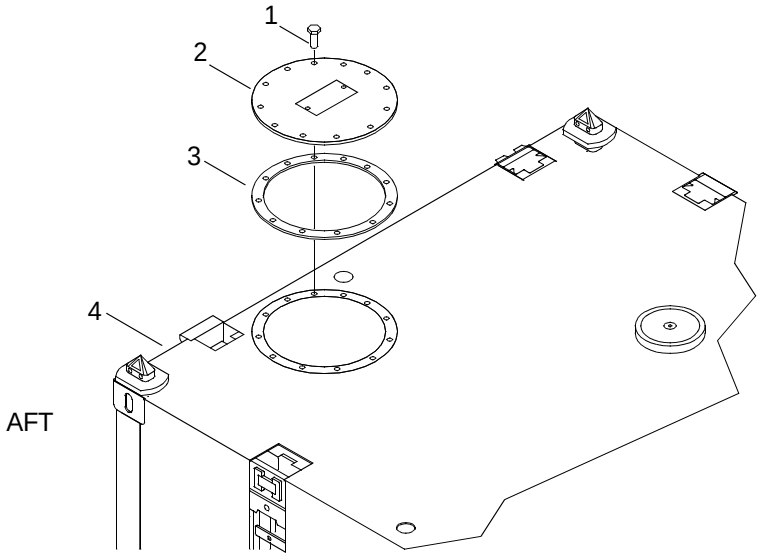
REMOVE PROPULSION MODULE FUEL/OIL COMPARTMENT GASKET

WARNING



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

1. Remove twelve hex head cap screws (1).



2. Remove hatch cover plate (2).
3. Remove gasket (3) from module (4).
4. Discard gasket (3).

INSTALL PROPULSION MODULE FUEL/OIL COMPARTMENT GASKET

WARNING



1. Using scraper and cleaner, remove gasket residue from module (4) and hatch cover plate (2).

WARNING



2. Using rag and cleaner, wipe all cover plate surfaces clean.
3. Position new gasket (3) on module (4).
4. Position hatch cover plate (2) over gasket (3) on module (4).
5. Install twelve hex head cap screws (1) through cover plate (2) and gasket (3) into module (4).
6. Tighten twelve hex head cap screws (1).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
NON-POWERED MODULE
MARINE GROWTH REMOVAL

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Hose Assembly, Rubber (Item 19, WP 0383 00)
Cleaner Power Washer (Item 6, WP 0383 00)
Scraper, Ship (Item 32, WP 0383 00)

Personnel Required

Seaman 88K

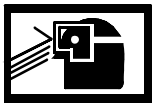
Equipment Condition

Non-Powered Module Dry-Docked.

REMOVE NON-POWERED MODULE MARINE GROWTH

1. Connect hose to power sprayer.

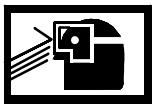
WARNING



EYE PROTECTION

2. Remove marine growth using a scraper.

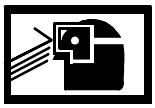
WARNING



EYE PROTECTION

3. Remove marine growth debris from the surface of the module using a hose with directed water spray.

WARNING



EYE PROTECTION

4. Remove marine growth from male and female connectors in both the extended and retracted position using a hose with directed water spray.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
NON-POWERED MODULE
CLEANING AND PAINTING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Brush, Paint (Item 4, WP 0382 00)
Cloth, Cleaning (Item 6, WP 0382 00)
Paint, Amercoat 385 #27 Haze Grey (Item 17, WP 0382 00)
Paint, Amercoat 385 AS Mid Graphite Grey (Item 18, WP 0382 00)
Paint, Amercoat 385 PA Oxide Red Primer (Item 19, WP 0382 00)
Roller Kit, Paint (Item 22, WP 0382 00)
Paper, Abrasive (Item 20, WP 0382 00)
Tape, Pressure Sensitive Adhesive (Item 33, WP 0382 00)
Zinc, Inorganic, No. 531 (Item 39, WP 0382 00)

Personnel Required

Seaman 88K

References

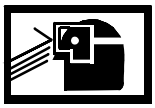
SSPC SP-2
DOD-PRF-24648
MIL-PRF-23236

Equipment Condition

Non-Powered Module Dry-Docked
Non-Powered Module Marine Growth Removed. (WP 0232 00)

PREPARE AND CLEAN NON-POWERED MODULE FOR PAINTING

WARNING



EYE PROTECTION

NOTE

This task is typical for exterior of modules. Power tools are not authorized for use when preparing modules for spot painting. Preparation procedures are in accordance with Steel Structures Painting Council, SP-2 Hand Tool Cleaning (SSPC SP-2).

The following steps will be preformed prior to module surface painting. Upon completion of rust and paint removal the substrate metal should have a faint metallic sheen and be free of oil, grease, dust, soil, salts and other contaminants.

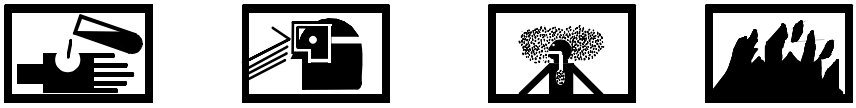
1. Remove all rust scale, mill scale, loose rust and loose paint to the degree specified by hand wire brushing, hand sanding, hand scraping, hand chipping or other hand impact tools or a combination of these methods.

2. Using clean, lint-free cloth, wipe area clean in preparation for painting.

PAINT EXTERIOR NON-POWERED MODULE STEEL SURFACES

1. Mask off areas to be painted.

WARNING



CHEMICAL EYE PROTECTION VAPOR FIRE

NOTE

Application temperature range limits are 40° - 120°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.

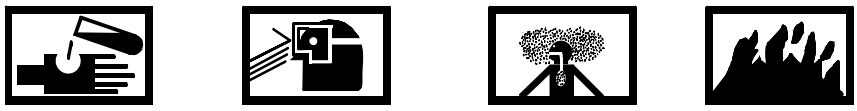
2. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours at 70°F.

WARNING



NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

5. Combine hardener with base paint and stir well.

WARNING



6. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

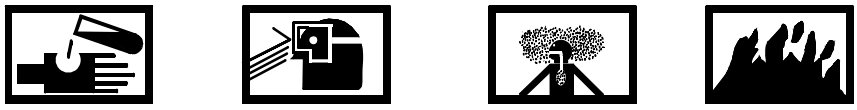
Cold temperatures or high humidity will retard drying time.

7. Allow topcoat to air dry hard, approximately 16 hours at 70°F.

APPLY DECK GRIP COATING TO EXTERIOR STEEL NON-POWERED MODULE SURFACES

1. Mask off area to coated.

WARNING



Do not apply anti-skid coating to air test plug ports, lift castings and shackles and connector castings as damage to equipment may occur.

NOTE

Application temperature range limits are 40° - 120°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. Using nylon roller, paint tray and brush, apply one coat of Amercoat 385 AS anti-skid coating to deck surface.

3. Back roll each coat while wet at a 90° angle to evenly spread the texture.

NOTE

Cold temperatures or high humidity will retard drying time.

4. Allow to dry tack free, approximately 3 hours at 70°F.

WARNING



Do not apply anti-skid coating to air test plug ports, lift castings and shackles and connector castings as damage to equipment may occur.

NOTE

Application temperature range limits are 40° - 120°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.

5. Apply a second coat of anti-skid coating, after the first coat is completely tack free.

NOTE

Cold temperatures or high humidity will retard drying time.

6. Allow anti-skid coating to dry 96 hours before heavy traffic or equipment is used on it.

PAINT NON-POWERED MODULE CLEATS, D-RINGS, GUILLOTINE CONNECTORS AND FLEXOR ASSEMBLIES

CAUTION

Do not prime or paint rubber surfaces of flexor assemblies as damage to equipment may occur.

1. Mask off areas to be painted.

WARNING



NOTE

Application temperature range limits are 40° - 120°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. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours at 70°F.

WARNING

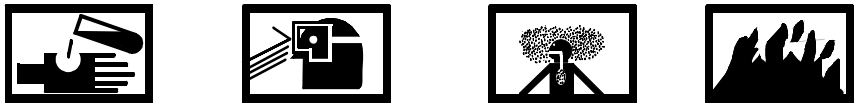


NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

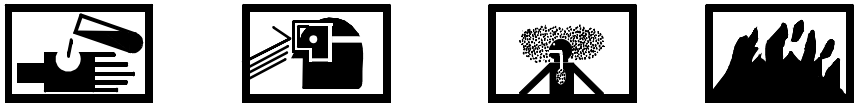
4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

WARNING



5. Combine hardener with base paint and stir well.

WARNING



CAUTION

Do not apply anti-skid coating to air test plug ports, lift castings and shackles and connector castings as damage to equipment may occur.

NOTE

Application temperature range limits are 40° - 120°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.

6. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

Cold temperatures or high humidity will retard drying time.

7. Allow topcoat to air dry hard, approximately 16 hours at 70°F.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
NON-POWERED MODULE
INSPECTION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Sling, 53,000 lb 25 ft (Brown) (Item 36, WP 0383 00)
Qty 2
Socket Wrench Set (Item 51, WP 0383 00)
Socket, Socket Wrench (Item 52, WP 0383 00)
Key, Socket Head Screw (Allen Wrench) (Item 53, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Seaman 88K

Equipment Condition

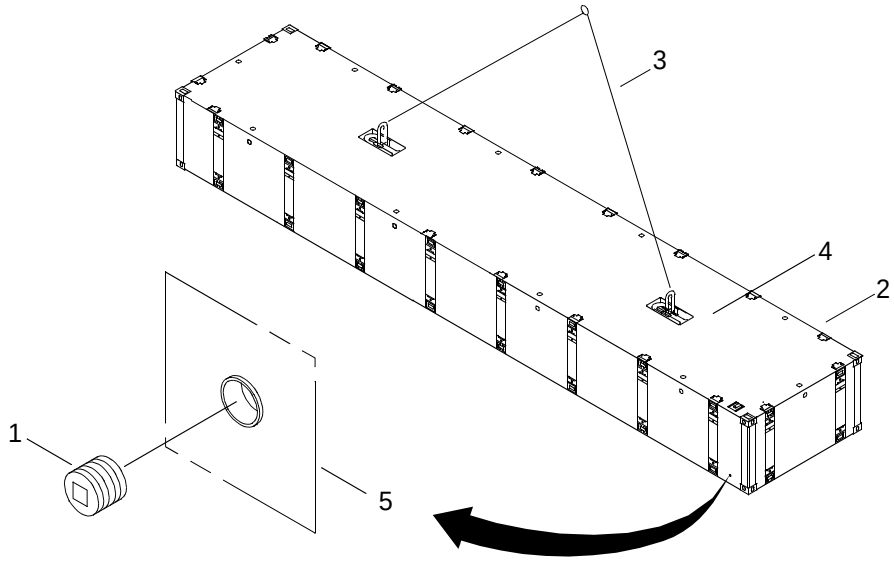
Non-Powered Module Dry-Docked.

INSPECT NON-POWERED MODULE FOR WATER

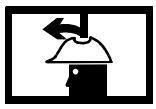
NOTE

The following procedure is typical for inspecting non-powered modules for water and for machine plug location.

1. Using breaker bar, socket and allen wrench, remove the machine plug (1) from the module (2).



WARNING



HELMET PROTECTION



HEAVY PARTS

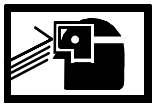
Modules must never be lifted with deck fittings. Failure to comply could result in equipment damage and serious injury or death to personnel.

2. Using crane, attach a sling (3) to the lifting shackles (4) on the module and tilt module to the side where the machine plug opening (5) is at its lowest point.

3. Inspect machine plug opening (5) for signs of water inside the module (1).

4. If water is found, pressure test the module (2). (WP 0235 00)

WARNING



EYE PROTECTION



CHEMICAL

5. Apply antiseize compound to threads of machine plug (1).

6. Using breaker bar, socket and allen wrench, Install plug (1) into module (2) and tighten.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
NON-POWERED MODULE
PRESSURE TESTING

INITIAL SETUP:

Test Equipment

Test Set, Compartment Air (Item 41, WP 0383 00)

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Compressor Unit, Reciprocating, Power Drive (Item 7, WP 0383 00)
Socket Wrench Set (Item 51, WP 0383 00)
Socket, Socket Wrench (Item 52, WP 0383 00)
Key, Socket Head Screw (Allen Wrench) (Item 53, WP 0383 00)

Materials/Parts

Sealing Compound (Item 24, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

Non-Powered Module Dry-Docked.

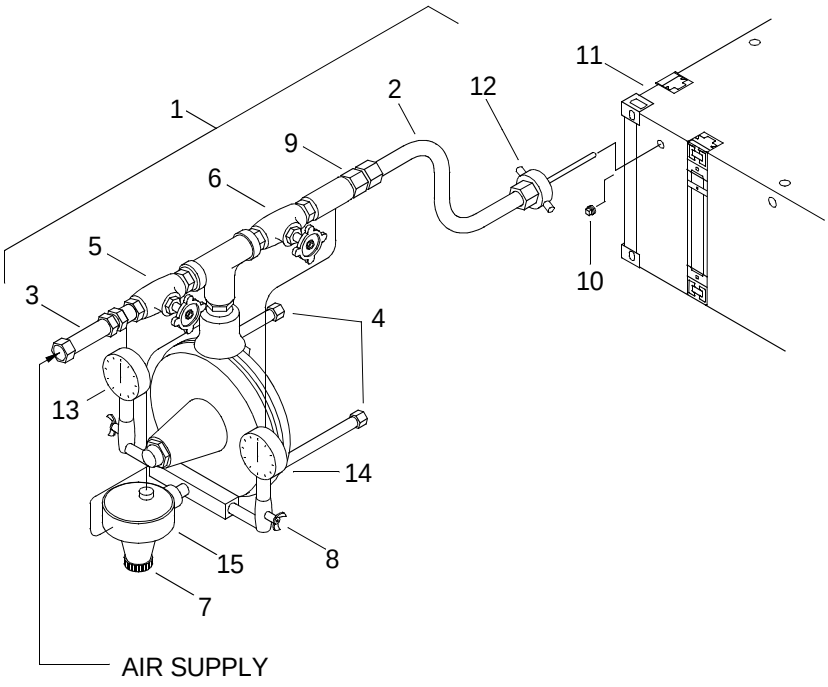
PRESSURE TEST NON-POWERED MODULE

NOTE

The following procedure is typical for pressure testing of all non-powered modules.

The pipe plug location on the module may vary.

1. Remove test set (1), sensing line (2) and charging line extension hose (3) from storage box.



2. Attach two extension legs (4).

3. Ensure inlet (5) and outlet valves (6), set pressure knob (7) and gauges pet cocks (8) are closed.

4. Connect sensing line (2) to the outlet coupling fitting (9).

5. Using breaker bar, socket and allen wrench, remove pipe plug (10) from one of three locations at side of module (11).

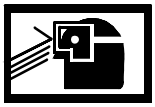
6. Install test set sensing line (2) into module through chosen pipe plug (10) opening.

7. Using pipe to hose adaptors (12), as required, connect sensing line (2) to pipe plug (10) opening.

8. Adjust length of legs (4) to position test set (1) on module (11).

9. Connect 100 PSI air supply to inlet valve (3) connector.

WARNING



EYE PROTECTION

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

10. Rotate set pressure knob (7) counterclockwise eight turns.

11. Open both gauge pet cocks (8).

12. Open air supply valve, applying input pressure.

13. Open test set inlet valve (5).

WARNING



EXPLOSION

A 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.

14. Observe input pressure gauge (13) and rotate set pressure knob (7) clockwise until gauge reads 2 PSI.

15. When input pressure gauge (13) is stable at 2 PSI, open outlet valve (6).

16. When output pressure gauge reads 2 PSI, close outlet valve (6).

17. Observe any pressure drop on output pressure gauge (14).

CAUTION

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

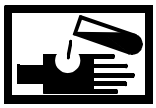
18. Inspect all seams for evidence of leakage and mark observed leakage areas. Report any leakage to the next higher maintenance level.

19. Seams must be welded watertight before proceeding with assembly for mission.

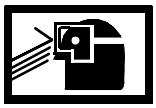
20. To shut down the test set (1), close air supply valve and remove charging line extension hose (3).

21. Remove test set sensing line (2) from pipe plug (10) opening and remove test set (1).

WARNING



CHEMICAL



EYE PROTECTION

22. Apply sealing compound on plug (10) threads.

23. Using breaker bar, socket and allen wrench, install the plug (10) to the module (11) test location and tighten.

24. Close inlet (5) and outlet (6) valve, gauge pet cocks (8) and rotate set pressure knob (7) clockwise to end of travel.

25. Remove leg extensions (4) and stow in storage box.

26. Remove adaptor (12), if used, and stow in storage box.

27. With valve handles (5 and 6) facing down, place test set (1) in storage box.

28. Coil sensing line (2) and charging line extension hose (3) in storage box.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS
INSPECTION, REPAIR, LUBRICATION AND ADJUSTMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Crowbar (Item 9, WP 0383 00)

Materials/Parts

Paint, Amercoat 385 #27 Haze Grey (Item 17, WP 0382 00)
Grease, Lubriplate (Item 9, WP 0382 00)
Sponge (Item 29, WP 0382 00)
Wedge, Wood (Item 37, WP 0382 00)

Personnel Required

Seaman 88K

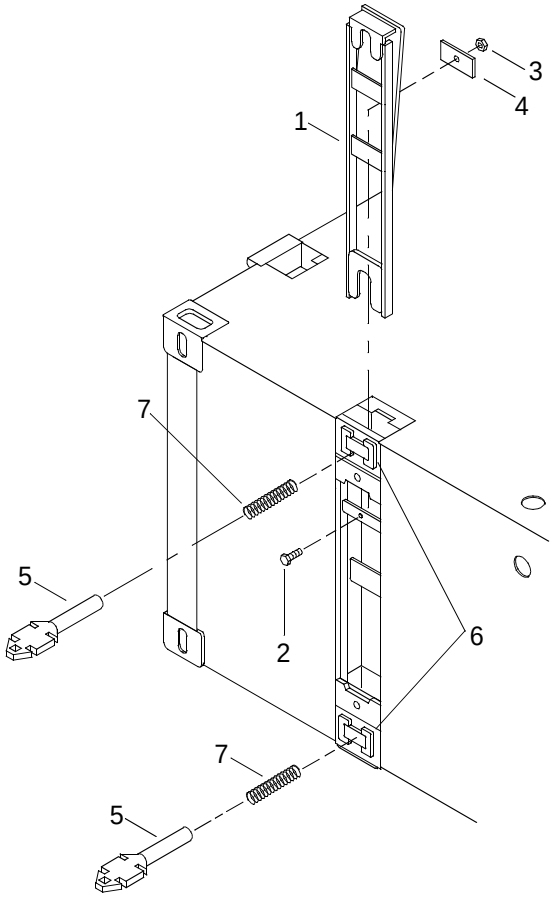
DISASSEMBLY OF NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

WARNING



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

1. Disassemble the male guillotine connector assembly.

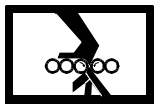


a. Remove the guillotine connector bar (1).

{1} Remove the bolt (2), nut (3) and friction plate (4).

{2} Pry up on the guillotine connector bar (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.

{3} Place a block of wood under the upper “lip” of the guillotine connector bar (1) after it is raised to hold it in the up position.

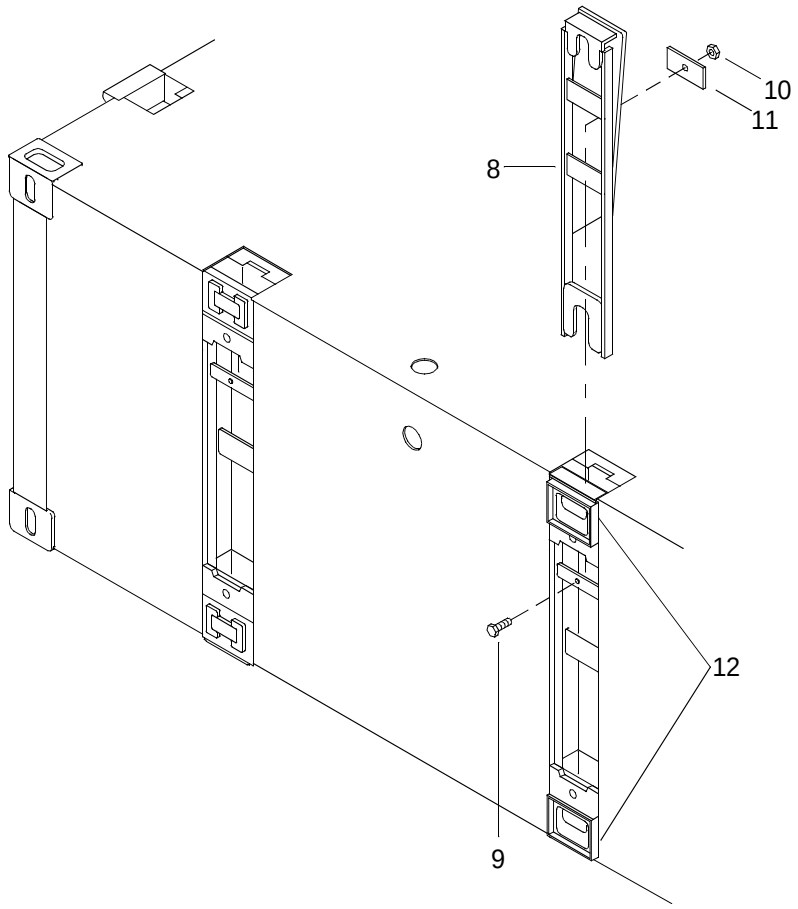
b. Push up on the retainer located on the underside of the male connector pin (5).

c. Remove male connector pin (5) from the guillotine connector lock housing (6).

d. Remove deployment spring (7).

e. Remove guillotine connector bar (1) from guillotine lock housing (6).

2. Disassemble the female guillotine connector assembly.



a. Remove the guillotine connector bar (8).

{1} Remove the bolt (9), nut (10) and friction plate (11).

{2} Pry up on the guillotine connector bar (8) using a crowbar.

b. Remove guillotine connector bar (8) from guillotine lock housing (12).

INSPECT AND REPAIR/REPLACE NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Inspect male connector pin (5) for cracks, cuts or corrosion. If damaged, replace connector pin.

2. Inspect deployment spring (7) for cracks, cuts or corrosion. If damaged, replace deployment spring.

3. Inspect guillotine connector bar (1, 8) for cracks, cuts or corrosion. If damaged, repair or replace guillotine connector bar (1, 8).

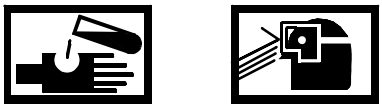
4. Inspect guillotine connector male and female lock housing (6, 12) for cracks, cuts or corrosion. If damaged, replace or replace guillotine connector lock housing (6, 12).

5. Inspect guillotine connector assembly friction plate (4, 11) for cracks, cuts or corrosion. If damaged, replace friction plate (4, 11).

LUBRICATE NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Lubricate the guillotine connector assemblies.

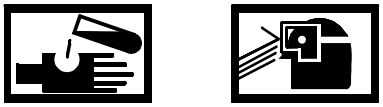
WARNING



CHEMICAL EYE PROTECTION

   a. Lubricate connector bar assemblies with a light coat of Lubriplate grease.

WARNING

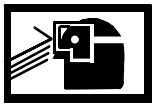


CHEMICAL EYE PROTECTION

   b. Lubricate deployment spring (3) with a light coat of Lubriplate grease.

2. Clean and/or paint exposed or rusty surfaces. (WP 0233 00)

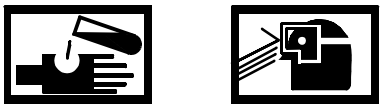
WARNING



EYE PROTECTION

   a. Wire brush exposed or rusting surfaces.

WARNING



CHEMICAL EYE PROTECTION

   b. Spot paint exposed surfaces with Haze Grey Amercoat 385 #27 paint.

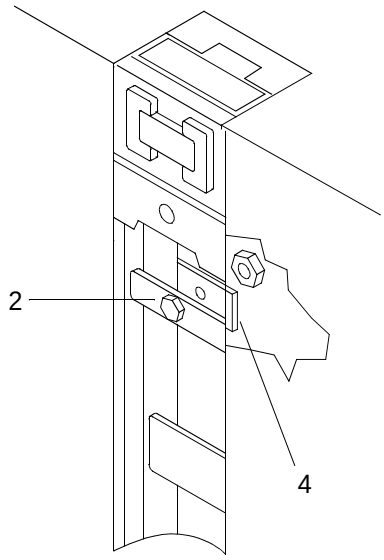
3. Remove standing water with a sponge from the guillotine connector assemblies.

ASSEMBLY OF NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Assemble the female guillotine connector assembly.
   a. Install guillotine connector bar (8) into guillotine lock housing (12).
   b. Install bolt (9) through friction plate (11) and nut (10).
2. Assemble the male guillotine connector assembly.
   a. Install guillotine connector bar (1) into guillotine lock housing (6).
   b. Install deployment spring (7) on male connector pin (5).
   c. Install male connector pin (5) into guillotine connector lock housing (6) by pushing down on the retainer located on the underside of the male connector pin (5) to lock pin in place.
   d. Install bolt (2) through friction plate (4) and nut (3).

ADJUST NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Locate the friction plate (4) on the guillotine connector assembly.



CAUTION

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

2. Tighten bolt (2) using two standard wrenches.
3. Remove block of wood.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ACCESS PANEL
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Personnel Required

Seaman 88K

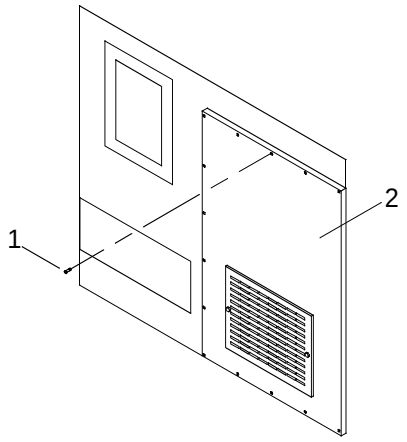
REMOVE OPERATORS CAB ACCESS PANEL

WARNING



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

1. Remove screws (1) from access panel (2).



2. Remove access panel (2).

INSTALL OPERATORS CAB ACCESS PANEL

1. Position access panel (2) over opening.
2. Install screws (1) in access panel (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB AIR INTAKE PLENUM
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

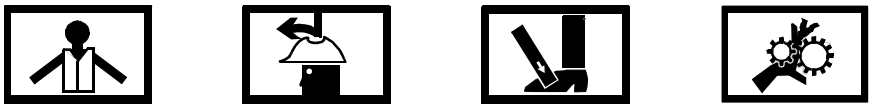
Air Intake Plenum Assembly
(34712)
PN E0702
Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

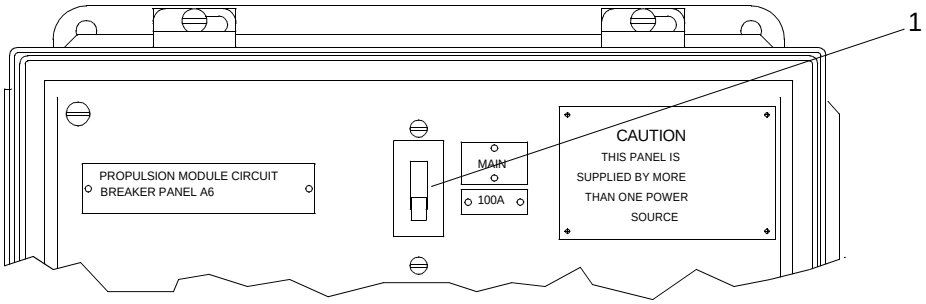
REMOVE OPERATORS CAB AIR INTAKE PLENUM

WARNING

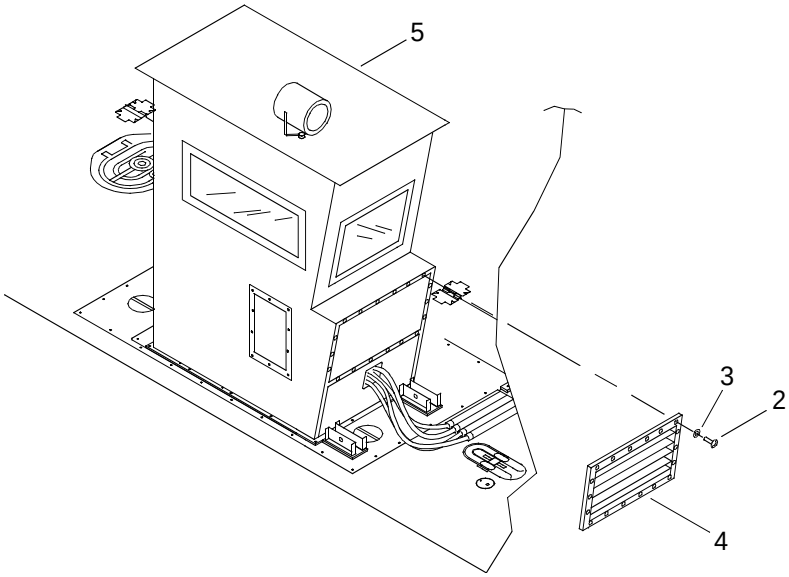


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove eighteen screws (2) and lock washers (3) from plenum (4).

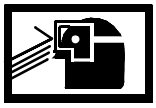


3. Remove plenum (4) from operators cab (5) and discard.

INSTALL OPERATORS CAB AIR INTAKE PLENUM

WARNING


CHEMICAL


EYE PROTECTION

1. Apply adhesive to screws (2).
2. Position new plenum (4) on operators cab (5).
3. Install eighteen lock washers (3) and screws (2) in plenum (4).
4. Tighten screws (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB DEFROSTER VALVES
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Valve, Defroster
(14959)
PN 88, 3/8 NPT
Qty 2
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

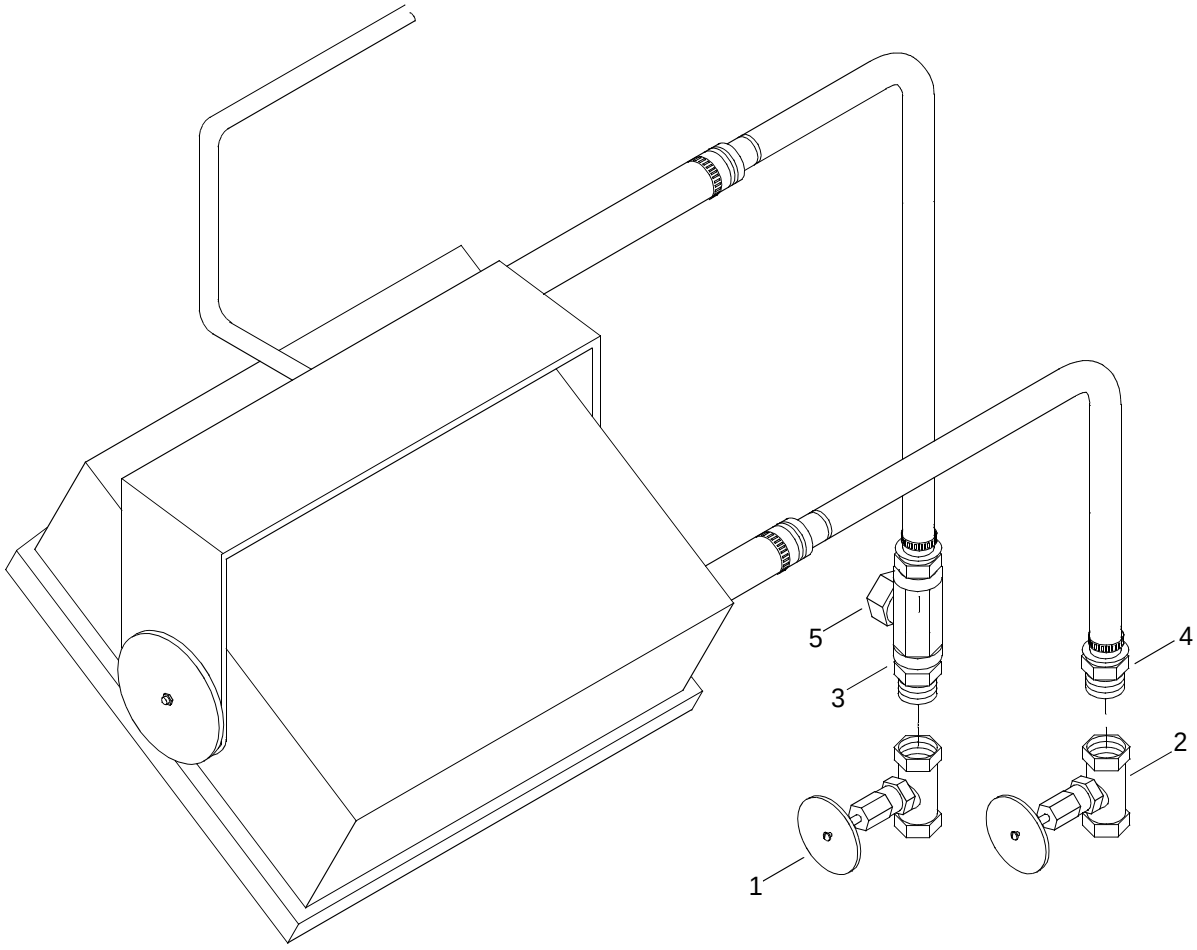
TM 55-1945-205-10-1

Equipment Condition

Cooling System Cool To Touch.
Operators Cab Side Access Panel Removed. (WP 0097 00)
Operators Cab Defroster Water Hoses Removed. (WP 0241 00)

REMOVE OPERATORS CAB DEFROSTER VALVES

1. Place drain pan under defrost valves (1 and 2) to collect coolant.



WARNING



2. Open defrost valves (1 and 2) and drain residual fluid into drain pan.

3. Remove valves (1 and 2) from pipe nipple (3 and 4) and discard.

WARNING

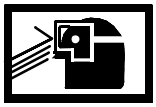


4. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL OPERATORS CAB DEFROSTER VALVES

WARNING

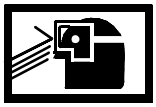

CHEMICAL


EYE PROTECTION

1. Apply sealing compound to threads on pipe nipple (4).
2. Install new valve (2) on pipe nipple (4) and tighten.

WARNING

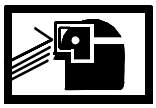

CHEMICAL


EYE PROTECTION

3. Apply sealing compound to threads on hose nipple (3).
4. Install new valve (1) on pipe nipple (3) and tighten.
5. Install operators cab defroster water hoses. (WP 0241 00)
6. Install operators side access panel. (WP 0097 00)
7. Start the starboard engine. (TM 55-1945-205-10-1)

WARNING

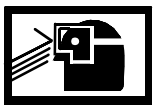

CHEMICAL


EYE PROTECTION

8. Place drain pan under tee (5) and loosen plug to bleed air from defroster coolant system.
9. Tighten plug on tee (5) when all trapped air has escaped.
10. Shut down the starboard engine. (TM 55-1945-205-10-1)

WARNING


CHEMICAL


EYE PROTECTION


POISON


VAPOR


SLICK FLOOR

11. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB HEATER VALVES
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts

Heater Valve
(14959)
PN 88, 3/4 NPT
Qty 2
Sealing Compound (Item 26, WP 0382 00)

Personnel Required

Engineer 88L

References

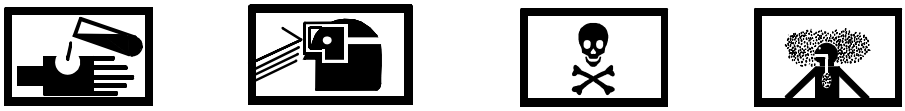
TM 55-1945-205-10-1

Equipment Condition

Cooling System Cool To Touch.
Operators Cab Side Access Panel Removed. (WP 0097 00)
Operators Cab Heater Water Hoses Removed. (WP 0242 00)

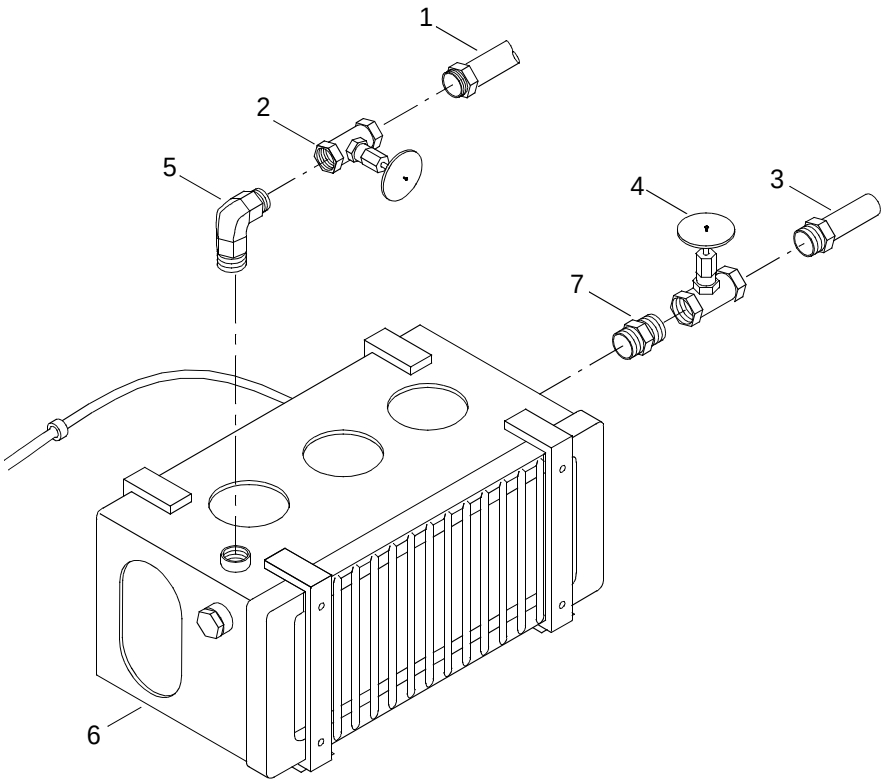
REMOVE OPERATORS CAB HEATER VALVES

WARNING



Ethylene glycol (antifreeze) is a skin and eye irritant. Wear approved safety goggles. Use only in adequate ventilation. Material can be fatal if swallowed. If taken internally, seek medical help immediately.

1. Remove hose fitting (1) from heater valve (2).



2. Remove hose fitting (3) from heater valve (4).
3. Remove elbow (5) and heater valve (2) from heater (6).
4. Remove nipple (7) and heater valve (4) from heater (6).
5. Remove heater valve (2) from elbow (5) and discard.
6. Remove heater valve (4) from nipple (7) and discard.

INSTALL OPERATORS CAB HEATER VALVES

WARNING



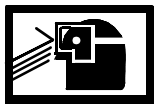
CHEMICAL **EYE PROTECTION**

1. Apply sealing compound to threads on nipple (7) and elbow (5).
2. Install new heater valve (4) on nipple (7).
3. Install new heater valve (2) on elbow (5).
4. Install nipple (7) and heater valve (4) into heater (6).
5. Install elbow (5) and heater valve (2) into heater (6).

WARNING



CHEMICAL



EYE PROTECTION

6. Apply sealing compound to threads on hose fittings (3 and 1).
7. Install hose fitting (3) into heater valve (4).
8. Install hose fitting (1) into heater valve (2).
9. Install operators cab heater hoses. (WP 0242 00)
10. Install operators cab side access panel. (WP 0097 00)
11. Perform operational check of heater. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB DEFROSTER WATER HOSES
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Defroster Hoses
(91016)
PN 80-038
Qty 2
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

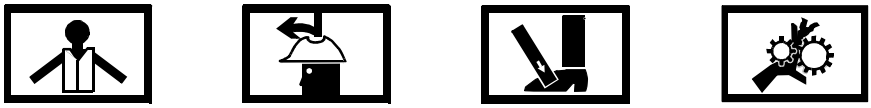
TM 55-1945-205-10-1

Equipment Condition

Cooling System Cool To Touch.
Operators Cab Side Access Panel Removed. (WP 0097 00)

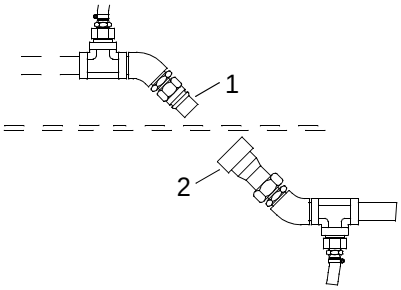
REMOVE OPERATORS CAB WATER DEFROSTER HOSES

WARNING

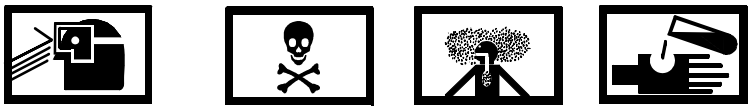


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Position drain pan under male (1) and female (2) quick disconnect water hoses below cab.

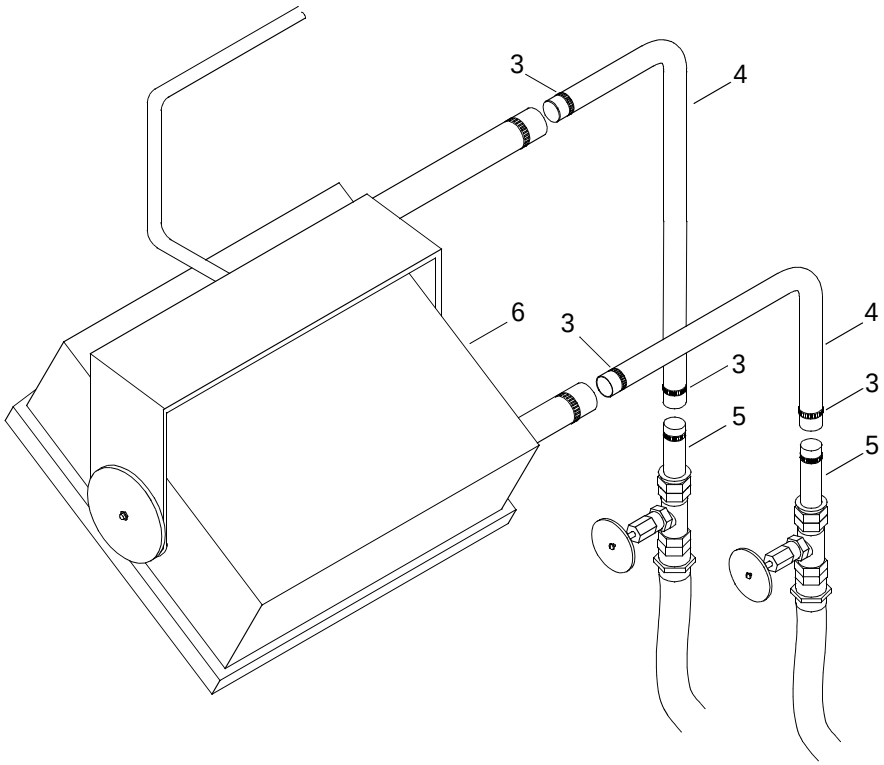


WARNING



2. Disconnect male (1) and female (2) quick disconnect water hoses.

3. Loosen four hose clamps (3) securing two hoses (4) at two hose nipples (5) and defroster (6).



4. Disconnect two hoses (4) from two hose nipples (5) and defroster (6).

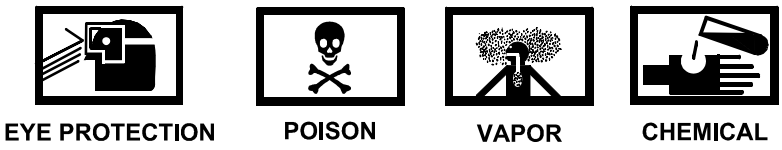
WARNING



5. Remove drain pan and dispose of contents in accordance with local procedures.

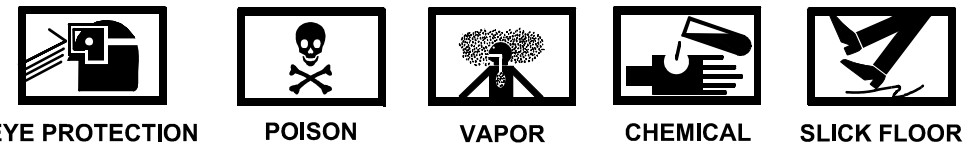
INSTALL OPERATORS CAB WATER DEFROSTER HOSES

WARNING



1. Install two hoses (4) on two hose nipples (5) and defroster (6).
2. Secure hoses (4) to hose nipples (5) and heater (6) with four hose clamps (3).
3. Connect male (1) and female (2) quick disconnect water hoses below cab.
4. Install operators cab side access panel. (WP 0097 00)

WARNING



5. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
6. Perform operational check of defroster. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB HEATER WATER HOSES
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Defroster Hoses
(91016)
PN 80-038
Qty 2
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Cooling System Cool To Touch.
Operators Cab Side Access Panel Removed. (WP 0097 00)

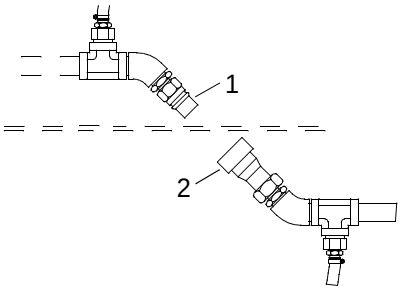
REMOVE OPERATORS CAB HEATER WATER HOSES

WARNING



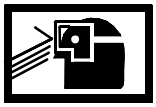
All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Position drain pan under male (1) and female (2) quick disconnect water hoses.



WARNING


POISON

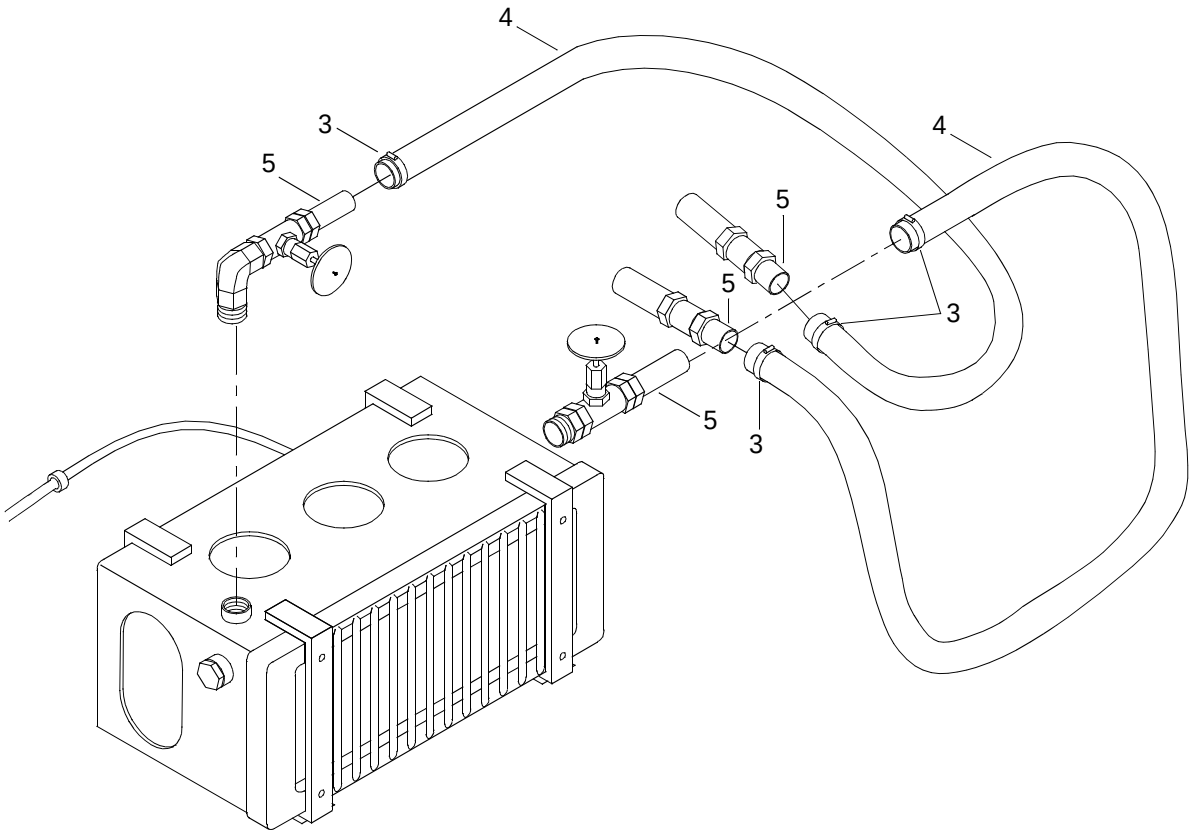

EYE PROTECTION


VAPOR


CHEMICAL

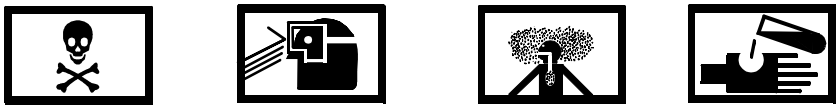
2. Disconnect male (1) and female (2) quick disconnect water hoses below cab.

3. Loosen four hose clamps (3) securing two hoses (4) to four hose nipples (5).



4. Disconnect two hoses (4) from four hose nipples (5).

WARNING



5. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL OPERATORS CAB HEATER WATER HOSES

1. Install two hoses (4) on four hose nipples (5).
2. Secure hoses (4) to hose nipples (5) with four hose clamps (3).
3. Connect male (1) and female (2) quick disconnect water hoses below cab.
4. Install operators cab side access panel. (WP 0097 00)

WARNING



5. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
6. Perform operational check of heater. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB HEATER HOSE MALE QUICK DISCONNECT REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)

Materials/Parts

Disconnect, Quick-Male
(01276)
PN FD-45-1002-12-12
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

Equipment Condition

Cooling System Cool To Touch.
Operators Cab Side Access Panel Removed. (WP 0097 00)

REMOVE OPERATORS CAB HEATER HOSE MALE QUICK DISCONNECT

WARNING

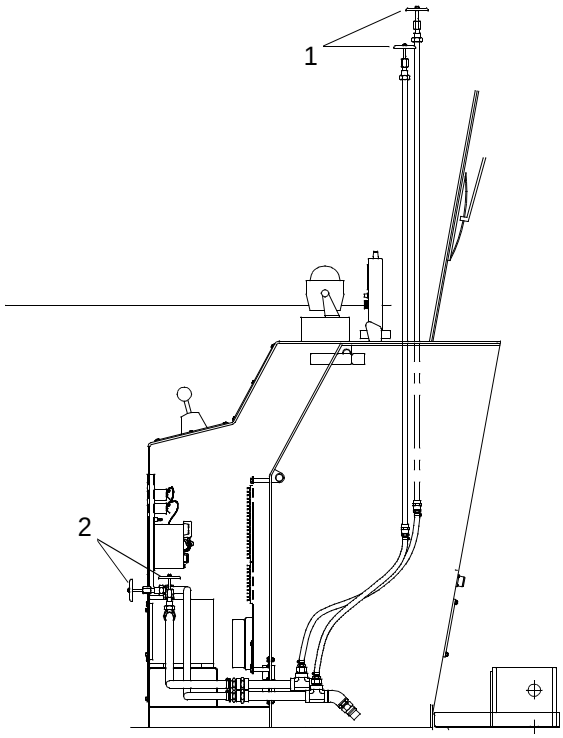


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

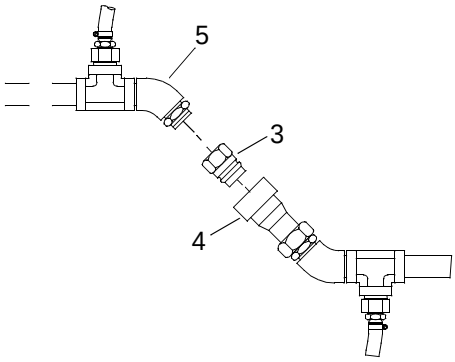
This task is typical for the replacement of operators cab heating hose male quick disconnects.

1. Close the inlet/outlet defrost needle valves (1).

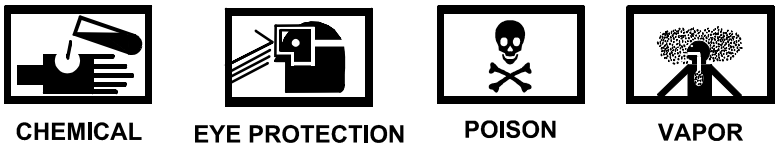


2. Close the inlet/outlet heater needle valves (2).

3. Place a drain pan under male (3) and female (4) quick disconnect water hoses.



WARNING



4. Disconnect male (3) and female (4) quick disconnect water hoses below cab.

5. Remove male quick disconnect (3) from elbow (5).

6. Discard male quick disconnect (3).

WARNING



7. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL OPERATORS CAB HEATER HOSE MALE QUICK DISCONNECT

WARNING



1. Apply sealing compound to threads on male quick disconnect (3).
2. Install new male quick disconnect (3) on elbow (5).
3. Tighten male quick disconnect (3).
4. Connect female (4) and male (3) quick disconnect water hoses below cab.
5. Open the inlet/outlet heater needle valves (2).
6. Open the inlet/outlet defrost needle valves (1).
7. Service heat exchanger. (TM 55-1945-205-24-1-2)
8. Install operators cab side access panel. (WP 0097 00)

WARNING



9. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.
10. Perform operational check of heater. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB WINDOW
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Window, Slide, S-1
(34712)
PN E12058
Window, Fixed
(34712)
PN E12068
Window, Slide, P-1
(34712)
PN E12048
Sealant, RTV Silicone, Tube (Item 23, WP 0382 00)

Personnel Required

Engineer 88L

REMOVE OPERATORS CAB WINDOW

WARNING

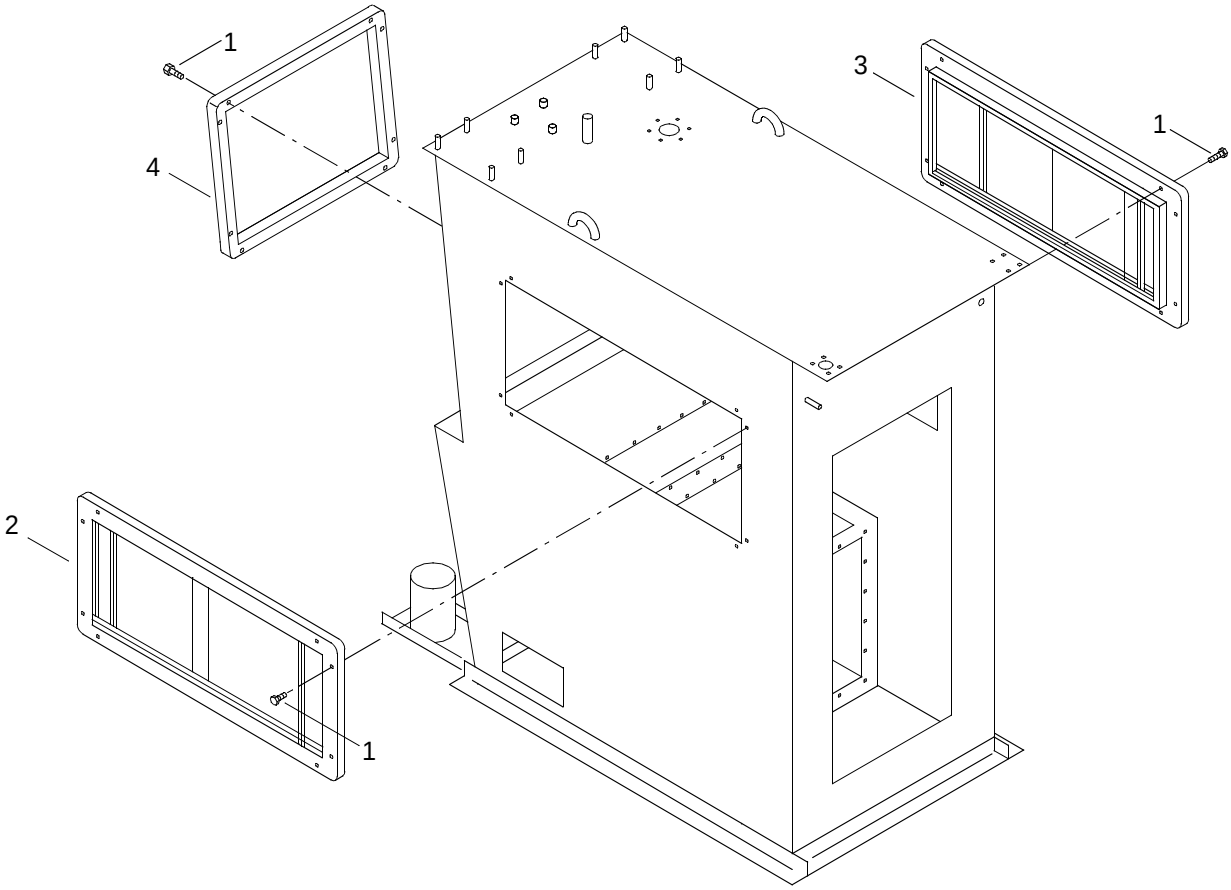


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the operators cab forward fixed or port and starboard windows.

1. Remove eight flat head screws (1) from window (2, 3 or 4).



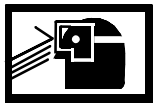
2. Remove slide window (2), slide window (3) or fixed window (4).

INSTALL OPERATORS CAB WINDOW

WARNING



CHEMICAL



EYE PROTECTION

1. Apply a sufficient bead of sealant around the entire window frame to achieve a continuous water tight seal.

2. Position new window in window frame.

3. Secure window (2, 3 or 4) with eight flat head screws (1).

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

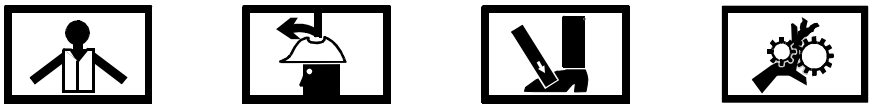
Engineer 88L

References

TM 55-1945-205-10-1

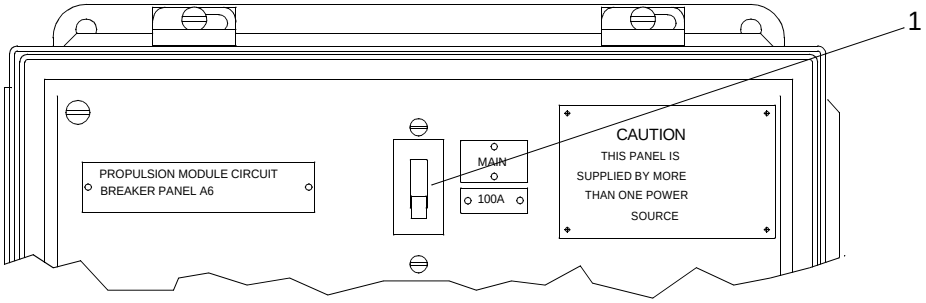
REMOVE MIDDLE CONTROL PANEL A1

WARNING

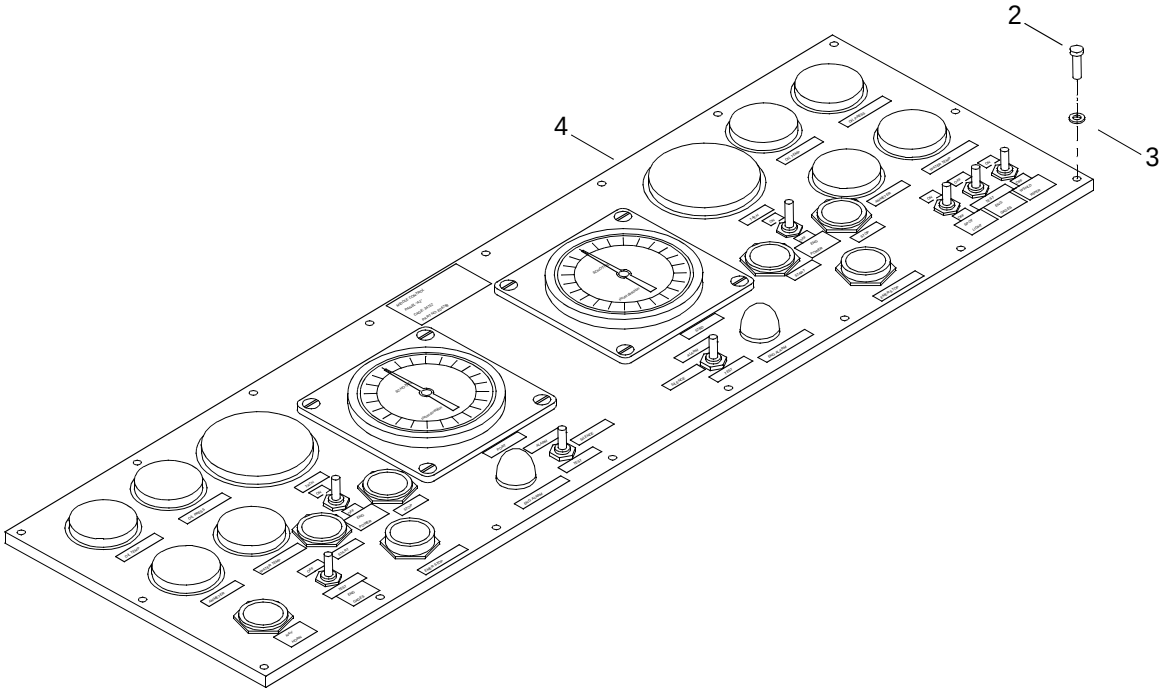


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove eighteen pan head screws (2) and lock washers (3) securing middle control panel (4).



3. Lift out the panel (4), being careful not to bend or chafe the wiring.

4. Tag and disconnect all wiring attached to the middle control panel A1 (4) controls and indicators.

INSTALL MIDDLE CONTROL PANEL A1

1. Connect all tagged wiring to the middle control panel A1 (4) controls and indicators.

2. Remove tags from electrical wiring.

WARNING



CHEMICAL **EYE PROTECTION**

3. Apply antiseize compound to pan head screws (2).

4. Position middle control panel (4) and secure with eighteen lock washers (3) and eighteen pan head screws (2).

5. Tighten screws (2).

6. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 INDICATOR LIGHT BULB REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Indicator Light Bulb
(96312)
PN 6S6 - 24V

Personnel Required

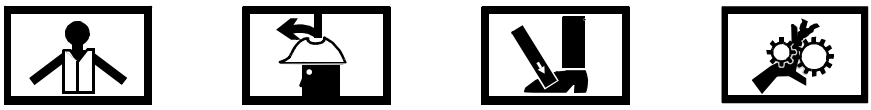
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE MIDDLE CONTROL PANEL A1 INDICATOR LIGHT BULB

WARNING

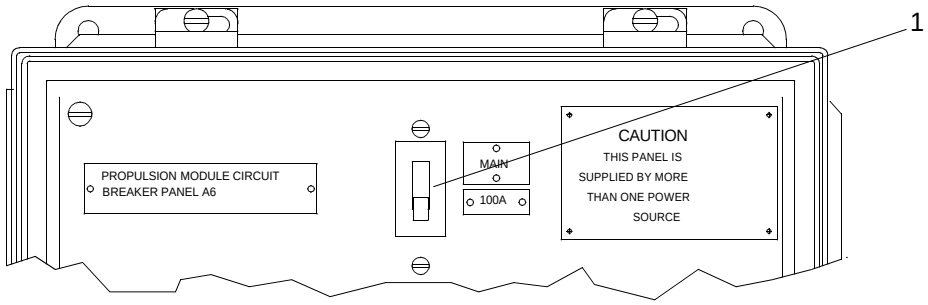


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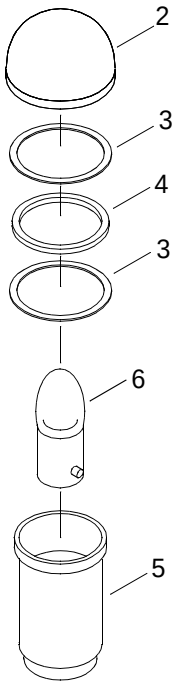
NOTE

The following procedure is typical for the removal and installation of indicator light bulbs on the middle control panel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove colored cap (2), two seals (3) and washer (4) from the indicator base (5).



3. Remove light bulb (6) from the indicator base (5) by rotating ¼ turn counterclockwise.

4. Discard light bulb (6).

INSTALL MIDDLE CONTROL PANEL A1 INDICATOR LIGHT BULB

1. Position new light bulb (6) in the indicator base (5).

2. Secure light bulb (6) by rotating ¼ turn clockwise.

3. Install colored cap (2), two seals (3) and washer (4) on indicator base (5).

4. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 TACHOMETER GAUGE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Tachometer Gauge M5 or M6
(59179)
PN 333 508

Personnel Required

Engineer 88L

References

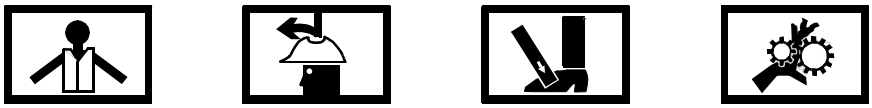
TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 TACHOMETER GAUGE

WARNING

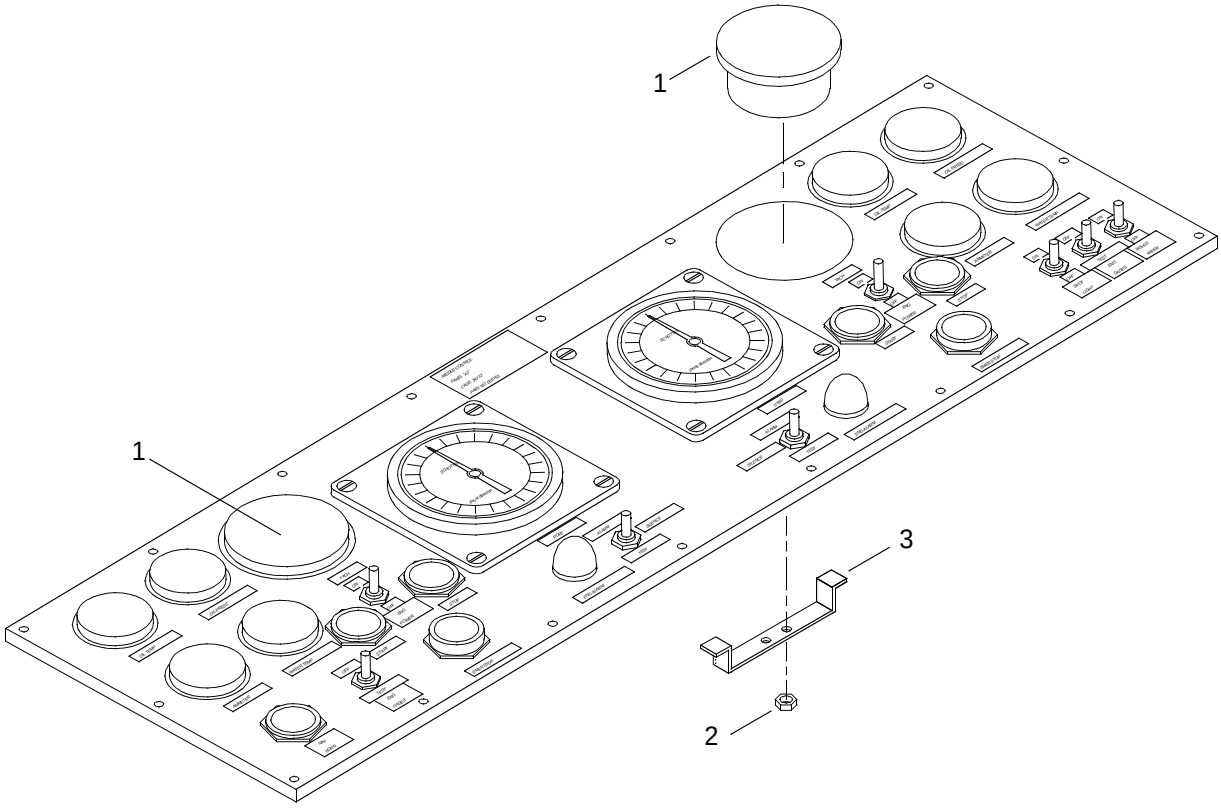


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of tachometer gauges.

1. Tag and disconnect the wiring from the tachometer gauge M5 or M6 (1).



2. Remove the hex nut (2) and bracket (3) securing tachometer gauge to middle control panel A1.

3. Lift gauge (1) out of the panel and discard.

INSTALL MIDDLE CONTROL PANEL A1 TACHOMETER GAUGE

1. Position new tachometer gauge M5 or M6 (1) and, from underside of middle control panel A1, secure with bracket (3) and hex nut (2).

2. Connect all wiring to gauge as previously tagged.

3. Remove tags.

4. Install middle control panel A1. (WP 0245 00)

5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 OIL PRESSURE GAUGE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Gauge, Oil Pressure
(59179)
PN 350 516

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 OIL PRESSURE GAUGE

WARNING

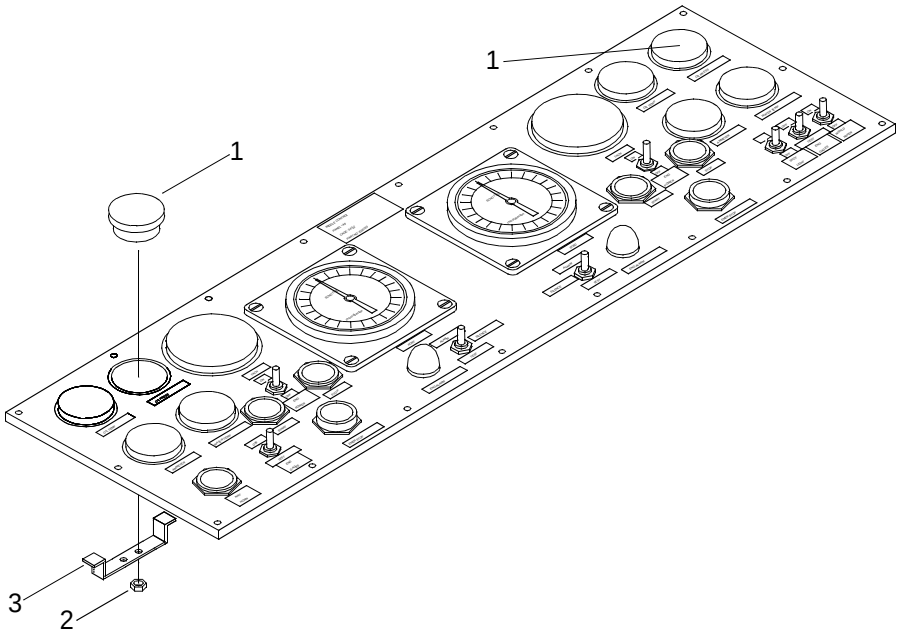


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of oil pressure gauges.

1. Tag and disconnect the wiring from the oil pressure gauge M3 or M9 (1).



2. Remove the hex nut (2) and bracket (3) securing oil pressure gauge to middle control panel A1.

3. Lift gauge (1) out of the panel and discard.

INSTALL MIDDLE CONTROL PANEL A1 OIL PRESSURE GAUGE

1. Position new oil pressure gauge M3 or M9 (1) from underside of middle control panel A1 and secure with bracket (3) and hex nut (2).

2. Connect all wiring to gauge as previously tagged.

3. Remove tags.

4. Install middle control panel A1. (WP 0245 00)

5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 AMMETER GAUGE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Ammeter Gauge M2 or M8
(59179)
PN 190 954

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A 1 AMMETER GAUGE

WARNING

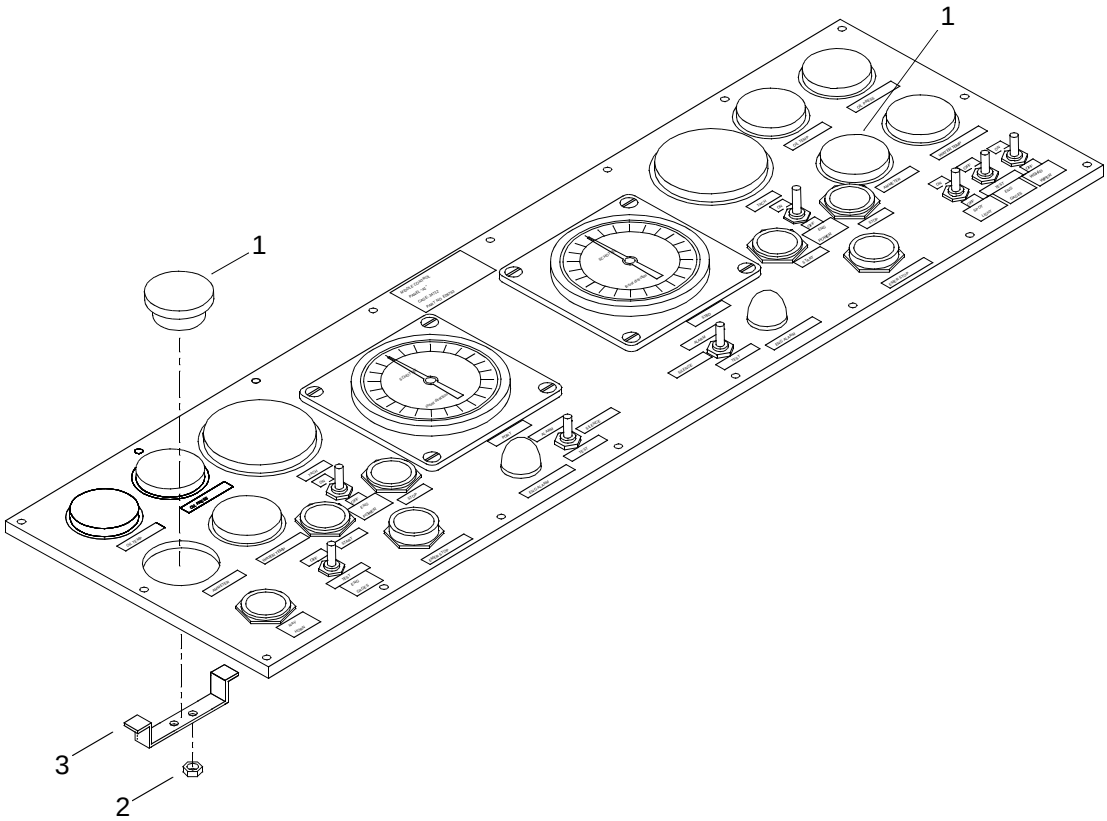


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of ammeter gauges.

1. Tag and disconnect the wiring from the ammeter gauge M2 or M8 (1).



2. Remove the hex nut (2) and bracket (3) securing ammeter gauge (1) to middle control panel A1.

3. Lift gauge (1) out of the panel and discard.

INSTALL MIDDLE CONTROL PANEL A1 AMMETER GAUGE

1. Position new ammeter gauge M2 or M8 (1) into middle control panel A1 and secure with bracket (3) and hex nut (2).

2. Connect all wiring to ammeter (1) as previously tagged.

3. Remove tags.

4. Install middle control panel A1. (WP 0245 00)

5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 WATER TEMPERATURE GAUGE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Gauge, Water Temperature
(59179)
PN 310 502

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 WATER TEMPERATURE GAUGE

WARNING

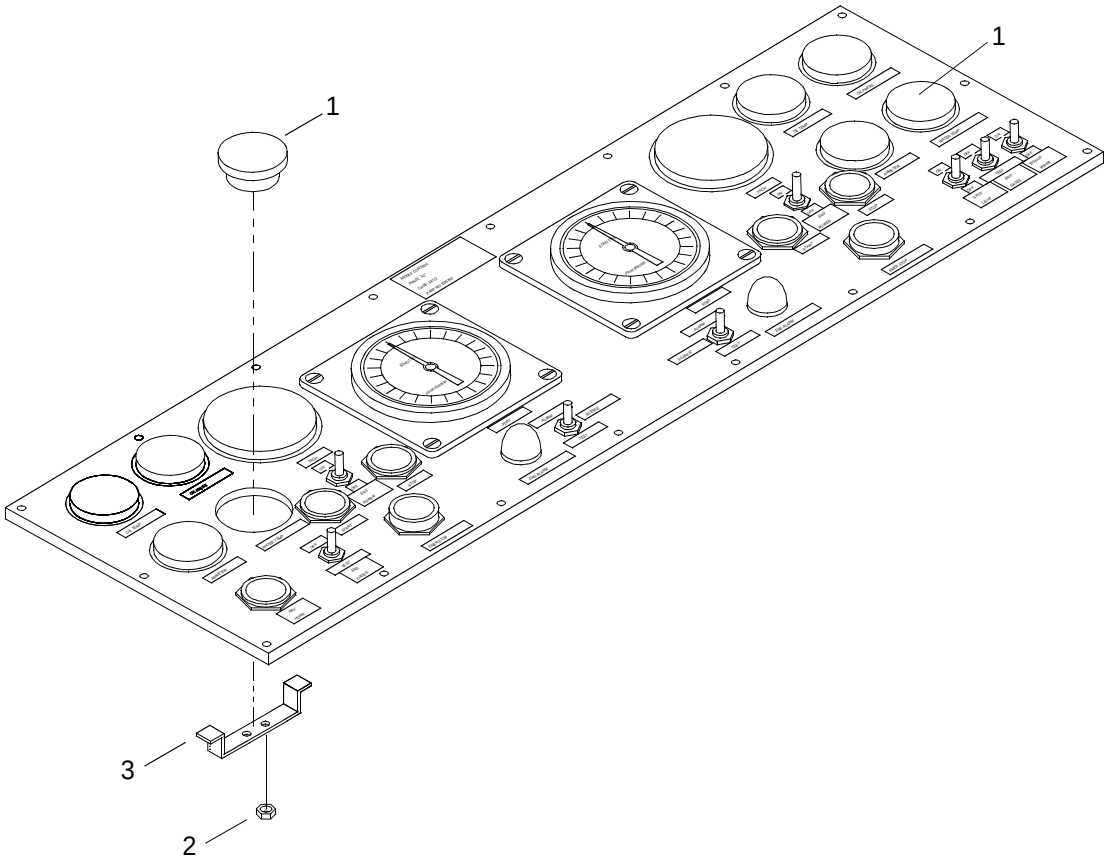


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of water temperature gauges.

1. Tag and disconnect the wiring from the water temperature gauge M1 or M7 (1).



2. Remove the hex nut (2) and bracket (3) securing water temperature gauge (1) to middle control panel A1.

3. Lift gauge (1) out of the panel and discard.

INSTALL MIDDLE CONTROL PANEL A1 WATER TEMPERATURE GAUGE

1. Position new water temperature gauge M1 or M7 (1) into middle control panel A1 and secure with bracket (3) and hex nut (2).

2. Connect all wiring to gauge as previously tagged.

3. Remove tags.

4. Install middle control panel A1. (WP 0245 00)

5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 OIL TEMPERATURE GAUGE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Gauge, Oil Temperature
(59179)
PN 310 502

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 OIL TEMPERATURE GAUGE

WARNING

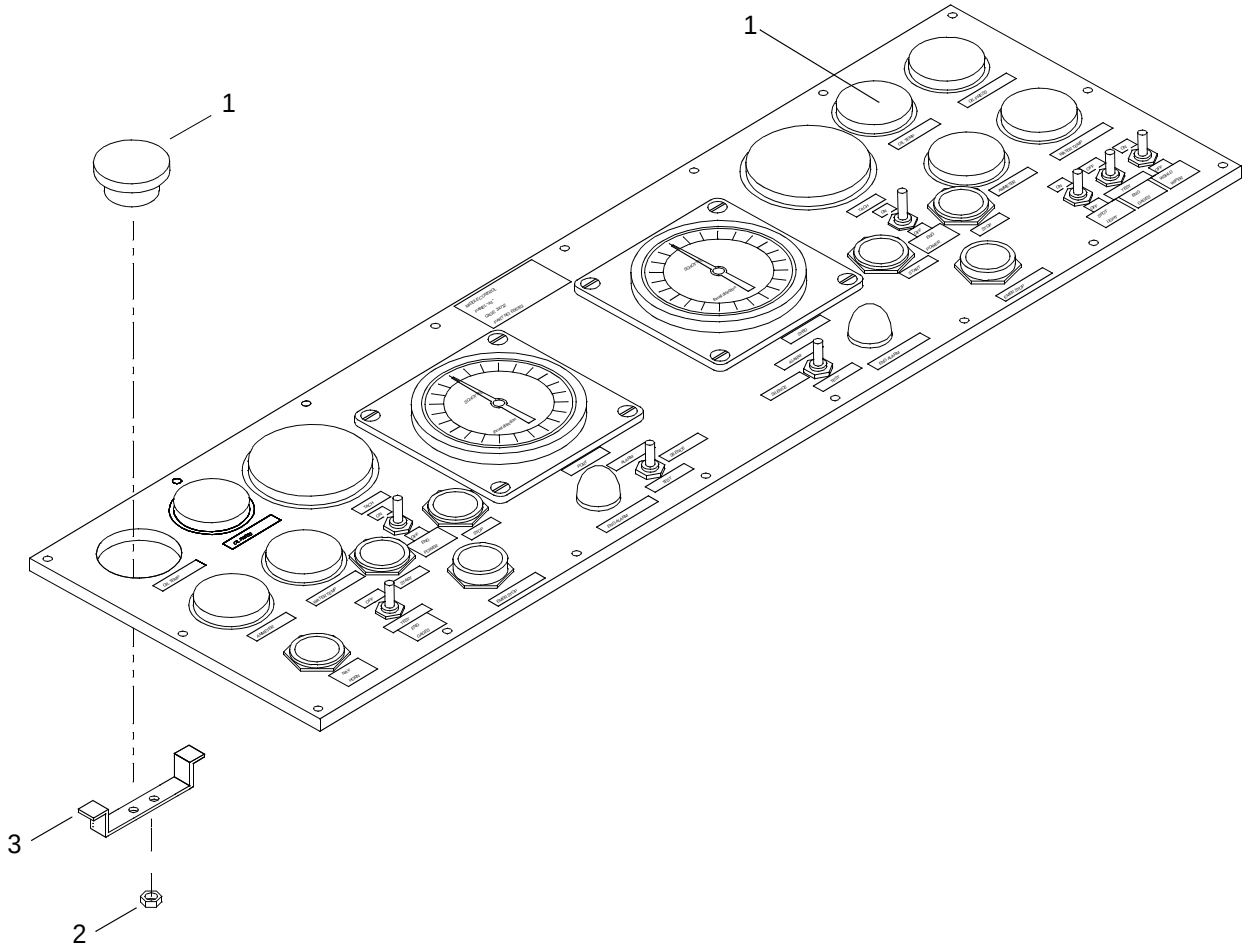


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of oil temperature gauges.

1. Tag and disconnect the wiring from the oil temperature gauge M4 or M10 (1).



2. Remove the hex nut (2) and bracket (3) securing oil temperature gauge (1) to middle control panel A1.

3. Lift gauge (1) out of the panel and discard.

INSTALL MIDDLE CONTROL PANEL A1 OIL TEMPERATURE GAUGE

1. Position new oil temperature gauge M4 or M10 (1) into middle control panel A1 and secure with bracket (3) and hex nut (2).

2. Connect all wiring to gauge as previously tagged.

3. Remove tags.

4. Install middle control panel A1. (WP 0245 00)

5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 ENGINE ALARM INDICATOR
REPLACEMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts
Base, Indicator, Engine Alarm
(96312)
PN 103-3101-05-103

Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

Equipment Condition
Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 ENGINE ALARM INDICATOR

WARNING

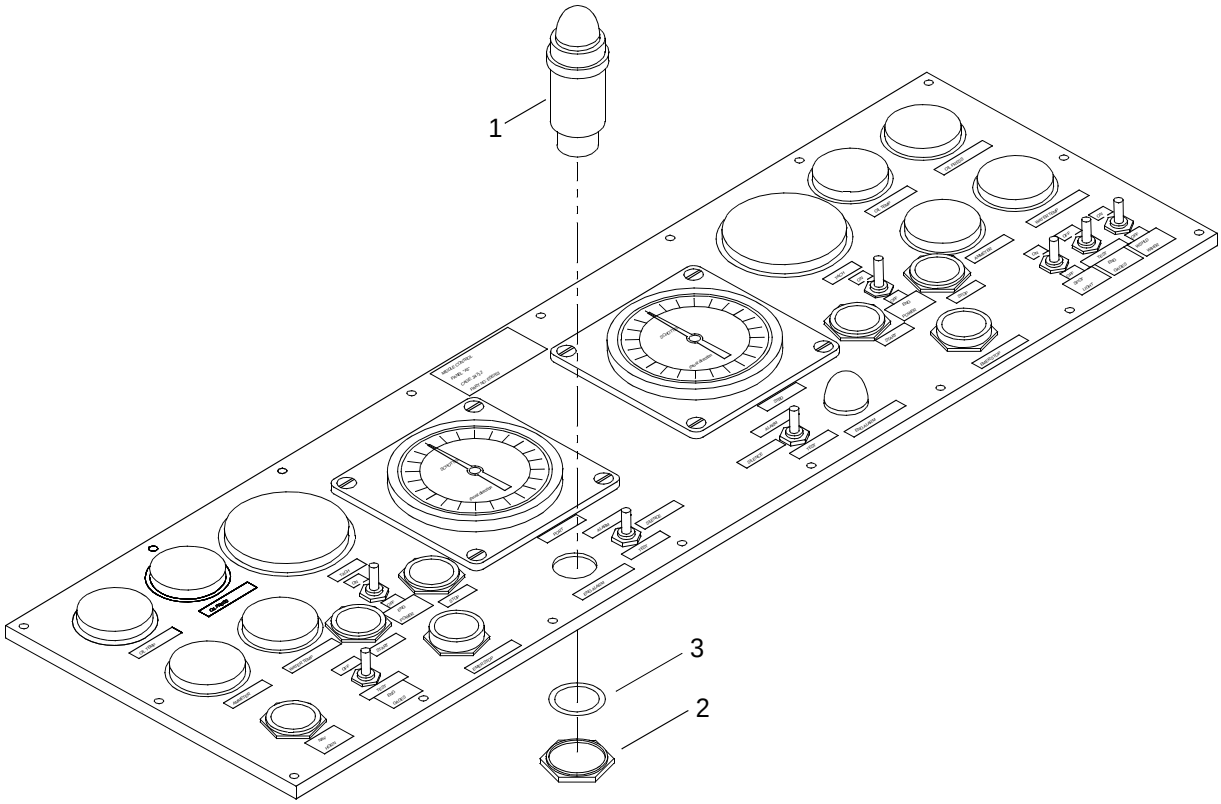


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of engine alarm indicators.

1. Tag and disconnect the wiring to the engine alarm indicator (1).



2. Remove the nut (2) and washer (3) securing the engine alarm indicator (1) to the middle control panel A1 (8).
3. Remove the engine alarm indicator (1) and discard.

INSTALL MIDDLE CONTROL PANEL A1 ENGINE ALARM INDICATOR

1. Position new engine alarm indicator base (1) in middle control panel A1 and secure with washer (3) and nut (2).
2. Connect all wiring to gauge as previously tagged.
3. Remove tags.
4. Install middle control panel A1. (WP 0245 00)
5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 ENGINE START PUSH BUTTON REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Push Button
(34712)
PN E30299

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 ENGINE START PUSH BUTTON

WARNING

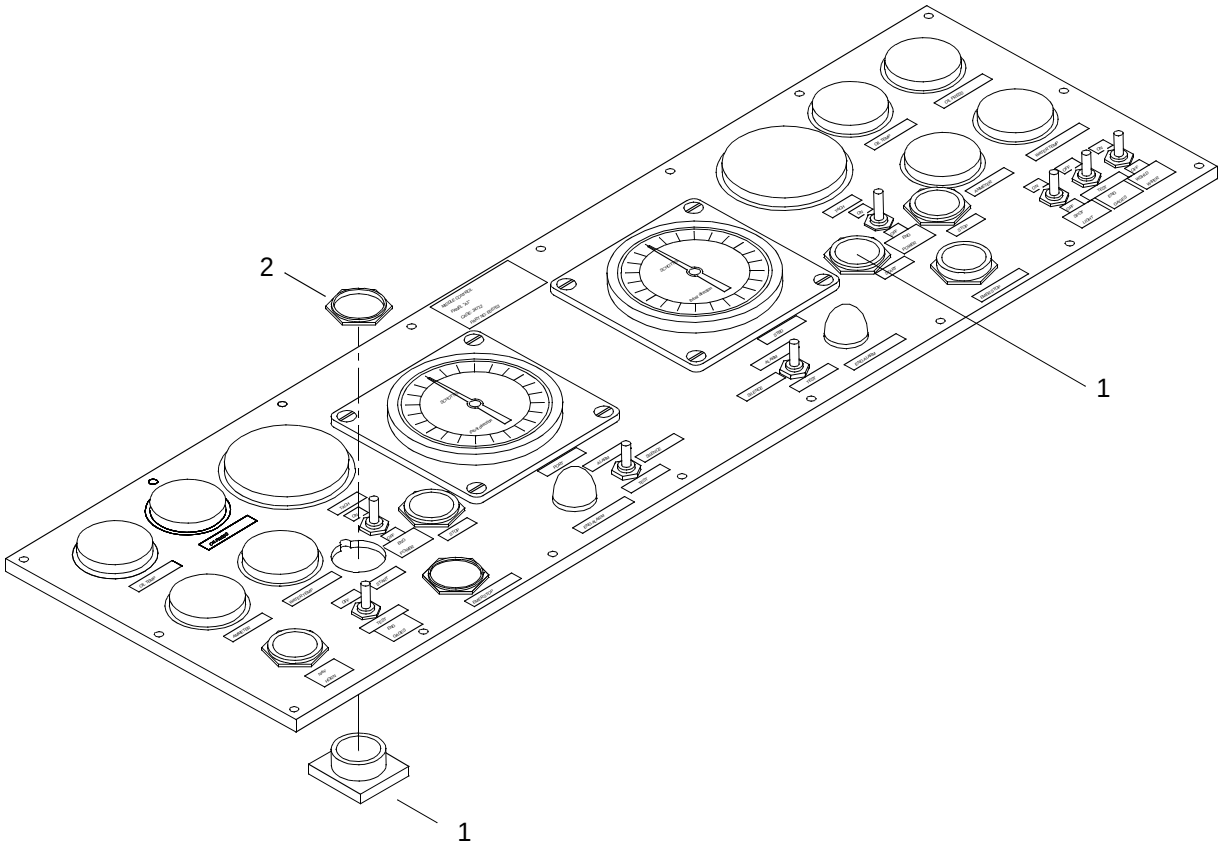


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of engine push buttons.

1. Tag and disconnect the wiring to engine start push button S2 or S7 (1).



2. Remove the hex nut (2) from top of middle control panel A1.

3. Remove the push button (1) from beneath the panel A1 and discard.

INSTALL MIDDLE CONTROL PANEL A1 ENGINE START PUSH BUTTON

1. Position new push button S2 or S7 (1) from the underside of middle control panel A1 and secure with hex nut (2) on top of panel A1.

2. Connect all wiring to engine start push button (1) as previously tagged.

3. Remove tags.

4. Install middle control panel A1. (WP 0245 00)

5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 TOGGLE SWITCH
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Switch, Toggle
(91929)
PN MS24523-22

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 TOGGLE SWITCH

WARNING

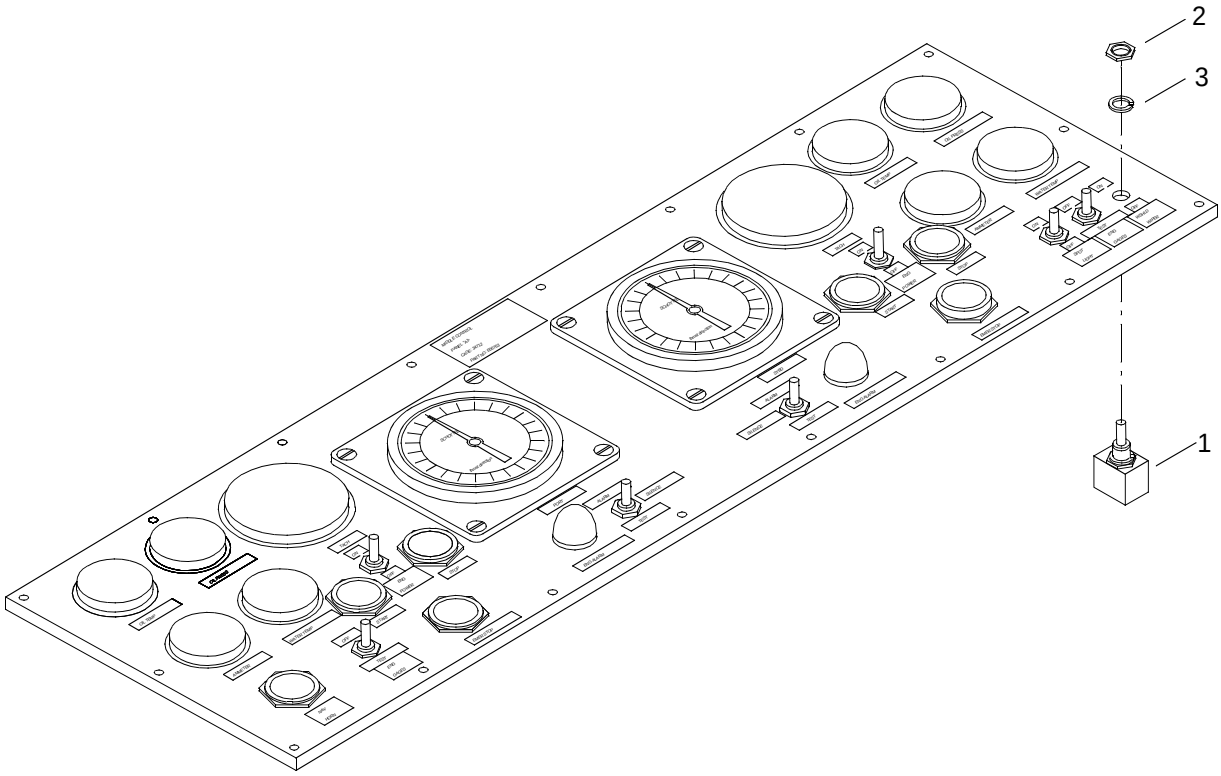


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of middle control panel toggle switches.

1. Tag and disconnect the wiring from the applicable toggle switch (1).



2. Remove hex nut (2) and lock washer (3), from toggle switch (1).

3. Remove switch from beneath of middle control panel A1.

4. Remove toggle switch (1) from beneath middle control panel A1 and discard.

INSTALL MIDDLE CONTROL PANEL A1 TOGGLE SWITCH

1. Position new toggle switch (1) from underside of middle control panel A1 and secure with hex lock washer (3) and nut (2).

2. Connect all wiring to toggle switch as previously tagged.

3. Remove tags.

4. Install middle control panel A1. (WP 0245 00)

5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Indicating Device, Thrust Direction
(0XS19)
PN 1037484

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE

WARNING

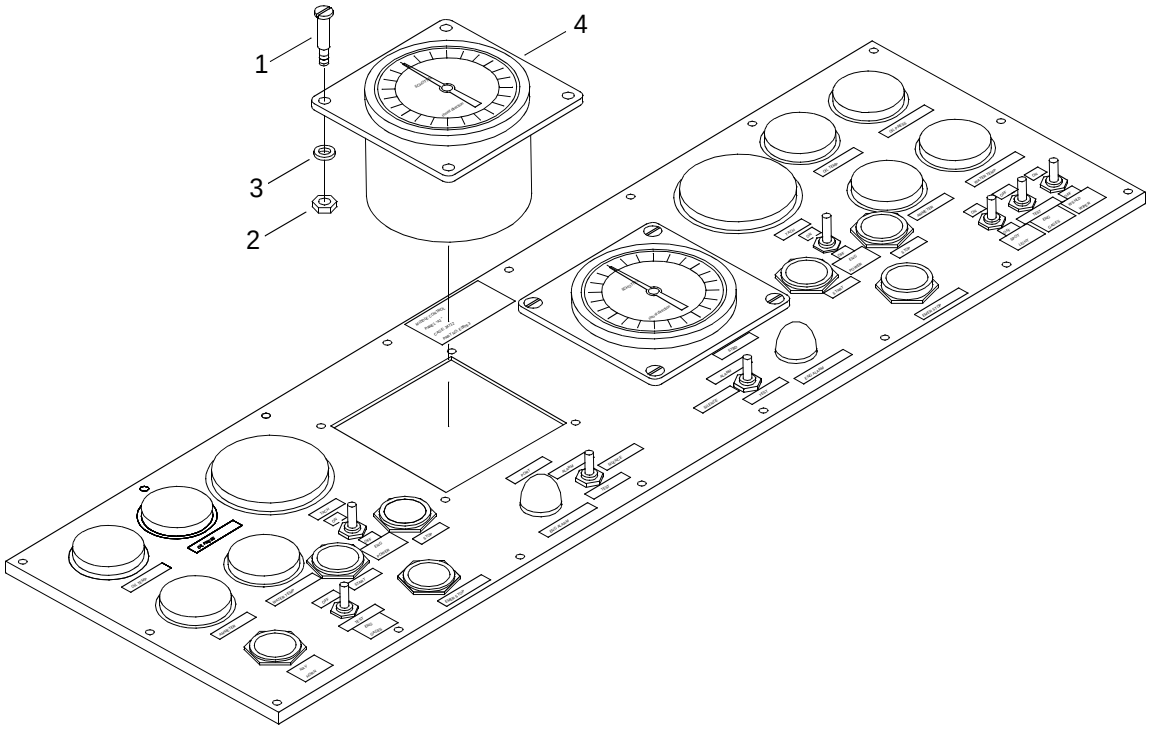


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of thrust indicating devices.

1. Tag and disconnect the wiring from the thrust direction indicating device (4).



2. Remove four screws (1), hex nuts (2) and flat washers (3) and remove thrust direction indicating device (4) from the middle control panel A1.

INSPECT MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE

1. Inspect the gasket material within the device frame for tears, breaks or deterioration. Replace entire frame unit if gasket does not provide a watertight seal.

2. Inspect control display for frayed, broken or loose wires or connections and repair/replace as required.

INSTALL MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE

1. Position new thrust direction indicating device (4) in top of middle control panel A1.

2. Secure thrust direction indicating device (4) with four screws (1), hex nuts (2) and flat washers (3).

3. Tighten screws (1).

4. Connect all wiring to thrust direction indicating device (4) as previously tagged.

5. Remove tags.

6. Install middle control panel A1. (WP 0245 00)

7. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE LIGHT BULB REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

REMOVE MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE LIGHT BULB

WARNING

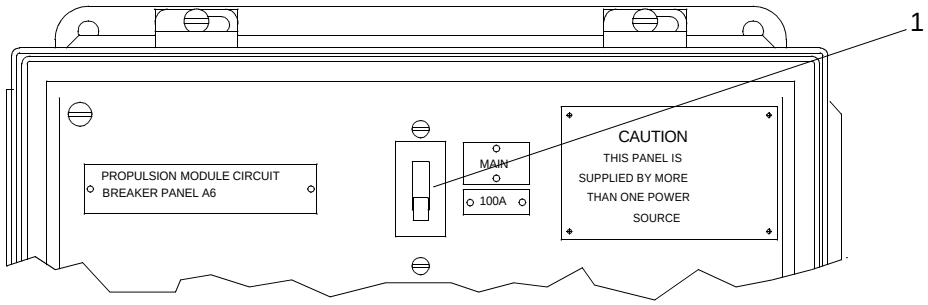


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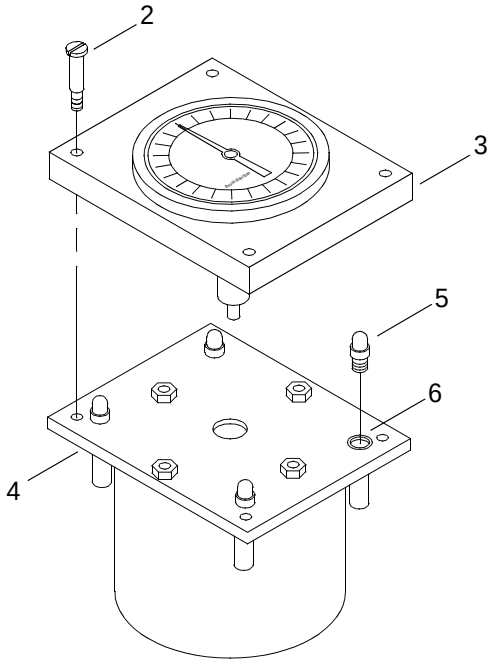
NOTE

The following procedure is typical for the removal and installation of thrust indicating device light bulbs.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove four screws (2) from thrust direction indicating device cover plate (3) and lift from middle control panel A1 thrust indicating device (4).



3. Unscrew light bulb (5) from lamp socket (6) on thrust indicating device (4) on middle control panel A1.

4. Remove light bulb (5) and discard.

INSTALL MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE LIGHT BULB

1. Position new thrust direction indicating light bulb (5) in the lamp socket (6).

2. Screw the light bulb (5) into the lamp socket (6).

3. Position the thrust indicating device cover plate (3) on middle control panel A1 thrust direction indicating device (4).

4. Install four screws (2) in thrust direction indicating device cover plate (3) and secure to middle control panel A1 thrust direction indicating device (4).

5. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE SERVO UNIT
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Personnel Required

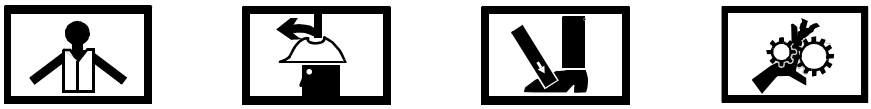
Engineer 88L

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE SERVO UNIT

WARNING

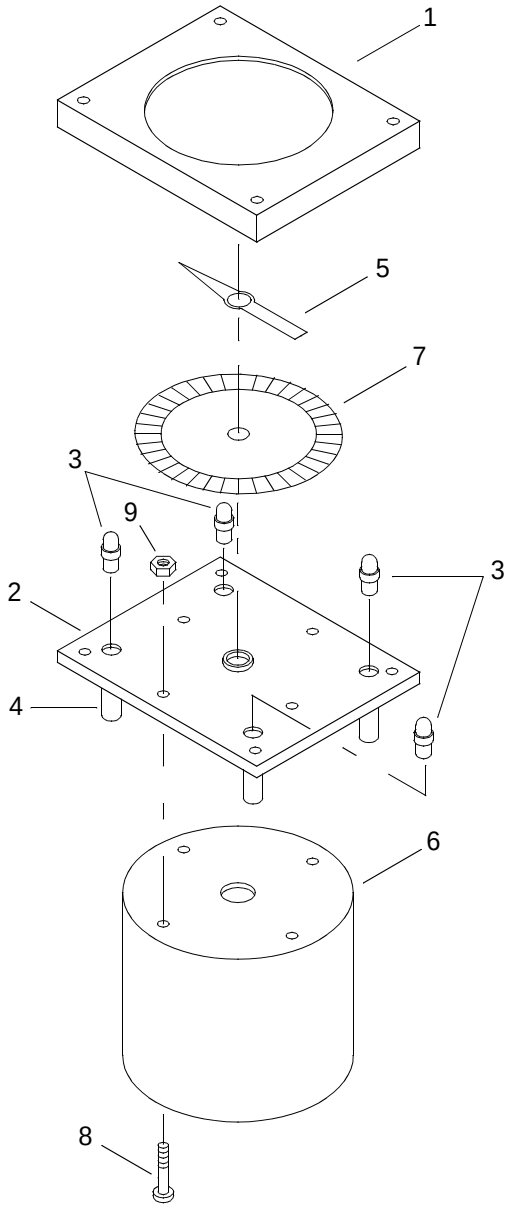


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of thrust indicating devices.

1. Pull up on frame (1) to separate from base plate (2).



2. Remove four bulbs (3) from lamp sockets (4).
3. Remove pointer (5) from servo unit (6).
4. Remove scale (7) from base plate (2).
5. Remove four self tapping screws (8) from nuts (9).
6. Separate base plate (2) from servo unit (6).

INSTALL MIDDLE CONTROL PANEL A1 THRUST INDICATING DEVICE SERVO UNIT

NOTE

Repair is limited to replacement of defective parts as necessary in the following steps.

1. Position servo unit (6) on base plate (2).
2. Install four self tapping screws (8) through servo unit and base plate (2) and secure with nuts (9).
3. Tighten nuts (9).
4. Position scale (7) on base plate (2).
5. Position and attach pointer (5) to servo unit (6).
6. Install four bulbs (3) in lamp sockets (4).
7. Position frame (1) base plate (2) and press down to attach.
8. Install middle control panel A1. (WP 0245 00)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 ENGINE ALARM INDICATOR LIGHT BULB REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Lamp
(96312)
PN 6S6 - 24V

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

REMOVE MIDDLE CONTROL PANEL A1 ENGINE ALARM INDICATOR LIGHT BULB

WARNING

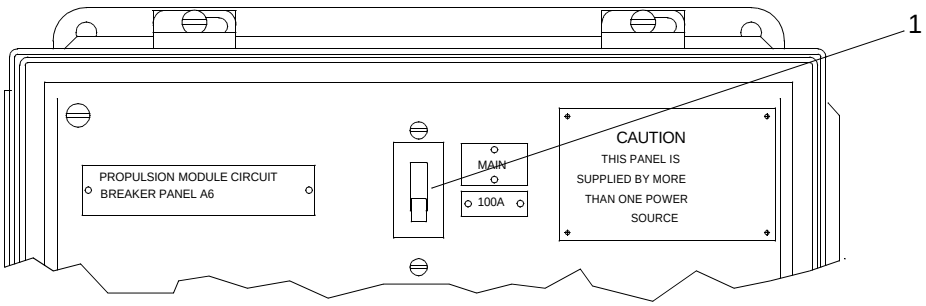


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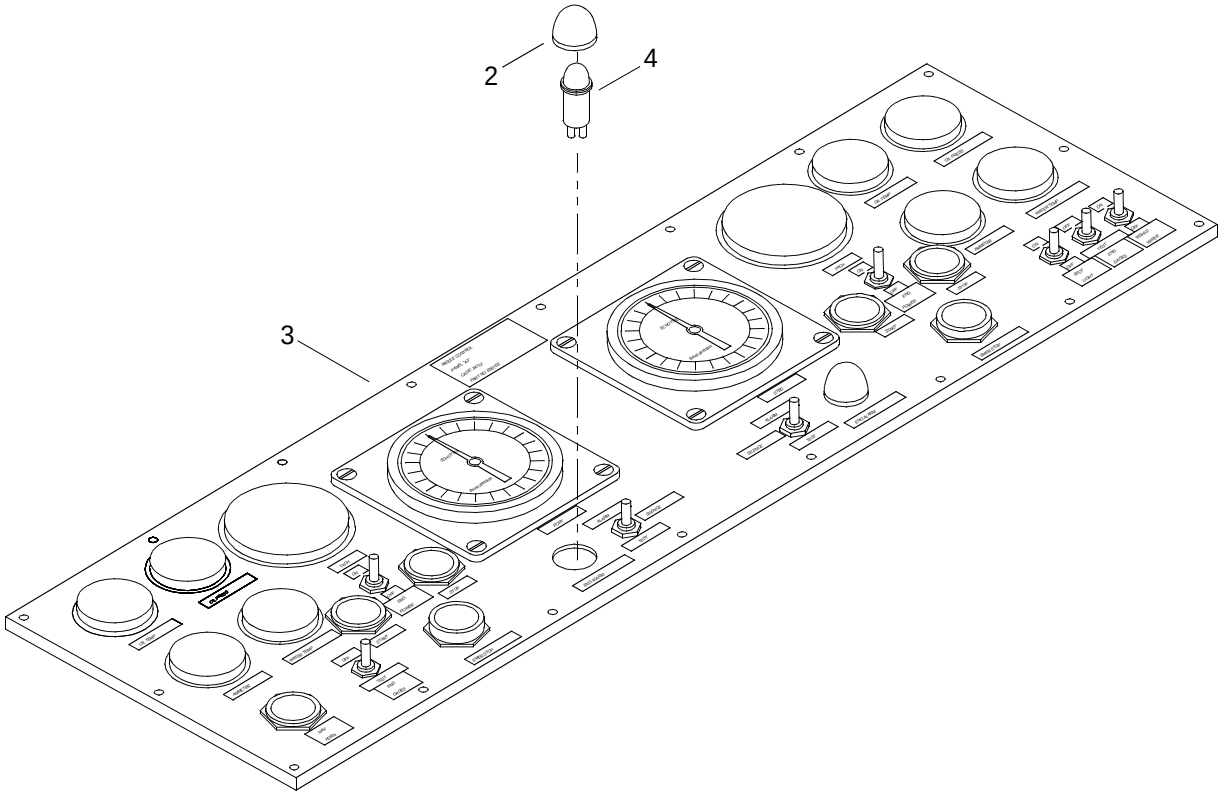
NOTE

The following procedure is typical for the removal and installation of engine alarm indicator light bulbs.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove red cap (2) from engine alarm indicator on middle control panel A1 (3).



3. Remove and discard light bulb (4).

INSTALL MIDDLE CONTROL PANEL A1 ENGINE ALARM INDICATOR LIGHT BULB

1. Install new light bulb (4) in engine alarm indicator on middle control panel A1 (3).
2. Install red cap (2) on engine alarm indicator on middle control panel A1 (3).
3. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1
EMERGENCY STOP PUSH BUTTON
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Push Button
(34712)
PN E30289

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 EMERGENCY STOP PUSH BUTTON

WARNING

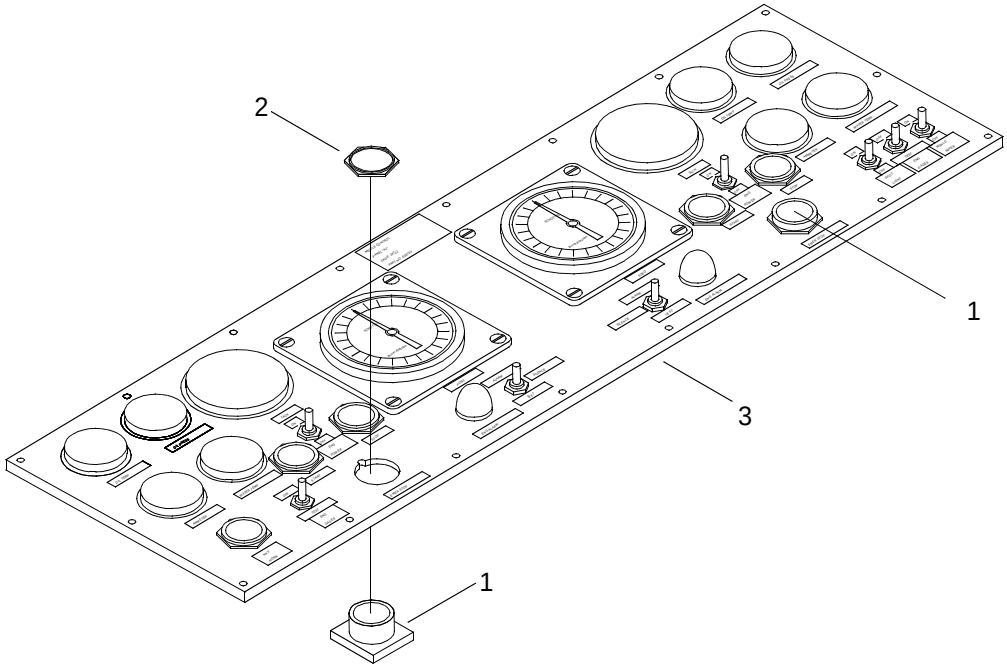


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of emergency stop push buttons.

1. Tag and disconnect the wiring to emergency stop push button S4 or S8 (1).



2. Remove the hex nut (2) (supplied with each push button) from top of middle control panel A1 (3).

3. Remove the push button (1) from beneath the panel (3) and discard push button (1).

INSTALL MIDDLE CONTROL PANEL A1 EMERGENCY STOP PUSH BUTTON

1. Position new push button S4 or S8 (1) from the underside of middle control panel A1 (3).

2. Secure new push button with hex nut (2) on top of panel (3)

3. Connect all wiring to emergency stop push button (1) as previously tagged.

4. Remove tags from electrical wiring.

5. Install middle control panel A1. (WP 0245 00)

6. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 ENGINE
STOP PUSH BUTTON
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Push Button
(34712)
PN E30309

Personnel Required

Engineer 88L

References

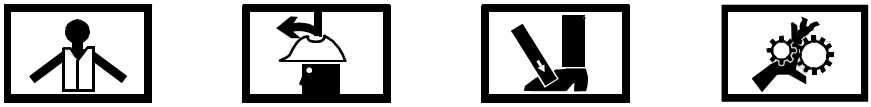
TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

REMOVE MIDDLE CONTROL PANEL A1 ENGINE STOP PUSH BUTTON

WARNING

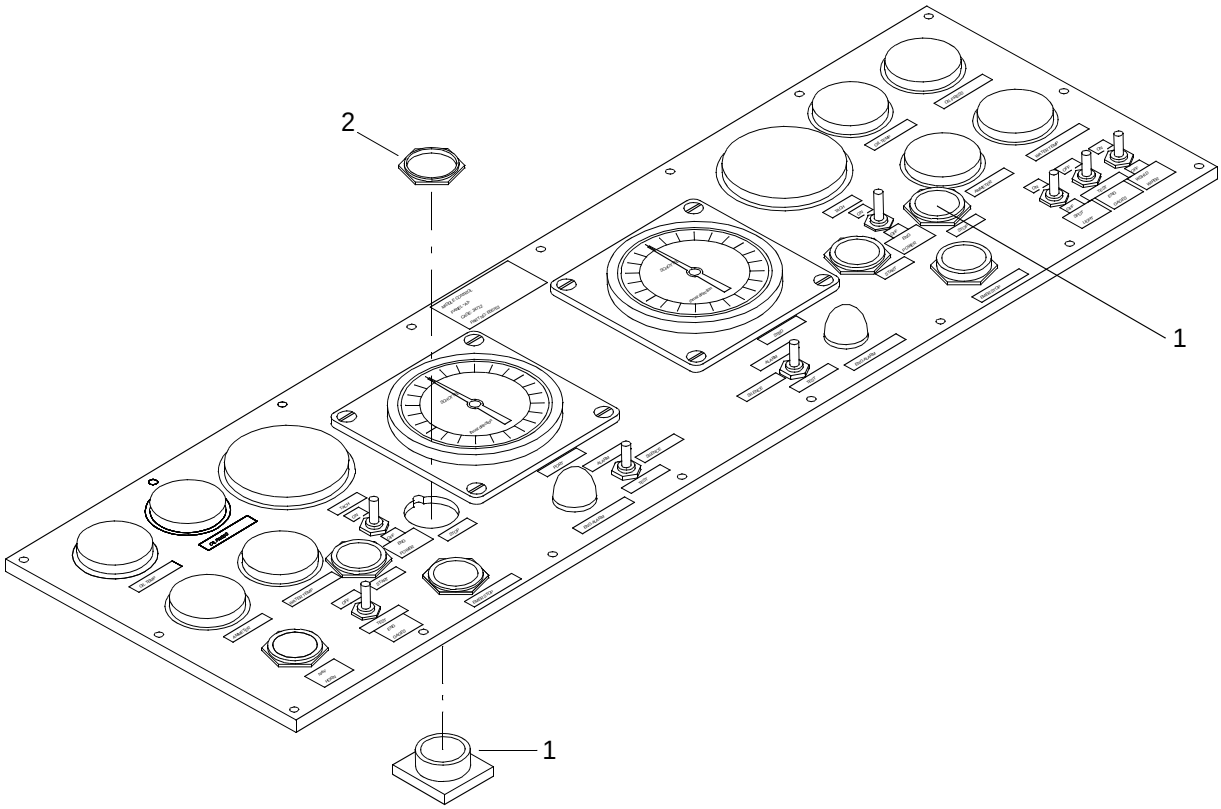


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of engine stop push buttons.

1. Tag and disconnect the wiring to engine stop push button S3 or S9 (1).



2. Remove the hex nut (2) from top of middle control panel A1.

3. Remove the push button (1) from beneath the middle control panel A1 and discard push button (1).

INSTALL MIDDLE CONTROL PANEL A1 ENGINE STOP PUSH BUTTON

1. Position new push button S3 or S9 (1) from the underside of middle control panel A1 and secure with hex nut (2) on top of middle control panel A1.

2. Tighten hex nut (2).

3. Connect all wiring to engine stop push button (1) as previously tagged.

4. Remove tags.

5. Install middle control panel A1. (WP 0245 00)

6. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
MIDDLE CONTROL PANEL A1 NAVIGATION HORN PUSH BUTTON REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Push Button
(34712)
PN E30299

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Middle Control Panel A1 Removed. (WP 0245 00)

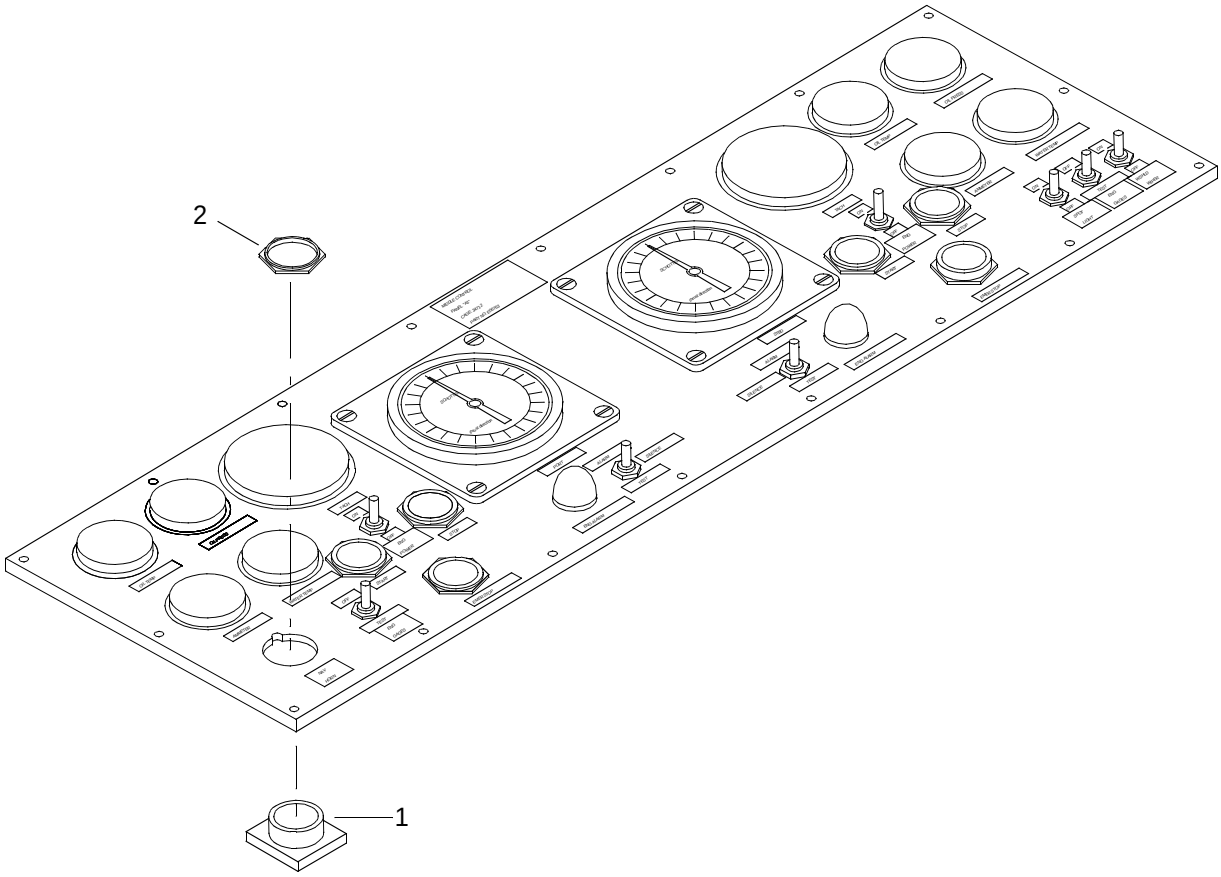
REMOVE MIDDLE CONTROL PANEL A1 NAVIGATION HORN PUSH BUTTON

WARNING



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

1. Tag and disconnect the wiring to navigation horn push button (1).



2. Remove the hex nut (2) from horn push button housing (1) on top of middle control panel A1.

3. Remove the horn push button (1) from beneath the middle control panel A1 and discard horn push button (1).

INSTALL MIDDLE CONTROL PANEL A1 NAVIGATION HORN PUSH BUTTON

1. Position new push button (1) from the underside of middle control panel A1 and secure with hex nut (2) on top of middle control panel A1.

2. Tighten hex nut (2).

3. Connect all wiring to navigation horn push button (1) as previously tagged.

4. Remove tags.

5. Install middle control panel A1. (WP 0245 00)

6. Perform operational check of middle control panel A1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

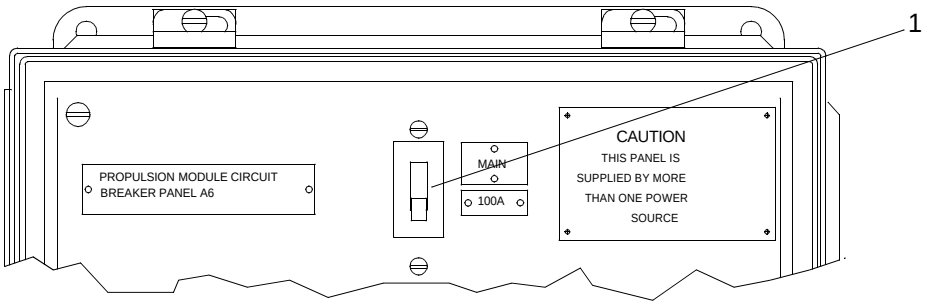
REMOVE LOWER CONTROL PANEL A2

WARNING

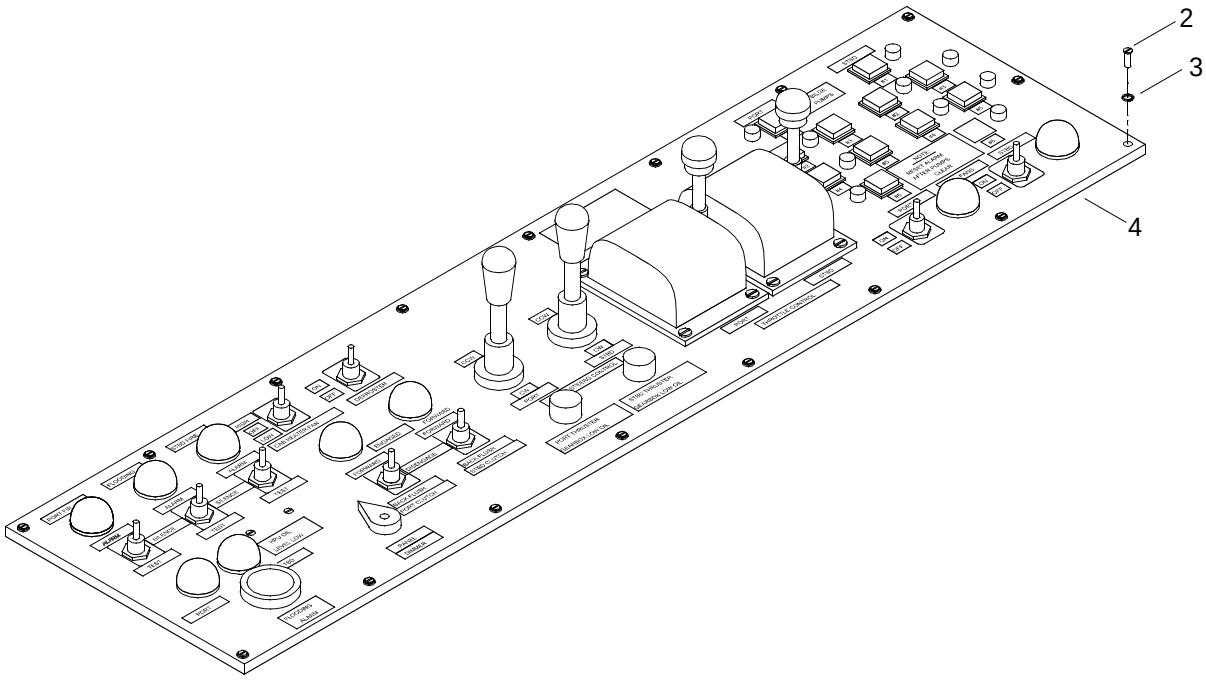


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove seventeen pan head screws (2) and seventeen lock washers (3) securing lower control panel (4).



3. Raise lower control panel sufficient distance to gain access to wiring.

4. Tag and disconnect all wires to all control and indicators on lower control panel (4).

5. Lift out lower control panel (4) while observing that no cables are bent or chafed during removal.

INSTALL LOWER CONTROL PANEL A2

1. Connect all tagged wiring to the lower control panel A2 (4) controls and indicators.

2. Remove tags.

WARNING



CHEMICAL **EYE PROTECTION**

3. Apply antiseize compound to pan head screws (2).

4. Position lower control panel (4) and secure with seventeen lock washers (3) and pan head screws (2).

5. Tighten pan head screws (2).

6. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 THROTTLE CONTROL
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Control, Throttle
(50064)
PN MS - 5

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)

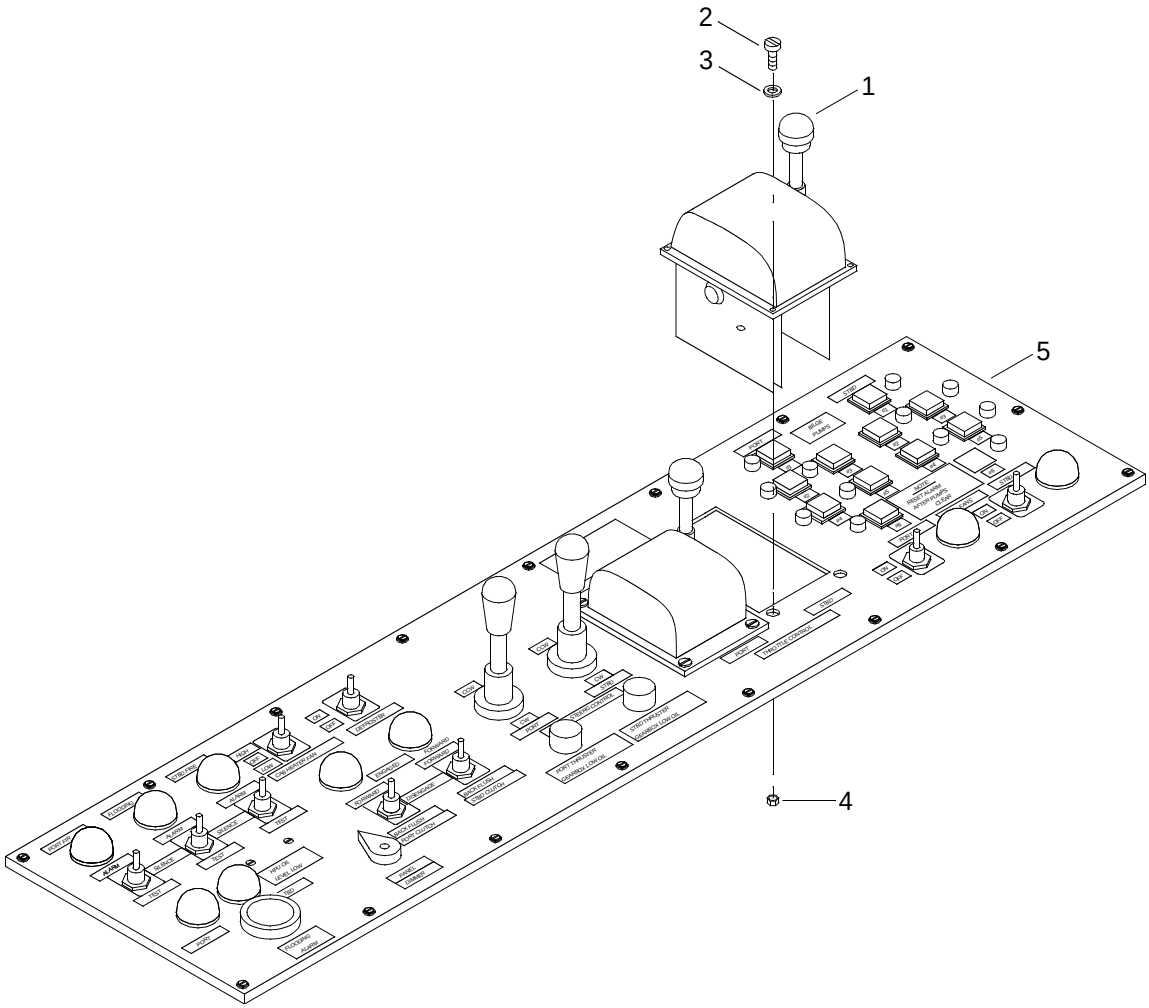
REMOVE LOWER CONTROL PANEL A2 THROTTLE CONTROL

WARNING



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

1. Tag and disconnect electrical wiring to throttle control (1).



2. Remove four pan head screws (2), four flat washers (3) and four hex nuts (4) securing throttle control (1) to lower control panel (5).

3. Remove and discard throttle control (4).

INSTALL LOWER CONTROL PANEL A2 THROTTLE CONTROL

1. Position new throttle control (1) on lower control panel (5).

2. Secure throttle control (1) with four pan head screws (2), four flat washers (3) and four hex nuts (4).

3. Tighten hex nuts (4).

4. Connect electrical wiring to throttle control (4).

5. Remove tags.

6. Install lower control panel A2. (WP 0262 00)

7. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 TOGGLE SWITCH
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Switch
(91929)
PN MS27406-2
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

Engineer 88L

References

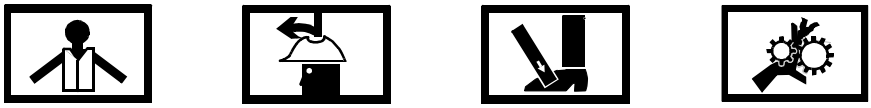
TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)

REMOVE LOWER CONTROL PANEL A2 TOGGLE SWITCH

WARNING

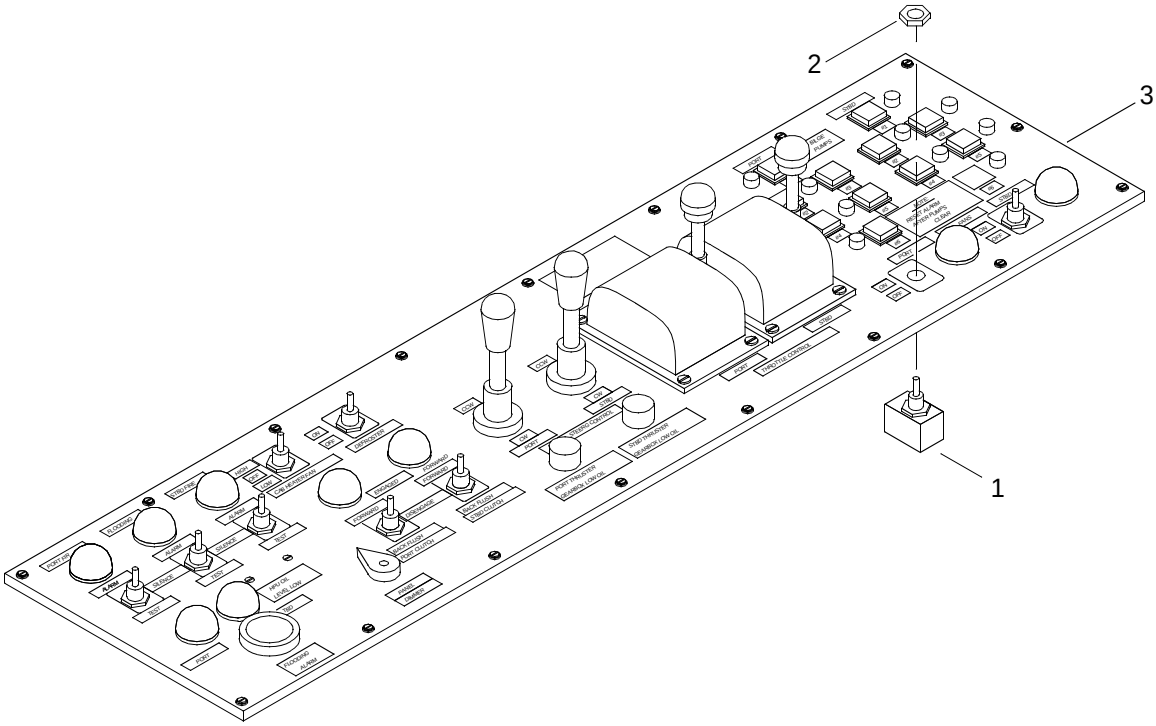


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of lower control panel toggle switches.

1. Tag and disconnect electrical wiring to toggle switch (1).



2. Remove hex nut (2) from the top side of the lower control panel (3).

3. Remove the toggle switch (1) from the bottom side of the lower control panel (3) and discard toggle switch (1).

INSTALL LOWER CONTROL PANEL TOGGLE SWITCH

1. Position new toggle switch (1) through the bottom side of the lower control panel (3)

2. Secure with nut (2) from the top side of the lower control panel (3).

3. Connect electrical wiring, as tagged, to toggle switch (1).

4. Remove tags.

5. Secure electrical wiring with tiedown straps.

6. Install lower control panel A2. (WP 0262 00)

7. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 STEERING
CONTROL JOYSTICK LEVER
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Control, Steering (Joystick)
(01121)
PN 800T-T2F3JJAA

Personnel Required

Engineer 88L

References

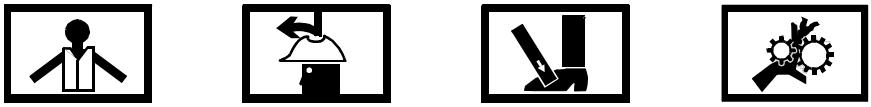
TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)

REMOVE LOWER CONTROL PANEL A2 STEERING CONTROL JOYSTICK LEVER

WARNING

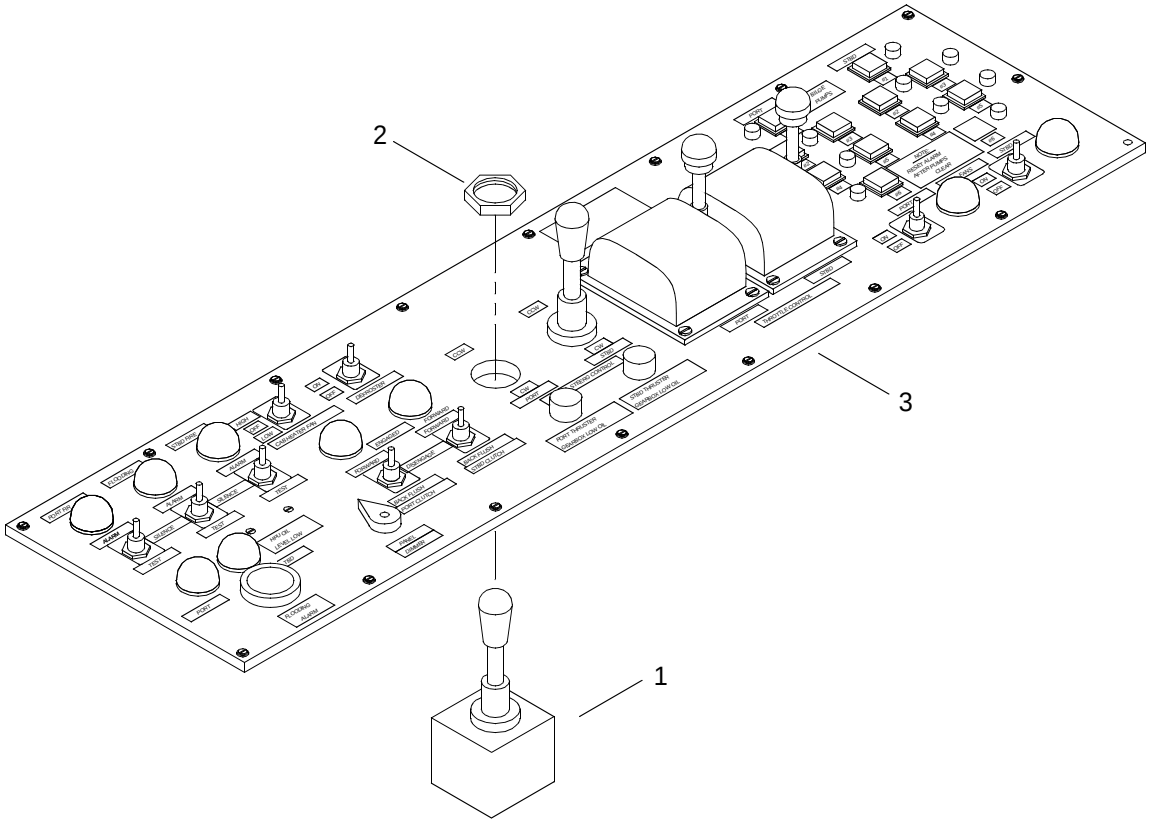


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of lower control panel joysticks.

1. Tag and disconnect electrical wiring to joystick (1).



2. Remove jam nut (2) from the top side of the lower control panel (3).

3. Remove the joystick (1) from the bottom side of the lower control panel (3) and discard.

INSTALL LOWER CONTROL PANEL A2 STEERING CONTROL JOYSTICK LEVER

1. Position new joystick (1) through the bottom side of the lower control panel (3)

2. Secure joystick (1) with jam nut (2) from the top side of the lower control panel (3).

3. Tighten nut (2).

4. Connect electrical wiring, as tagged, to joystick (1).

5. Remove tags.

6. Install lower control panel A2. (WP 0262 00)

7. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 DIMMER SWITCH REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Dimmer Assembly
(34712)
PN E09408

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)

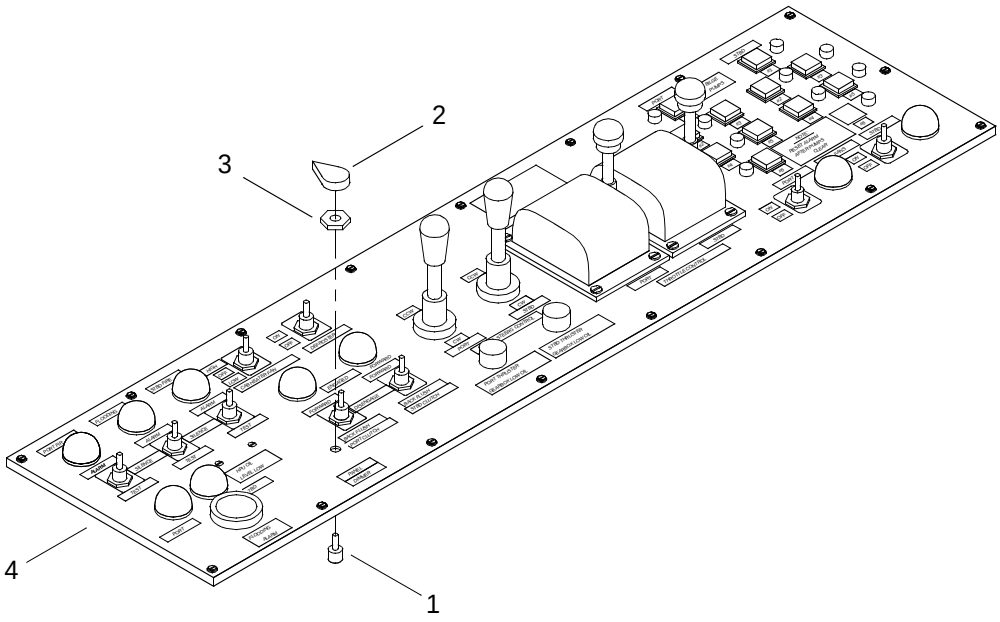
REMOVE LOWER CONTROL PANEL A2 DIMMER SWITCH

WARNING



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

1. Tag and disconnect electrical wiring to dimmer switch (1).



2. Remove the control knob (2) from dimmer switch (1) post.
3. Remove the hex nut (3) from the top of the dimmer switch (1).
4. Pull the dimmer switch (1) through the under side of the lower control panel (4).
5. Discard dimmer switch (1).

INSTALL LOWER CONTROL PANEL A2 DIMMER SWITCH

1. Position dimmer switch (1) on under side of lower control panel (4).
2. Secure dimmer switch (1) to the lower control panel (4) with hex nut (3).
3. Tighten hex nut (3).
4. Position control knob (2) on dimmer switch (1) and press onto dimmer switch (1) post.
5. Connect electrical wiring to dimmer switch (1) and remove tags.
6. Install lower control panel A2. (WP 0262 00)
7. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 INDICATOR
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Base, Indicator
(96312)
PN 103-3101-05-103

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)

REMOVE LOWER CONTROL PANEL A2 INDICATOR

WARNING

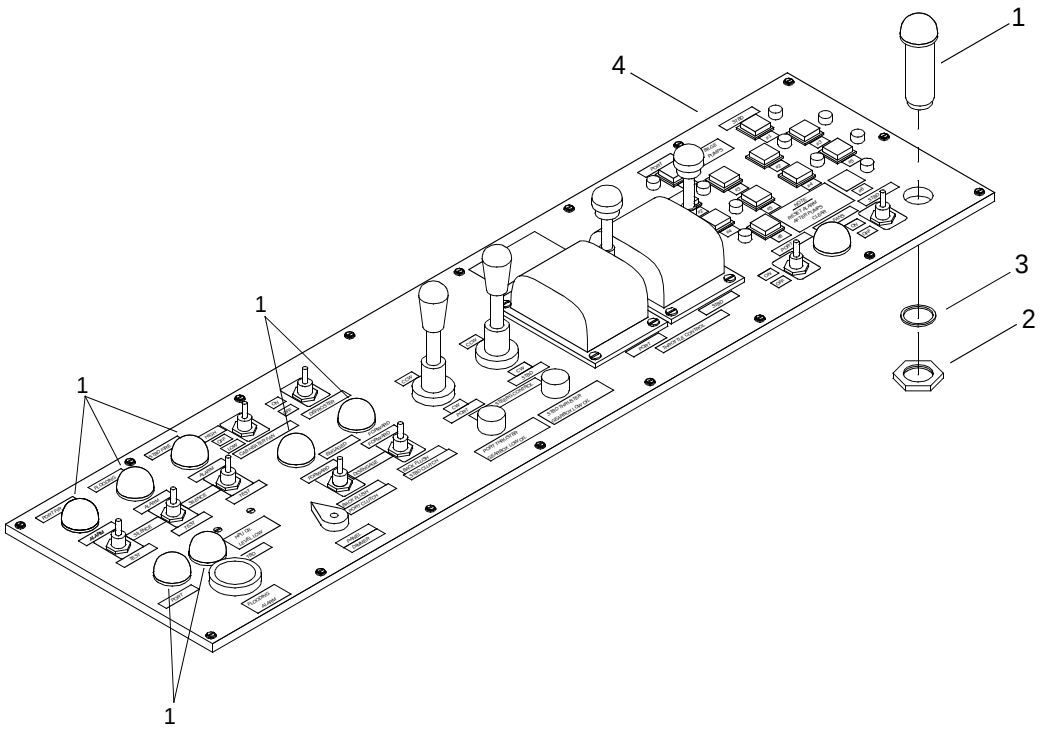


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of lower control panel A2 indicators.

1. Tag and disconnect electrical wiring to indicator (1).



2. Remove hex nut (2) and washer (3) from the underside of the lower control panel (4).
3. Remove indicator (1) from lower control panel (4) and discard.

INSTALL LOWER CONTROL PANEL A2 INDICATOR

1. Position new indicator (1) on the top side of the lower control panel (4).
2. Secure with washer (3) and hex nut (2) from the underside of the lower control panel (4).
3. Tighten hex nut (2).
4. Connect electrical wiring, as tagged, to indicator (1).
5. Remove tags.
6. Install lower control panel A2. (WP 0262 00)
7. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 INDICATOR LIGHT BULB REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Indicator Light Bulb
(96312)
PN 6S6 - 24V

Personnel Required

Engineer 88L

References

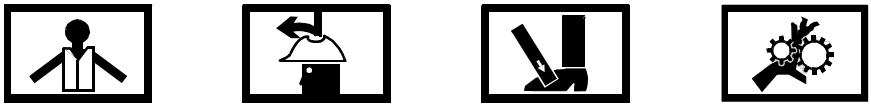
TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)
Lower Control Panel A2 Indicator Removed. (WP 0267 00)

REMOVE LOWER CONTROL PANEL A2 INDICATOR LIGHT BULB

WARNING

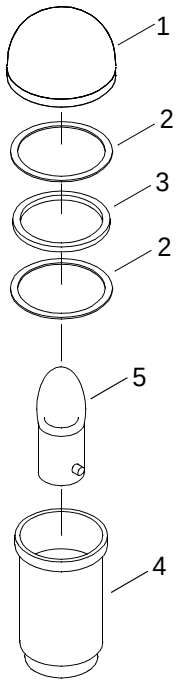


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for the removal and installation of lower control panel A2 indicator light bulbs.

1. Remove colored cap (1), seals (2) and washer (3) from the indicator base (4).



2. Remove light bulb (5) from the indicator base (4) by rotating ¼ of a turn and discard light bulb (5).

INSTALL LOWER CONTROL PANEL A2 INDICATOR LIGHT BULB

1. Position new light bulb (5) in the indicator base (4).
2. Secure light bulb (5) by rotating ¼ of a turn.
3. Secure colored cap (1) with washer (3) and seals (2).
4. Install lower control panel A2 indicator. (WP 0267 00)
5. Install lower control panel A2. (WP 0262 00)
6. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 SONALERT BEEPER INDICATOR REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Beeper, Sonalert
(02828)
PN SC268AJ

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)

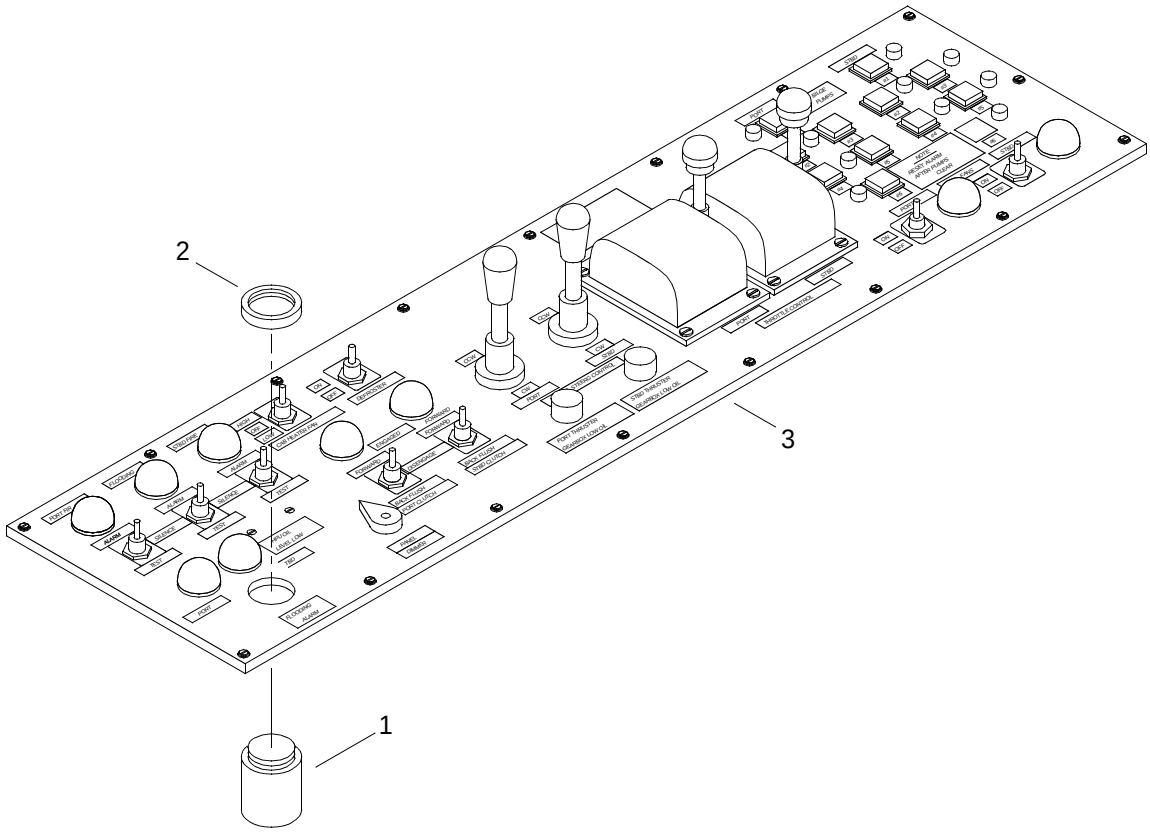
REMOVE LOWER CONTROL PANEL A2 SONALERT BEEPER INDICATOR

WARNING



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

1. Tag and disconnect electrical wiring to sonalert beeper (1).



2. Remove knurled nut (2) from the top side of the lower control panel (3).

3. Pull the sonalert beeper (1) through the bottom side of the lower control panel (3) and discard sonalert beeper (1).

INSTALL LOWER CONTROL PANEL A2 SONALERT BEEPER INDICATOR

1. Install new sonalert beeper (1) through the bottom side of the lower control panel (3).

2. Secure with knurled nut (2) from the top side of the lower control panel (3).

3. Tighten knurled nut (2)

4. Connect wires, as tagged, to the sonalert beeper (1).

5. Remove tags.

6. Install lower control panel A2. (WP 0262 00)

7. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 BILGE PUMP SYSTEM
INDICATOR LIGHT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Light, Indicator
(96312)
PN 162-8430-0931502

Personnel Required

Engineer 88L

References

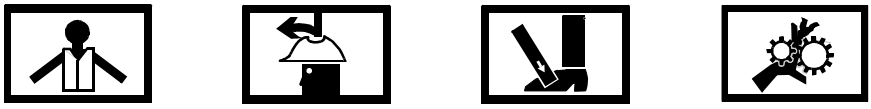
TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)

REMOVE LOWER CONTROL PANEL A2 BILGE PUMP SYSTEM INDICATOR LIGHT

WARNING



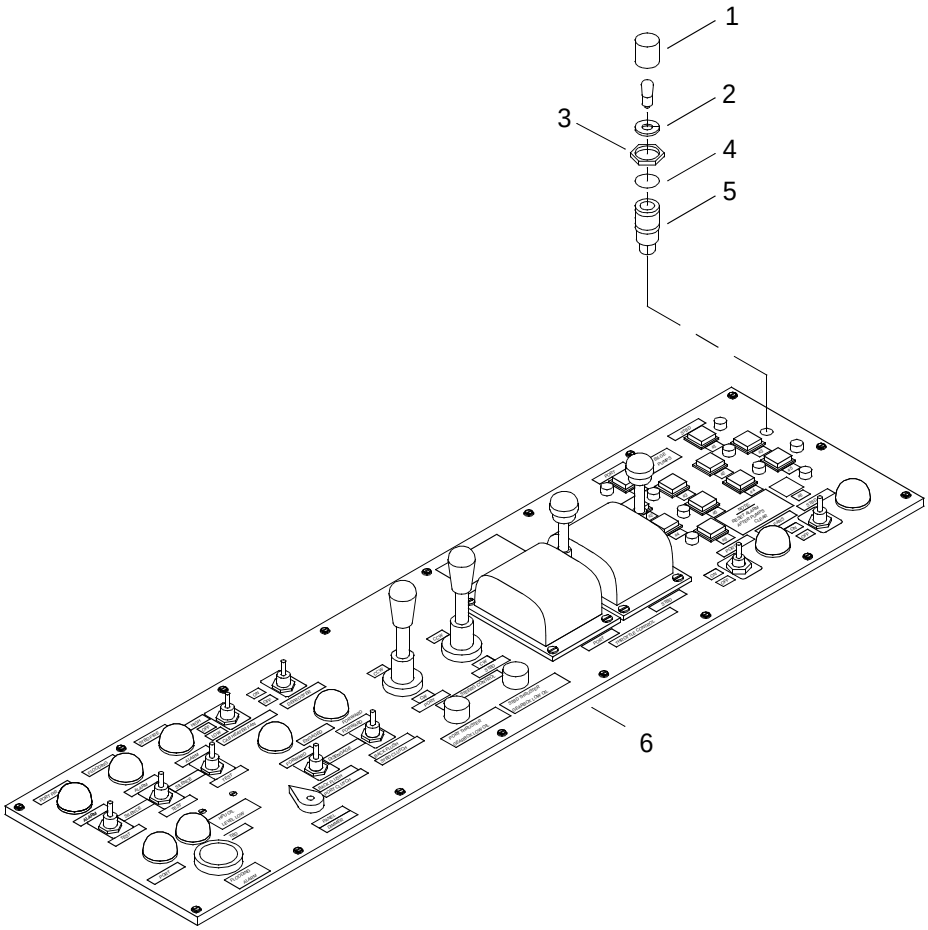
All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

The following procedure is typical for removal and installation of the lower control panel bilge pump system indicator lights.

1. Tag and disconnect electrical wiring to bilge system indicator lights.

2. Unscrew lens cap (1) to remove.



3. Remove lock washer (2), hex nut (3) and bushing (4).

4. Remove light base (5) from back side of panel (6) and discard light base (5).

INSTALL LOWER CONTROL PANEL A2 BILGE PUMP SYSTEM INDICATOR LIGHT

1. Position new light base (5) from back side of lower panel (6) through appropriate hole in panel.

2. Secure with bushing (4), hex nut (3) and lock washer (2).

3. Tighten hex nut (3).

4. Screw on lens cap (1).

5. Connect electrical wiring, as tagged, to indicator lights.

6. Remove tags.

7. Install lower control panel A2. (WP 0262 00)

8. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
LOWER CONTROL PANEL A2 BILGE PUMP SYSTEM INDICATOR LIGHT BULB REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Indicator Light Bulb
(96312)
PN 1820-T3-¼

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Lower Control Panel A2 Removed. (WP 0262 00)
Bilge Pump Indicator Light Removed. (WP 0270 00)

REMOVE LOWER CONTROL PANEL A2 BILGE PUMP SYSTEM INDICATOR LIGHT BULB

WARNING

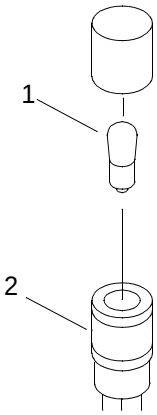


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NOTE

The following procedure is typical for removal and installation of the lower control panel A2 bilge pump system indicator light bulbs.

1. Unscrew light bulb (1) ¼ turn.



2. Remove light bulb (1) from indicator base (2) and discard light bulb (1).

INSTALL LOWER CONTROL PANEL A2 BILGE PUMP SYSTEM INDICATOR LIGHT BULB

1. Position new light bulb (1) in indicator light base (2).
2. Secure light bulb (1) by turning ¼ turn.
3. Install bilge pump indicator light. (WP 0270 00)
4. Install lower control panel A2. (WP 0262 00)
5. Perform operational check of lower control panel A2. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CIRCUIT BREAKER PANEL A3
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

References

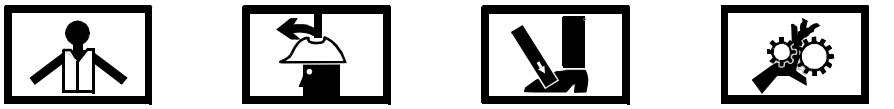
TM 55-1945-205-10-1

Equipment Condition

Operators Cab Access Panel Removed. (WP 0237 00)

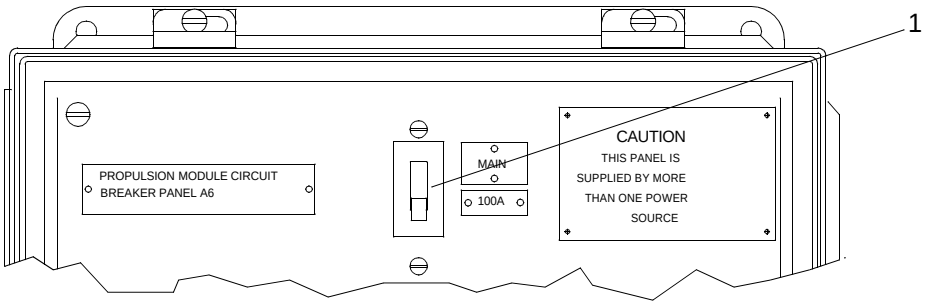
REMOVE OPERATORS CAB CIRCUIT BREAKER PANEL A3

WARNING

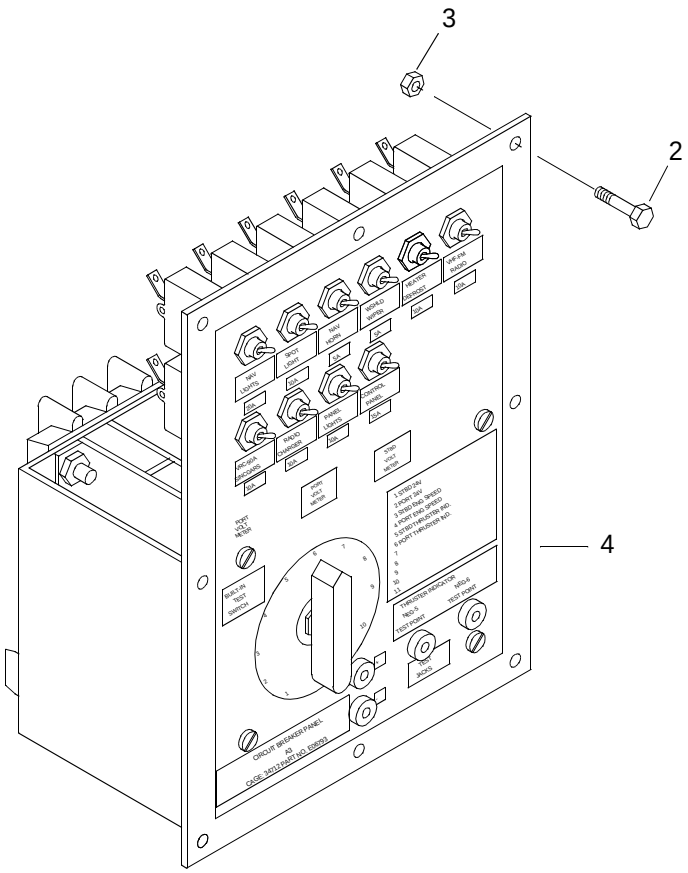


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove eight pan head screws (2) and hex nuts (3) from circuit breaker panel A3 (4).



3. Disconnect and tag electrical wiring attached to circuit breaker panel A3 (4).

4. Remove operators cab circuit breaker panel A3 (4).

INSTALL OPERATORS CAB CIRCUIT BREAKER PANEL A3

WARNING



CHEMICAL **EYE PROTECTION**

1. Apply antiseize compound to pan head screws (2).

2. Connect electrical wiring and remove tags.

3. Position circuit breaker panel A3 (4) on front of operators console.

4. Install eight pan head screws (2) and hex nuts (3) to secure circuit breaker panel A3 (4).

5. Tighten screws (2).

6. Install operators cab access panel. (WP 0237 00)

7. Perform operational check of operators cab circuit breaker panel A3. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CIRCUIT BREAKER PANEL A3 ROTARY SWITCH REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Switch, Rotary
(81073)
PN 19001-11UL
Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

References

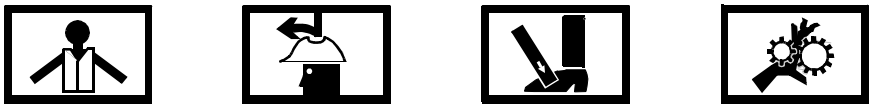
TM 55-1945-205-10-1

Equipment Condition

Operators Cab Access Panel Removed. (WP 0237 00)
Operators Cab Circuit Breaker Panel A3 Removed. (WP 0272 00)

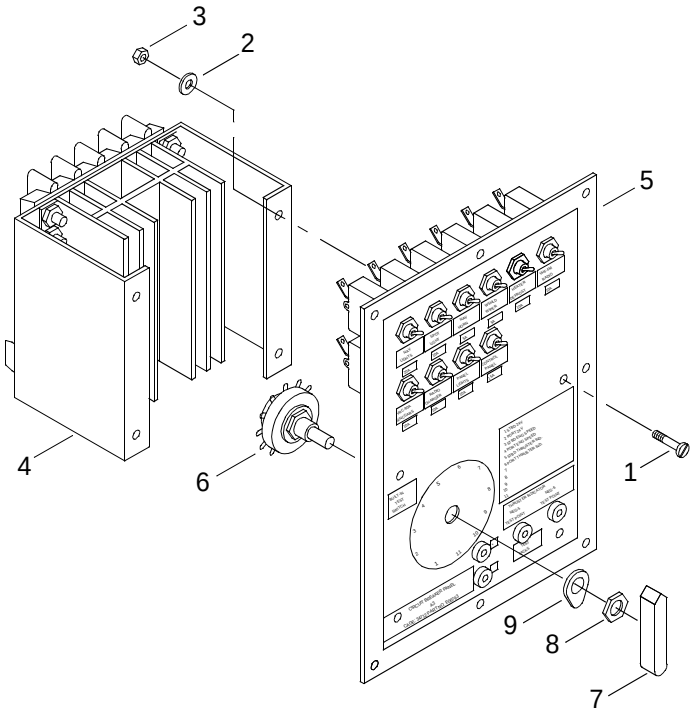
REMOVE OPERATORS CAB CIRCUIT BREAKER PANEL A3 ROTARY SWITCH

WARNING



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1. Remove four pan head screws (1), lock washers (2) and hex nuts (3).



2. Remove heat sink/bracket assembly (4) from the front panel (5).
3. Tag and disconnect the electrical wiring to rotary switch (6).
4. Remove the rotary switch indicator bar (7) from the shaft of the rotary switch (6).
5. Remove the body of the rotary switch (6) by removing hex nut (8) and washer (9) from the front side of the panel (5).
6. Discard rotary switch (6).

INSTALL OPERATORS CAB CIRCUIT BREAKER PANEL A3 ROTARY SWITCH

WARNING



CHEMICAL **EYE PROTECTION**

1. Apply antiseize compound to threads on pan head screws (1) and hex nut (8).
2. Position the new rotary switch (6) in panel and replace hex nut (8) and washer (9).
3. Tighten hex nut (8).
4. Connect the wiring as tagged.
5. Remove tags.

6. Position the heat sink/bracket assembly (4) on the back of the panel (5) and secure with four pan head screws (1), lock washers (2) and hex nuts (3).

7. Tighten hex nuts (3)

8. Install operators cab circuit breaker panel A3. (WP 0272 00)

9. Install operators cab access panel. (WP 0237 00)

10. Perform operational check of operators cab circuit breaker panel A3. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CIRCUIT BREAKER PANEL A3
TESTING

INITIAL SETUP:

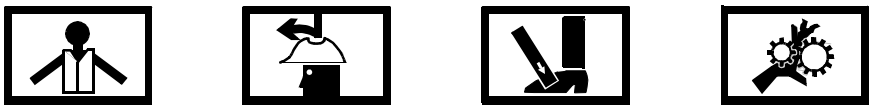
Test Equipment
Multimeter (Item 23, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Personnel Required
Engineer 88L

TEST CIRCUITS ON OPERATORS CAB CIRCUIT BREAKER PANEL A3

WARNING

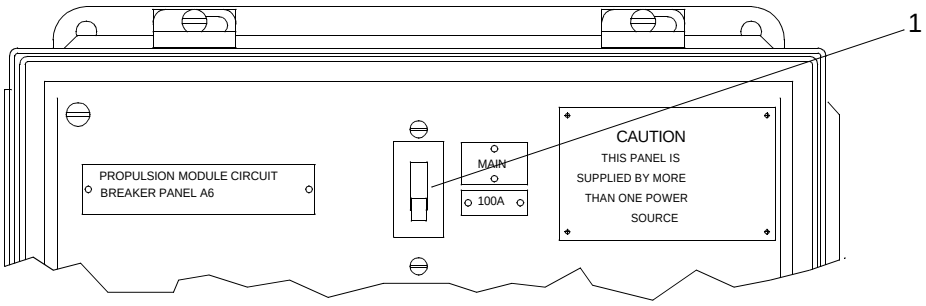


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

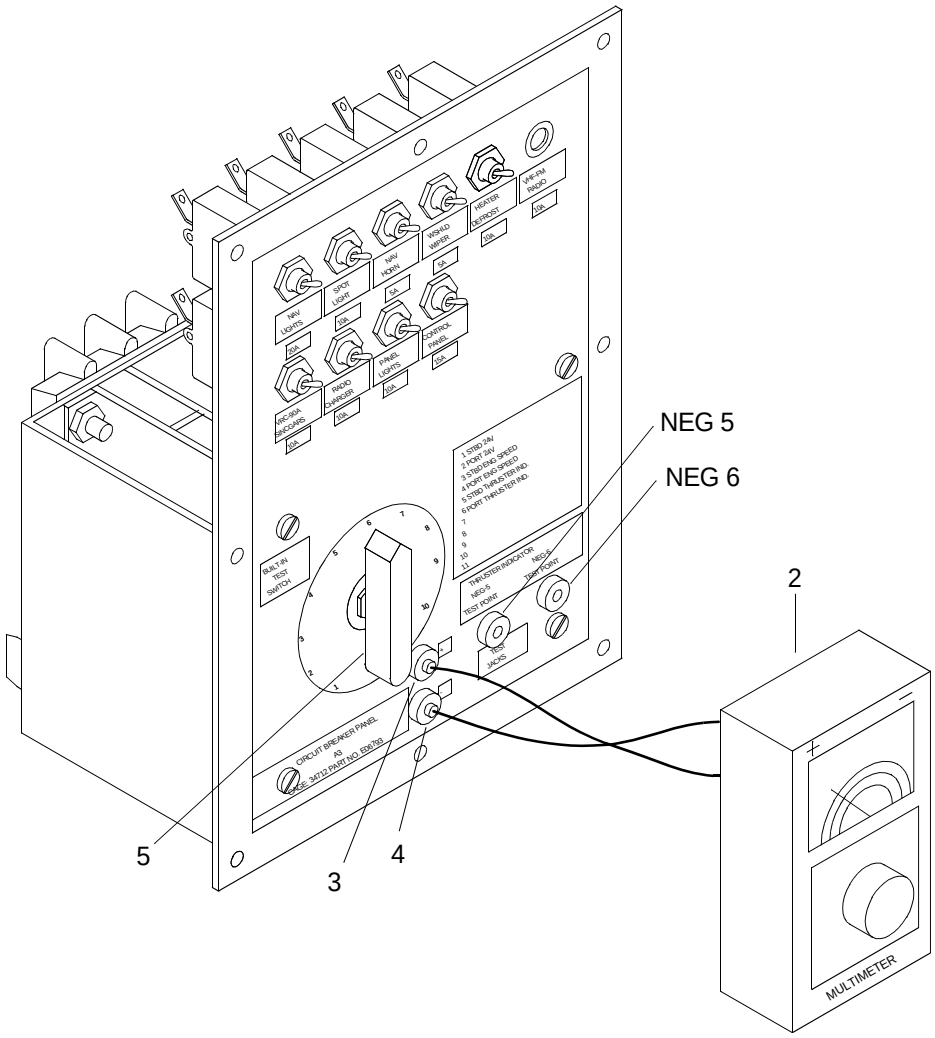
NOTE

The following test indicates only that power exists to the various units described.

1. Position MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to on.



2. Insert positive (+) or negative (-) leads of the multimeter tester (2) into positive test jack (3) and negative test jack (4), respectively, making sure that the polarity of the leads matches the test jacks.



3. If measurement of voltage to the thrust indicators is desired, insert the negative (-) multimeter (2) lead into either NEG 5 or NEG 6 jack, depending upon which is to be tested.

4. Turn the BUILT IN TEST switch (5) to select circuit to be tested. Use label on front right side of panel as a guide.

5. Select appropriate scale on the multimeter (2) to read approximately 24 VDC.

6. If reading on multimeter (2) is not approximately 24 VDC, proceed to applicable troubleshooting work package.

7. Remove multimeter (2) leads when testing is completed.

8. Position MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to off.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB CIRCUIT BREAKER PANEL A3 CIRCUIT BREAKERS
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Breaker, Circuit
(77342)
PN W31X2M1G-05
Breaker, Circuit
(77342)
PN W31X2M1G-10
Breaker, Circuit
(77342)
PN W31X2M1G-15
Breaker, Circuit
(77342)
PN W31X2M1G-20

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Operators Cab Access Panel Removed. (WP 0237 00)
Operators Cab Circuit Breaker Panel A3 Removed. (WP 0272 00)

REMOVE OPERATORS CAB CIRCUIT BREAKER PANEL A3 CIRCUIT BREAKERS

WARNING



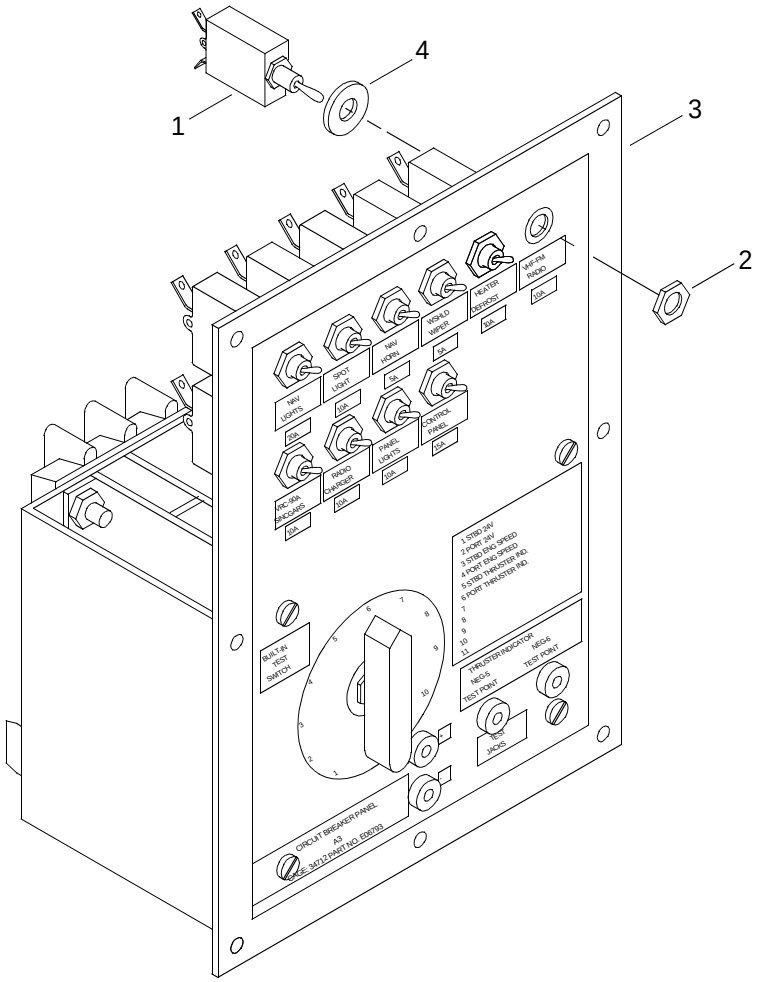
VEST HELMET PROTECTION HEAVY PARTS MOVING PARTS

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

NOTE

The following procedure is typical for the removal and installation of operators cab circuit breaker panel A3 circuit breakers.

1. Tag and disconnect the wiring from the circuit breaker (1) to be changed.
2. Remove hex nut (2) holding the circuit breaker (1) in the panel (3).



3. Remove circuit breaker (1) and washer (4) from panel (3) and discard circuit breaker (1).

INSTALL OPERATORS CAB CIRCUIT BREAKER PANEL A3 CIRCUIT BREAKERS

1. Position new circuit breaker (1) and washer (4) in panel (3).
2. Secure circuit breaker (1) in panel (3) with hex nut (2).
3. Tighten hex nut (2).
4. Connect electrical wiring as tagged.
5. Remove tags.
6. Install operators cab circuit breaker panel A3. (WP 0237 00)
7. Install operators cab access panel removed. (WP 0237 00)
8. Perform operational check of operators cab circuit breaker panel A3. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
TERMINAL STRIP A4
REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 12, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

Engineer 88L

Equipment Condition

Operators Cab Access Panel Removed. (WP 0237 00)

REPAIR TERMINAL STRIP A4

WARNING

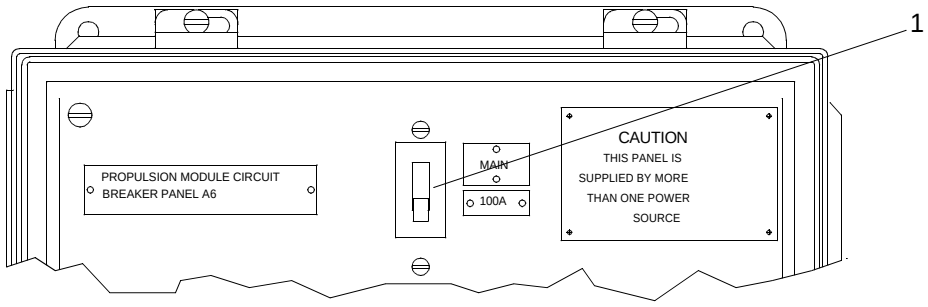


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

NOTE

Repair is limited to the replacement of damaged components.

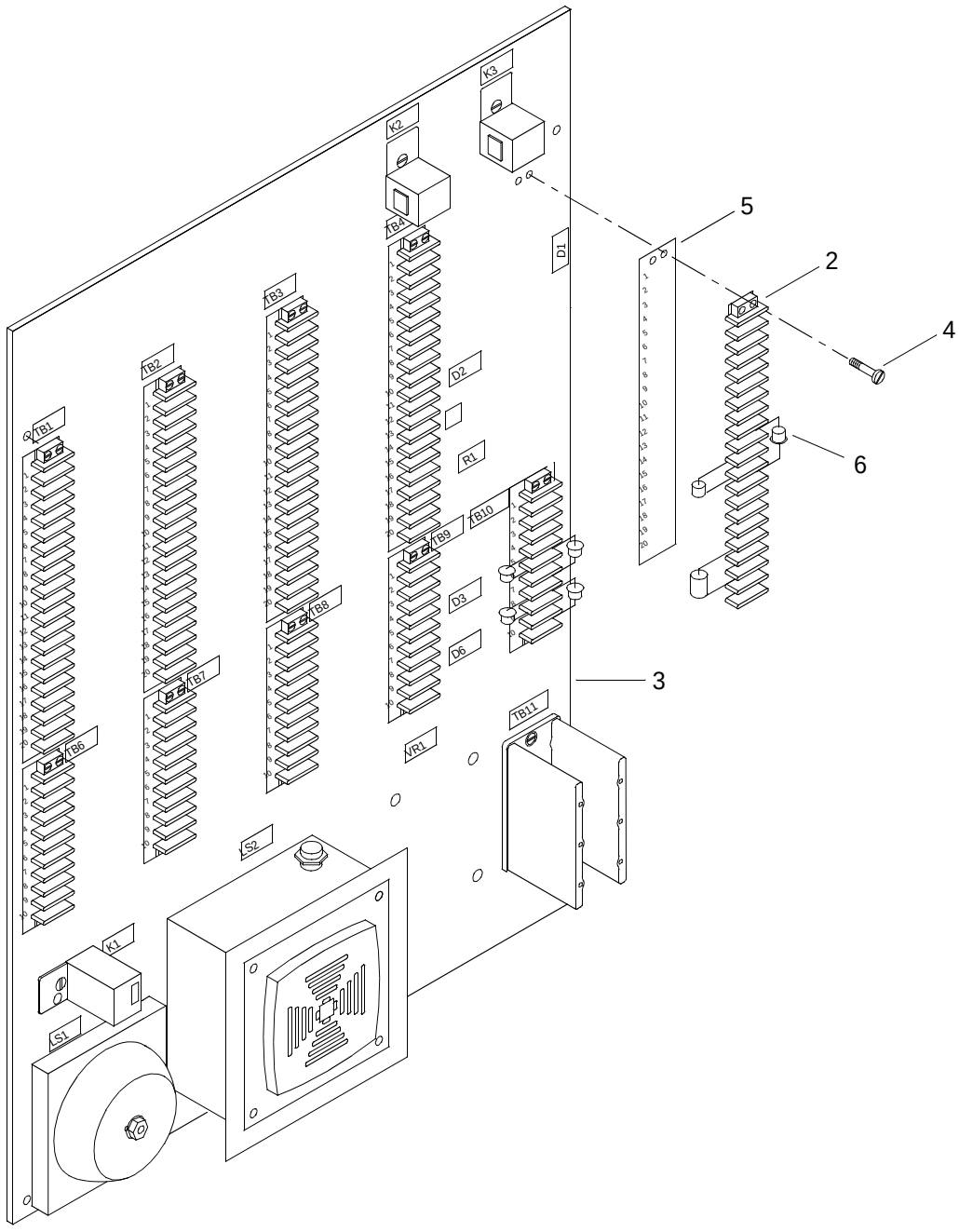
1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



NOTE

The following steps are typical for the removal of all terminal blocks on the terminal strip assembly A4.

2. Remove terminal block (2) from terminal strip assembly A4 (3).



a. Tag and disconnect wiring from terminal strip assembly A4 (3) to terminal block (2).

b. Cut tiedown straps as required.

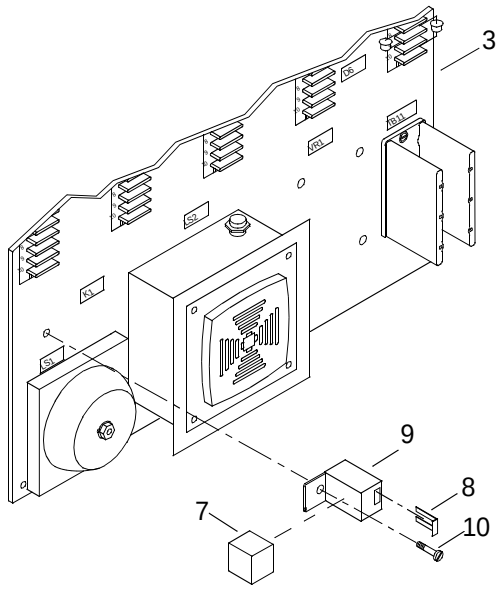
c. Remove four pan head screws (4).

d. Remove terminal block (2), marker strip (5) and attached diodes (6) from terminal strip assembly A4 (3).

NOTE

The following steps are typical for the removal of all engine relays on the terminal strip assembly A4.

3. Remove engine relay (7) from terminal strip assembly A4 (3).



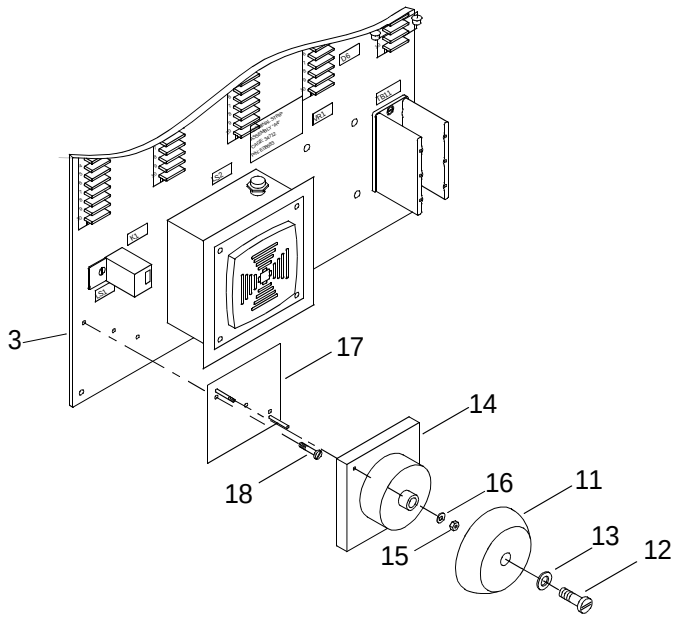
   a. Unlatch relay retainer (8).

   b. Remove engine relay (7) from relay socket (9).

   c. Remove round head screw (10).

   d. Remove relay socket (9) from terminal strip assembly A4 (3).

4. Remove engine malfunction alarm bell (11) from terminal strip assembly A4 (3).



a. Remove cap screw (12) and washer (13) from alarm bell (11).

b. Remove alarm bell (11) to expose bell solenoid (14).

c. Tag and disconnect wiring from terminal strip assembly (3) to bell solenoid (14).

d. Cut tiedown straps as required.

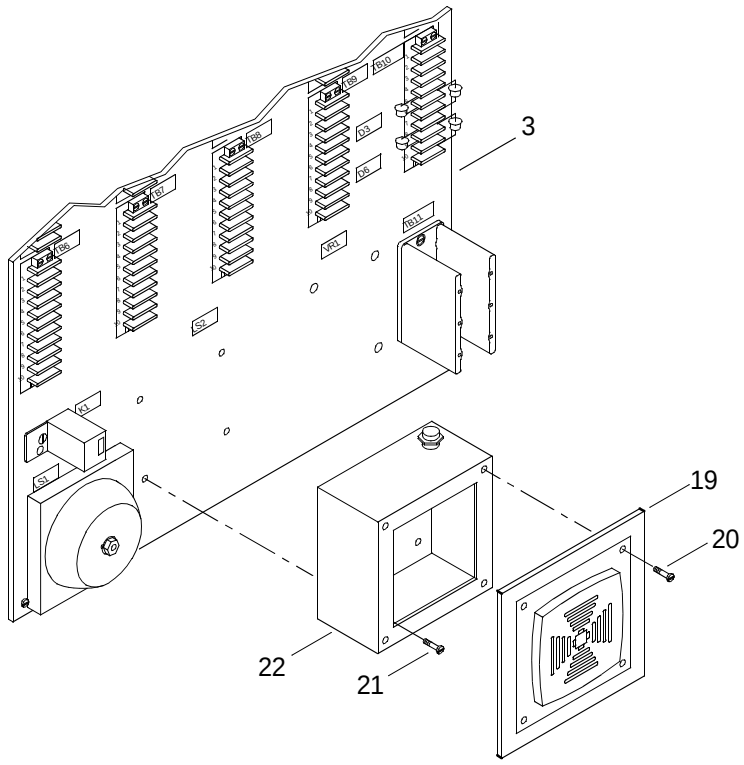
e. Remove nut (15) and washer (16).

f. Remove solenoid (14) from base (17).

g. Remove three round head screws (18).

h. Remove base (17) from terminal strip assembly A4 (3).

5. Remove alarm horn (19) from terminal strip assembly A4 (3).



a. Remove four round head screws (20).

b. Tag and disconnect wiring from terminal strip assembly A4 (3) to alarm horn (19).

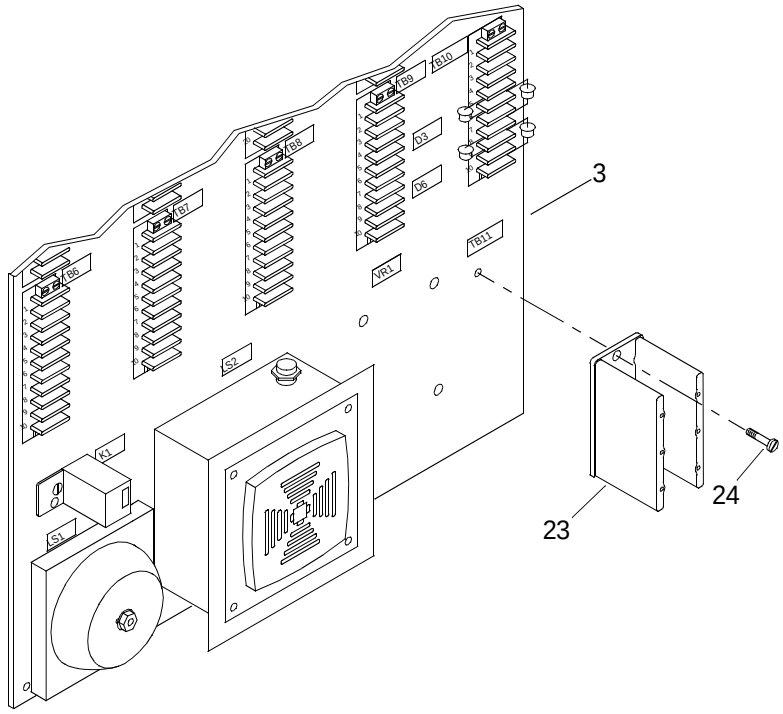
c. Cut tiedown straps as required.

d. Remove alarm horn (19).

e. Remove four round head screws (21) from junction box (22).

f. Remove junction box (22) from terminal strip assembly A4 (3).

6. Remove power distribution block (23) from terminal strip assembly A4 (3).



a. Tag and disconnect wiring from terminal strip assembly A4 (3) to power distribution block (23).

b. Cut tiedown straps as required.

c. Remove two pan head screws (24).

d. Remove power distribution block (23) from terminal strip assembly A4 (3).

7. Install power distribution block (23) on terminal strip assembly A4 (3).

WARNING



CHEMICAL **EYE PROTECTION**

a. Apply adhesive to threads on two pan head screws (24).

b. Position power distribution block (23) against terminal strip assembly A4 (3).

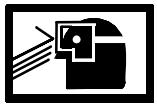
c. Install two pan head screws (24).

d. Tighten two pan head screws (24).

e. Connect wiring to terminal block (3) and remove tags. Use tiedown straps to secure loose wiring.

8. Install alarm horn (19) on terminal strip assembly A4 (3).

WARNING

CHEMICAL EYE PROTECTION

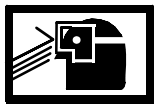
a. Apply adhesive to threads on two round head screws (21).

b. Position junction box (22) against terminal strip assembly A4 (3).

c. Install four round head screws (21) through junction box (22).

d. Tighten two round head screws (21).

WARNING

CHEMICAL EYE PROTECTION

e. Apply adhesive to threads on four round head screws (20).

f. Position alarm horn (19) against junction box (22).

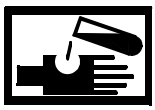
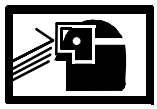
g. Install four round head screws (20).

h. Tighten four round head screws (20).

i. Connect wiring to terminal block (3) and remove tags. Use tiedown straps to secure loose wiring.

9. Install engine malfunction alarm bell (11) on terminal strip assembly A4 (3).

WARNING

CHEMICAL EYE PROTECTION

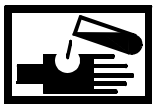
a. Apply adhesive to threads on three round head screws (18).

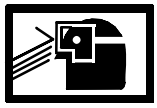
b. Position base (17) against terminal strip assembly A4 (3).

c. Install three round head screws (18).

d. Tighten three round head screws (18).

WARNING


CHEMICAL


EYE PROTECTION

e. Apply adhesive to threads inside nut (15).

f. Position solenoid (14) against base (17).

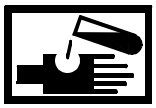
g. Install washer (16) and nut (15).

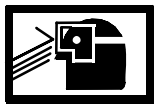
h. Tighten nut (15).

i. Connect wiring to terminal block (3) and remove tags. Use tiedown straps to secure loose wiring.

j. Position alarm bell (11) over solenoid (14).

WARNING


CHEMICAL


EYE PROTECTION

k. Apply adhesive to threads on cap screw (12).

l. Install washer (13) and cap screw (12).

m. Tighten cap screw (12).

NOTE

The following steps are typical for the installation of all engine relays on the terminal strip assembly A4.

10. Install engine relay (7) on terminal strip assembly A4 (3).

WARNING


CHEMICAL


EYE PROTECTION

a. Apply adhesive to threads on round head screw (10).

b. Position relay socket (9) against terminal strip assembly A4 (3).

c. Install round head screw (10).

d. Tighten round head screw (10).

e. Install engine relay (7) into relay socket (9).

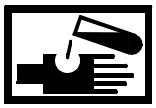
f. Latch relay retainer (8).

NOTE

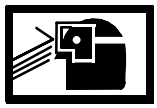
The following steps are typical for the installation of all terminal strips on the terminal strip assembly A4.

11. Install terminal block (2) on terminal strip assembly A4 (3).

WARNING



CHEMICAL



EYE PROTECTION

a. Apply adhesive to threads on four pan head screws (4).

b. Position diode (6), marker strip (5) and terminal block (2) against terminal strip assembly A4 (3).

c. Install four pan head screws (4).

d. Tighten four pan head screws (4).

e. Connect wiring to terminal block (3) and remove tags. Use tiedown straps to secure loose wiring.

12. Install operators cab access panel. (WP 0237 00)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
TERMINAL STRIP A4
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Adhesive (Item 1, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Operators Cab Access Panel Removed. (WP 0237 00)

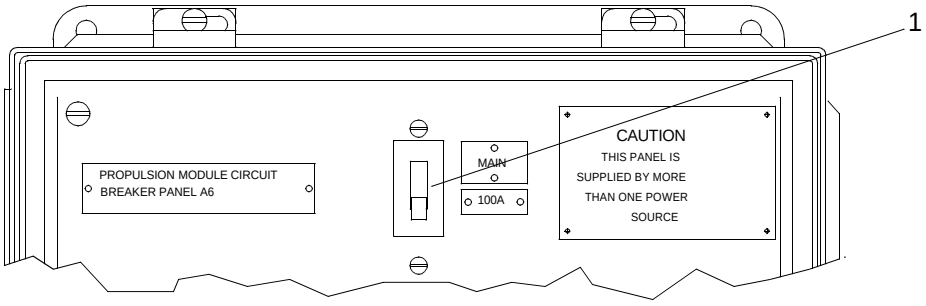
REMOVE TERMINAL STRIP A4

WARNING

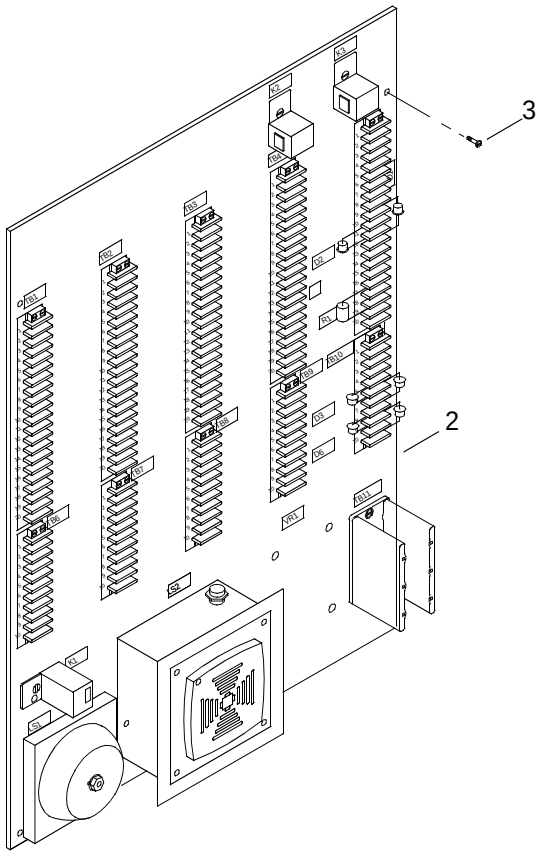


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1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. On terminal strip assembly A4 (2), tag and disconnect all wiring.



3. Remove four pan head screws (3) from terminal strip assembly A4 (2).

4. Remove terminal strip assembly A4 (2).

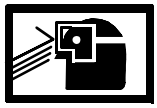
INSTALL TERMINAL STRIP A4

1. Position terminal strip assembly (2) on bulkhead.

WARNING



CHEMICAL



EYE PROTECTION

2. Apply adhesive to four pan head screws (2).

3. Install four pan head screws (3) through terminal strip assembly A4 (2) and into bulkhead.

4. Connect all wiring to terminal strip assembly A4 (2) and remove tags.

5. Install operators cab access panel. (WP 0237 00)

6. Perform operational check of terminal strip A4. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
SPOTLIGHT
CLEANING AND ADJUSTMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 47, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)

Materials/Parts

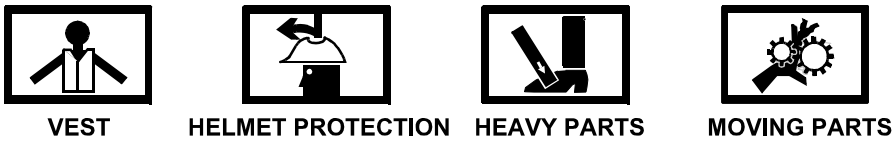
Cleaner (Item 5, WP 0382 00)
Cloth, Cleaning (Item 6, WP 0382 00)

Personnel Required

Seaman 88K

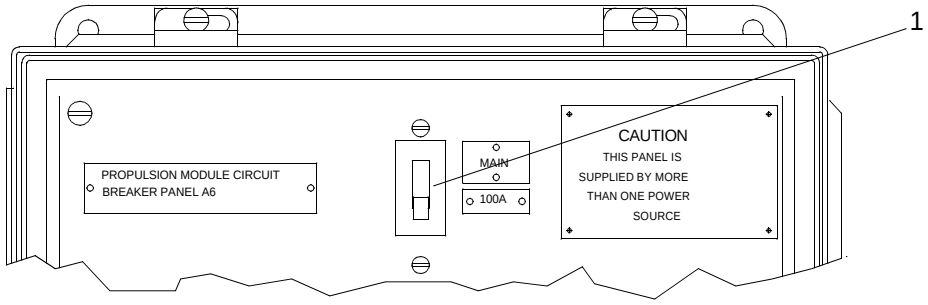
CLEAN SPOTLIGHT LENS

WARNING



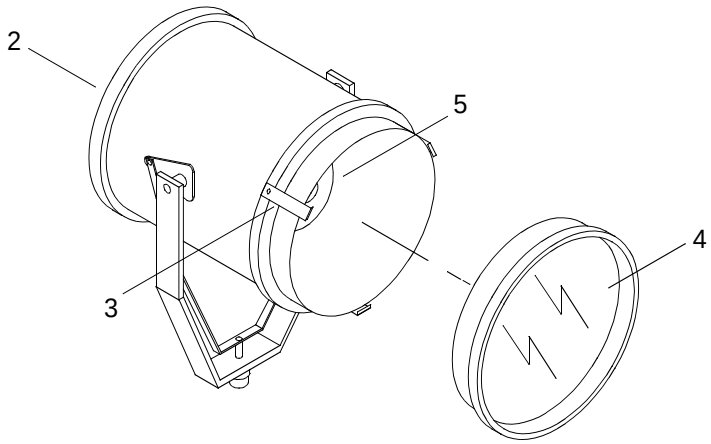
All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Using ladder, climb to top of operators cab to access spotlight (2).

3. Clean the spotlight lens (3) with cloth and cleaner.

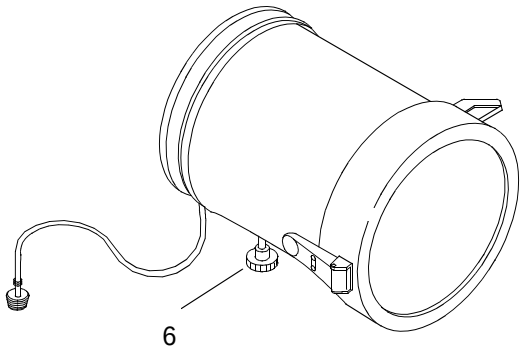


CLEAN REFLECTOR

1. Release clips (3) and remove lens (4) to expose reflector (5).
2. Clean reflector (5) with cloth and cleaner.
3. Install lens (4).

ADJUST SPOTLIGHT

1. Project a spotlight (2) beam on a flat surface approximately 50 feet away.
2. Using ladder, climb to top of operators cab to access spotlight (2).
3. Use the knob (6) at the bottom of the spotlight (2) to focus until the beam pattern is the smallest.



END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
SPOTLIGHT BULB
REPLACEMENT

INITIAL SETUP:

Tools

Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)

Materials/Parts

Lamp
(81493)
PN 4212400

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

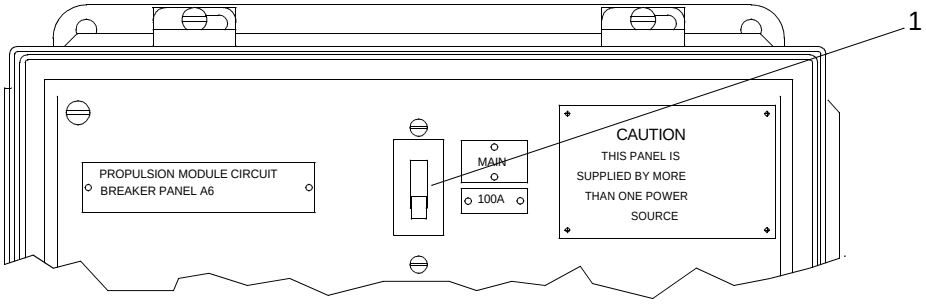
REMOVE SPOTLIGHT BULB

WARNING

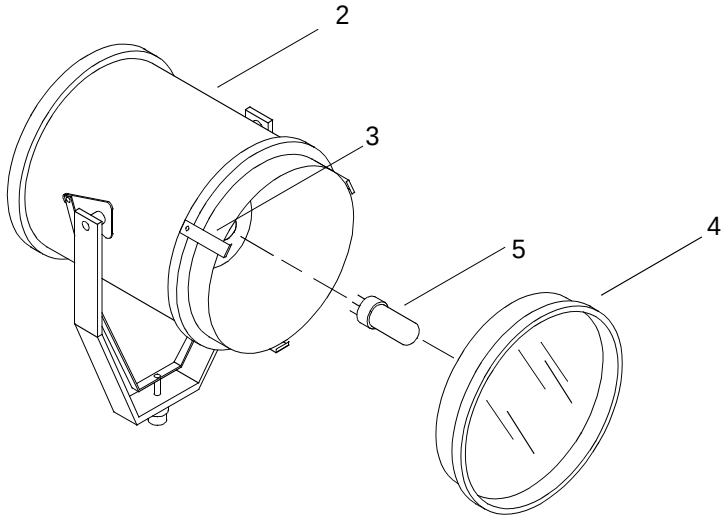


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Using ladder, climb to top of operators cab to access spotlight (2).



3. Release clips (3) and remove lens (4).

4. Wearing a pair of gloves, remove the light bulb (5) from inside the spotlight (2).

5. Discard light bulb (5).

INSTALL SPOTLIGHT BULB

1. Wearing a pair of gloves, install the new light bulb (5) inside the spotlight (2).

2. Position the lens (4) on the front of the spotlight (2) and secure with clips (3).

3. Descend from top of operators cab and remove ladder.

4. Perform operational check of spotlight. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
SPOTLIGHT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)

Materials/Parts

Spotlight
(34712)
PN E25649

Personnel Required

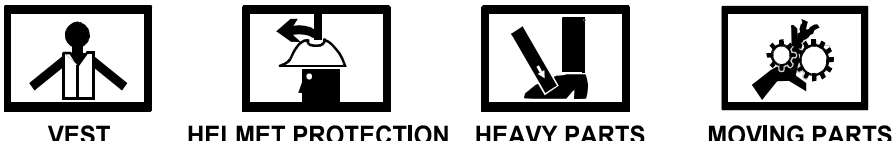
Seaman 88K

References

TM 55-1945-205-10-1

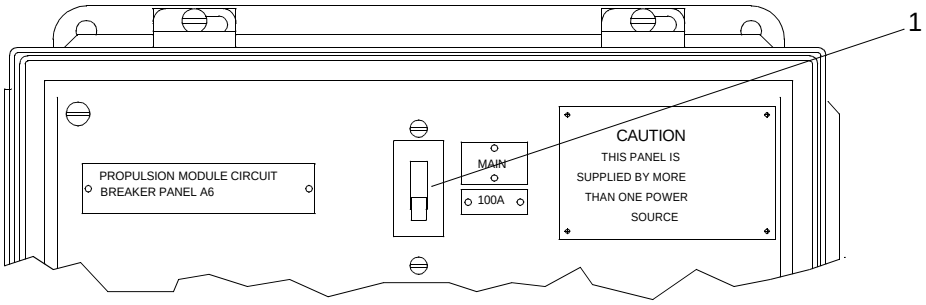
REMOVE SPOTLIGHT

WARNING

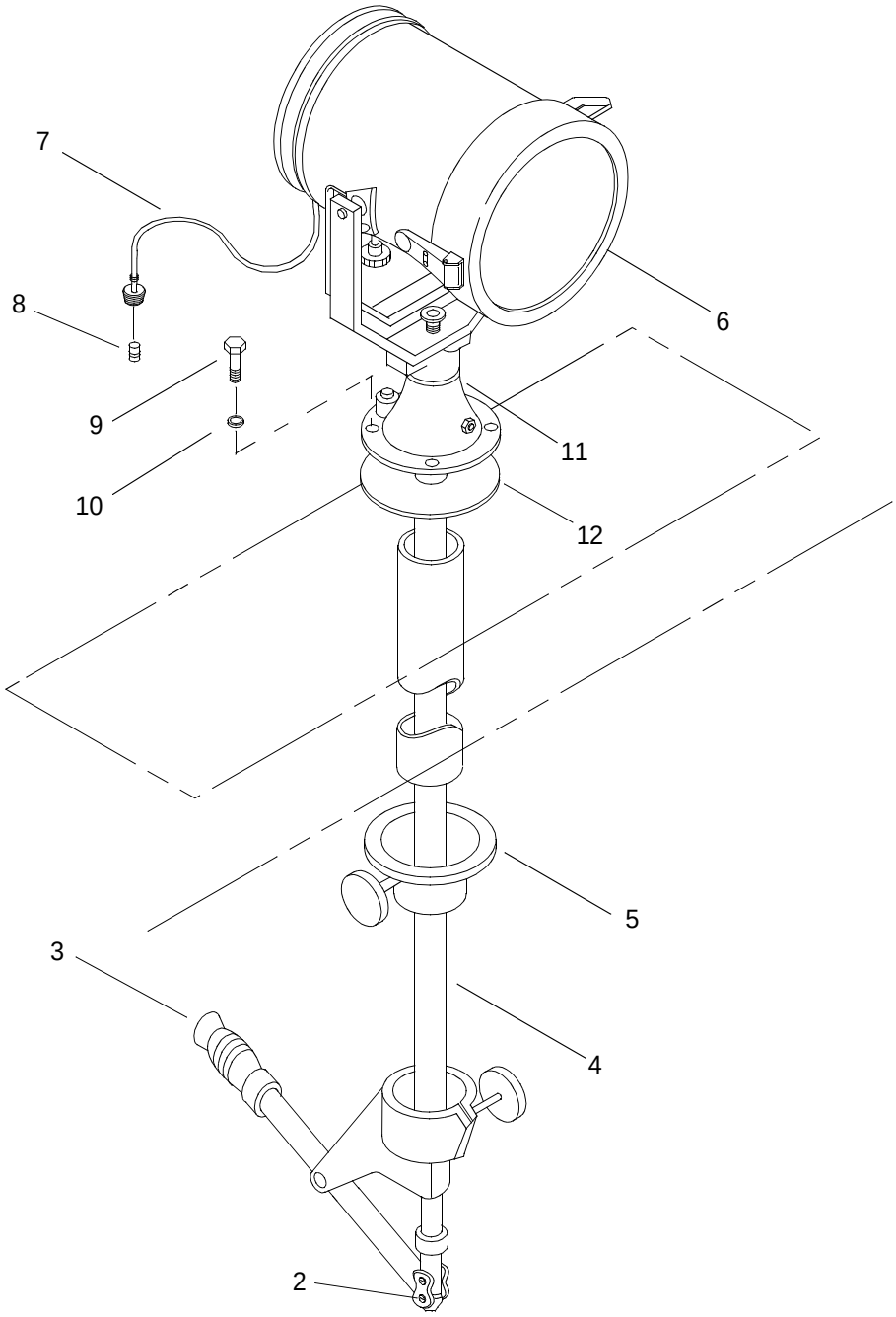


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove the pin (2) from the control lever (3) from the bottom of the spotlight control tube (4).



3. Remove the lower flange (5), located inside the operators cab, from the spotlight control tube (4).

4. Using ladder, climb to top of operators cab to access spotlight (6).

5. Disconnect the spotlight (6) and tag electrical cable (7) at the connector (8) located on top of the operators cab.

6. Remove cap screws (9) and lock washers (10) from the upper flange (11) securing the spotlight to the roof of the operators cab.

7. Pull the spotlight (6), gasket (12), upper flange (11) and control tube (4) out of the roof of the cab.

INSTALL SPOTLIGHT

1. Position the spotlight (6), gasket (12), upper flange (11) and control tube in the roof of the operators cab.
2. Install cap screws (9) and lock washers (10) to secure the upper flange (11) to the roof of the operators cab.
3. Tighten screws (9).
4. Connect the spotlight (6) and electrical cable (7) to the connector located on top of the operators cab. Remove tag.
5. Position the lower flange (5) on the control tube (4) inside the cab.
6. Position the control lever (3) at the bottom of the control tube (4) and secure with pin (2).
7. Perform operational check of spotlight. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
SPOTLIGHT PUSH-ROD PACKING REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

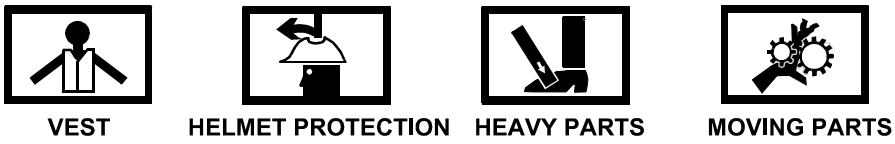
Push-Rod Packing
(81493)
PN 51012

Personnel Required

Engineer 88L

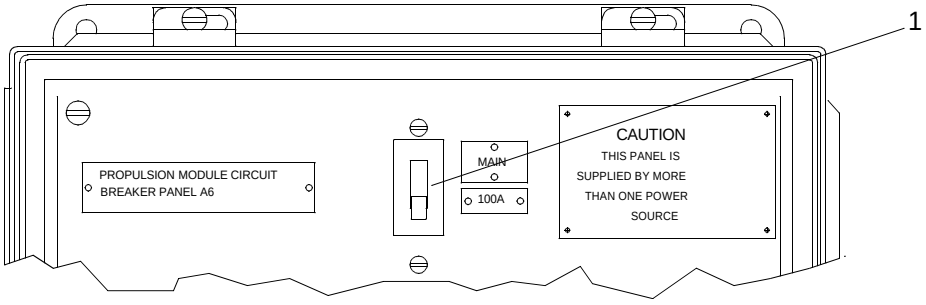
REMOVE SPOTLIGHT PUSH-ROD PACKING

WARNING

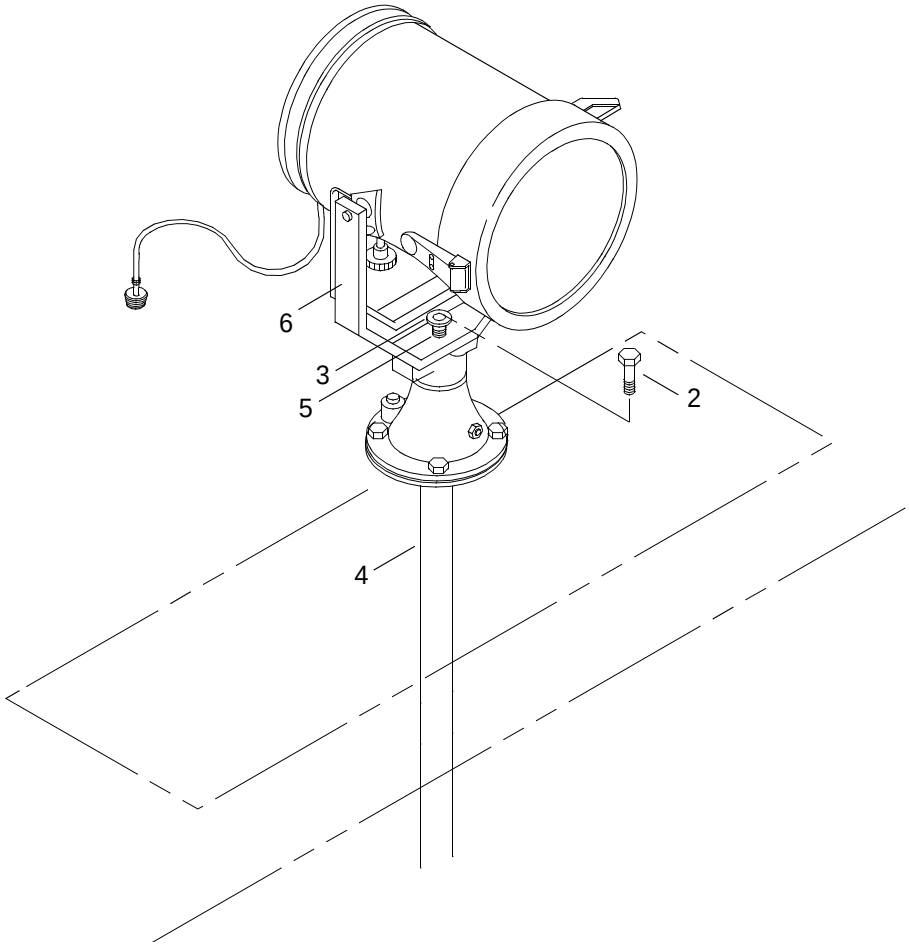


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove the two screws (2) on the packing flange (3).



3. Slide the packing flange (3) up the push-rod (4).

4. Remove and discard the push-rod packing (5).

INSTALL SPOTLIGHT PUSH-ROD PACKING

1. Wind the new push-rod packing (5) around the push-rod (4) and work it tightly into the pocket on the harp (6).

2. Slide the packing flange (3) down the push-rod (4).

3. Tighten screws (2) to compress the packing (5).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
SPOTLIGHT MOUNTING GASKET
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)
Scraper, Ship (Item 32, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 12, WP 0383 00)

Materials/Parts

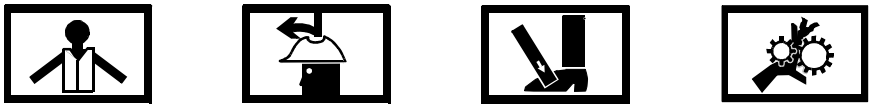
Cotter Pin
(81493)
PN 65108
Qty 2
Gasket
(34712)
PN E24701
Adhesive (Item 1, WP 0382 00)
Cleaner (Item 5, WP 0382 00)
Rag, Wiping (Item 21, WP 0382 00)

Personnel Required

Engineer 88L

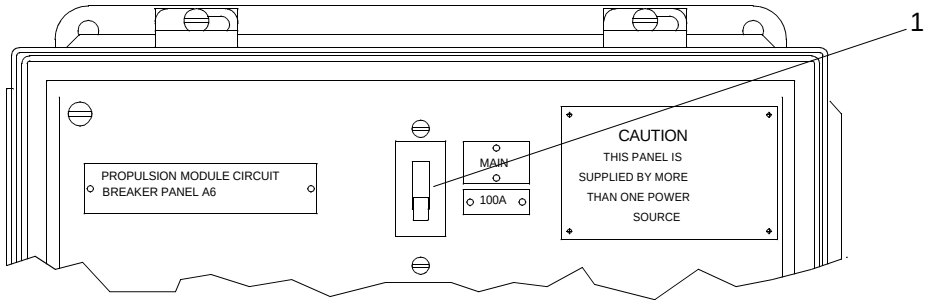
REMOVE SPOTLIGHT MOUNTING GASKET

WARNING



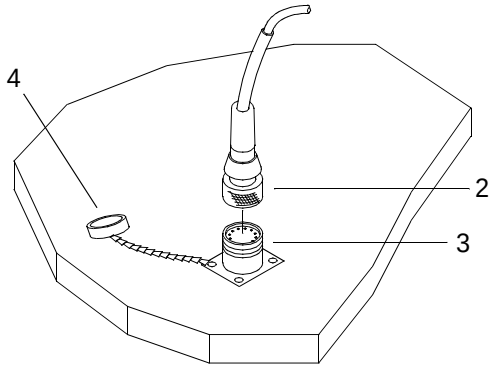
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



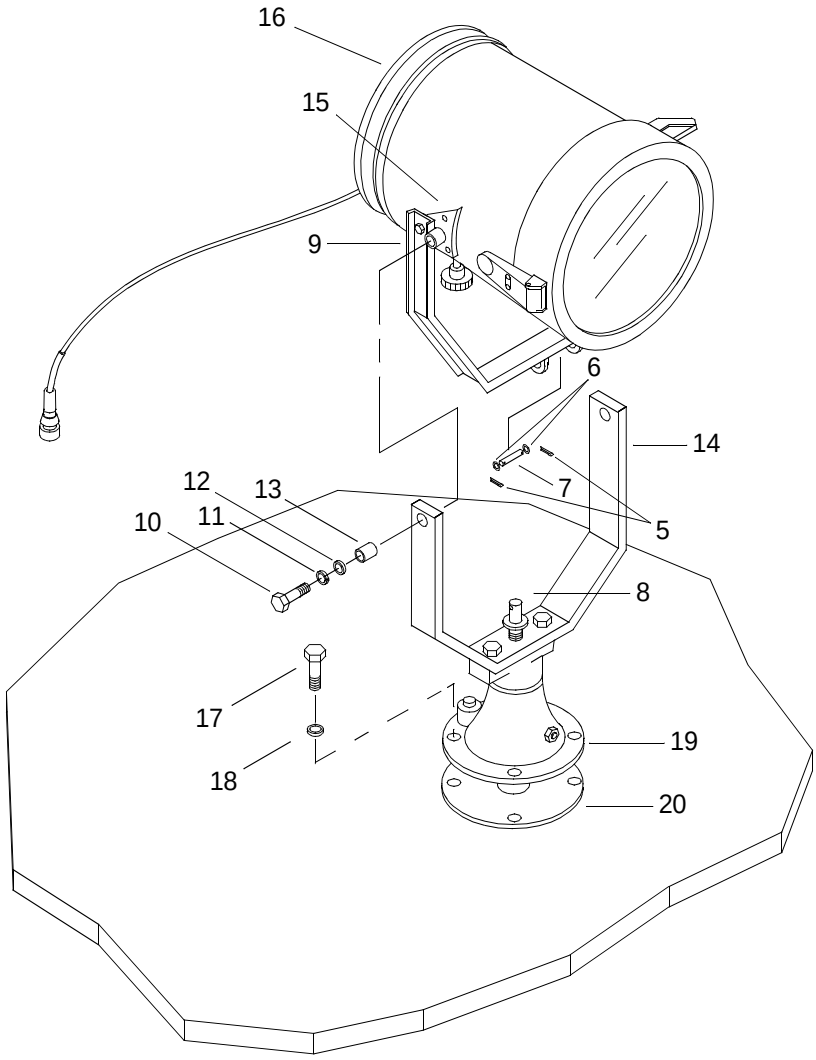
2. Using 12 foot ladder, climb on top of operators cab roof.

3. Disconnect power supply plug (2) from roof electrical receptacle (3).



4. Install receptacle dust cap (4) on electrical receptacle (3).

5. Remove cotter pins (5) and flat washers (6) from clevis pin (7) in spotlight push-rod (8) at base of the yoke (9).



6. Retain washers (6).

7. Discard cotter pins (5).

8. Remove and retain clevis pin (7).

9. Remove cap screws (10), lock washers (11), flat washers (12) and bearings (13) from both sides of harp (14).

10. Retain cap screws (10), lock washers (11), flat washers (12) and bearings (13).

11. Separate harp (14) from bracket support (15) and lift out spotlight (16).

12. Retain spotlight (16).

13. Remove four hex head cap screws (17) and four flat washers (18) from roof flange assembly (19).

14. Retain cap screws (17) and washers (18).

15. Lift roof flange assembly (19) off gasket (20).

16. Using scraper, remove spotlight gasket (20) from roof and any particles remaining on roof flange (19).

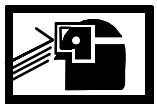
17. Discard gasket (20).

INSTALL SPOTLIGHT MOUNTING GASKET

WARNING



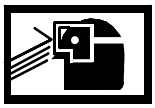
CHEMICAL



EYE PROTECTION

1. Using rags and cleaner, clean surface area of operators cab roof.

WARNING



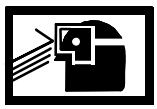
EYE PROTECTION

2. Using wire brush, remove old adhesive from four hex head cap screws (17).

WARNING



CHEMICAL



EYE PROTECTION

3. Apply adhesive to threads of four hex head cap screws (17).

4. Position new gasket (20) on operators cab, aligning screws holes.

5. Position roof flange assembly (19) over push-rod (8) and gasket (20), aligning cap screw holes in flange (19) with holes in gasket (20).

6. Install washers (18) on hex head cap screws (17).

7. Install cap screws (17) and flat washers (18) to secure the roof flange assembly (20) to the roof of the operators cab.

8. Tighten cap screws (17).

9. Position spotlight (16) so bracket support (15) is aligned with screw holes on both sides of harp (14).

10. Install a lock washer (11), flat washer (12) and bushing (13) on cap screws (10).

11. Install cap screws (10) with lock washers (11), flat washers (12) and bushings (13) through harp (14), into bracket support (15) on spotlight (16).

12. Tighten cap screws (10).

13. Position spotlight so base of yolk (9) aligns with push-rod (8).

14. Install clevis pin (7) through yolk (9) and push-rod (8).

15. Install flat washers (6) and new cotter pins (5) on ends of clevis pin (7).

16. Remove receptacle cap (4).

17. Connect the spotlight power supply plug (2) to electric receptacle (3) located on top of the operators cab.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB DEFROSTER
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Heater, Gun Type, Electric (Item 16, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Crimping Tool, Terminal Hand (Item 8, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 12, WP 0383 00)

Materials/Parts

Defroster
(71741)
PN 6001-010624
Connector, Butt
(0788X)
PN M14BC
Tubing, Heat Shrink (Item 34, WP 0382 00)
Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

Engineer 88L

References

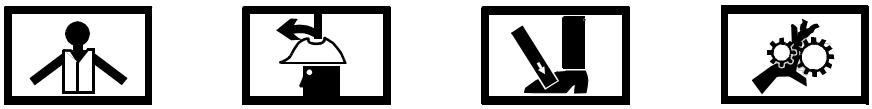
TM 55-1945-205-10-1
TM 55-1945-205-24-1-2

Equipment Condition

Cooling System Cool To Touch.

REMOVE OPERATORS CAB DEFROSTER

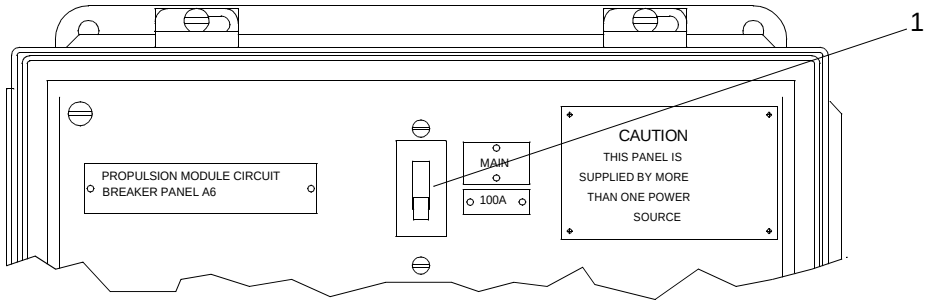
WARNING



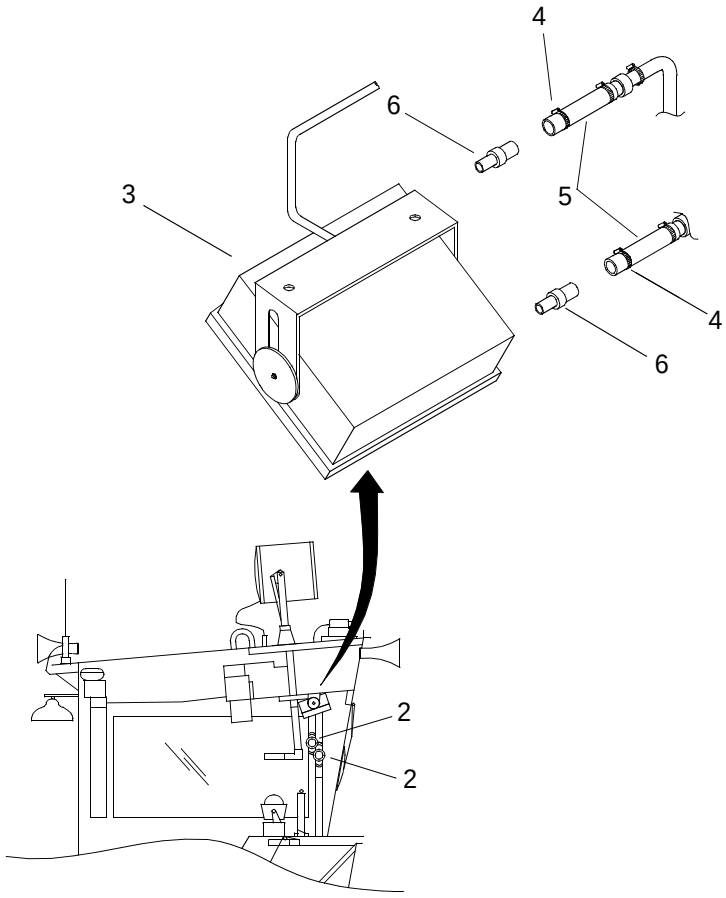
VEST HELMET PROTECTION HEAVY PARTS MOVING PARTS

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

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Close the inlet/outlet defrost needle valves (2).



3. Position drain pan under operators cab enclosure defroster (3).

WARNING



4. Loosen two hose clamps (4) and slide up hoses (5).

WARNING



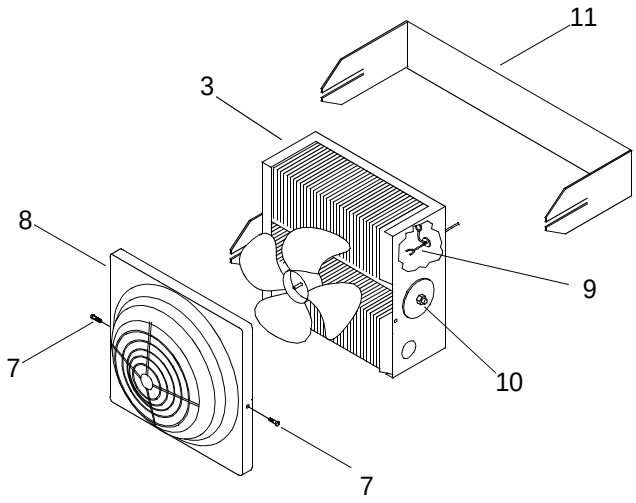
5. Remove two hoses (5) from union connectors (6).

WARNING



6. Allow hoses (5) to drain into drain pan.

7. Remove two screws (7) from defroster cover (8).



8. Remove defroster cover (8) from defroster (3).

9. Inside defroster (3), cut operators cab cabling (9).

10. Loosen two nuts (10) and remove defroster (3) from mounting bracket (11).

WARNING



11. Remove two union connectors (6) from defroster (3).

WARNING



12. Drain contents of defroster (3) into drain pan and discard defroster (3).

WARNING



13. Remove drain pan and dispose of contents in accordance with local procedures.

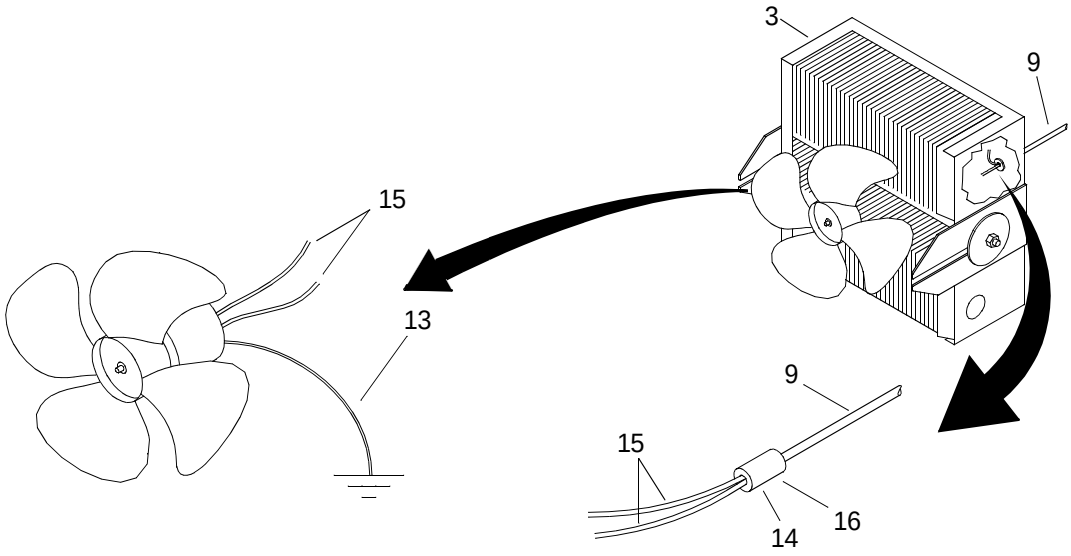
INSTALL OPERATORS CAB DEFROSTER

WARNING



1. Apply sealing compound to threads on union connectors (6).
2. Install two union connectors (6) in new defroster (3) and tighten two union connectors (6).
3. Remove two screws (7) from defroster cover (8).
4. Remove defroster cover (8) from defroster (3).

5. Disconnect fan motor ground wire (13) from defroster (3) and discard.



6. Position defroster (3) on mounting bracket (11) and tighten nuts (10).
7. Position heat shrink tubing (14) on operators cab cabling (9).
8. Install operators cab cabling (9) and fan motor wires (15) in ends of butt connector (16).
9. Using crimping tool, crimp butt connector (16).
10. Position heat shrink tubing (14) on crimped butt connector (16).

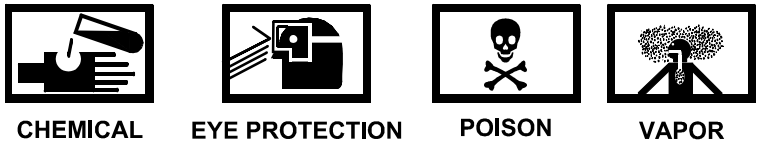
WARNING



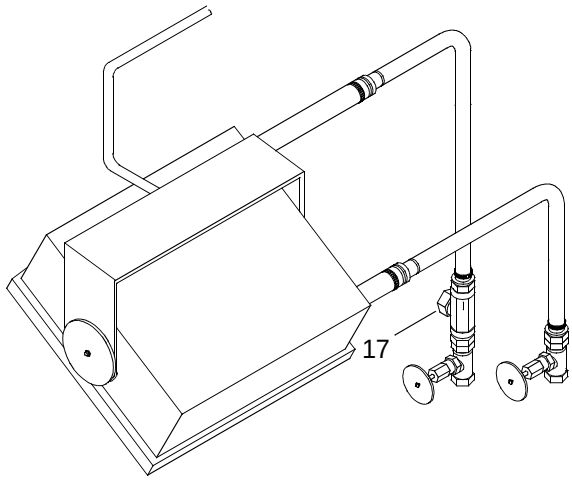
HOT AREA

11. Using heat gun, apply heat to heat shrink tubing (14).
12. Position defroster cover (8) on defroster (3).
13. Install two screws (7) in defroster cover (8) and tighten screws (7).
14. Position two hoses (5) on union connectors (6).
15. Install two hose clamps (4) on hoses (5) and tighten.
16. Open the inlet/outlet defrost needle valves (2).
17. Service cooling system. (TM 55-1945-205-24-1-2)
18. Start starboard engine. (TM 55-1945-205-10-1)

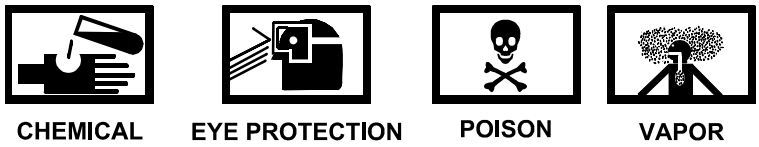
WARNING



19. Place drain pan under defrost bleed plug (17).

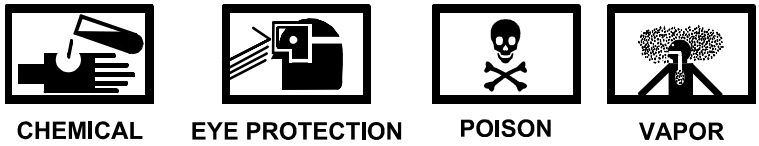


WARNING



20. Loosen bleed plug (17) to bleed air from defroster coolant system. (17).

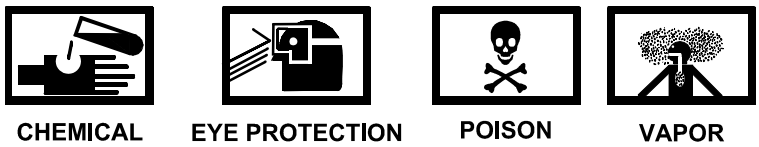
WARNING



21. Tighten plug (17) when all trapped air has escaped.

22. Shut down starboard engine. (TM 55-1945-205-10-1)

WARNING



23. Remove drain pan and dispose of contents in accordance with local procedures.

WARNING



24. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ENCLOSURE HEATER
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Heater
(71741)
PN 6001-014424

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Cooling System Cool To Touch.
Powered Section Operators Cab Side Access Panel Removed. (WP 0097 00)
Operators Cab Access Panel Removed. (WP 0237 00)
Operators Cab Heater Water Hoses Removed. (WP 0242 00)

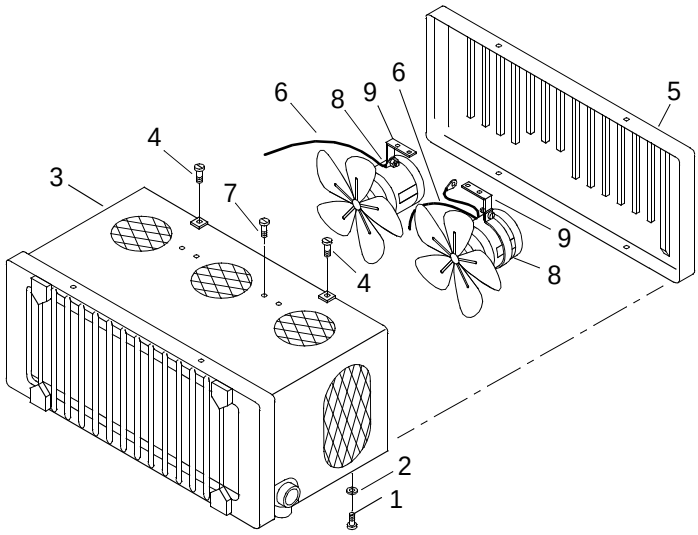
REMOVE OPERATORS CAB ENCLOSURE HEATER

WARNING



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1. Remove four cap screws (1) and lock washers (2) from the underside of the heater (3).



2. Remove the heater (3).
3. Remove four screws (4) that secure rear grille (5) to heater (3).
4. Inside the heater, tag and disconnect the two fans electrical leads (6).
5. Remove four screws (7) holding the two fans (8) mounting brackets (9).
6. Remove the two fans (8) with their brackets (9) from inside the heater (3).
7. Discard fans (8) and brackets (9).

INSTALL OPERATORS CAB ENCLOSURE HEATER

1. Align the two new fans (8), with their attached new brackets (9), to the holes in the top of the new heater (3).
2. Attach the two fan brackets (9) with four screws (7).
3. Tighten screws (8).
4. Connect the two fans electrical leads (6) to the inside of the heater (3).
5. Remove tags.
6. Install the four screws (4) to secure the grille (5) to the rear of the heater (3).
7. Tighten screws (4).
8. Slide the heater (3) into place and secure with four cap screws (1) and lock washers (2).
9. Tighten cap screws (1).
10. Install heater water hoses. (WP 0242 00)
11. Install operators cab access panel. (WP 0237 00)
12. Install operators cab side access panel. (WP 0097 00)
13. Perform operational check of heater. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
WINDSHIELD WIPER BLADE
REPLACEMENT

INITIAL SETUP:

Tools

Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Wiper Blade
(24956)
PN BD721020-10

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

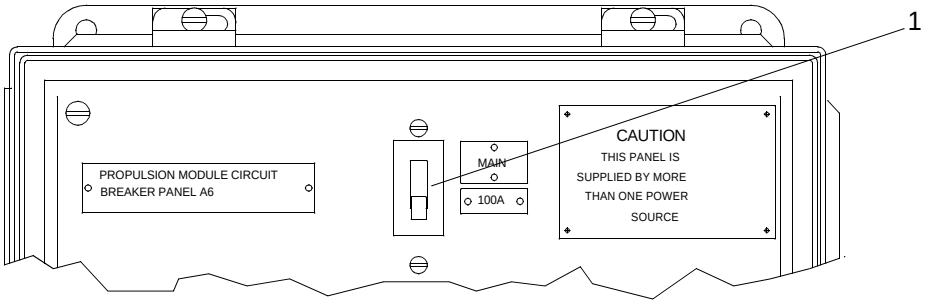
REMOVE WINDSHIELD WIPER BLADE

WARNING

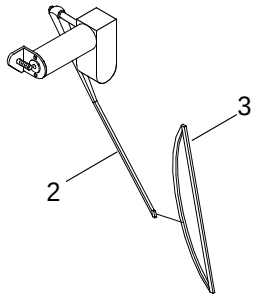


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Pull wiper arm (2) away from window.



3. Squeeze clip and slide out wiper blade (3).

4. Discard wiper blade (3).

INSTALL WINDSHIELD WIPER BLADE

1. Slide new wiper blade (3) into groove on wiper arm (2).

2. Push wiper arm (2) back on window.

3. Perform operational check of windshield wiper. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
WINDSHIELD WIPER ARM
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Wiper Arm
(24956)
PN LE721156

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Windshield Wiper Blade Removed. (WP 0285 00)

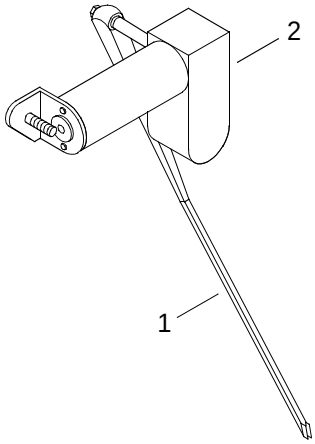
REMOVE WINDSHIELD WIPER ARM

WARNING



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

1. Grasp wiper arm (1) at wiper motor (2) shaft and pull.



2. Remove wiper arm (1) from windshield wiper motor (2) shaft.

3. Discard wiper arm (1).

INSTALL WINDSHIELD WIPER MOTOR

1. Press new wiper arm (1) on windshield wiper motor (2) shaft.

2. Install windshield wiper blade. (WP 0285 00)

3. Perform operational check of windshield wiper. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
WINDSHIELD WIPER MOTOR
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Windshield Wiper Motor
(24956)
PN WWF-24-C-17105
Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Windshield Wiper Blade Removed. (WP 0285 00)
Windshield Wiper Arm Removed. (WP 0286 00)

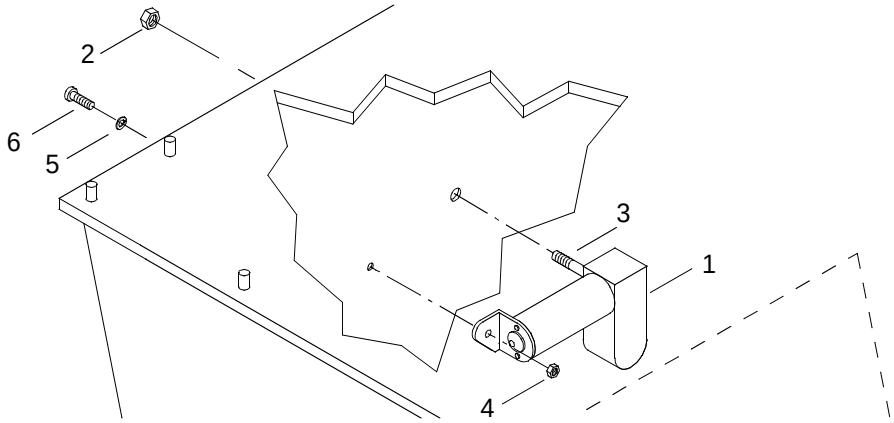
REMOVE WINDSHIELD WIPER MOTOR

WARNING



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

1. Disconnect and tag electrical wires to windshield wiper motor (1).



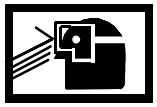
2. Remove the lock nut (2) from the motor output shaft (3).
3. Remove the nut (4), lock washer (5) and pan head screw (6).
4. Remove the windshield wiper motor (1) from the interior of the cab front wall.
5. Discard windshield wiper motor (1).

INSTALL WINDSHIELD WIPER MOTOR

WARNING



CHEMICAL



EYE PROTECTION

1. Apply antiseize compound to pan head screw (6).
2. Position new windshield wiper motor (1) from interior of cab front wall.
3. Install the pan head screw (6), lock washer (5) and nut (4).
4. Tighten nut (4).
5. Install the lock nut (2) on the wiper motor output shaft (3).
6. Tighten lock nut (2).
7. Connect electrical wires to windshield wiper motor (1). Remove tags.
8. Install windshield wiper arm. (WP 0286 00)
9. Install windshield wiper blade. (WP 0285 00)
10. Perform operational check of windshield wiper. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
VHF/FM HANDHELD TRANSCEIVER ANTENNA
REPLACEMENT

INITIAL SETUP:

Tools

Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Flexible Antenna
(0JDM6)
PN 21-200006

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

REMOVE VHF/FM HANDHELD TRANSCEIVER ANTENNA

WARNING



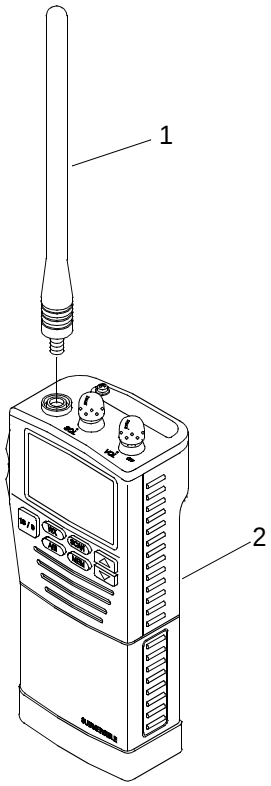
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of VHF/FM handheld transceiver antennas.

1. Turn VHF/FM handheld transceiver power off. (TM 55-1945-205-10-1)

2. Turn antenna (1) in a counter-clockwise direction.



3. Remove antenna (1) from transceiver (2).
4. Discard antenna (1).

INSTALL VHF/FM HANDHELD TRANSCEIVER ANTENNA

1. Align new antenna (1) with antenna connector.
2. Turn antenna (1) in a clockwise direction until hand tight.
3. Perform operational check on the handheld transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
VHF/FM HANDHELD TRANSCEIVER CONTROL KNOBS
REPLACEMENT

INITIAL SETUP:

Tools

Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Knob
(0JDM6)
PN 21-200010

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

REMOVE VHF/FM HANDHELD TRANSCEIVER CONTROL KNOBS

WARNING



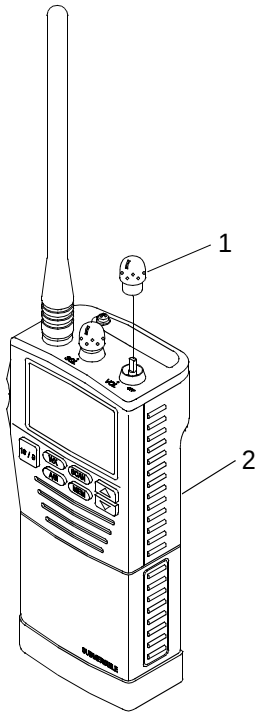
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of VHF/FM handheld transceiver control knobs.

1. Turn VHF/FM handheld transceiver power off. (TM 55-1945-205-10-1)

2. Grasp knob (1) and pull straight up.



3. Remove knob (1) from transceiver (2).

4. Discard knob (1).

INSTALL VHF/FM HANDHELD TRANSCEIVER CONTROL KNOBS

1. Align new control knob (1) with half-moon shaped control knob shaft on top of transceiver (2).

2. Position and gently push knob onto shaft until seated.

3. Perform operational check on the handheld transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

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

INITIAL SETUP:

Tools

Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Battery Pack, Rechargeable
(0JDM6)
PN 21-200015

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

REMOVE VHF/FM HANDHELD TRANSCEIVER RECHARGEABLE BATTERY PACK

WARNING



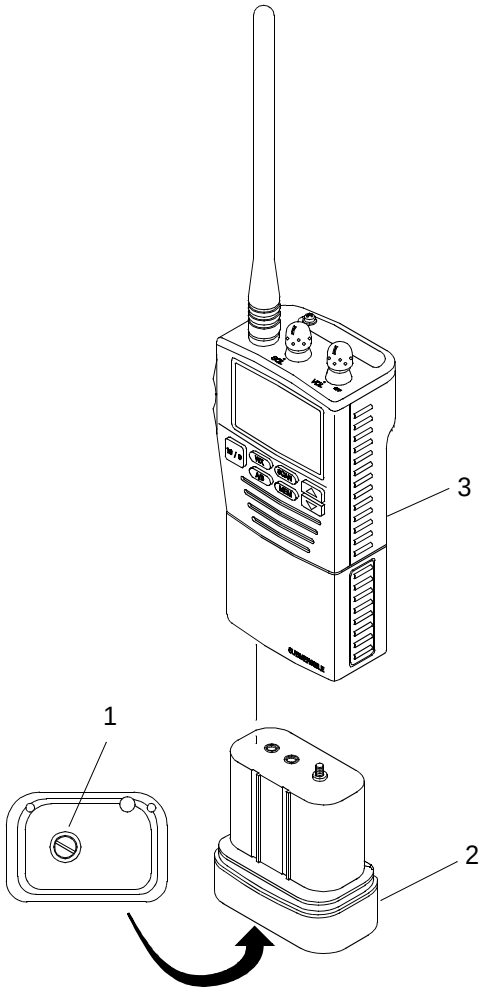
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of VHF/FM handheld transceiver rechargeable battery packs.

1. Turn VHF/FM handheld transceiver power off. (TM 55-1945-205-10-1)

2. Turn battery lock screw (1) counterclockwise 8 or 9 complete turns.



3. Grasp the battery pack (2), pull out from transceiver (3).

INSTALL VHF/FM HANDHELD TRANSCEIVER RECHARGEABLE BATTERY PACK

1. Align battery pack (2) with slots in battery cavity (can only be installed one way).
2. Slide battery pack (2) into battery cavity of transceiver (3) until fully inserted.
3. Turn the battery lock screw (1) clockwise until hand-tightened.
4. Perform operational check on the handheld transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

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

INITIAL SETUP:

Tools

Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Battery, Nonrecharge
(80204)
NSN 6135-00-95-7845
PN 20-0571-1988-NEDA 15A
Qty 6

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

REMOVE VHF/FM HANDHELD TRANSCEIVER ALKALINE BATTERY PACK

WARNING



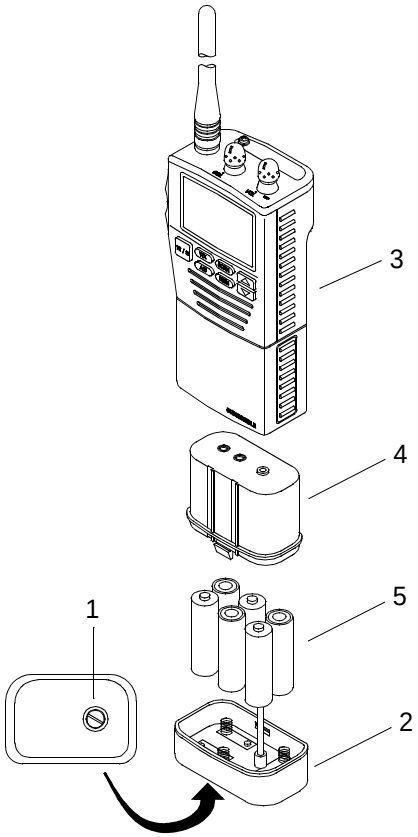
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of VHF/FM handheld transceiver alkaline batteries.

1. Turn VHF/FM handheld transceiver power off. (TM 55-1945-205-10-1)

2. Turn battery lock screw (1) counterclockwise 8 or 9 complete turns.



3. Grasp the battery pack base (2) and pull out from transceiver (3).

4. Squeeze sides of battery pack cover (4) and separate from battery pack base (2).

5. Remove six batteries (5) from battery pack cover (4) and discard.

INSTALL VHF/FM HANDHELD TRANSCEIVER ALKALINE BATTERY PACK

1. Install six new batteries (5) in battery pack cover (4).

2. Press battery pack base (2) on battery pack cover (4).

NOTE

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

3. Align battery pack base (2) and battery pack cover (4) with slots in transceiver (3) cavity. Slide assembled battery pack base (2) and cover into cavity of transceiver (3).

4. Turn the battery lock screw (1) clockwise until hand-tightened.

5. Perform operational check on the handheld transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

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

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Battery Charger
(0JDM6)
PN 21-200016

Personnel Required

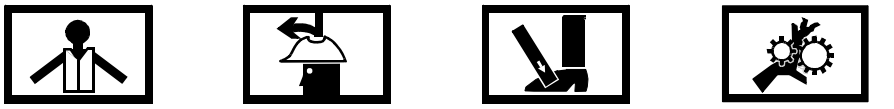
Engineer 88L

References

TM 55-1945-205-10-1

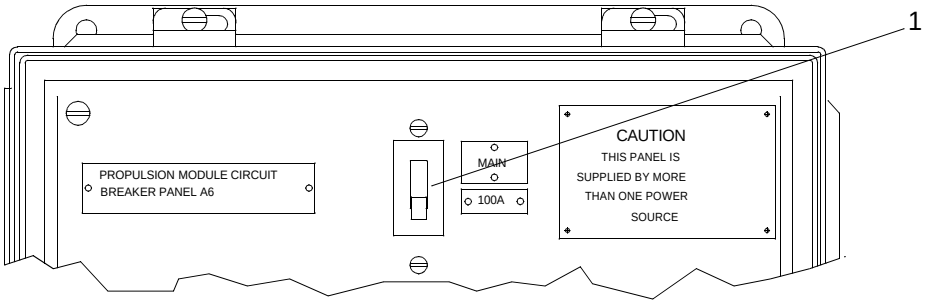
REMOVE VHF/FM HANDHELD TRANSCEIVER BATTERY CHARGER

WARNING

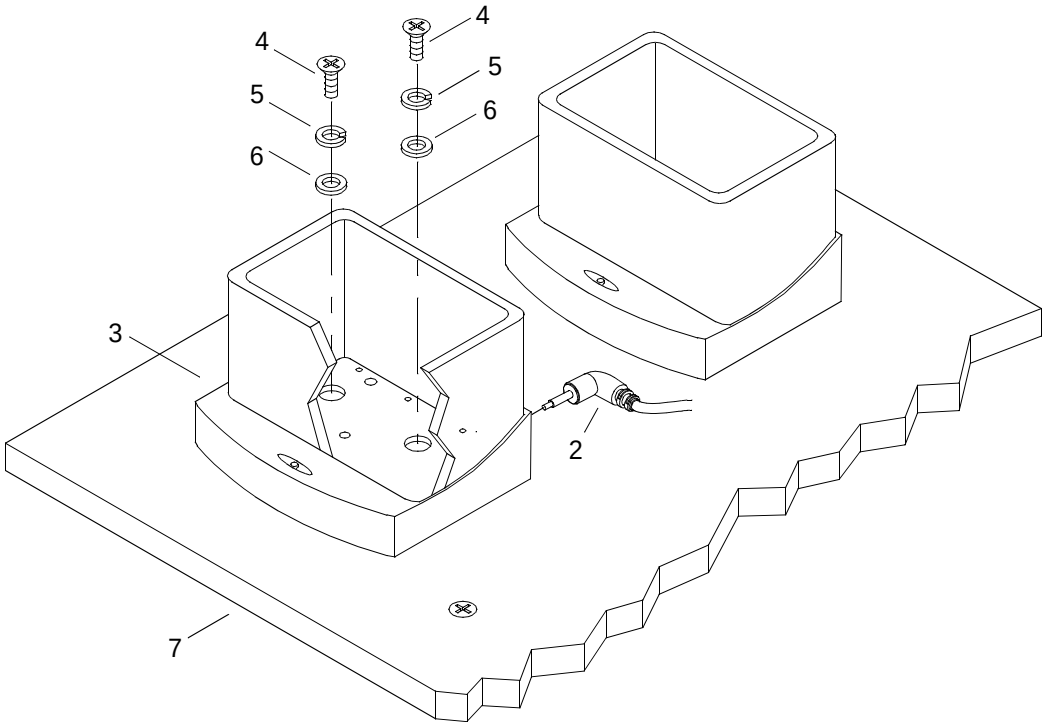


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove the battery charger power cord (2) from the rear of the charger (3).



3. Remove two screws (4), lock washers (5) and washers (6) holding charger onto console (7).

4. Remove and discard charger (3).

INSTALL VHF/FM HANDHELD TRANSCEIVER BATTERY CHARGER

1. Position new charger (3) on the console (7).

2. Install two screws (4), lock washers (5) and washers (6) through charger (3) into console (7).

3. Tighten screws (4).

4. Plug battery charger power cord (2) into back of charger (3).

5. Perform operational check on the handheld transceiver battery charger. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
AN/PSN-11 INTERFACE AND SWITCHBOX REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Switchbox
(0JDM6)
PN 9801

Personnel Required

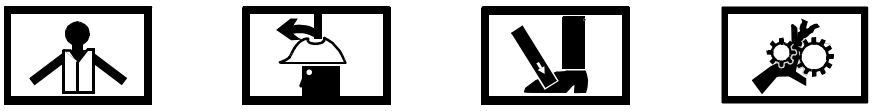
Engineer 88L

References

TM 55-1945-205-10-1

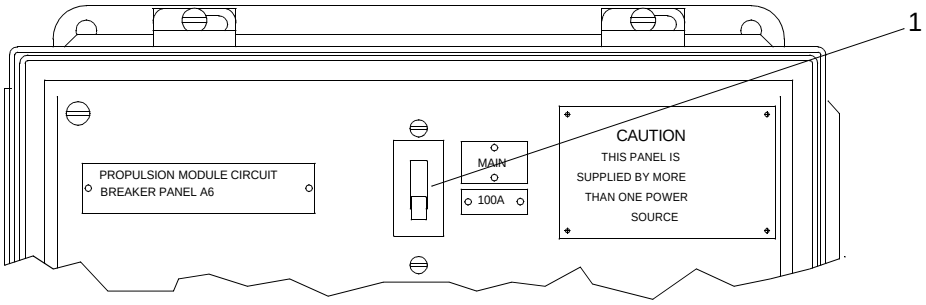
REMOVE AN/PSN-11 INTERFACE AND SWITCHBOX

WARNING

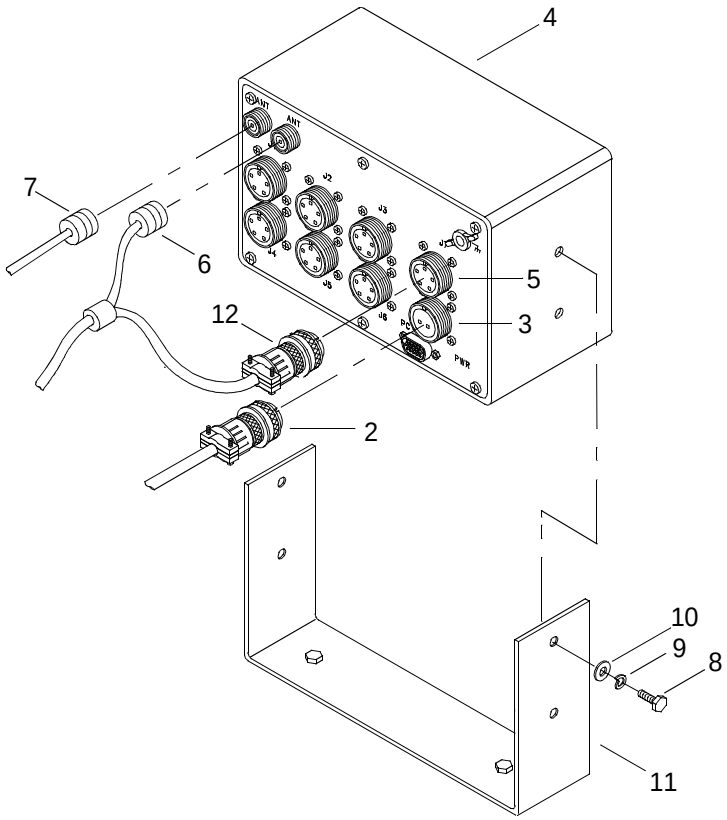


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove power cable plug (2) from PWR receptacle (3) from back of the interface and switchbox (4).



3. Remove PLGR cable from J7 receptacle (5).
4. Remove PLGR antenna coaxial lead (6).
5. Remove GPS antenna coaxial lead (7).
6. Remove four bolts (8), lock washers (9) and flat washers (10) from mounting bracket (11).
7. Remove the interface and switchbox (4).

INSTALL AN/PSN-11 INTERFACE AND SWITCHBOX

1. Position new interface/switchbox (4) on mounting bracket (11) and secure in place with four bolts (8), lock washers (9) and flat washers (10).
2. Tighten bolts (8).
3. Install GPS antenna coaxial lead (7) and tighten connector.
4. Install PLGR antenna coaxial lead (6) and tighten connector.
5. Install PLGR cable (12) in the J7 receptacle (5) and tighten connector.
6. Install power cable (2) in the PWR receptacle and tighten connector.
7. Perform operational check on the interface and switchbox. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
AN/PSN-11 INTERFACE AND SWITCHBOX MOUNT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Bracket, Mount
(0JDM6)
PN 50-200026

Personnel Required

Engineer 88L

Equipment Condition

AN/PSN-11 Interface/Switchbox Removed. (WP 0293 00)

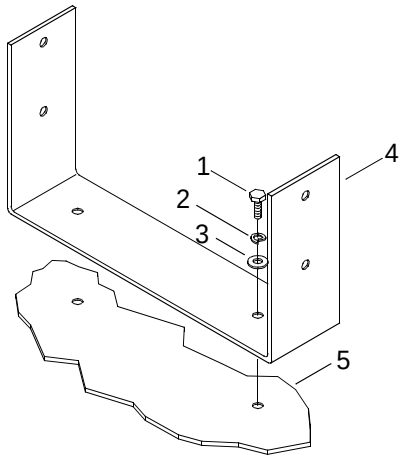
REMOVE AN/PSN-11 INTERFACE AND SWITCHBOX MOUNT

WARNING



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

1. Remove two bolts (1), lock washers (2) and flat washers (3).



2. Remove mounting bracket (4) from mounting surface (5).

INSTALL AN/PSN-11 INTERFACE AND SWITCHBOX MOUNT

1. Position mounting bracket (4) on mounting surface (5).

2. Install two bolts (1), lock washers (2) and flat washers (3) through mounting bracket (4) and into mounting surface (5).

3. Tighten bolts (1).

4. Install AN/PSN-11 interface and switchbox. (WP 0293 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUBLIC ADDRESS SET (LOUDHAILER) MICROPHONE REPLACEMENT

INITIAL SETUP:

Tools

Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Microphone
(7H422)
PN G263596-2

Personnel Required

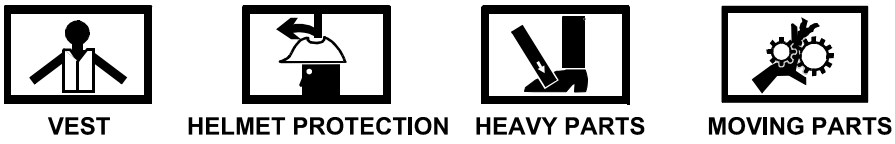
Seaman 88K

References

TM 55-1945-205-10-1

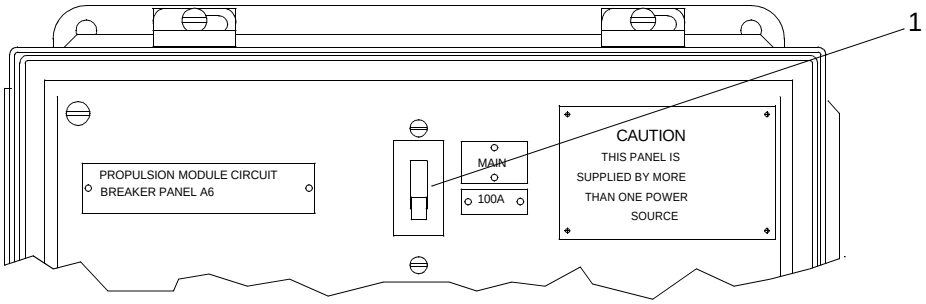
REMOVE PUBLIC ADDRESS SET (LOUDHAILER) MICROPHONE

WARNING

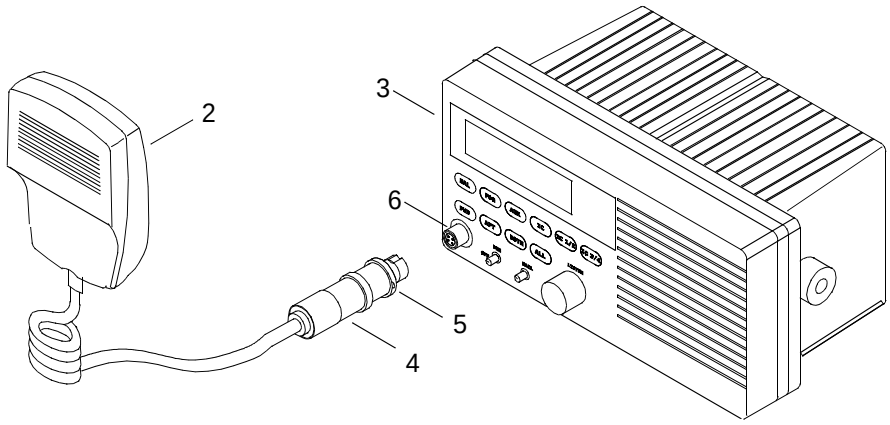


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove microphone (2) from loudhailer (3).



3. Grasp microphone connector (4) and turn knurled nut (5) counterclockwise to remove.

4. Discard microphone (2).

INSTALL PUBLIC ADDRESS SET (LOUDHAILER) MICROPHONE

1. Install new microphone (2) on loudhailer (3).

2. Line up keyway on microphone connector (4) with keyway on loudhailer connector (6).

3. Insert microphone connector (4) into loudhailer connector (6) and turn knurled nut (5) clockwise until hand tight.

4. Perform operational check on the loudhailer. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUBLIC ADDRESS SET (LOUDHAILER)
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Public Address Set
(7H422)
PN RAY430

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

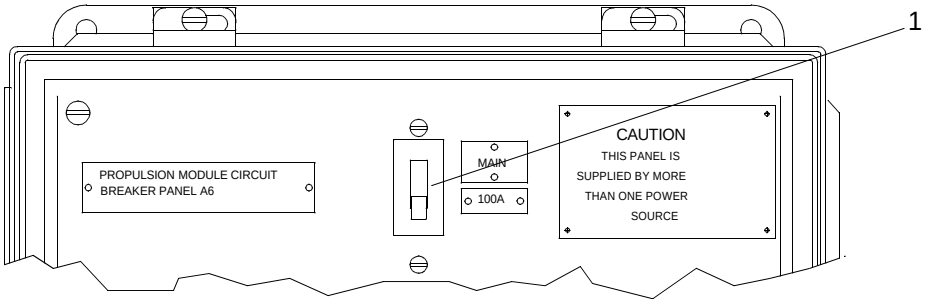
REMOVE THE PUBLIC ADDRESS SET (LOUDHAILER)

WARNING

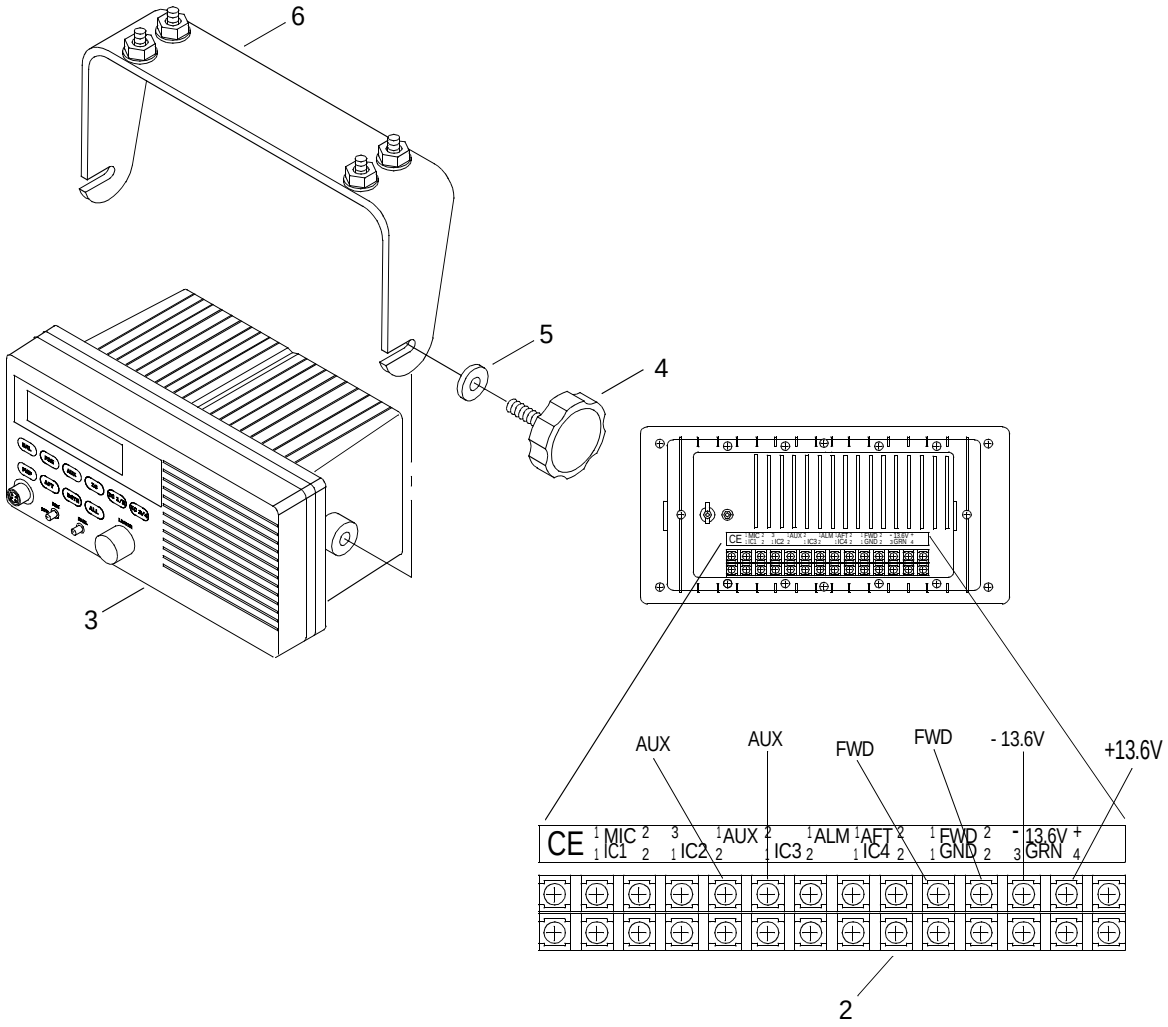


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Tag and disconnect wiring from terminal strip (2) on the rear of the loudhailer (3).



3. Remove 2 knobs (4) and washers (5) from loudhailer (3).

4. Remove the loudhailer (3) from the mount (6).

INSTALL THE PUBLIC ADDRESS SET (LOUDHAILER)

1. Position new loudhailer (3) in mount (6).

2. Install 2 knobs (4) through washers (5) and into loudhailer (3).

3. Tighten knobs (4) hand-tight.

4. Connect wiring to terminal strip (2) on the rear of the loudhailer (3).

5. Remove tags.

6. Perform operational check on the loudhailer. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PUBLIC ADDRESS SET (LOUDHAILER) MOUNT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Mount
(7H422)
PN G263596-4

Personnel Required

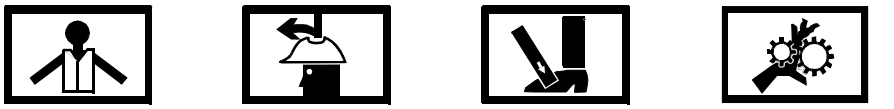
Seaman 88K

Equipment Condition

Public Address Set (Loudhailer) Removed. (WP 0296 00)
VHF/FM DSC Transceiver Microphone Removed. (WP 0302 00)
VHF/FM DSC Transceiver Removed. (WP 0303 00)

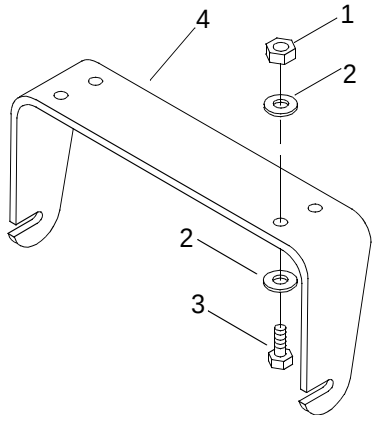
REMOVE PUBLIC ADDRESS SET (LOUDHAILER) MOUNT

WARNING



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

1. Remove two self-locking nuts (1), four flat washers (2) and two bolts (3) from mounting bracket (4).



2. Remove bracket (4) from beneath shelf.
3. Discard bracket (4).

INSTALL PUBLIC ADDRESS SET (LOUDHAILER) MOUNT

1. Position new mounting bracket (4) beneath shelf.
2. Install two bolts (3) with washers (2) through bracket holes and through holes in shelf.
3. Install second washers (2) and self-locking nuts (1) on bolts (3).
4. Tighten nuts (1).
5. Install VHF/FM DSC transceiver. (WP 0303 00)
6. Install VHF/FM DSC transceiver microphone. (WP 0302 00)
7. Install public address set (loudhailer). (WP 0296 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HAILER HORN (LOUDHAILER EXTERNAL SPEAKER)
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Crimping Tool, Terminal Hand (Item 8, WP 0383 00)

Materials/Parts

Hailer Horn
(7H422)
PN M95435
Splice Electrical, Butt
(06090)
PN CWT3809W1

Personnel Required

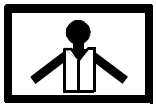
Engineer 88L

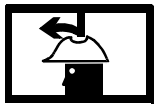
References

TM 55-1945-205-10-1

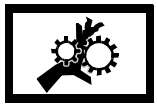
REMOVE HAILER HORN (LOUDHAILER EXTERNAL SPEAKER)

WARNING


VEST


HELMET PROTECTION


HEAVY PARTS

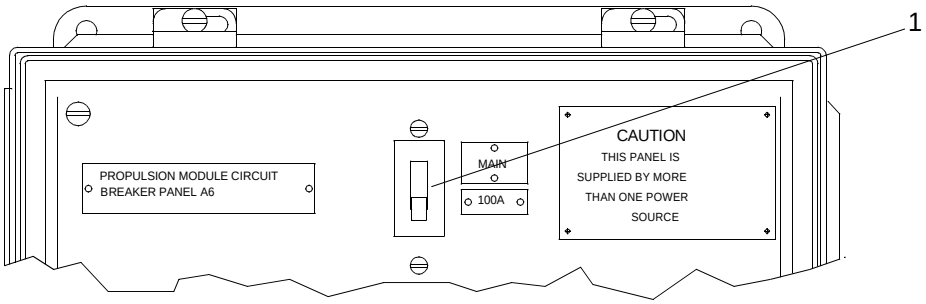

MOVING PARTS

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

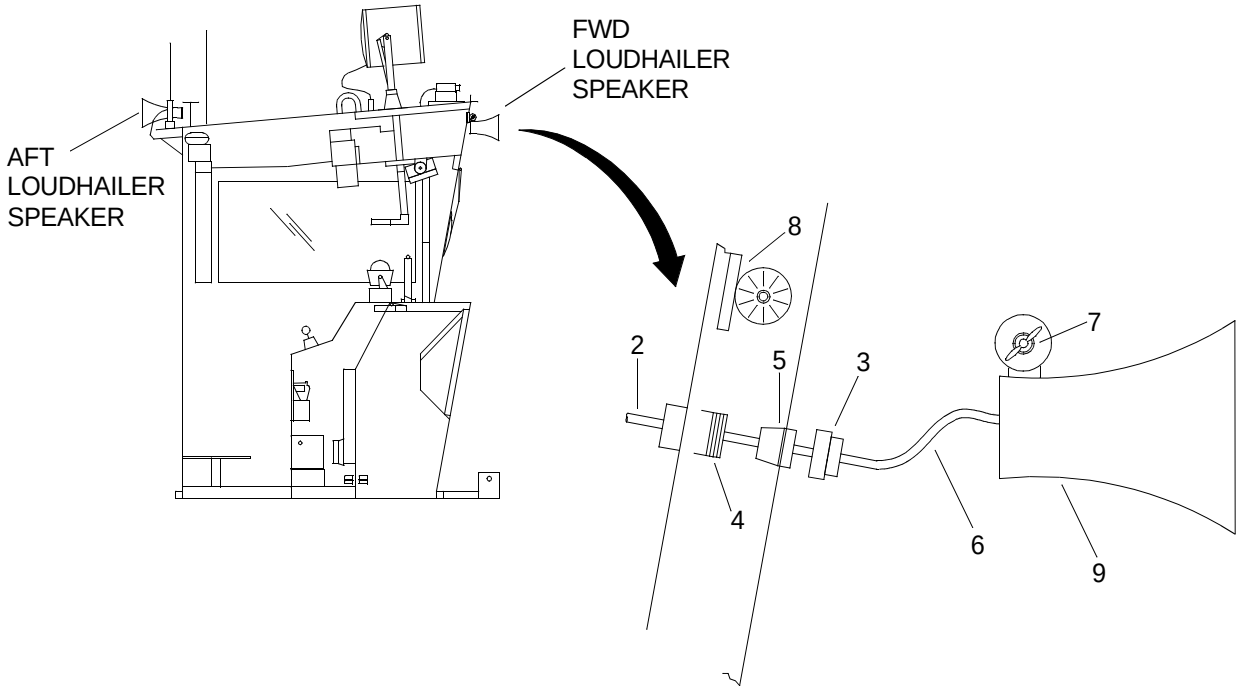
NOTE

The following procedure is typical for both the front and rear loudhailer speakers on the operators cab.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. From inside the operators cab, locate the speaker wire (2) and cut it with wire cutters.



3. Remove the nylon stuffing tube packing retaining cap (3) from the nylon stuffing tube (4) by turning the cap counterclockwise.

4. Remove the stuffing tube packing (5) from the nylon stuffing tube (4).

5. Outside the operators cab, pull the speaker wire (6) completely through the nylon stuffing tube (4).

6. Remove the wing bolt (7) securing the speaker to the bracket (8) and remove the speaker (9).

7. Discard speaker (9).

INSTALL HAILER HORN (LOUDHAILER EXTERNAL SPEAKER)

1. Position the new loudhailer speaker (9) onto its bracket (8) and secure it with the wing bolt (7).

2. Tighten wing bolt (7).

3. Feed the new speaker wire (6) through the nylon stuffing tube retaining cap (3), stuffing tube packing (5) and nylon stuffing tube into the interior of the operators cab.

4. Connect the new speaker wire (2) to the old wire inside the cab using electrical splices and electrical splice crimping tool.

5. Insert stuffing tube packing (5) into nylon stuffing tube (4).

6. Install the nylon stuffing tube packing retaining cap (3) on nylon stuffing tube (4) by turning the cap clockwise.

7. Tighten cap (3).

8. Perform operational check on the loudhailer. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
SINCGARS RADIO
REMOVAL AND INSTALLATION

INITIAL SETUP:

Personnel Required
Seaman 88K

References
TM 11-5820-890-10-8

REMOVE AND INSTALL SINCGARS RADIO

Refer to TM 11-5820-890-10-8 for removal and installation of the AN/VRC-88D SINCGARS radio.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
SINCGARS RADIO REMOTE AND MICROPHONE
REMOVAL AND INSTALLATION

INITIAL SETUP:

Personnel Required
Seaman 88K

References
TM 11-5820-890-10-8

REMOVE AND INSTALL SINCGARS RADIO REMOTE AND MICROPHONE

Refer to TM 11-5820-890-10-8 for removal and installation of the AN/VRC-88D SINCGARS radio remote and microphone.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
SINCGARS RADIO ANTENNA
REMOVAL AND INSTALLATION

INITIAL SETUP:

Personnel Required
Seaman 88K

References
TM 11-5820-890-10-8

REMOVE AND INSTALL SINCGARS RADIO ANTENNA

Refer to TM 11-5820-890-10-8 for removal and installation of the AN/VRC-88D SINCGARS radio antenna.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER MICROPHONE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

VHF/FM DSC Transceiver Microphone
(0JDM6)
PN 21-200001

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

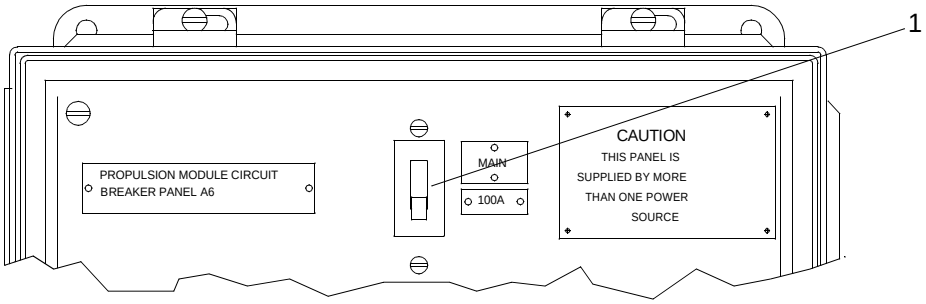
REMOVE VHF/FM DSC TRANSCEIVER MICROPHONE

WARNING

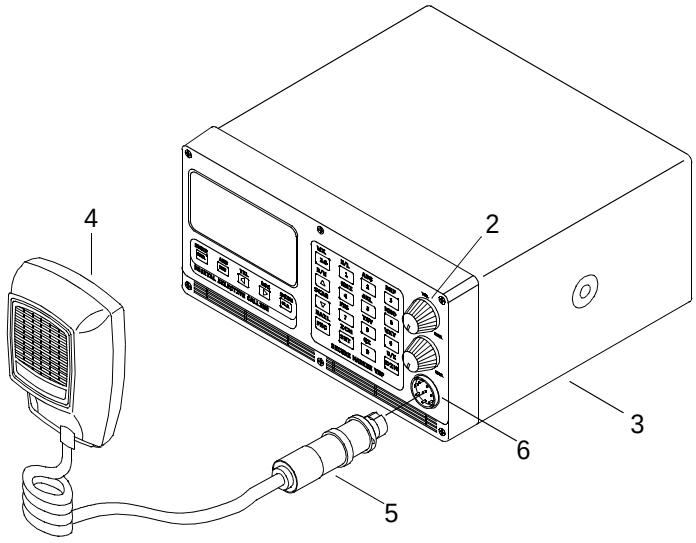


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Rotate the volume knob (2) on transceiver (3) to the OFF position.



3. Grasp microphone connector (5), turn knurled nut counterclockwise and remove microphone (4) from connector port (6).

4. Discard microphone (4).

INSTALL VHF/FM DSC TRANSCEIVER MICROPHONE

1. Line up keyway on new microphone connector (5) with keyway on transceiver connector port (6).

2. Insert connector (5) and tighten knurled nut clockwise to install.

3. Perform operational check on the DSC transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER
REPLACEMENT

INITIAL SETUP:

Tools

Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

VHF/FM DSC Transceiver
(0WF67)
PN DSC-500

Personnel Required

Seaman 88K

References

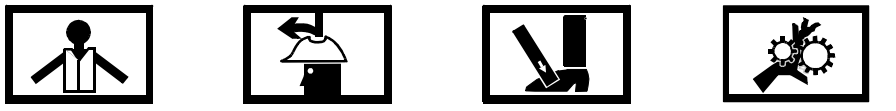
TM 55-1945-205-10-1

Equipment Condition

VHF/FM DSC Transceiver Microphone Removed. (WP 0302 00)

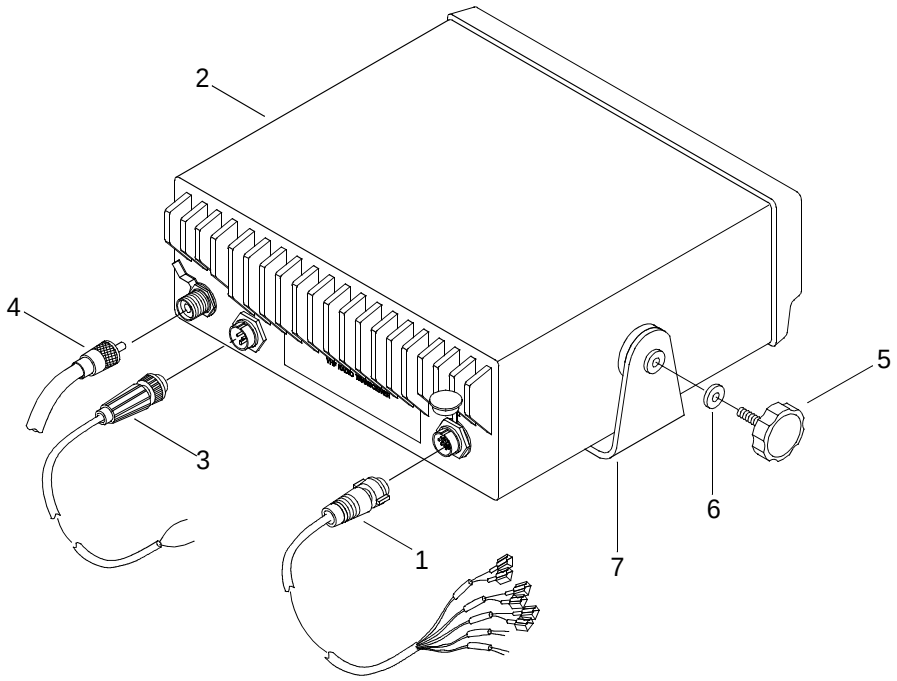
REMOVE VHF/FM DSC TRANSCEIVER

WARNING



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

1. Detach the interface cable (1) from the back of the transceiver (2) by turning the connector counterclockwise to remove.



2. Detach the power cable (3) from the back of the transceiver (2) by turning the connector counterclockwise to remove.

3. Detach the antenna coaxial cable (4) from the back of the transceiver (2) by turning the connector counterclockwise to remove.

4. Remove the two knobs (5) and washers (6) from the mount (7) by turning the knobs counterclockwise.

5. Remove the transceiver (2) from the mount (7).

INSTALL VHF/FM DSC TRANSCEIVER

1. Position the transceiver (2) in mount (7) and align the mount holes.

2. Install two washers (6) and knobs (5) through the mount (7) into the transceiver (2). Tighten knobs (5).

3. Attach antenna coaxial cable (4) to back of transceiver (2) by turning the connector clockwise and hand tighten.

4. Attach the power cable (3) to back of transceiver (2) by aligning the keyways, then turning the connector clockwise and hand tighten.

5. Attach the interface cable (1) to back of transceiver (2) by aligning the keyways then turning the connector clockwise and hand tighten.

6. Install VHF/FM DSC transceiver microphone. (WP 0302 00)

7. Perform operational check on the DSC transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER MOUNT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

VHF/FM DSC Transceiver Mount
(0JDM6)
PN 21-200003

Personnel Required

Seaman 88K

Equipment Condition

VHF/FM DSC Transceiver Microphone Removed. (WP 0302 00)
VHF/FM DSC Transceiver Removed. (WP 0303 00)

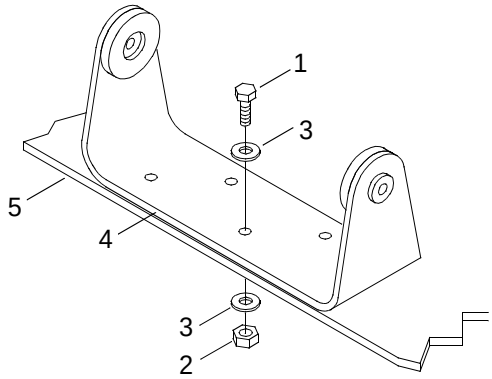
REMOVE VHF/FM DSC TRANSCEIVER MOUNT

WARNING



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

1. Remove four hex head bolts (1), four self-locking nuts (2) and eight flat washers (3) attaching mount (4) to shelf (5).



2. Remove and discard mount (4).

INSTALL VHF/FM DSC TRANSCEIVER MOUNT

1. Align new mount (4) with holes in shelf (5).
2. Install four hex head bolts (1), eight flat washers (3) and four self-locking nuts (2) through mount (4) and shelf (5).
3. Install VHF/FM DSC transceiver. (WP 0303 00)
4. Install VHF/FM DSC transceiver microphone. (WP 0302 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER ANTENNA
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)

Materials/Parts

Antenna
(23657)
PN 5240

Personnel Required

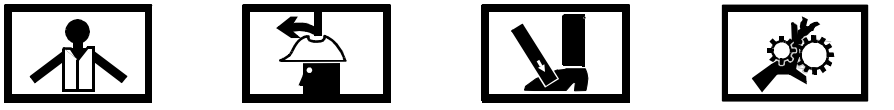
Engineer 88L

References

TM 55-1945-205-10-1

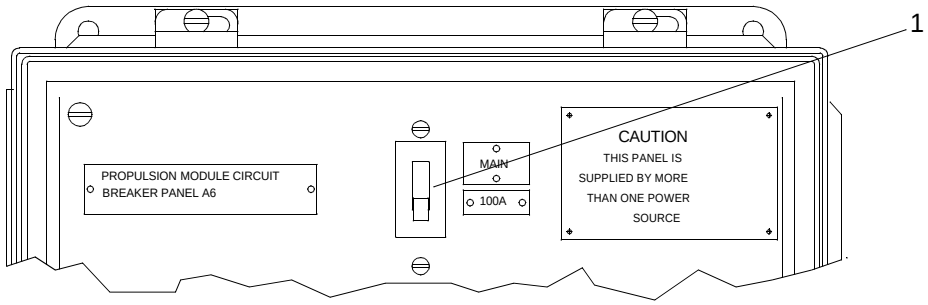
REMOVE VHF/FM DSC TRANSCEIVER ANTENNA

WARNING



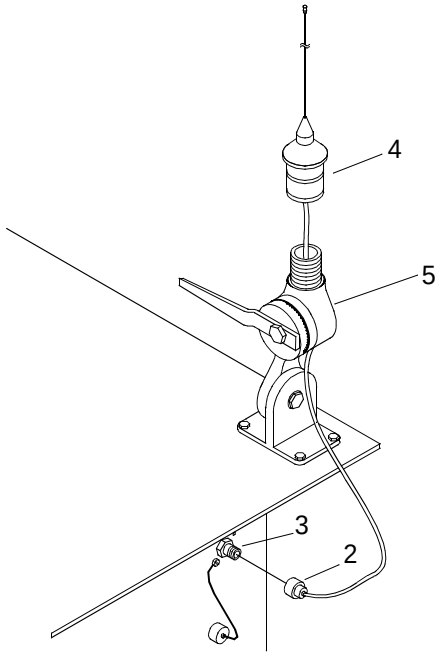
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Use a ladder to gain access to the top of the operators cab.

3. Disconnect VHF connector (2) from bulkhead adaptor (3).



4. Unscrew VHF/FM DSC transceiver antenna (4) from VHF/FM DSC transceiver mount (5).

5. Discard antenna (4).

INSTALL VHF/FM DSC TRANSCEIVER ANTENNA

1. Screw new VHF/FM DSC transceiver antenna (4) onto VHF/FM DSC transceiver mount (5).

2. Install VHF connector (2) on bulkhead adaptor (3).

3. Perform operational check on the DSC transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER ANTENNA MOUNT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Mount, Antenna
(23657)
PN 366-H
Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

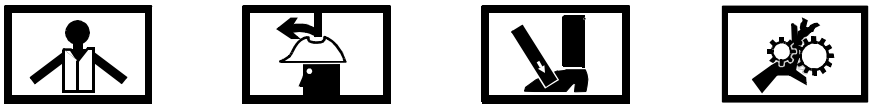
Engineer 88L

Equipment Condition

VHF/FM DSC Transceiver Antenna Removed. (WP 0305 00)

REMOVE VHF/FM DSC TRANSCEIVER ANTENNA MOUNT

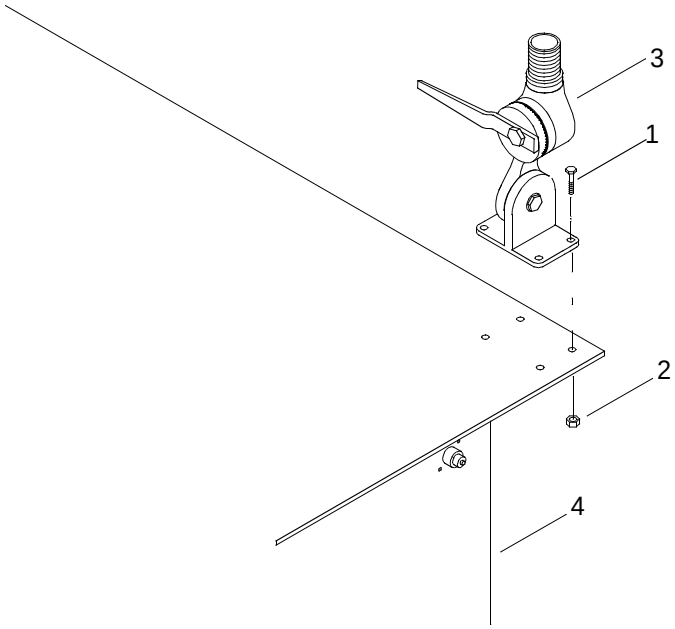
WARNING



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

1. Use a ladder to gain access to the top of the operators cab.

2. Remove the four cap screws (1) and four hex nuts (2) securing the VHF/FM DSC antenna mount (3) to the operators cab (4).



3. Remove and discard the VHF/FM DSC transceiver antenna mount (3).

INSTALL VHF/FM DSC TRANSCEIVER ANTENNA MOUNT

WARNING



CHEMICAL EYE PROTECTION

1. Apply antiseize compound to threads on cap screws (1).
2. Align new antenna mount (3) on operators cab (4) and secure with cap screws (1) and nuts (2).
3. Tighten nuts (2).
4. Install VHF/FM DSC transceiver antenna. (WP 0305 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
VHF/FM DSC TRANSCEIVER ANTENNA CABLE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Antenna Cable
(34712)
PN E06508-5
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

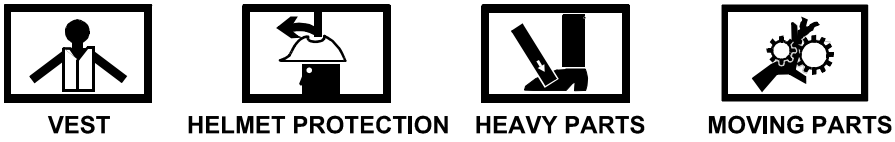
Engineer 88L

References

TM 55-1945-205-10-1

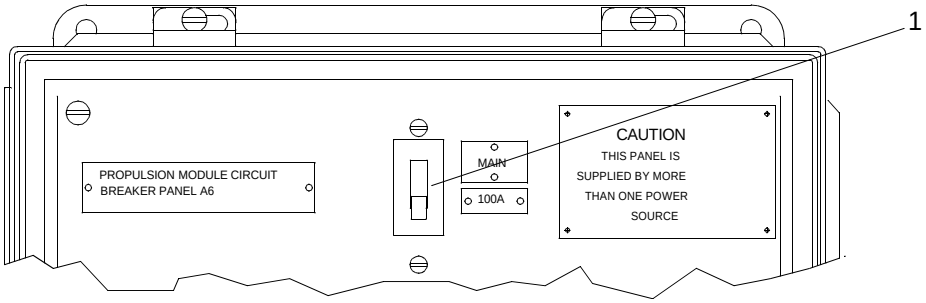
REMOVE VHF/FM DSC TRANSCEIVER ANTENNA CABLE

WARNING

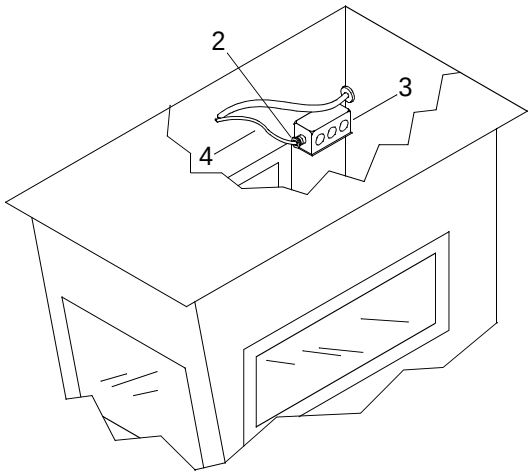


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

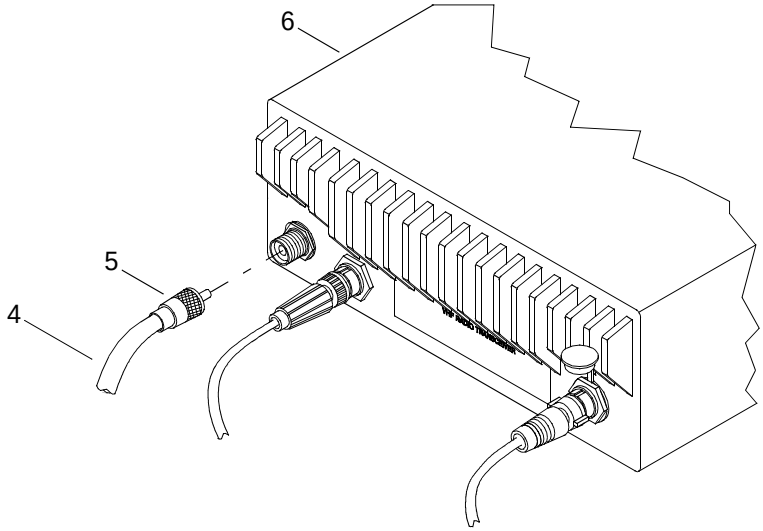


2. Remove antenna connector (2) from the male-to-male interface (3) on the rear inside wall of the operators cab by turning counterclockwise.



3. Cut all the tiedown straps holding the antenna cable (4) in place.

4. Remove antenna connector (5) from the rear of the VHF/FM DSC transceiver (6) by turning counterclockwise.



5. Remove and discard the antenna cable (4).

INSTALL VHF/FM DSC TRANSCEIVER ANTENNA CABLE

1. Attach the new antenna cable connector (5) to the rear of the VHF/FM DSC transceiver (6).

2. Run the new antenna cable (4) along inside top of operators cab starboard side wall.

3. Replace the tiedown straps to hold the antenna cable (4) in place in all locations.

4. Attach antenna cable connector (2) to the male-to-male interface (3) on the rear inside wall of the operators cab by turning clockwise.

5. Perform operational check on the DSC transceiver. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
COMPASS
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

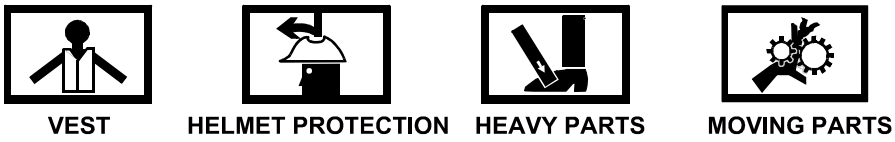
Compass
(34712)
PN HB-85

Personnel Required

Engineer 88L

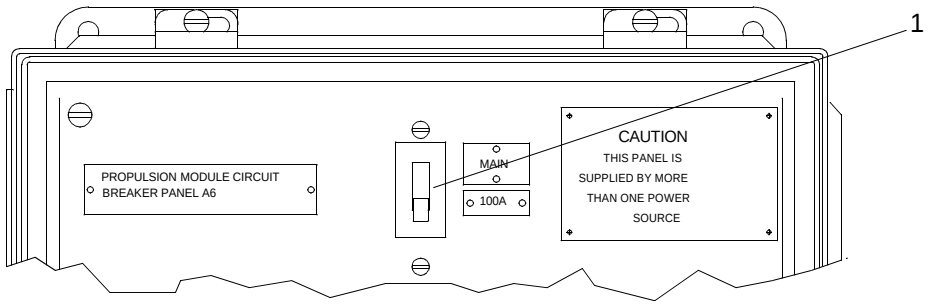
REMOVE COMPASS

WARNING



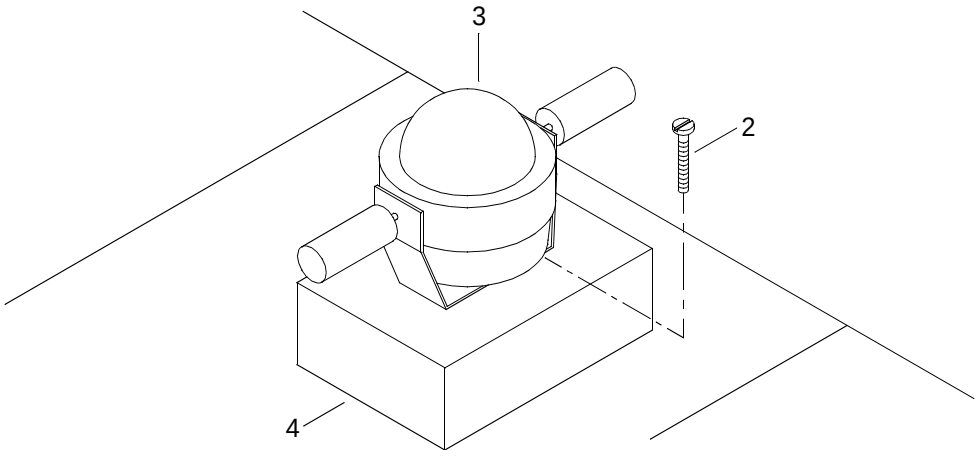
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Tag and disconnect compass wiring.

3. Remove two brass wood screws (2) that secures compass (3) to wooden block base (4).



4. Remove and discard compass (3).

INSTALL COMPASS

1. Align new compass (3) over two holes in wooden base (4).
2. Secure compass (3) to wooden base (4) with two brass wood screws (2).
3. Tighten screws (2).
4. Connect compass wiring and remove tags.
5. Reassess compass deviation card.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR) MEMORY BATTERY REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts

Battery, Non-rechargeable
(51215)
PN VE461-5013-0001

Personnel Required

Seaman 88K

References

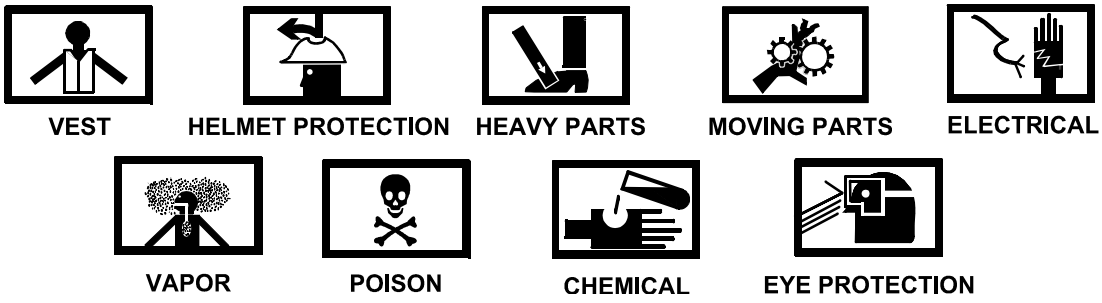
TM 55-1945-205-10-1

Equipment Condition

PLGR Removed. (WP 0312 00)

REMOVE PLGR MEMORY BATTERY

WARNING



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

NOTE

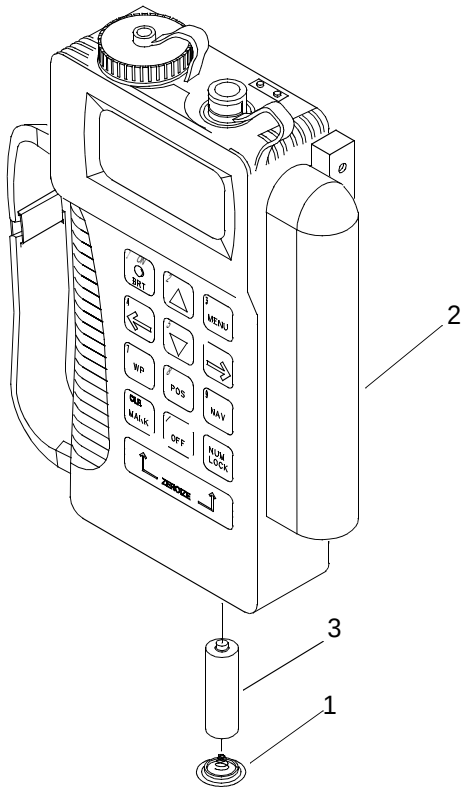
The PLGR must have a live main power source (battery or external) connected while replacing the memory battery or all memory will be lost.

1. Remove the memory battery cover (1) (bottom of the unit) by turning it counterclockwise with a flat-tip screwdriver.

2. Tilt the unit (2) right side up to slide battery (3) out.

3. Dispose of the old battery in accordance with local procedures.

4. Inspect the gasket on the battery cover (1) for damage and dirt. Clean if necessary.



INSTALL PLGR MEMORY BATTERY

1. Install the battery (3) positive (+) end first.

2. Tighten memory battery cover (1) by turning it in a clockwise direction until snug, using a flat tip screwdriver.

3. Install PLGR. (WP 0312 00)

4. Check the display. If the WARNING message PLGR HAS CLEARED MEMORY appears, perform initial setup of PLGR. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR) BATTERY REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts

Battery, Non-rechargeable
(U4596)
PN 2E/416-027

Personnel Required

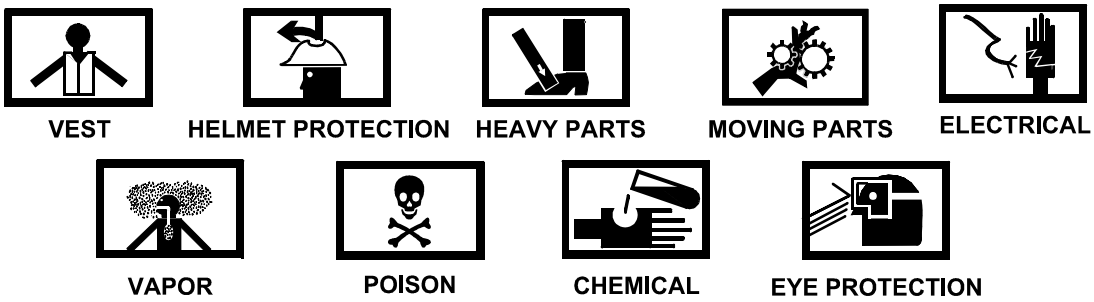
Seaman 88K

Equipment Condition

PLGR Removed. (WP 0312 00)

INSTALL PLGR BATTERY

WARNING

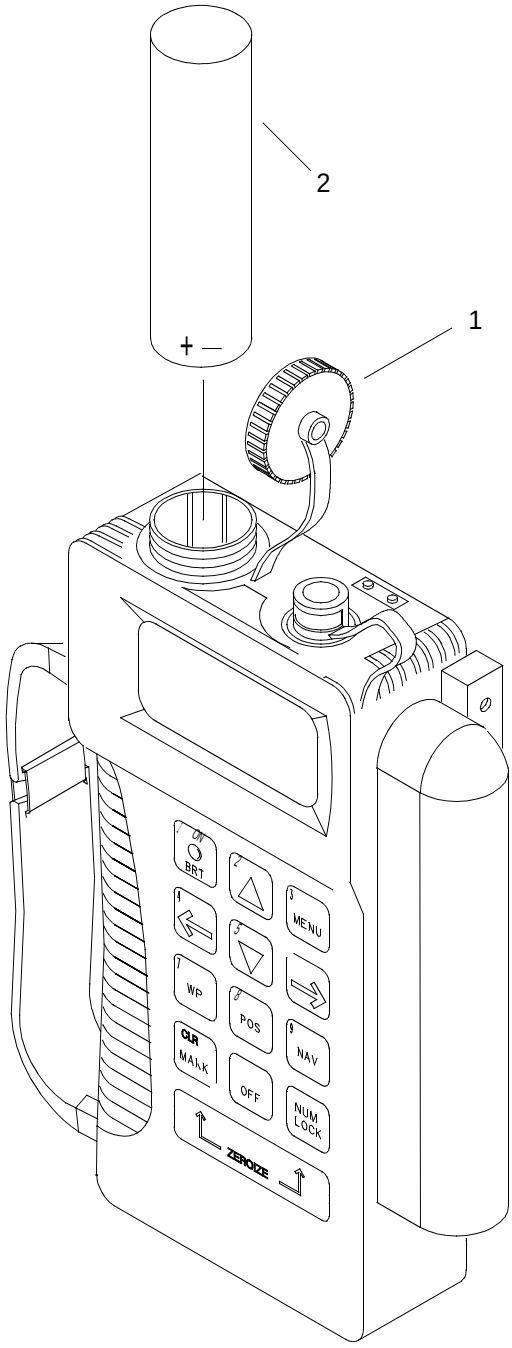


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

To ensure proper PLGR operation when installing or replacing both the power and memory batteries, ensure the power battery is installed or ship's power is connected to PLGR prior to memory battery replacement.

1. Remove the power battery cover (1) (top of the unit) by twisting it counterclockwise.



2. Inspect the gasket on the battery cover (1) for damage and dirt. Clean if necessary.

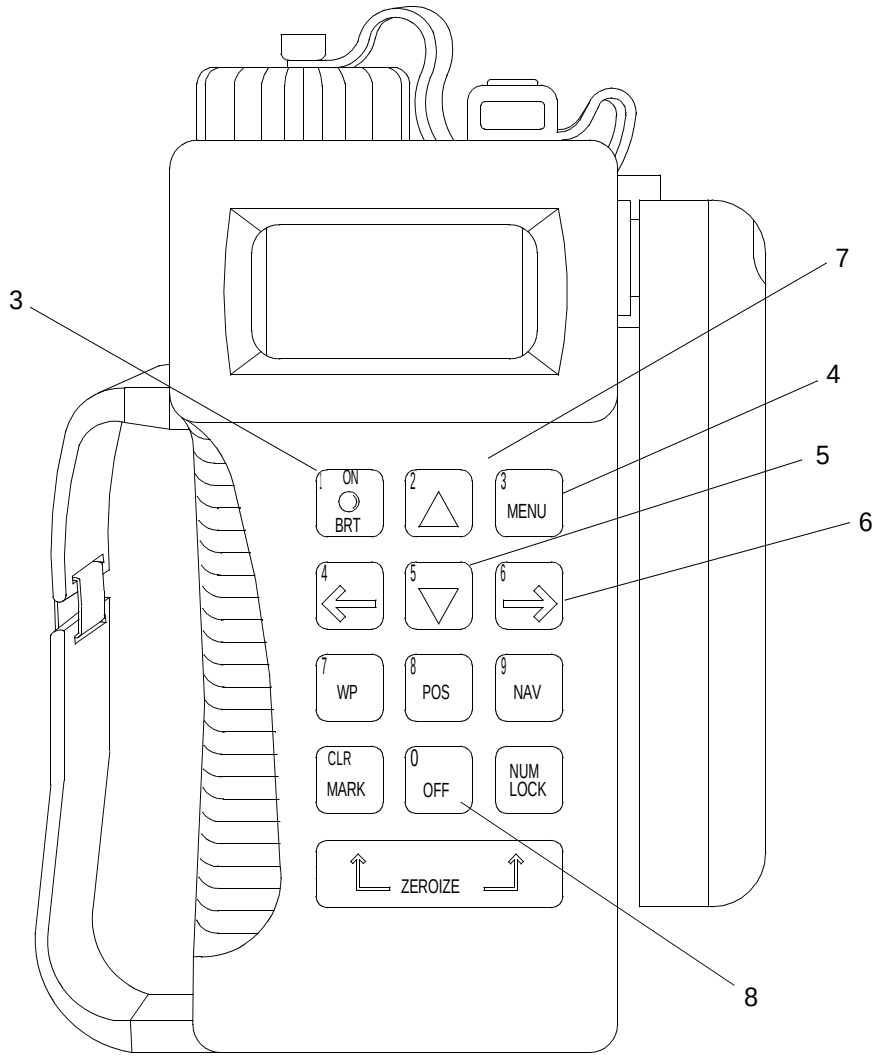
NOTE

If a nickel cadmium (rechargeable) battery is installed, check to be sure it is fully charged and observe correct polarity and observe correct polarity.

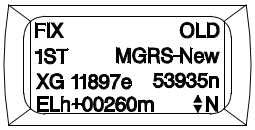
3. Install the battery (2) marked (+ -) end first.

4. Install the power battery cover (1) (top of the unit) by twisting it clockwise.

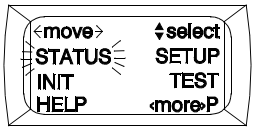
5. Press the ON key (3) to turn the PLGR on.



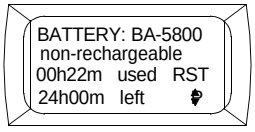
6. When the screen below is displayed, press the MENU key (4).



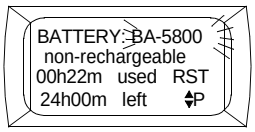
7. When STATUS flashes on screen, press the DOWN ARROW key (5) twice.



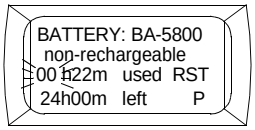
8. Press RIGHT ARROW key (6) to check type of battery.



9. Press RIGHT ARROW key (6) to select the battery type, either BA-5800 lithium, AA-Lithium or AA-Alkaline.



10. Press RIGHT ARROW key (6) to move to hour/minute display then using UP/DOWN ARROW keys (5/7), enter the amount of time the battery has been used. For example, if a used battery is installed with 1.5 hours of use, enter 0130 (hours and minutes). If a new battery is installed, enter 0000 (or activate the RST (reset) field). This time is to be updated each time a different battery is installed.



REMOVE PLGR BATTERY

1. Press the PLGR power OFF key (8).

2. Remove the power battery cover (1) (top of the unit) by twisting it counterclockwise. Tilt the unit (8) upside down to slide battery (2) out into your hand.

3. Install PLGR. (WP 0312 00)

NOTE

The BA-5800/U lithium sulphur dioxide (LISO2) battery is the secondary power source for the PLGR and contains a feature called the Complete Discharge Device (CDD). The CDD is a small switch located under a removable seal at the top of the BA-5800/U. Its purpose is to consume remaining lithium in the battery after use and before disposal.

4. Press the CDD button and place the BA-5800 in a ventilated non-occupied area for five days.

5. Dispose of the old battery in accordance with local procedures.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR)
INTERFACE CABLE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

PLGR Interface Cable
(0JDM6)
PN 50-200027
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

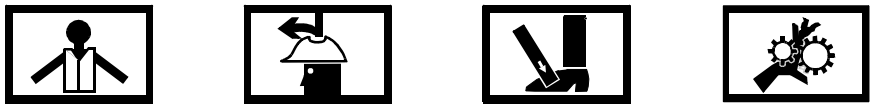
Engineer 88L

References

TM 55-1945-205-10-1

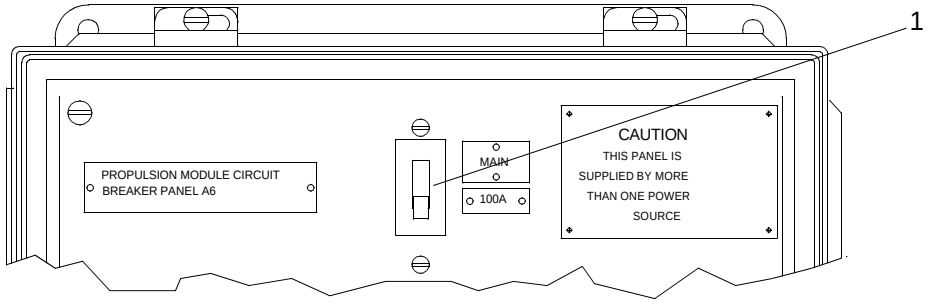
REMOVE PLGR INTERFACE CABLE

WARNING

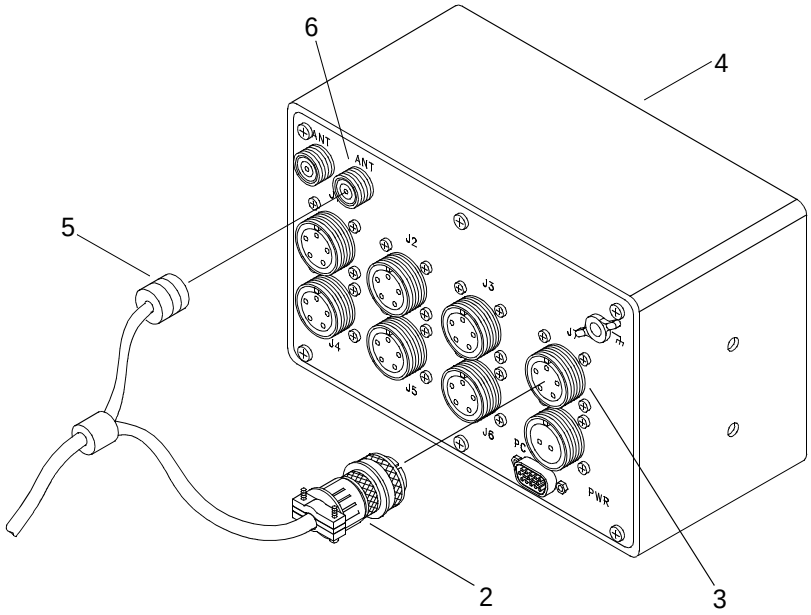


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.

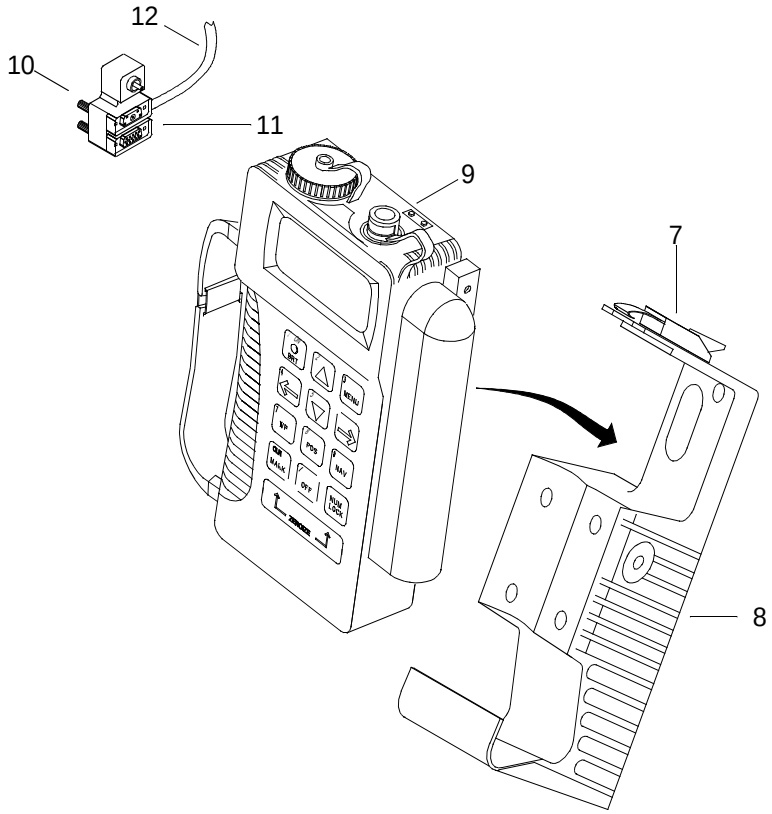


2. Loosen the connector shell of the cable plug (2) and unplug the PLGR cable plug (2) from the port (3) on the back of the AN/PSN-11 interface and switchbox (4).



3. Detach antenna coaxial lead (5) from the port (6) of the interface and switchbox (4) back.

4. Lift up and release clip (7) on top of PLGR mounting base (8).



5. Remove PLGR (9) from mounting base (8).

6. Loosen four knurled screws (10) on PLGR cable connector (11).
7. Cut tiedown straps and remove the PLGR interface cable (12).
8. Discard cable (12).

INSTALL PLGR INTERFACE CABLE

1. Position new PLGR cable (12) on PLGR (8).
2. Tighten four knurled screws (10) on cable connector (11).
3. Position PLGR (9) on mounting base (8), base first.
4. Align mounting base retaining clip (7) with clip retainer on PLGR (9) and snap shut.
5. Attach antenna coaxial lead (5) to the port (6) of the interface and switchbox (4) back.
6. Plug the PLGR cable plug (2) into the port (3) of the interface and switchbox (4) back. Tighten the connector shell of the cable plug (2) on the back of the interface and switchbox (4).
7. Secure PLGR interface cable with tiedown straps.
8. Perform operational check on the PLGR. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR)
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

PLGR
(13499)
PN 822-0077-103

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

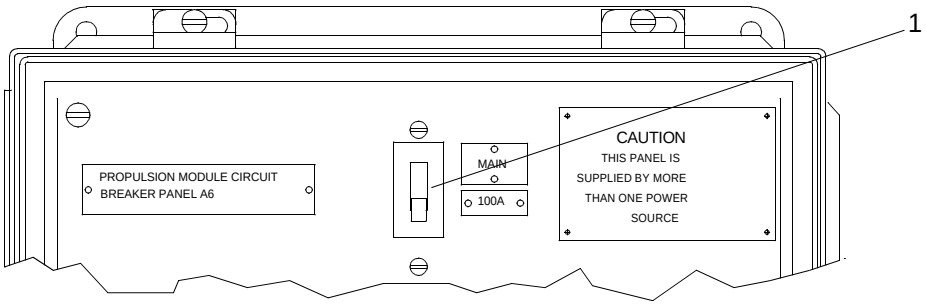
REMOVE PLGR

WARNING

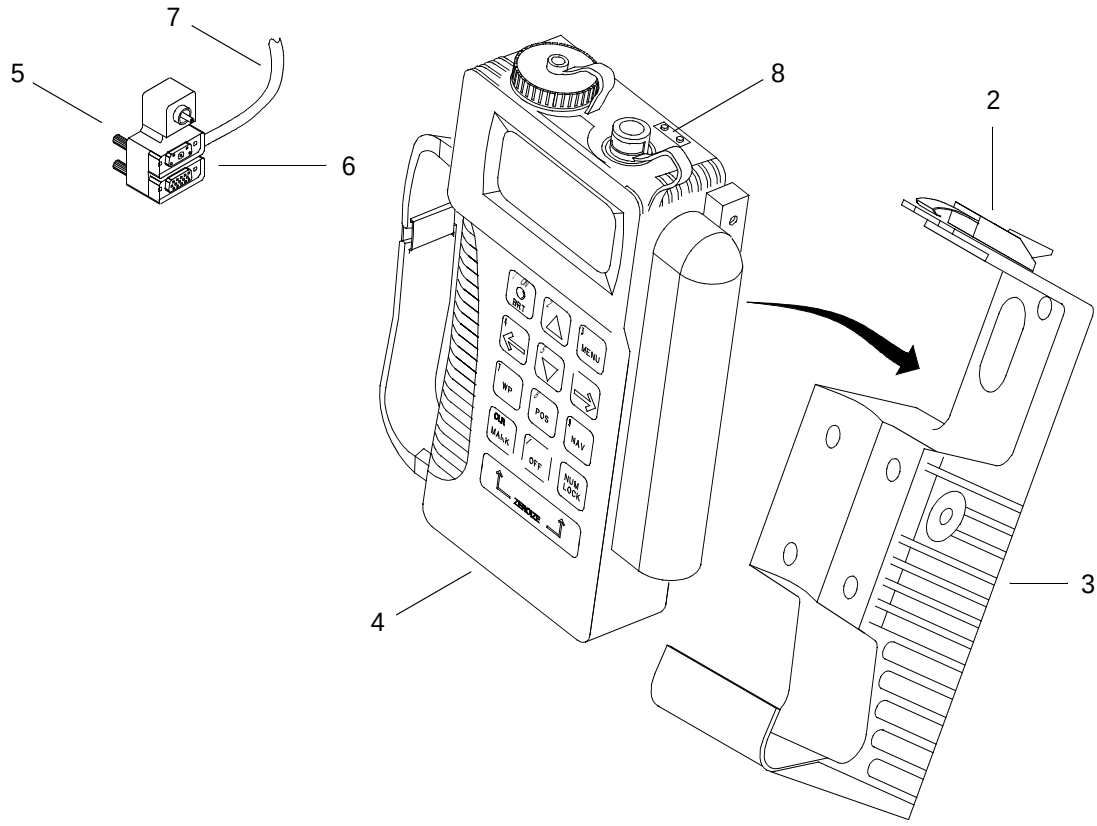


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Lift up and release clip (2) on top of PLGR mounting base (3).



3. Remove PLGR (4) from mounting base (3).
4. Loosen four knurled screws (5) on PLGR cable connector (6) and remove cable (7).
5. Remove the PLGR memory battery. (WP 0309 00)

INSTALL PLGR

1. Install the PLGR memory battery. (WP 0309 00)
2. Position and install PLGR cable connector (6) on the new PLGR (4) and tighten four knurled screws (5).
3. Position PLGR (4) on mounting base (3), base first.
4. Align mounting base retaining clip (2) with clip retainer (8) and snap shut.
5. Position MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to on.
6. Perform initial setup of PLGR. (TM 55-1945-205-10-1)
7. Position MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 to off.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR)
MOUNTING BASE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

PLGR Mounting Base
(19200)
PN 12967998

Personnel Required

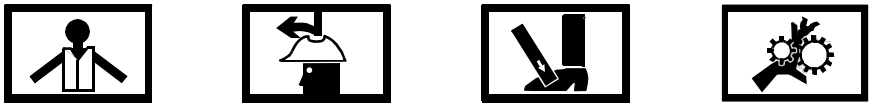
Engineer 88L

Equipment Condition

PLGR Removed. (WP 0312 00)

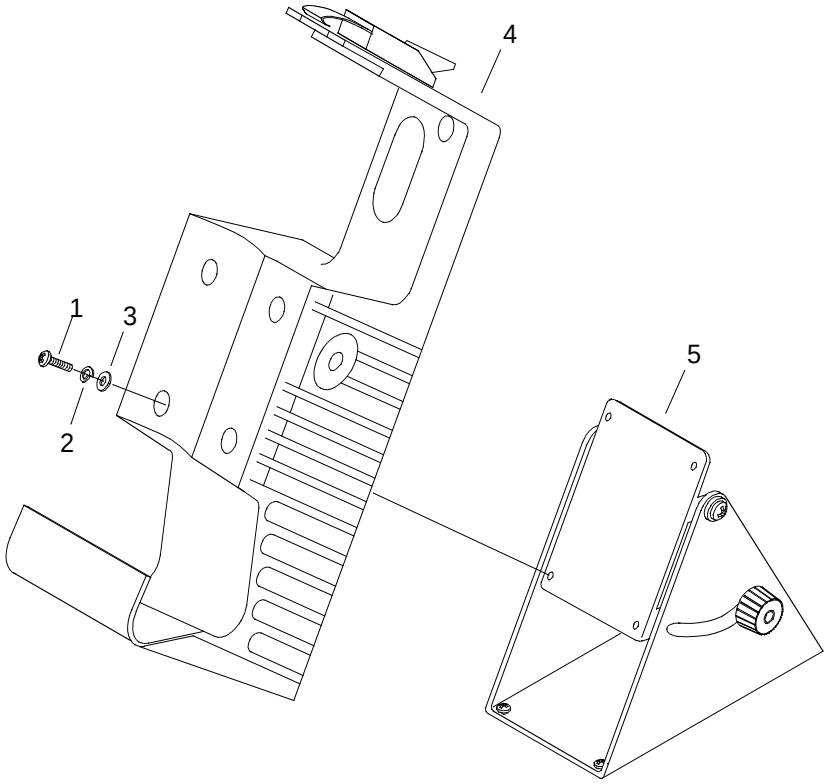
REMOVE PLGR MOUNTING BASE

WARNING



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

1. Remove four screws (1), lock washers (2) and washers (3).



2. Remove mounting bracket (4) from PLGR mounting base (5).

3. Discard mounting base (5).

INSTALL PLGR MOUNTING BASE

1. Position mounting bracket (4) on new PLGR mounting base (5).

2. Install four screws (1), lock washers (2) and flat washers (3) through mounting bracket (4) and PLGR mounting base (5).

3. Tighten screws (1).

4. Install PLGR. (WP 0312 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR)
PIVOT MOUNT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

PLGR Pivot Mount
(0JDM6)
PN 50-200022

Personnel Required

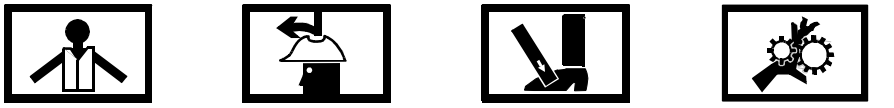
Engineer 88L

Equipment Condition

PLGR Removed. (WP 0312 00)

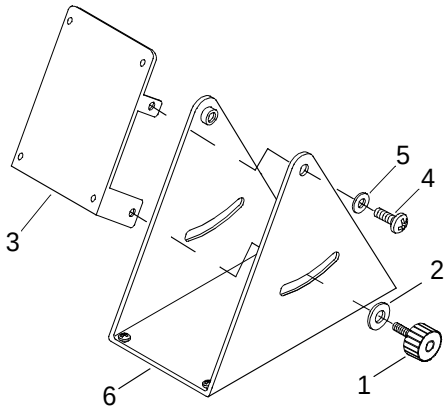
REMOVE PLGR PIVOT MOUNT

WARNING



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

1. Remove two friction knobs (1) and washers (2) from PLGR pivot mount (3).



2. Remove two screws (4) and nylon washers (5) from PLGR pivot mount (3).
3. Remove PLGR pivot mount (3) from PLGR pivot base (6).
4. Discard pivot mount (3).

INSTALL NAVIGATION PLGR PIVOT MOUNT

1. Position new PLGR pivot mount (3) on PLGR pivot base (6).
2. Install two screws (4) and nylon washers (5) through pivot base (6) and into PLGR pivot mount (3).
3. Install two friction knobs (1) and washers (2) through PLGR pivot base (6) and into pivot mount (3).
4. Tighten knobs (1).
5. Install PLGR. (WP 0312 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PRECISION LIGHTWEIGHT GLOBAL POSITIONING RECEIVER (PLGR)
PIVOT BASE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

PLGR Pivot Base
(0JDM6)
PN 50-200023

Personnel Required

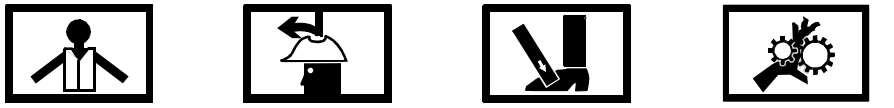
Engineer 88L

Equipment Condition

PLGR Removed. (WP 0312 00)
PLGR Pivot Mount Removed. (WP 0314 00)
PLGR Mounting Base Removed. (WP 0313 00)

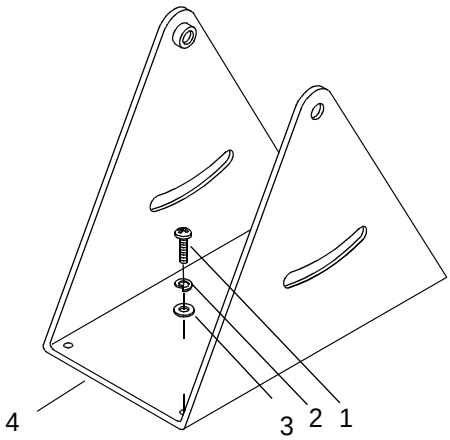
REMOVE PLGR PIVOT BASE

WARNING



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

1. Remove screw (1), lock washer (2) and flat washers (3) from each corner of the PLGR pivot base (4).



2. Remove PLGR pivot base (4) from mounting surface.
3. Discard PLGR pivot base (4).

INSTALL PLGR PIVOT BASE

1. Position new PLGR pivot base (4) on mounting surface.
2. Install screw (1), lock washer (2) and flat washers (3) in each corner of the PLGR pivot base (4).
3. Tighten screw (1).
4. Install PLGR mounting base. (WP 0313 00)
5. Install PLGR pivot mount. (WP 0314 00)
6. Install PLGR. (WP 0312 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
GLOBAL POSITIONING SYSTEM (GPS) ANTENNA REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

GPS Antenna
(0JDM6)
PN 50-200021
Tape, Insulation, Electrical (Item 31, WP 0382 00)
Tape, Electrical (Item 32, WP 0382 00)
Insulating Varnish, Electrical (Item 12, WP 0382 00)
Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

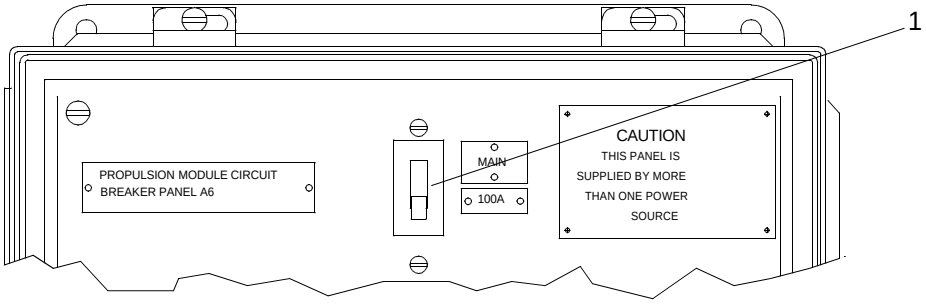
REMOVE GPS ANTENNA

WARNING



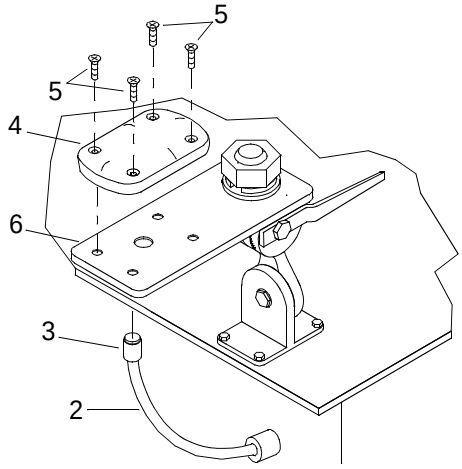
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Use a ladder to gain access to the top of the operators cab.

3. Peel off electrical tape from outer insulation of antenna cable (2).



CAUTION

When cutting tape, care should be taken to avoid cutting cable. Cutting the cable could cause damage to equipment.

   a. Score any remaining electrical tape with sharp utility knife.

   b. Remove electrical tape.

   c. Repeat if necessary, to expose antiseize tape (rubber tape).

4. Peel off rubber tape from antenna cable.

   a. Score any remaining rubber tape with sharp utility knife.

   b. Remove rubber tape.

   c. Repeat if necessary to expose connector.

5. Disconnect GPS antenna cable connector (3) from GPS antenna (4).

6. Remove four cap screws (5) securing GPS antenna (4) to antenna plate (6).

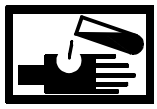
7. Remove GPS antenna (4) from antenna mount plate (6).

8. Discard antenna (4).

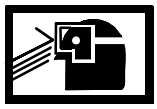
INSTALL GPS ANTENNA

1. Position and install new antenna (4) on mount plate (6).

WARNING



CHEMICAL



EYE PROTECTION

2. Apply antiseize compound to threads of screws (5).
3. Install four cap screws (5) through antenna into mount plate (6).
4. Tighten screws (5).
5. Connect GPS antenna cable connector (3) to GPS antenna (4).

NOTE

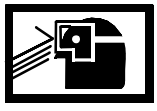
Ensure that the connection is secured and that the cable is secured in the connector.

5. Wrap rubber tape around cable approximately 2 in. below the edge of the antenna connector (1), stretching the tape tightly.
6. Wrap rubber tape around cable, toward the antenna, stretching tightly to make a tight seal.
7. Cut rubber tape with knife when connector is completely covered with tape.
8. Apply a second layer of rubber tape overlapping the previous layer by approximately 75%.
9. Apply electrical tape around cable approximately 1 in. below the edge of the rubber tape stretching the tape slightly.
10. Continue wrapping electrical tape around cable and connector, stretching slightly, and overlapping previous layer by approximately 50%.
11. Apply a second layer of electrical tape starting at the connector and working towards the cable.
12. Continue past the first layer approximately 1 in. Ensure the final 3 wraps are not stretched in order to prevent unravelling.
13. Cut tape with knife.

WARNING



CHEMICAL



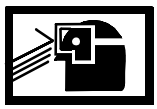
EYE PROTECTION

14. Apply electrical insulating varnish on electrical tape, covering completely, and extending onto antenna cable (2) and antenna (4) ½ in. Allow electrical insulating varnish to dry.

WARNING



CHEMICAL



EYE PROTECTION

15. Apply a second coat of electrical insulating varnish on the electrical tape, covering completely, and extending onto antenna cable (1) and antenna (2) ½ in.

16. Perform operational check on the PLGR. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
GLOBAL POSITIONING SYSTEM (GPS) ANTENNA MOUNT PLATE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)

Materials/Parts

Mount Plate
(0JDM6)
PN 50-200079

Personnel Required

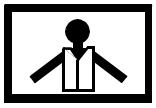
Engineer 88L

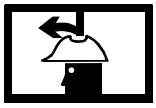
Equipment Condition

GPS Antenna Removed. (WP 0316 00)

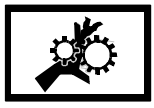
REMOVE GPS ANTENNA MOUNT PLATE

WARNING


VEST


HELMET PROTECTION

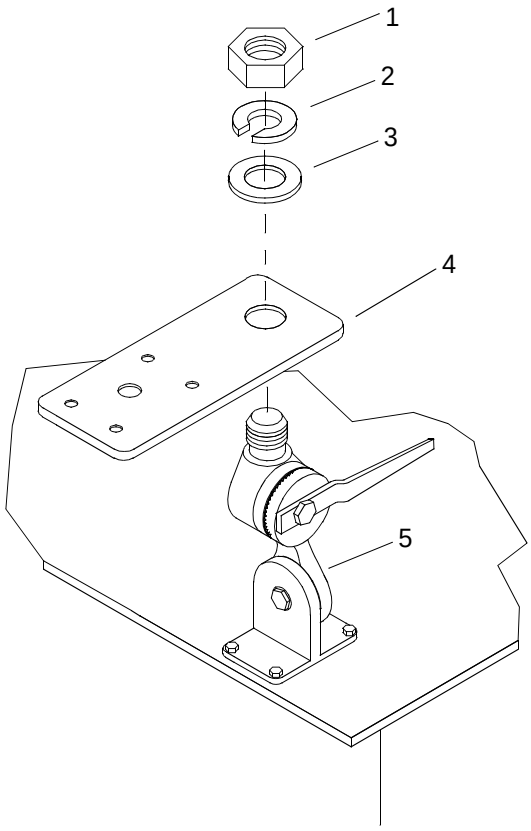

HEAVY PARTS


MOVING PARTS

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

1. Using ladder, gain access to the top of the operators cab.

2. Remove nut (1), lock washer (2) and washer (3) from stud on top of antenna mount (5).



3. Remove mount plate (4) from antenna mount (5).

4. Discard mount plate (4).

INSTALL GPS ANTENNA MOUNT PLATE

1. Position new mount plate (4) on antenna mount (5).

2. Install washer (3), lock washer (2) and nut (1)on stud atop antenna mount (5).

3. Tighten nut (1).

4. Install Global Positioning System (GPS) antenna (WP 0316 00)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
GLOBAL POSITIONING SYSTEM (GPS) ANTENNA MOUNT
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

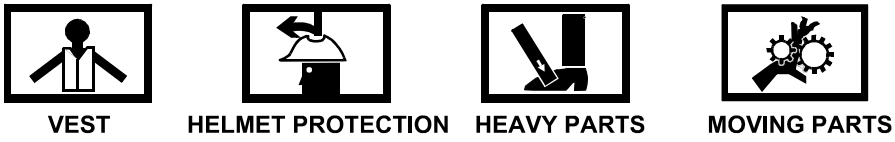
Mount
(23657)
PN 4187
Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

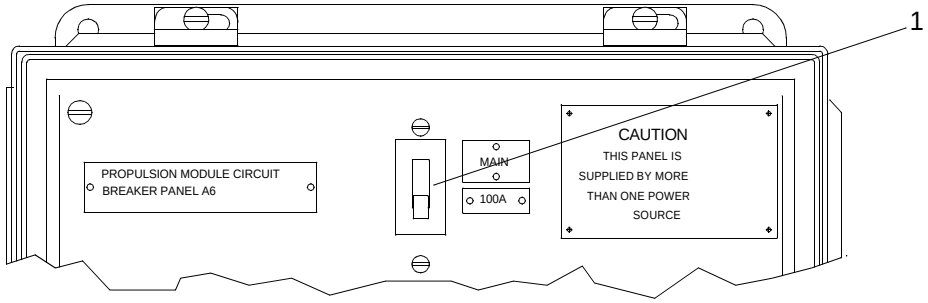
REMOVE GPS ANTENNA MOUNT

WARNING



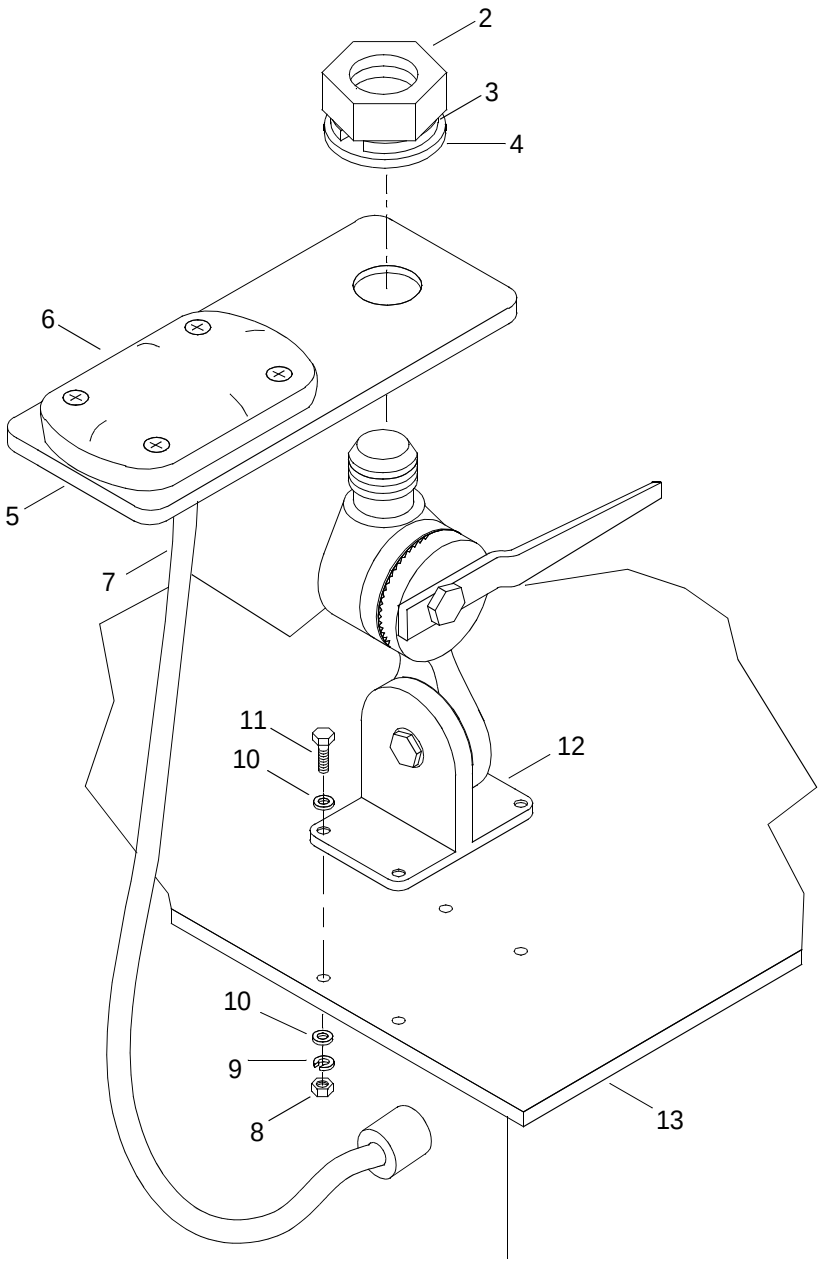
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Using ladder, gain access to the top of the operators cab.

3. Remove nut (2) and lock washer (3) and washer (4) off antenna mount plate (5).



CAUTION

Care should be given in placement of the removed antenna and antenna cable to prevent damage to the equipment. Failure to comply could result in damage to equipment.

4. Remove antenna mount plate (5) with attached antenna (6) and antenna cable (7).

5. Remove four nuts (8), four lock washers (9), eight washers (10) and four bolts (11) from antenna mount (12).

6. Remove antenna mount (12) from top of operators cab (13).

7. Discard antenna mount (12).

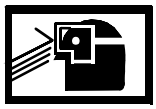
INSTALL GPS ANTENNA MOUNT

1. Install new antenna mount (12) on top of operators cab (13).

WARNING



CHEMICAL



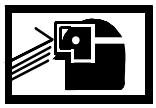
EYE PROTECTION

2. Apply antiseize compound to threads of bolts (11).
3. Install four bolts (11), eight washers (10), four lock washers (9) and four nuts (8).
4. Tighten nuts (8).
5. Position antenna mount plate (5) with attached antenna (6) and antenna cable (7) on antenna mount (12).

WARNING



CHEMICAL



EYE PROTECTION

6. Apply antiseize compound to threads of antenna mount (12).
7. Install antenna mount plate (5), washer (4), lock washer (3) and nut (2) on the antenna mount (12)
8. Tighten nut (2).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
GLOBAL POSITIONING SYSTEM (GPS) ANTENNA CABLE REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Crimping Tool, Terminal Hand (Item 8, WP 0383 00)
Pliers (Wire Cutter, Combination) (Item 25, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Cable, Antenna
(0JDM6)
PN 02-10-M17164
Connectors, TNC
(0JDM6)
PN 02-AT575-32W-TNC-0
Qty 2
Strap, Tiedown (Item 30, WP 0382 00)
Tape, Insulation, Electrical (Item 33, WP 0382 00)
Tape, Electrical (Item 32, WP 0382 00)
Insulating Varnish, Electrical (Item 12, WP 0382 00)

Personnel Required

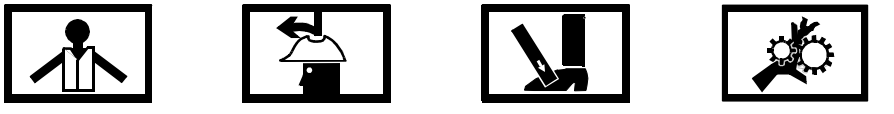
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE GPS ANTENNA CABLE

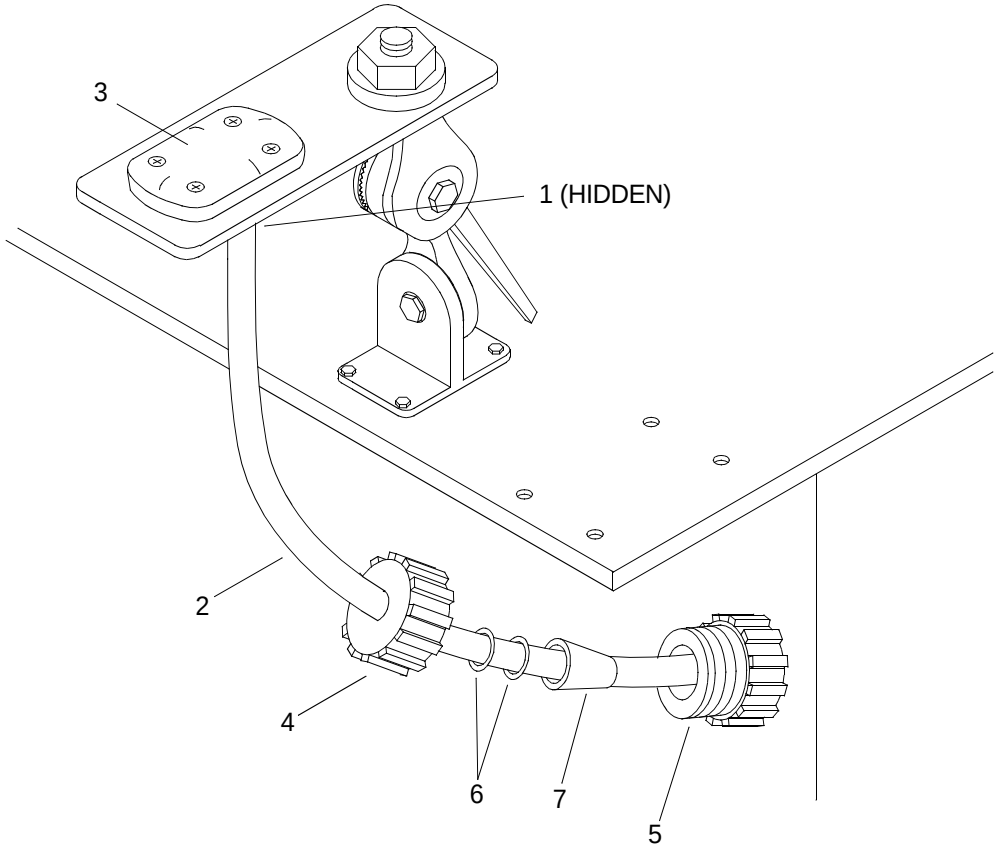
WARNING



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

1. Using ladder, gain access to the top rear of the operators cab.

2. Peel off electrical tape from antenna cable connector (1) and antenna cable (2).



   a. Score any remaining electrical tape with sharp utility knife.

   b. Remove electrical tape.

   c. Repeat if necessary, to expose rubber tape.

3. Peel off rubber tape from antenna cable (2).

   a. Score any remaining rubber tape with sharp utility knife.

   b. Remove rubber tape.

   c. Repeat if necessary to expose connector (1).

4. Detach antenna connector (1) from the bottom of the antenna (3) by turning the connector counterclockwise.

5. On outside rear of the cab, unscrew the nylon stuffing tube packing retainer cap (4) by turning counterclockwise and slide the retainer cap (4) away from the nylon stuffing tube (5).

6. Slide the plastic packing washers (6), if installed, away from the nylon stuffing tube (5).

7. Slide the stuffing tube packing (7) away from the nylon stuffing tube (5).

8. Cut the GPS antenna connector (1) from the end of the antenna cable (2). Use combination wire cutter pliers.

NOTE

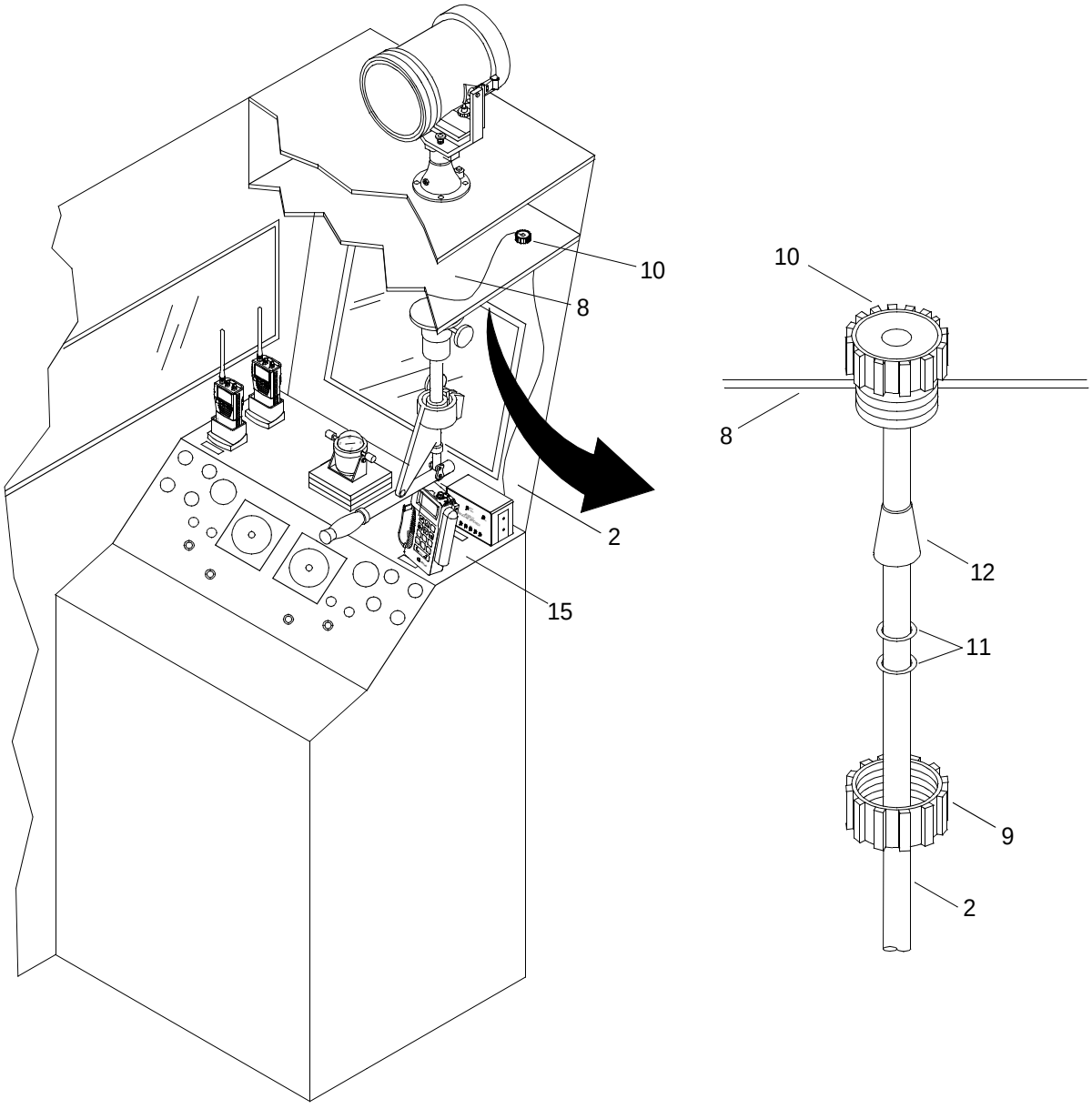
Retain the stuffing tube packing, plastic packing washers and packing retainer cap for installation.

9. Remove the nylon stuffing tube packing retainer cap (4), plastic packing washers (5) and stuffing tube packing (7) from the antenna cable (2).

10. From inside the operators cab, pull the antenna cable (2) through the nylon stuffing tube (5).

11. Cut all tiedown straps securing antenna cable (2) in operators cab.

12. Below communication equipment shelf (8) in operators cab, unscrew the nylon stuffing tube packing retainer cap (9) from the nylon stuffing tube (10) by turning counterclockwise.



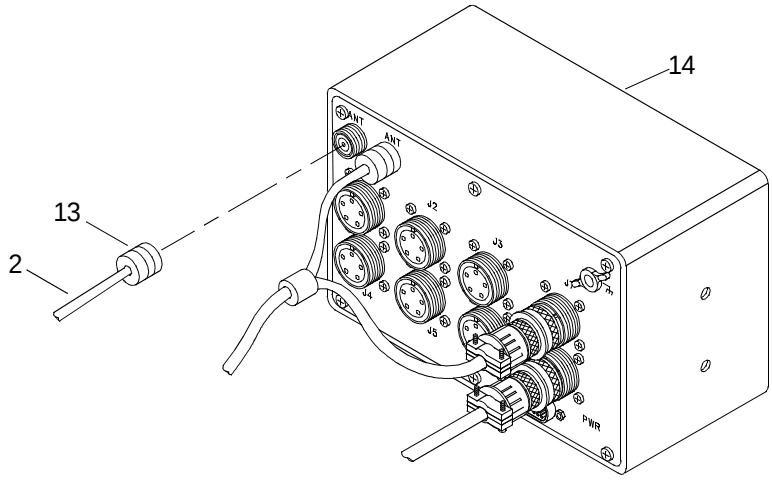
13. Pull the antenna cable (2) down through the nylon stuffing tube (10).

NOTE

Retain the stuffing tube packing, plastic packing washers and packing retainer cap for installation.

14. Remove the retainer cap (9), plastic packing washers (11) and stuffing tube packing (12) from the antenna cable (2).

15. Detach antenna connector (13) from rear of the interface and switchbox (14).



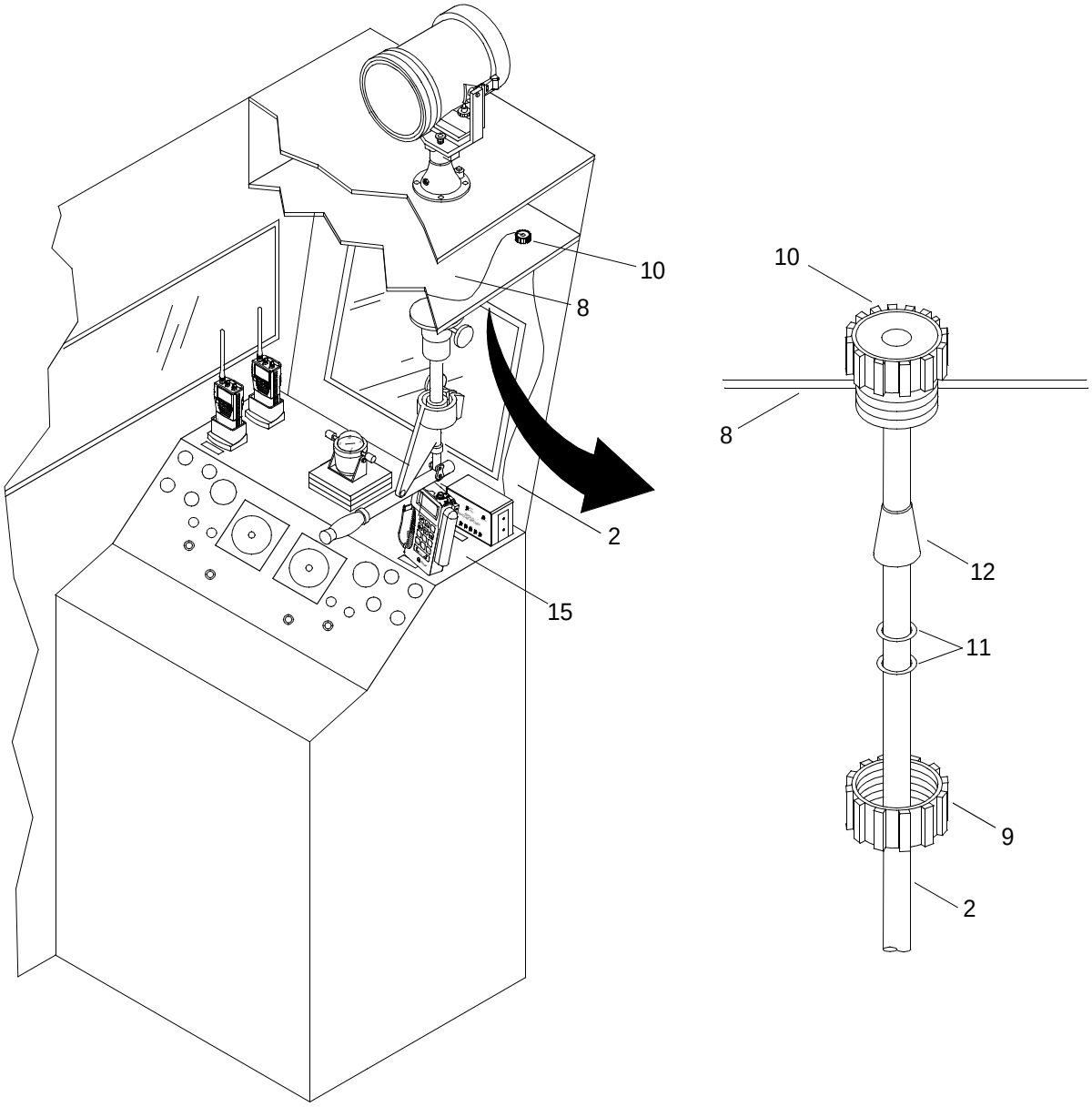
16. Remove antenna cable (2) from operators cab and discard.

INSTALL GPS ANTENNA CABLE

1. Attach a new TNC connector to one end of the new antenna cable (2). Use crimper.

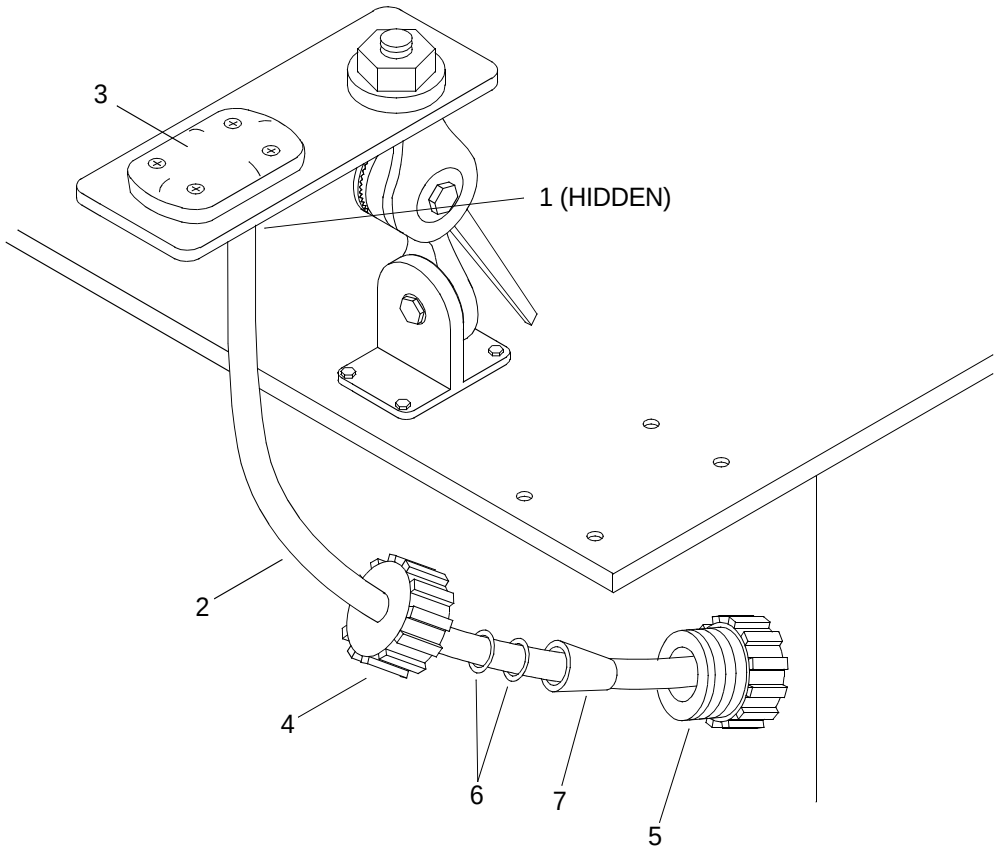
2. Attach the new TNC connector (13) to the rear of the interface and switchbox (14).

3. Install the retainer cap (9) on the antenna cable (2).



4. Install the plastic packing washers (11) on the antenna cable (2).
5. Install the stuffing tube packing (12) on the antenna cable (2).
6. Run the new antenna cable up through the stuffing tube (10).
7. Secure new antenna cable to cable bundle between the console (15) and communication equipment shelf (8). Use tiedown straps.
8. Install retainer cap (9) on nylon stuffing tube (10) by turning the retainer cap (9) clockwise.
9. Run the new antenna cable (2) along the starboard side of the operators cab.
10. Secure the new antenna cable (2) to the VHF/FM DSC transceiver antenna cable. Use tiedown straps.

11. Run the new antenna cable through (2) the nylon stuffing tube (5) on the aft wall of the operators cab.



12. Install the stuffing tube packing (7) on the antenna cable (2).

13. Install the plastic packing washers (6) on the antenna cable (2).

14. Install the retainer cap (4) on the antenna cable (2).

15. Install retainer cap (4) on nylon stuffing tube (5) by turning the retainer cap (4) clockwise.

16. Attach a new TNC connector to the antenna end of the new antenna cable (2). Use crimper.

17. Install new antenna connector (1) on GPS antenna (3) by turning clockwise.

NOTE

Ensure that the connection is secured and that the cable is secured in the connector.

18. Wrap rubber tape around cable approximately 2 in. below the edge of the antenna connector (1), stretching the tape tightly.

19. Wrap rubber tape around cable, toward the antenna (3), stretching tightly to make a tight seal.

20. Cut rubber tape with knife when connector is completely covered with tape.

21. Apply a second layer of rubber tape overlapping the previous layer by approximately 75%.

22. Apply electrical tape around cable approximately 1 in. below the edge of the rubber tape stretching the tape slightly.

23. Continue wrapping electrical tape around cable and connector, stretching slightly, and overlapping previous layer by approximately 50%.

24. Apply a second layer of electrical tape starting at the connector and working towards the cable.

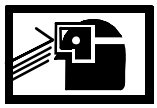
25. Continue past the first layer approximately 1 in. Ensure the final 3 wraps are not stretched in order to prevent unravelling.

26. Cut tape with knife.

WARNING



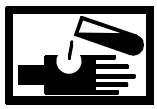
CHEMICAL



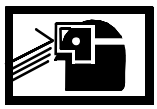
EYE PROTECTION

27. Apply electrical insulating varnish, on electrical tape, covering completely, and extending onto antenna cable (2) and antenna (3) ½ in. Allow electrical insulating varnish to dry.

WARNING



CHEMICAL



EYE PROTECTION

28. Apply a second coat of electrical insulating varnish on the electrical tape, covering completely, and extending onto antenna cable (2) and antenna (3) ½ in.

29. Perform operational check on the PLGR. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
NAVIGATIONAL HORN
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)

Materials/Parts

Navigational Horn
(98905)
PN IC/H3D3

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

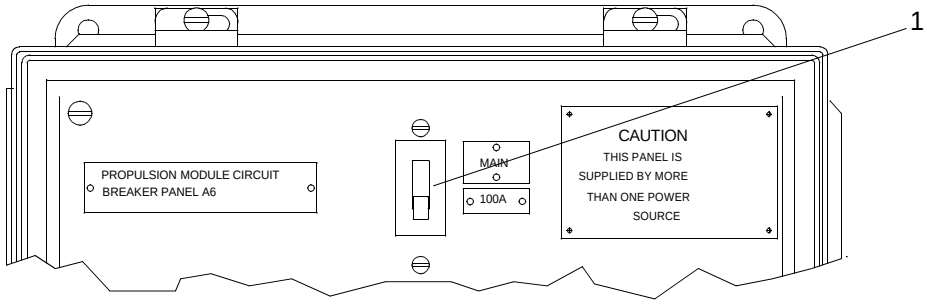
REMOVE NAVIGATION HORN

WARNING



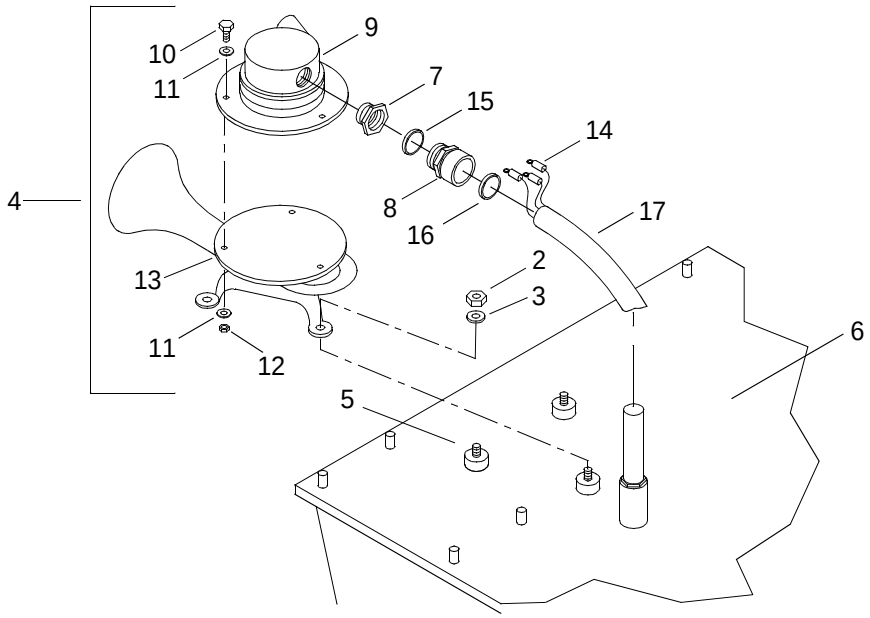
All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Using ladder, gain access to the top of the operators cab.

3. Remove three self-locking cap nuts (2) and washers (3) securing the navigational horn assembly (4) to studs (5) on the roof of the operators cab (6).



4. Remove pipe reducer (7) and stuffing tube (8) from the horn bellows (9).

5. Remove six hex nuts (10), twelve washers (11) and six hex head bolts (12) securing the horn bellows (9) to the horn pedestal (13).

6. Separate the horn bellows (9) from the horn pedestal (13).

7. Tag and disconnect the three electrical leads (14) from the interior of the horn bellows (9).

8. Remove pipe reducer (7), stuffing tube (8), packing (15) and grounding gasket (16) from the electrical cable (17).

9. Discard navigation horn assembly (4).

INSTALL NAVIGATION HORN

1. Install electrical cable (17) through the grounding gasket (16), stuffing tube (8), packing (15),and pipe reducer (7) into the side of the new horn bellows (9).

2. Connect three electrical leads (14) inside the horn bellows (9) and remove tags.

3. Install pipe reducer (7), packing (16), stuffing tube (8) and grounding gasket (16) into the side of the horn bellows (9). Tighten stuffing tube (8) and pipe reducer (7).

4. Position the horn bellows (9) on the new horn pedestal (13) and secure with six hex head bolts (12), twelve washers (11) and six hex nuts (10). Tighten hex nuts (10)

5. Position the new navigational horn assembly (4) on studs (5) on roof of the operators cab (6) and secure with three washers (3) and self-locking cap nuts (2). Tighten self-locking cap nuts (2).

6. Perform operational check on the navigation horn. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAST ENCLOSURE A7 FUSES
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Puller, Fuse (Item 28, WP 0383 00)

Materials/Parts

Fuses (250 Volt, 5 amp)
(71400)
PN AGC-5

Personnel Required

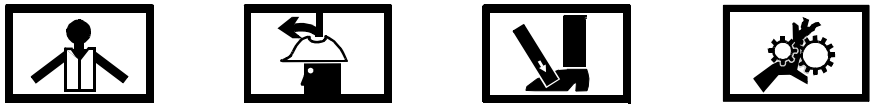
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE MAST ENCLOSURE A7 FUSES

WARNING

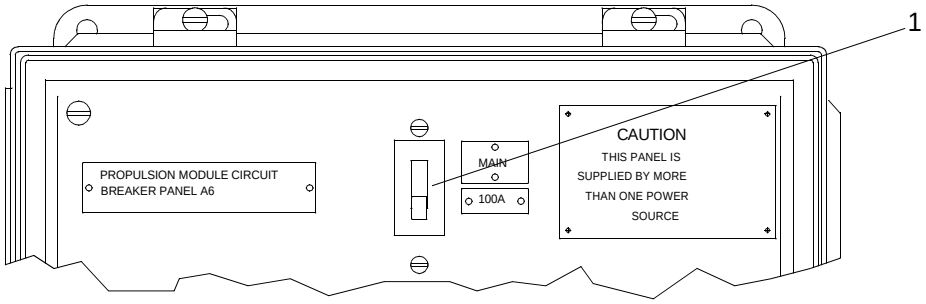


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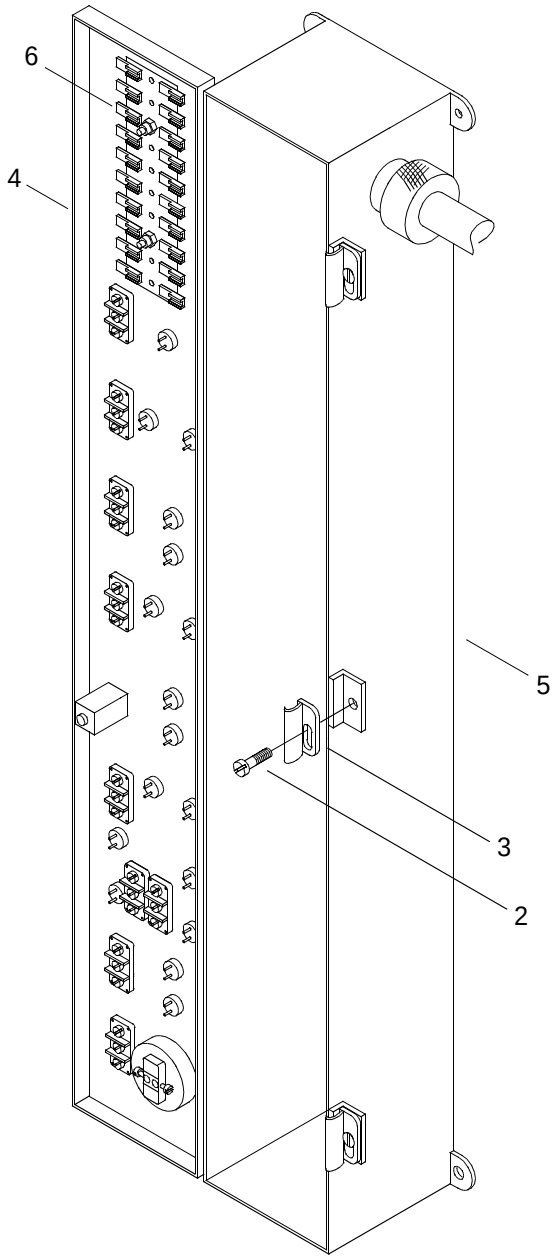
NOTE

The following procedure is typical for removal and installation of mast enclosure fuses.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove three screws (2) and clamps (3) securing enclosure door (4) to enclosure (5).



3. Open door (4) to access interior of enclosure (5).

4. Remove fuse (6) using fuse puller.

5. Discard fuse.

INSTALL MAST ENCLOSURE A7 FUSES

1. Install new fuse (6) of proper amperage and voltage into fuse holder.

2. Close mast enclosure door (4) and secure with three clamps (3) and screws (2).

3. Tighten screws (2).

4. Perform operational check on the mast enclosure. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAST ENCLOSURE A7 TOGGLE SWITCH
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Toggle Switch, Two Position
(91929)
PN MS24523-21
Toggle Switch, Three Position
(91929)
PN MS24523-22
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

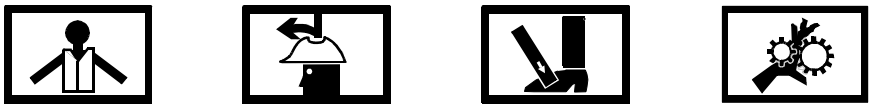
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE MAST ENCLOSURE A7 TOGGLE SWITCH

WARNING

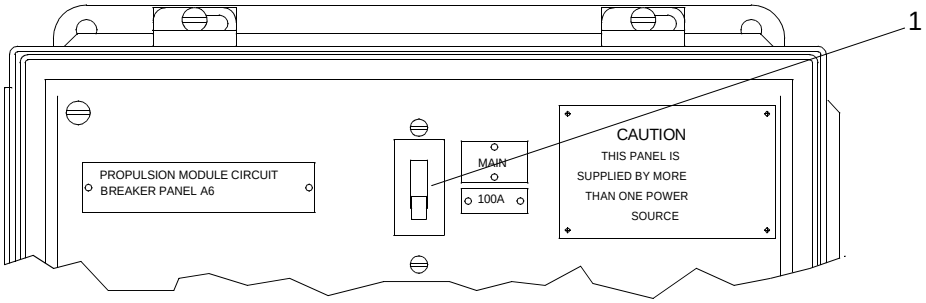


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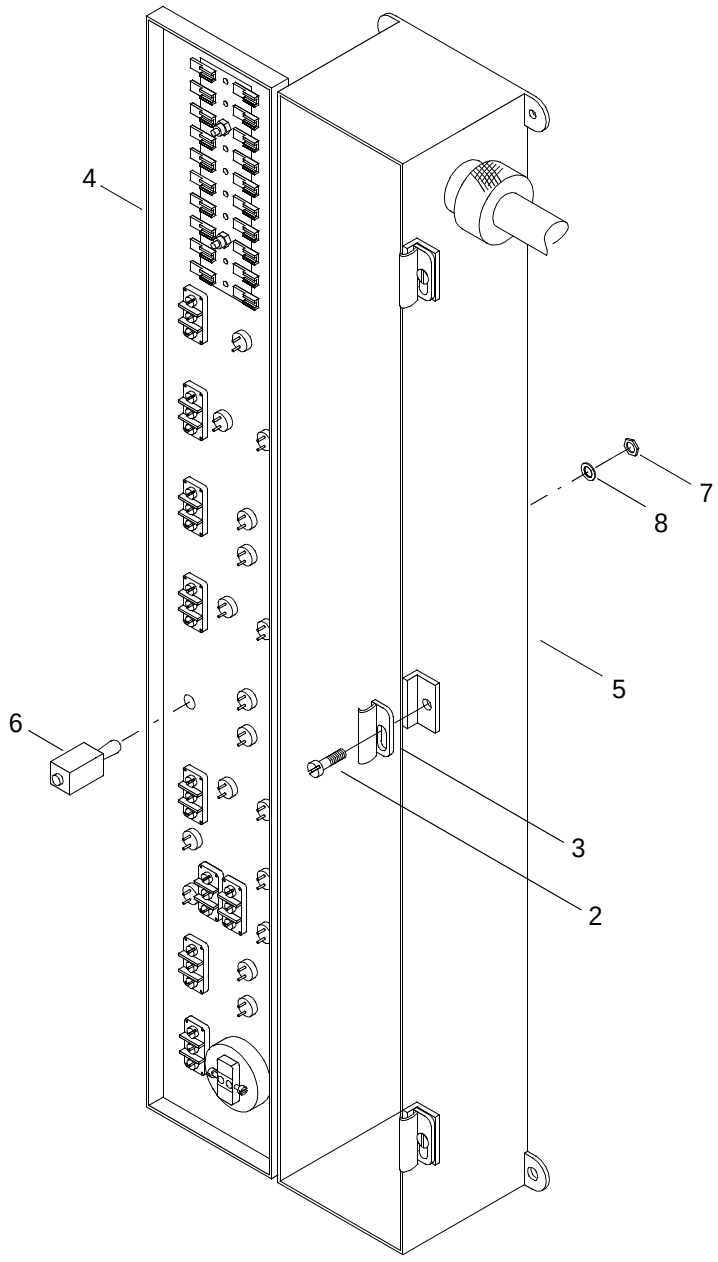
NOTE

The following procedure is typical for removal and installation of mast enclosure toggle switches.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove three screws (2) and clamps (3) securing enclosure door (4) to enclosure (5).



3. Open door (4) to access interior of enclosure (5).

4. Tag and remove wires from toggle switch (6).
5. Remove tiedown straps securing loose wires
6. Remove hex nut (7) and washer (8) from toggle switch (6).
7. Remove and discard toggle switch (6).

INSTALL MAST ENCLOSURE A7 TOGGLE SWITCH

1. Install new toggle switch (6) into enclosure door (4).
2. Install lock washer (8) and hex nut (7).
3. Tighten nut (7).
4. Connect wires to toggle switch (6) and remove tags.
5. Use tiedown straps to secure loose wires.
6. Close mast enclosure door (4) and secure with three clamps (3) and screws (2).
7. Tighten screws (2).
8. Perform operational check on the mast enclosure. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAST ENCLOSURE A7 SONALERT BEEPER REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Sonalert Beeper
(02828)
PN SC628AJ
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

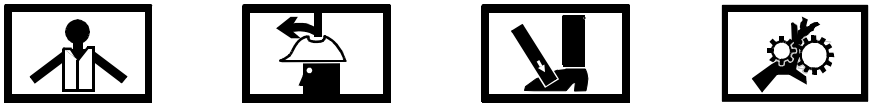
Engineer 88L

References

TM 55-1945-205-10-1

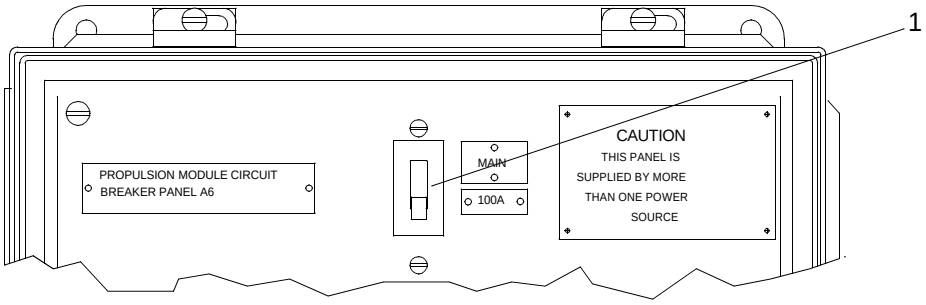
REMOVE MAST ENCLOSURE A7 SONALERT BEEPER

WARNING

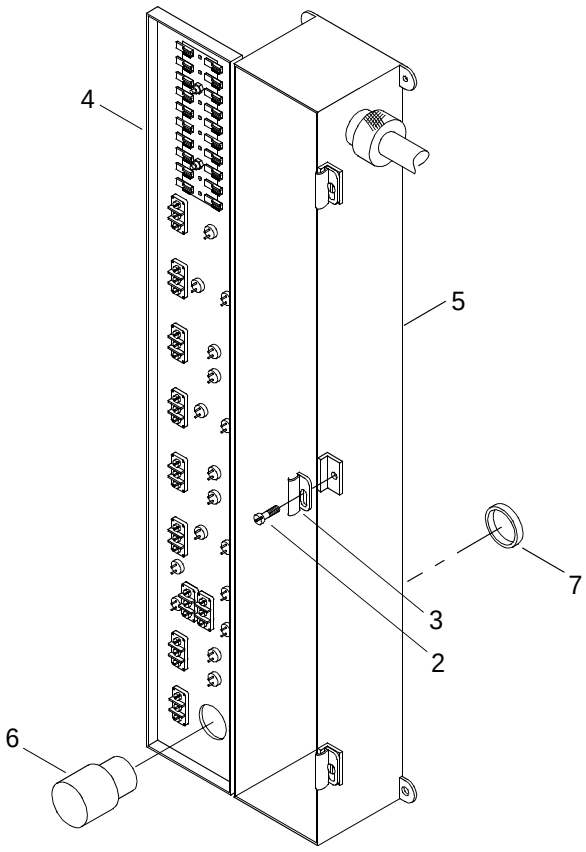


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove three screws (2) and clamps (3) securing enclosure door (4) to enclosure (5).



3. Open door (4) to access interior of enclosure (5).
4. Tag and remove two wires from sonalert beeper (6).
5. Remove tiedown straps securing loose wires
6. Remove knurled nut (7) from sonalert beeper (6).
7. Remove and discard sonalert beeper (6).

INSTALL MAST ENCLOSURE A7 SONALERT BEEPER

1. Install new sonalert beeper (6) into enclosure door (4).
2. Install knurled nut (7) on sonalert beeper (6).
3. Tighten nut (7).
4. Connect two wires to sonalert beeper (6) and remove tags.
5. Secure loose wires with tiedown straps.
6. Close mast enclosure door (4) and secure with three clamps (3) and screws (2).
7. Tighten screws (2).
8. Perform operational check on the mast enclosure. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAST ENCLOSURE A7 REED SWITCH ASSEMBLY
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Reed Switch Assembly
(34712)
PN E27623
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

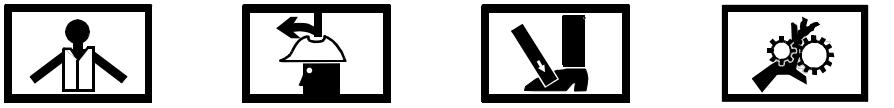
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE MAST ENCLOSURE A7 REED SWITCH ASSEMBLY

WARNING

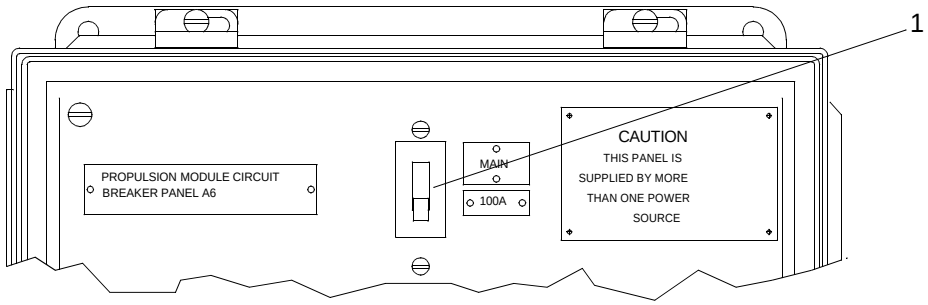


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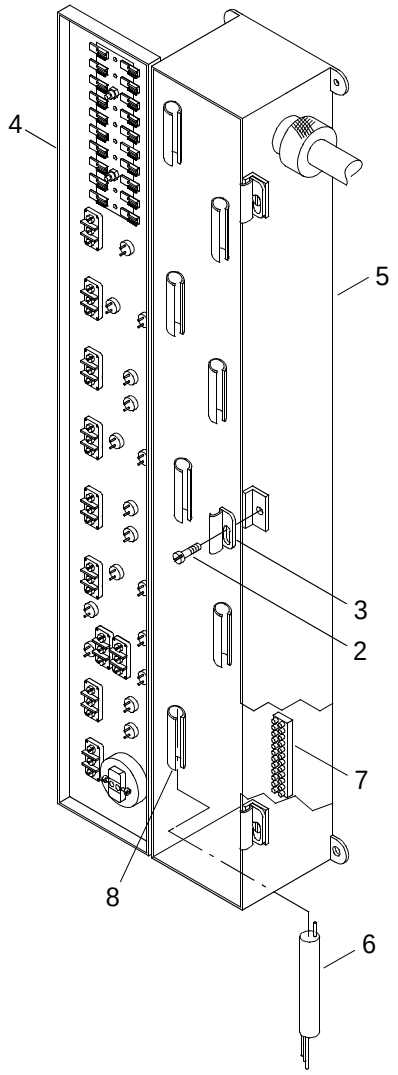
NOTE

This task is typical for removal and installation of mast enclosure reed switch assemblies.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove three screws (2) and clamps (3) securing enclosure door (4) to enclosure (5).



3. Open door (4) to access interior of enclosure (5).
4. Tag and remove four reed switch (6) wires from terminal block (7).
5. Remove tiedown straps securing loose wires.
6. Remove reed switch (6) from clip (8).
7. Discard reed switch (6).

INSTALL MAST ENCLOSURE A7 REED SWITCH ASSEMBLY

1. Install new reed switch (6) into clip (8).
2. Connect four reed switch (6) wires to terminal block (7) and remove tags.
3. Secure loose wires with tiedown straps.
4. Close mast enclosure door (4) and secure with three clamps (3) and screws (2).

5. Tighten screws (2).

6. Perform operational check on the mast enclosure. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAST ENCLOSURE A7 TERMINAL BLOCK
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Terminal Block, 12 Terminal
(06229)
PN 29.401.1253
Terminal Blocks, 20 Terminal
(06229)
PN 29.401.2053
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

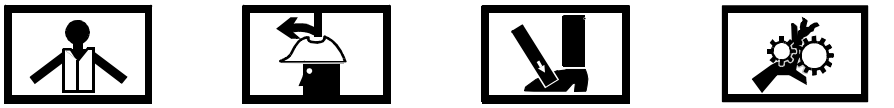
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE MAST ENCLOSURE A7 TERMINAL BLOCK

WARNING

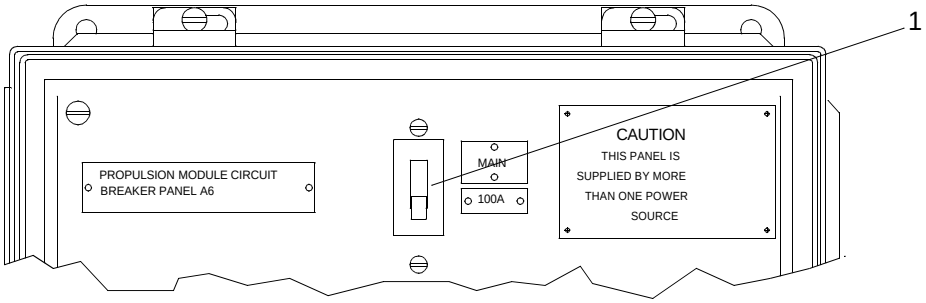


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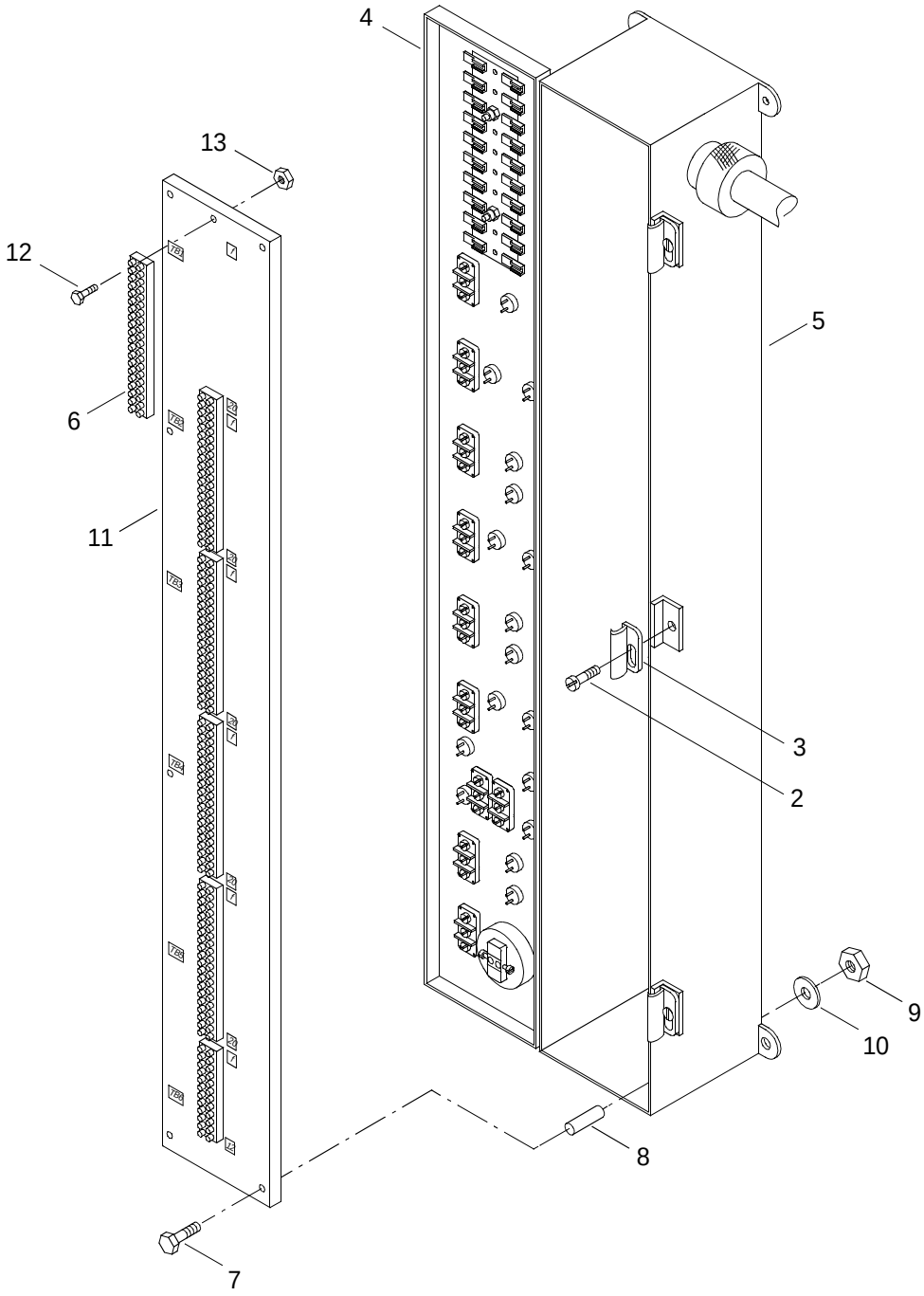
NOTE

The following procedure is typical for removal and installation of mast enclosure terminal blocks.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove three screws (2) and clamps (3) securing enclosure door (4) to enclosure (5).



3. Open door (4) to access interior of enclosure (5).
4. Tag and remove all wires to terminal block (6).
5. Remove tiedown straps securing loose wires.
6. Remove eight pan head screws (7), standoffs (8), nuts (9) and lock washers (10) from back plate (11).
7. Pull back plate (11) forward enough to remove two pan head screws (12) and hex nuts (13) to remove terminal block (6).
8. Discard terminal block (6).

INSTALL MAST ENCLOSURE A7 TERMINAL BLOCK

1. Install new terminal block (6) on back plate (11) using two pan head screws (12) and hex nuts (13).
2. Tighten nuts (13).
3. Install back plate (11) into mast enclosure (5) using eight pan head screws (7), standoffs (8), lock washers (10) and nuts (9).
4. Tighten nuts (9).
5. Connect electrical wiring to right and left side of terminal block (6) and remove tags.
6. Route wiring to right and left side of enclosure (5) into a twisted bundle to hinge side of door (4).
7. Use tiedown straps to secure loose wires.
8. Close mast enclosure door (4) and secure with three clamps (3) and screws (2).
9. Tighten screws (2).
10. Perform operational check on the mast enclosure. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAST ENCLOSURE A7 INDICATOR LIGHT REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Indicator Light
(96312)
PN 249-7872-3731504

Personnel Required

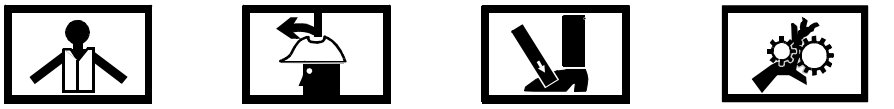
Engineer 88L

References

TM 55-1945-205-10-1

REMOVE MAST ENCLOSURE A7 INDICATOR LIGHT

WARNING

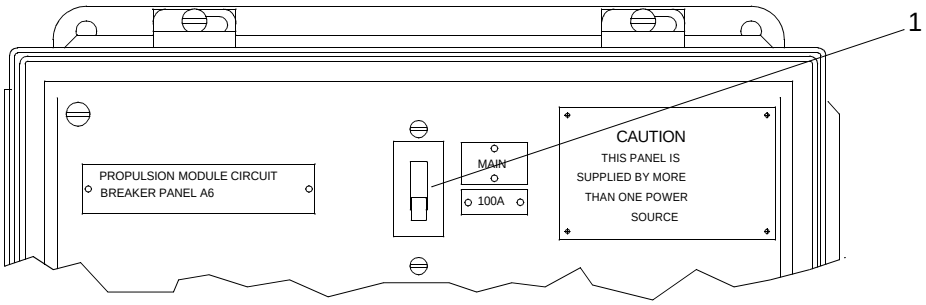


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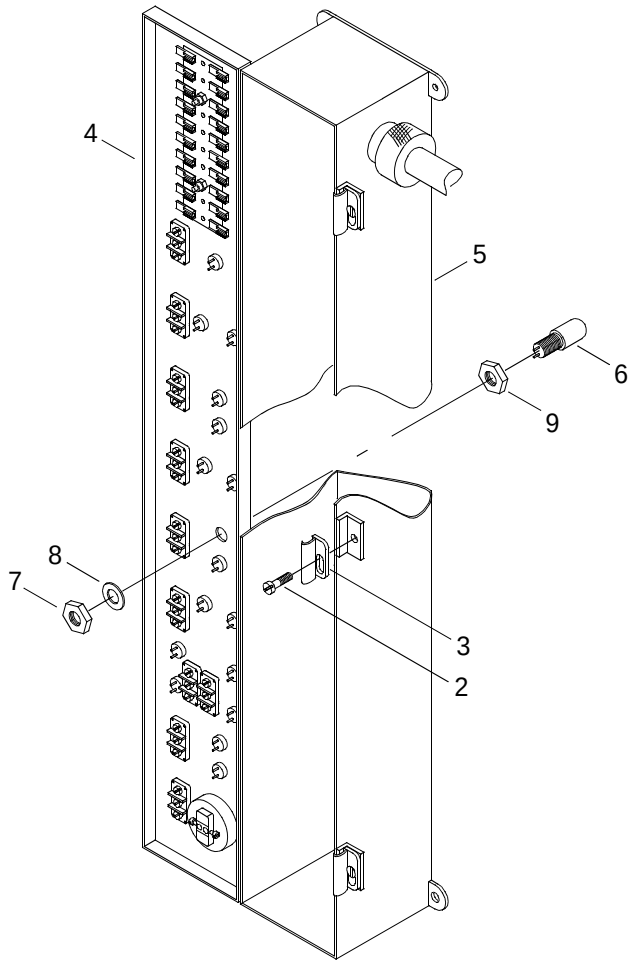
NOTE

The following procedure is typical for removal and installation of mast enclosure indicator lights.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove three screws (2) and clamps (3) securing enclosure door (4) to enclosure (5).



3. Open door (4) to access interior of enclosure (5).
4. Tag and remove two wires to indicator light (6).
5. Remove hex nut (7), lock washer (8) and knurled flange nut (9) and remove light (6) from mast enclosure door (4).
6. Discard light (6).

INSTALL MAST ENCLOSURE A7 INDICATOR LIGHT

1. Install new indicator light (6) on mast enclosure door (4) using knurled flange nut (9), lock washer (8) and hex nut (7).
2. Tighten nuts (9 and 7).
3. Connect two wires to indicator light (6) and remove tags.
4. Close mast enclosure door (4) and secure with three clamps (3) and screws (2).
5. Tighten screws (2).
6. Perform operational check on the mast enclosure. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAST ENCLOSURE A7
REMOVAL, INSPECTION AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Cloth, Cleaning (Item 6, WP 0382 00)
Strap, Tiedown (Item 30, WP 0382 00)

Personnel Required

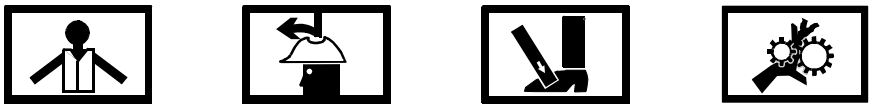
Engineer 88L

References

TM 55-1945-205-10-1

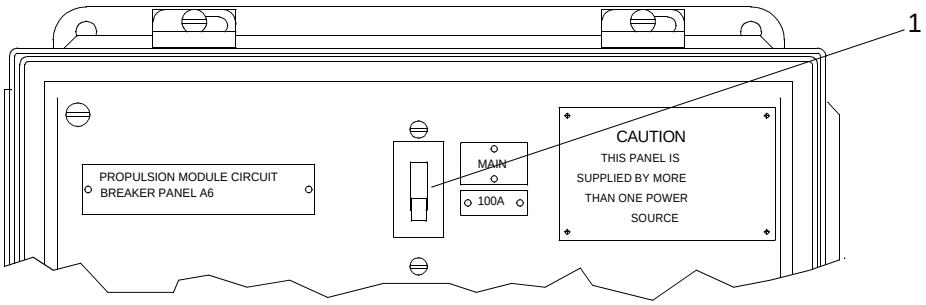
REMOVE MAST ENCLOSURE A7

WARNING

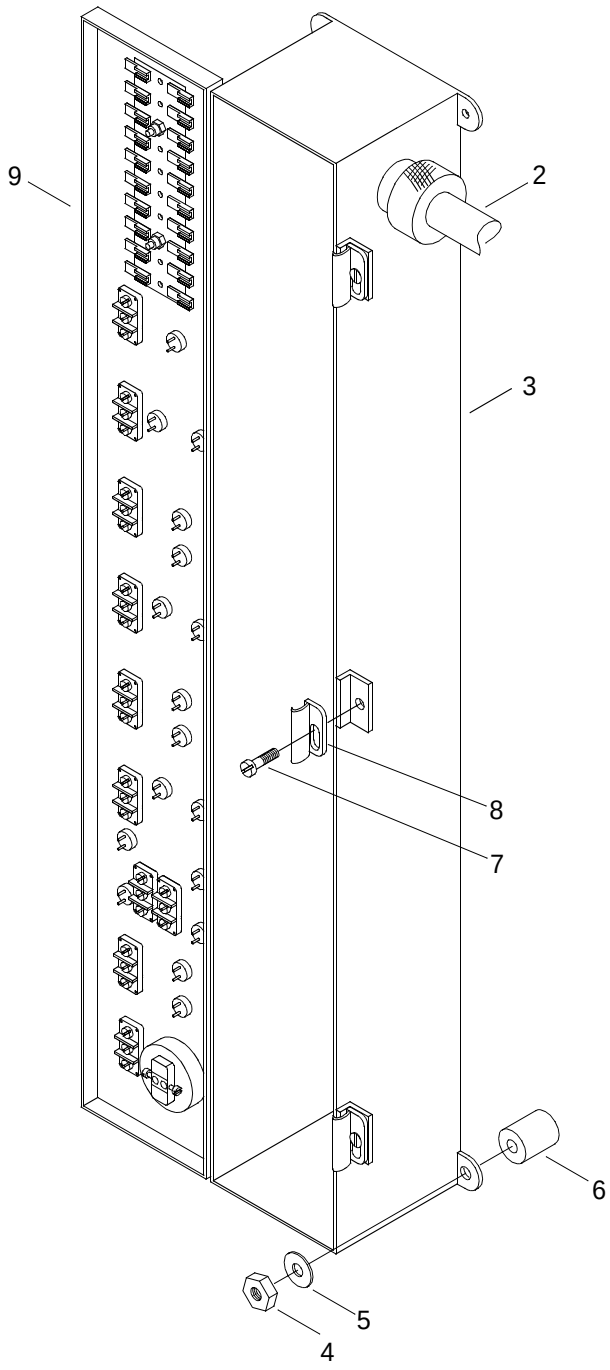


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1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Disconnect electrical cable (2) to mast enclosure (3).



3. Remove four hex nuts (4), washers (5) and spacers (6) and remove mast enclosure (3).

4. Remove three screws (7) and three clamps (8) securing enclosure door (9) to enclosure (3).

5. Open door (9) to access interior of enclosure (3).

INSPECT MAST ENCLOSURE A7

1. Inspect all electrical components for corrosion, deterioration, dirt, condensation, loose or missing hardware and inspect broken, cut, discolored or frayed wiring.

2. Remove any dirt or condensation with a lint free cloth.

3. Inspect and replace any missing tiedown straps.

INSTALL MAST ENCLOSURE A7

1. Close mast enclosure door (9) and secure with three clamps (8) and screws (7).

2. Install four spacers (6) on hull mast enclosure studs.

3. Install mast enclosure (3) against spacers (6) and secure with four washers (5) and nuts (4).

4. Tighten nuts (4).

5. Connect electrical cable (2) to mast enclosure (3).

6. Tighten screws (7).

7. Perform operational check on the mast enclosure. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAIN MAST NAVIGATION ASSEMBLY
REMOVAL, INSPECTION, REPAIR AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Sling, 8400 lb 20 ft (Yellow) (Item 39, WP 0383 00)
Ladder, Straight (Item 20, WP 0383 00)

Materials/Parts

Neoprene Rubber Strip (Item 16, WP 0382 00)

Personnel Required

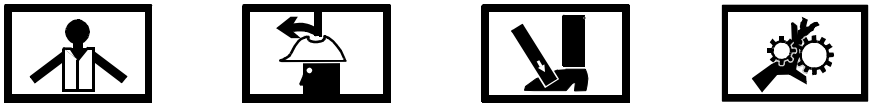
Engineer 88L

References

TM 55-1945-205-10-1
DOD-PRF-24648
MIL-PRF-23236

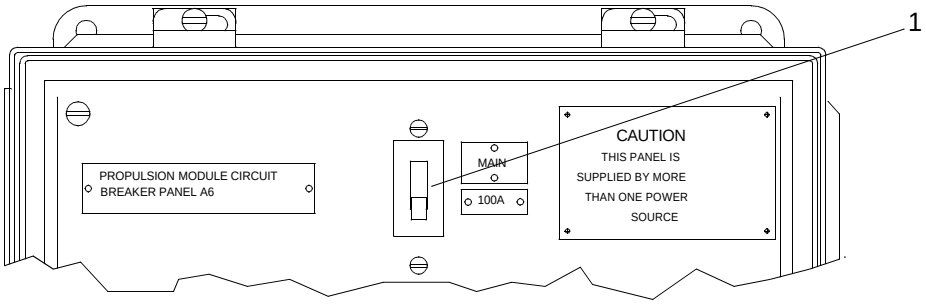
REMOVE MAIN MAST NAVIGATION ASSEMBLY

WARNING



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

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



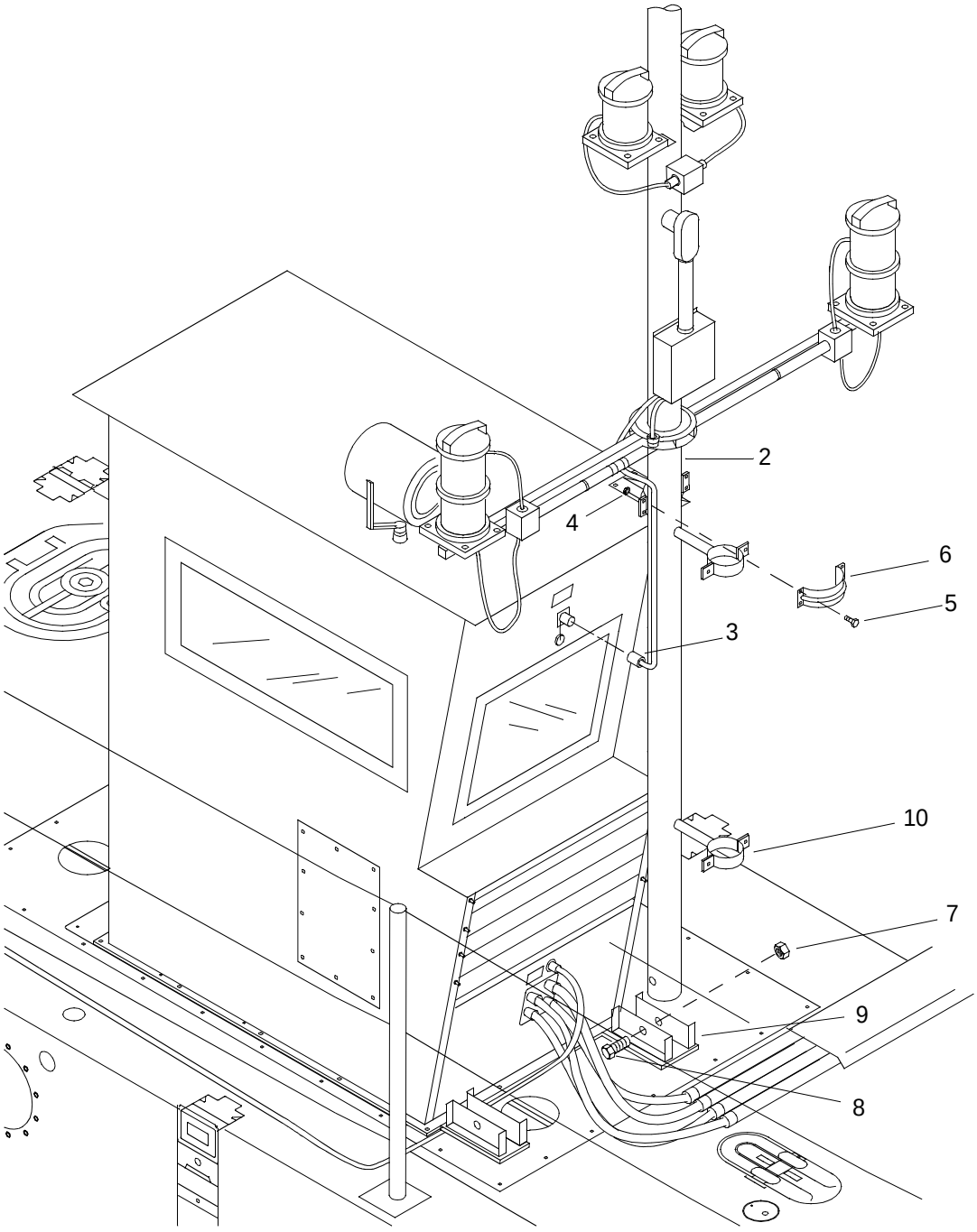
2. Using ladder, gain access to top of operators cab.

WARNING



HEAVY PARTS

3. Support main navigation mast (2) using crane and sling.



4. Remove pigtail connector (3).

5. With sling under tension using crane, remove four hex nuts (4), cap screws (5) and clamp (6).

6. Remove hex nut (7) on bolt (8).

WARNING



HEAVY PARTS

7. Using crane and sling, lower mast (2) onto work stand.

8. Remove bolt (7) from deck holder (9).

INSPECT MAIN MAST NAVIGATION ASSEMBLY

1. Inspect cables for cuts, cracks, deterioration and fraying.

2. Inspect connectors for bent, broken or missing pins, cracked or broken backshells, corrosion and dirt.

3. Inspect main mast assembly clamps (10) neoprene strips for damage.

4. Inspect main mast (2) for chipped or damaged paint and corrosion.

REPAIR MAIN MAST NAVIGATION ASSEMBLY

1. Prepare and paint main mast (2) in accordance with procedures contained in DOD-PRF-24648 and MIL-PRF-23236.

2. Replace damaged cables, connectors or corroded attaching hardware as required.

INSTALL MAIN MAST NAVIGATION ASSEMBLY

WARNING



HEAVY PARTS

NOTE

When the operators cab assembly is installed on the starboard side of the powered section, install the mast in the port deck holder. When the operators cab assembly is installed on the port side of the powered section, install the mast in the starboard deck holder.

1. Using crane and sling, position mast (2) into deck holder (9).

2. Install bolt (8) and hex nut (7).

3. Using crane and sling, lift mast (2) to vertical position.

4. Install clamp (6) using four cap screws (5) and hex nuts (4).

5. Tighten hex nut (7) on bolt (8).

6. Connect pigtail connector (3).

7. Perform operational check on the main mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAIN MAST YARDARMS
REMOVAL, INSPECTION, REPAIR AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Materials/Parts

Upper and Lower Yardarms
(06229)
PN 29.401.1253
Jam Hex Nut
(06229)
PN 29.401.2053
Adhesive (Item 1, WP 0382 00)
Cloth, Cleaning (Item 6, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1
DOD-PRF-24648
MIL-PRF-23236

Equipment Condition

Main Mast Navigation Assembly Removed. (WP 0328 00)
Main Mast Navigation Lights Removed. (WP 0331 00)
Main Mast Navigation Junction Box Removed. (WP 0332 00)

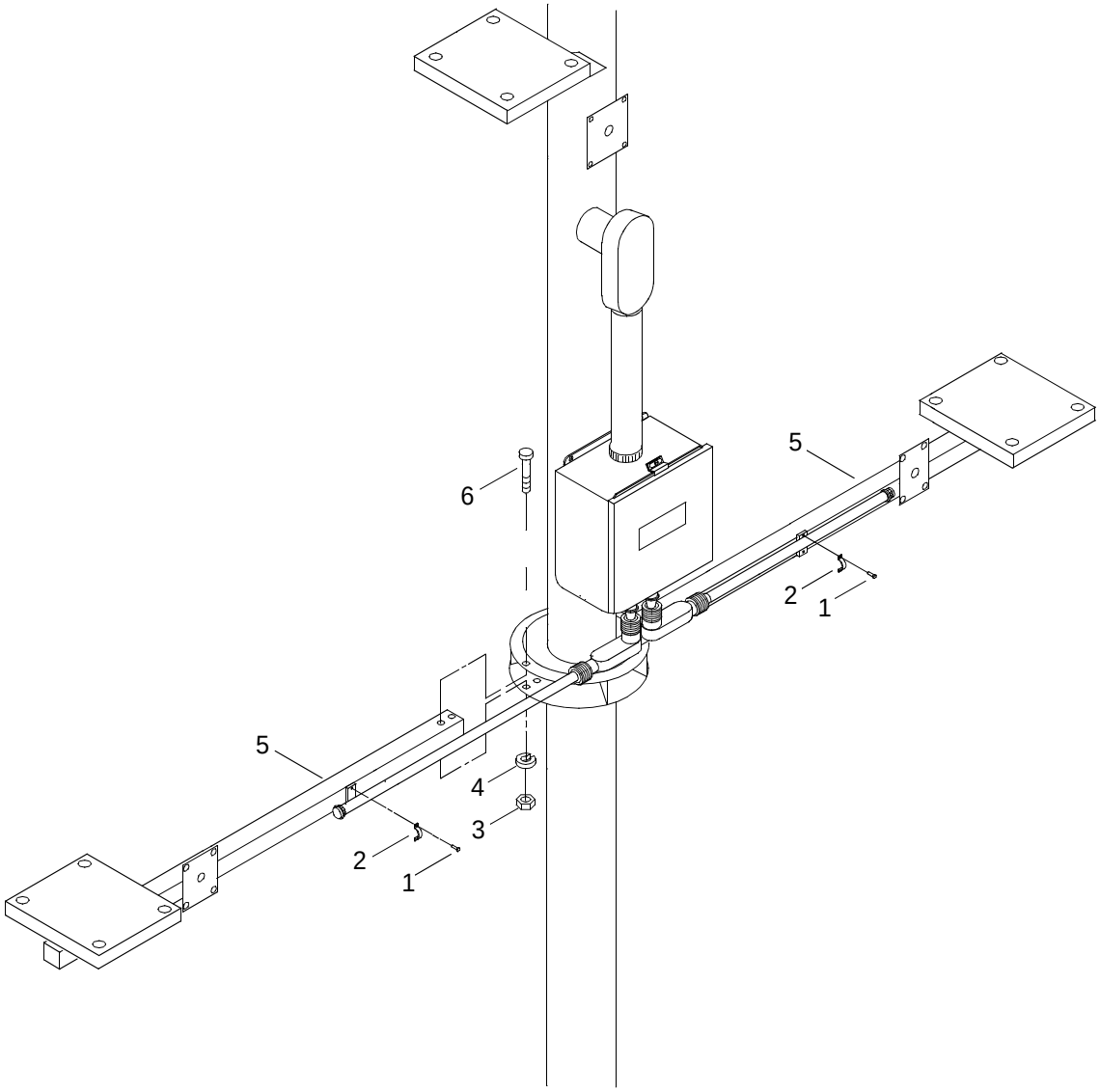
REMOVE MAIN MAST PORT AND STARBOARD LOWER YARDARM

WARNING



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

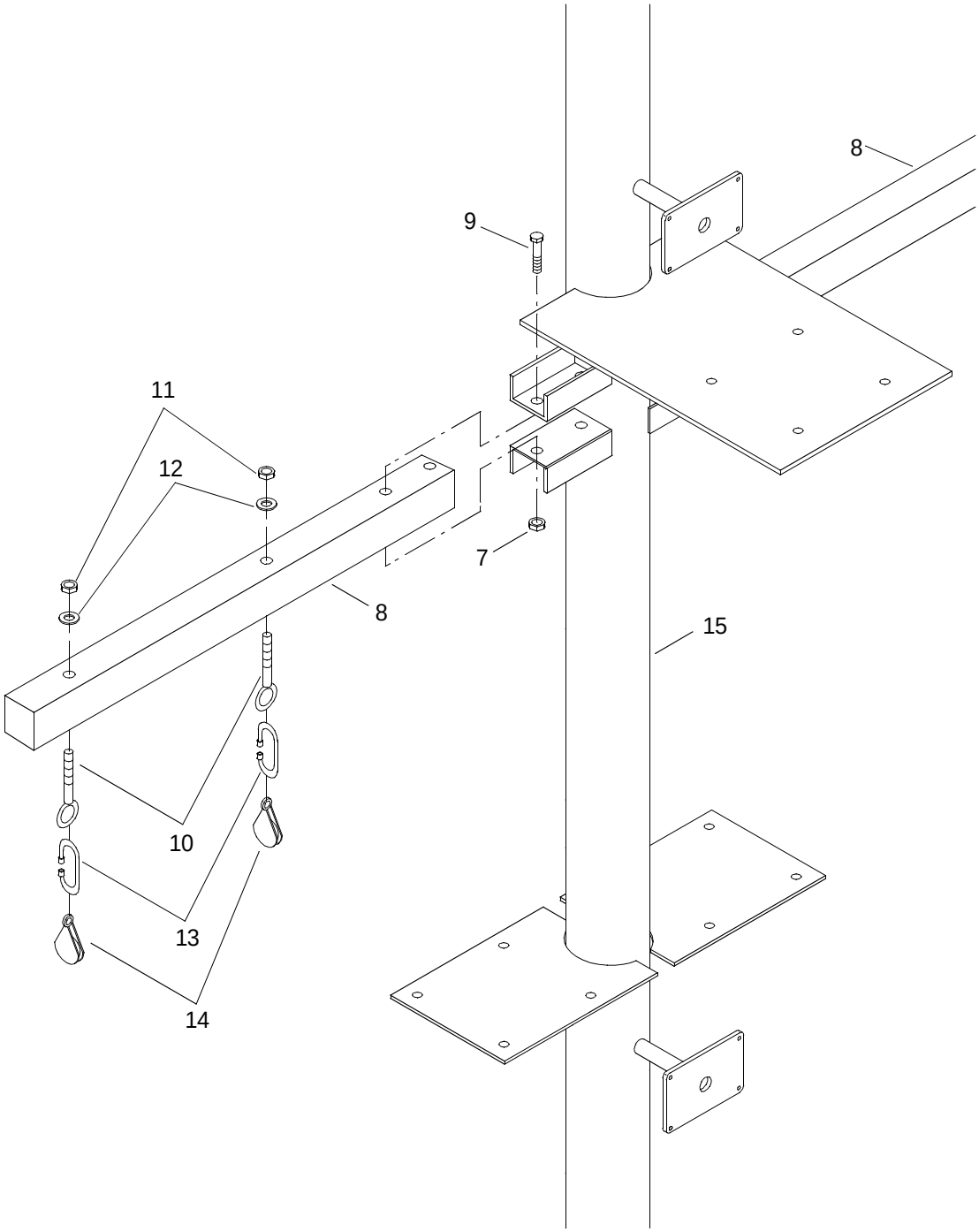
1. Remove cap screw (1) and clamp (2).



2. Remove two hex nuts (3) and lock washers (4).
3. Hold yardarm (5) and remove two cap screws (6).
4. Remove yardarm (5).

REMOVE MAIN MAST PORT AND STARBOARD UPPER YARDARM

1. Remove two hex nuts (7).



2. While supporting yardarm (8), remove two cap screws (9).

3. Remove yardarm (8).

4. While holding eye bolt (10), remove nuts (11) and flat washers (12).

INSPECT MAIN MAST YARDARMS AND ATTACHING HARDWARE

1. Inspect yardarms (8) for chipped or damaged paint and corrosion.
2. Inspect eye bolts (10), connector chains (13) and rope pulleys (14) for cracks and corrosion.

REPAIR MAIN MAST YARDARMS AND ATTACHING HARDWARE

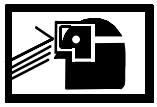
1. Prepare and paint main mast (15) in accordance with procedures contained in DOD-PRF-24648 and MIL-PRF-23236.
2. Replace damaged cables, connectors or corroded attaching hardware as required.

INSTALL MAIN MAST PORT AND STARBOARD LOWER YARDARMS

WARNING



CHEMICAL



EYE PROTECTION

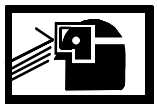
1. Apply adhesive to two cap screws (6).
2. Hold yardarm (5) in position and install two cap screws (6).
3. Install two hex nuts (3) with lock washers (4).
4. Install clamp (2) using cap screw (1).

INSTALL MAIN MAST PORT AND STARBOARD UPPER YARDARMS

WARNING



CHEMICAL



EYE PROTECTION

NOTE

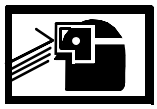
Discard hex nut supplied with eyebolt and assemble using jam hex nut.

1. Apply adhesive to eye bolt (10).
2. While holding eye bolt (10), install flat washers (12) and nut (11).
3. Tighten nut (11).

WARNING



CHEMICAL



EYE PROTECTION

4. Apply adhesive to two cap screws (9).
5. Holding yardarm (8) in position, install two cap screws (9) and hex nuts (7).
6. Tighten two hex nuts (7).
7. Install main mast navigation lights. (WP 0331 00)
8. Install main mast navigation light junction box. (WP 0332 00)
9. Install main mast navigation assembly. (WP 0328 00)
10. Perform operational check on the main mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAIN MAST NAVIGATION LIGHT BULBS
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Bulb, Light
(61204)
PN 90400171

Personnel Required

Seaman 88K

References

TM 55-1945-205-10-1

Equipment Condition

Main Mast Navigation Assembly Removed. (WP 0328 00)

REMOVE MAIN MAST NAVIGATION LIGHT BULBS (SINGLE LAMP FIXTURES)

WARNING

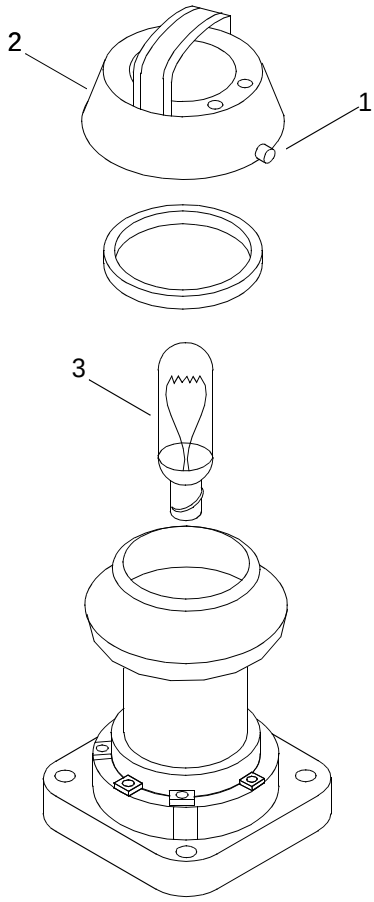


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedures is typical for the removal and installation of the single anchor, single vessel aground and single task navigation light bulbs.

1. Loosen safety knob screw (1).



(SINGLE)

2. Turn cover (2) by its handle to the left and remove.

3. Rotate bulb (3) ¼ of a turn, remove and discard.

INSTALL MAIN MAST NAVIGATION LIGHT BULBS (SINGLE LAMP FIXTURES)

1. Align new bulb (3) and rotate a ¼ of a turn.

2. Install cover (2).

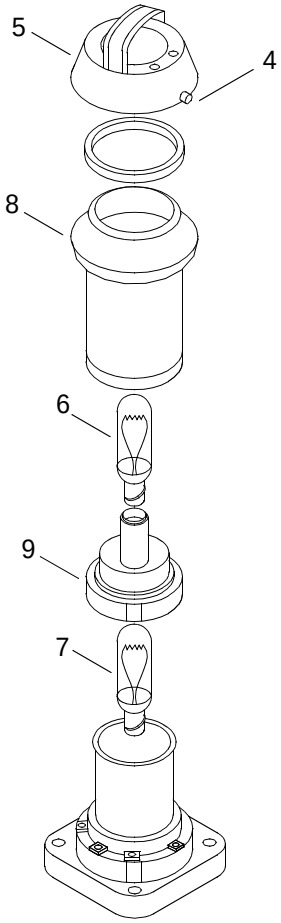
3. Tighten safety knob screw (1).

REMOVE MAIN MAST NAVIGATION LIGHT BULBS (DUAL LAMP FIXTURES)

NOTE

The following procedures is typical for the removal and installation of the double sidelight (port and starboard) and double masthead light bulbs.

1. Loosen safety knob screw (4).



(DUAL)

2. Turn cover (5) by its handle to the left and remove.
3. Rotate bulb (6) ¼ of a turn, remove and discard.
4. To reach bottom bulb (7), remove lens (8) and mounting plate (9).
5. Turn bottom bulb (7) ¼ of a turn, remove and discard.

INSTALL MAIN MAST NAVIGATION LIGHT BULBS (DUAL LAMP FIXTURES)

1. Align new bottom bulb (7) and rotate ¼ of a turn.
2. Install mounting plate (9) and lens (8).
3. Align new top bulb (6) and rotate ¼ of a turn.
4. Install cover (5).
5. Tighten safety knob screw (4).
6. Install main mast navigation assembly. (WP 0328 00)
7. Perform operational check on the main mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAIN MAST NAVIGATION LIGHTS
REMOVAL, INSPECTION, REPAIR AND INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Wrench, Torque (0-175 ft lbs) (Item 47, WP 0383 00)

Materials/Parts
Cloth, Cleaning (Item 6, WP 0382 00)

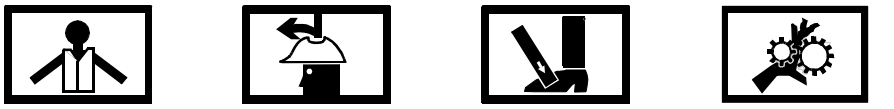
Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

Equipment Condition
Main Mast Navigation Assembly Removed. (WP 0328 00)

REMOVE MAIN MAST NAVIGATION LIGHTS

WARNING

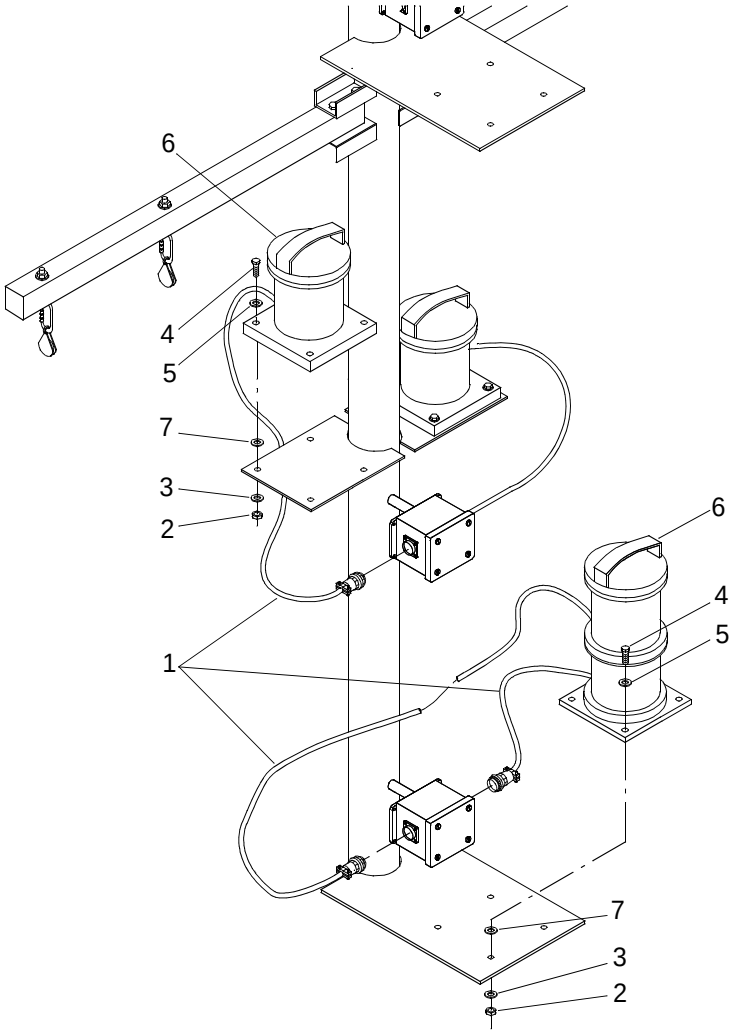


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

NOTE

The following procedure is typical for the removal and installation of mast navigation lights.

1. Remove electrical connectors (1).



2. Remove four hex nuts (2), lock washers (3), cap screws (4) and flat washers (5).

3. Carefully remove light (6) and four plastic washers (7) under light (6).

INSPECT MAIN MAST NAVIGATION LIGHTS

1. Inspect cables for cuts, cracks, deterioration and fraying.

2. Inspect connector for bent, broken or missing pins, cracked or broken backshells, corrosion and dirt.

REPAIR MAIN MAST NAVIGATION LIGHTS

1. Replace cut, cracked, frayed or deteriorated cables.

2. Straighten bent connector pins.

3. Replace broken or missing pins.

4. Replace cracked backshells.

5. Remove corrosion and dirt from interior of connectors using a clean, lint free cloth.

INSTALL MAIN MAST NAVIGATION LIGHTS

NOTE

When installing port or starboard double sidelight, the screen must be oriented to the aft and inboard position. With double masthead lights, the screen must be oriented to the aft position.

1. Place four plastic washers (7) on light base and position light (6) on washers (7).
2. Install four bolts (4) with flat washers (5).
3. Install four lock washers (3) and nuts (2).
4. Torque nuts (2) to 35 ft lbs (47.46 Nm).
5. Install electrical connectors (1).
6. Install main mast navigation assembly. (WP 0328 00)
7. Perform operational check on the main mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAIN MAST NAVIGATION LIGHT JUNCTION BOX
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

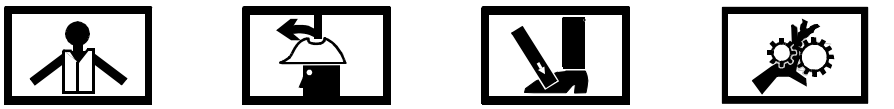
Personnel Required
Engineer 88L

References
TM 55-1945-205-10-1

Equipment Condition
Main Mast Navigation Assembly Removed. (WP 0328 00)

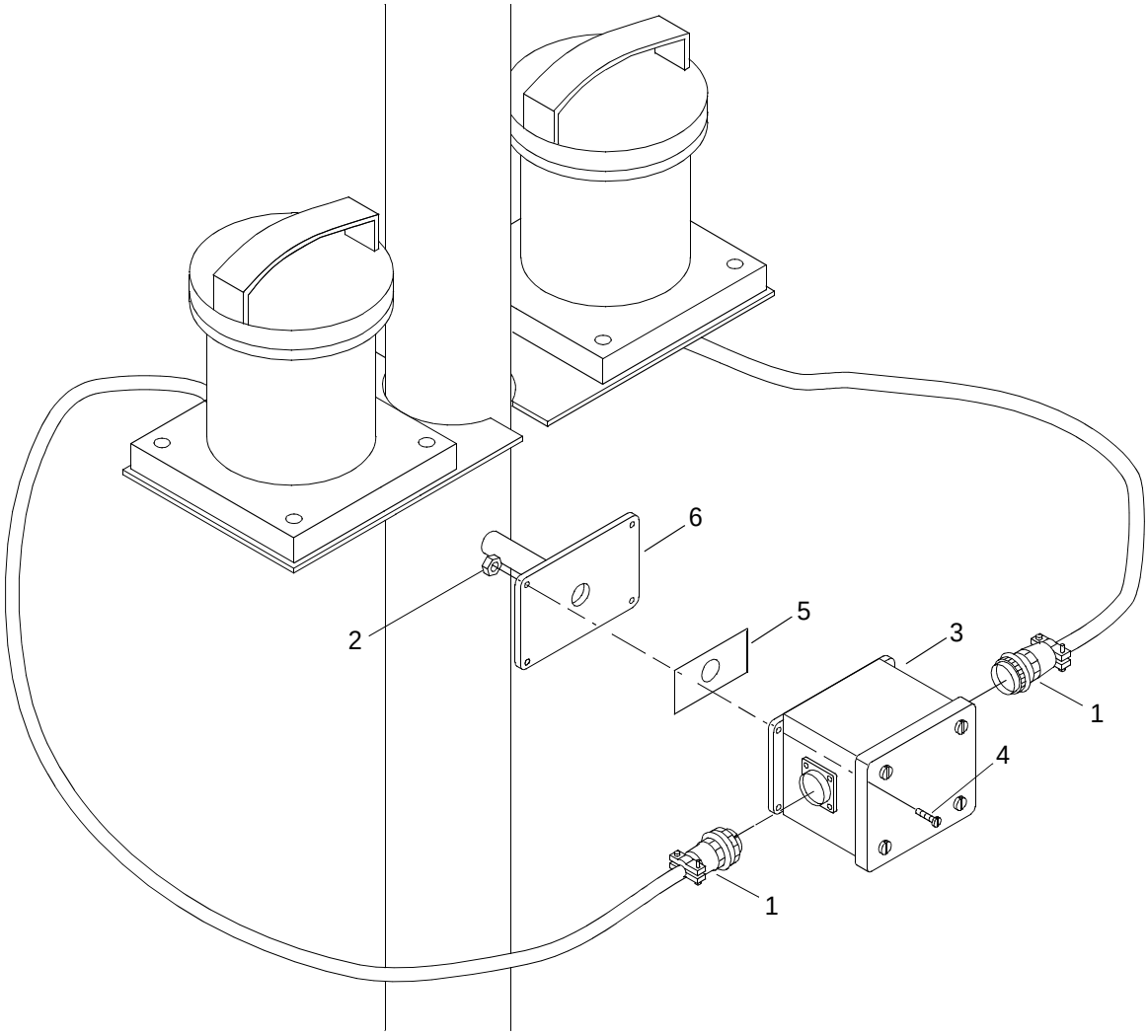
REMOVE MAIN MAST NAVIGATION LIGHT JUNCTION BOX

WARNING



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

1. Remove two or three light pigtail connectors (1), as required.



2. Remove four hex nuts (2).
3. While supporting junction box (3), remove four cap screws (4).
4. Remove gasket (5).

INSTALL MAIN MAST NAVIGATION LIGHT JUNCTION BOX

1. Position gasket (5) between junction box (3) and mast base (6).
2. Install four cap screws (4) and hex nuts (2).
3. Tighten four hex nuts (2).
4. Connect two or three light pigtails connectors (1) as required.
5. Install main mast navigation assembly. (WP 0328 00)
6. Perform operational check on the main mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAIN MAST NAVIGATION ASSEMBLY TERMINAL BOX
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

References

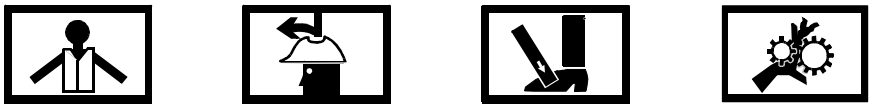
TM 55-1945-205-10-1

Equipment Condition

Main Mast Navigation Assembly Removed. (WP 0328 00)

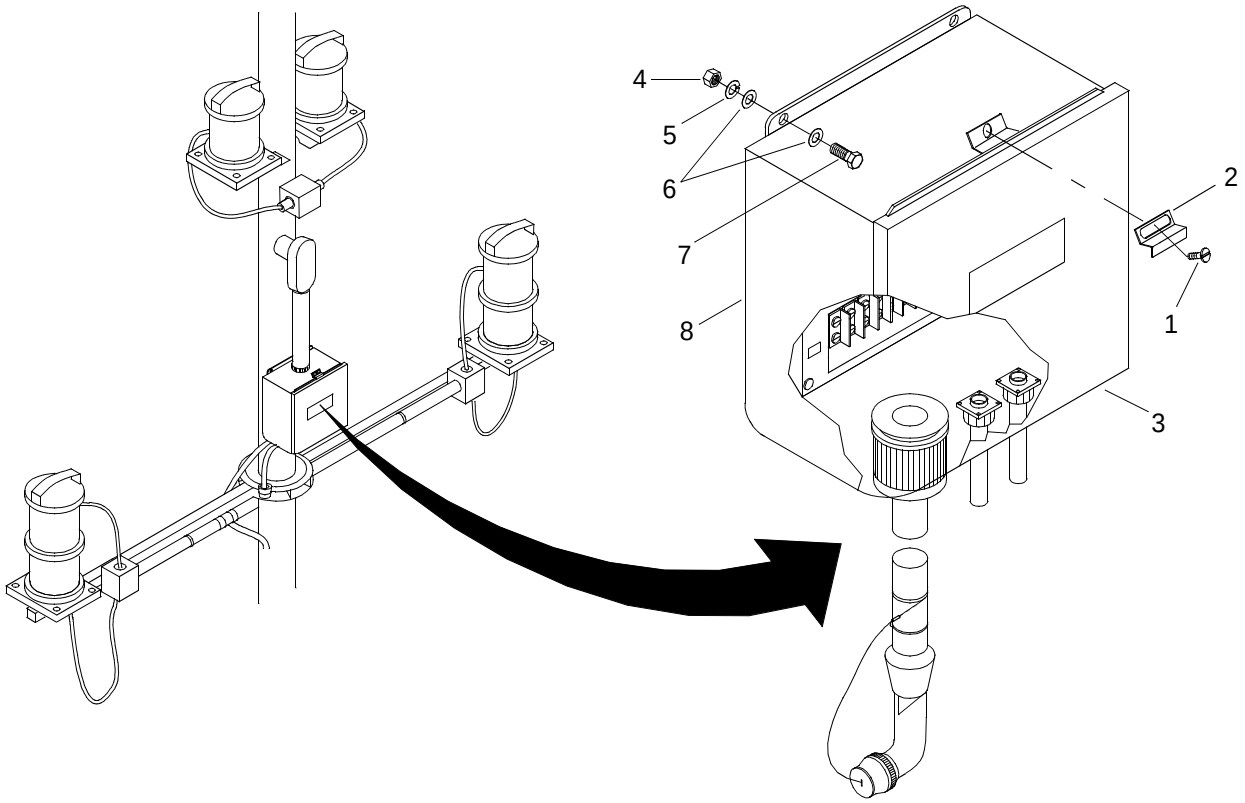
REMOVE MAIN MAST NAVIGATION ASSEMBLY TERMINAL BOX

WARNING



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

1. Remove four screws (1) and clamps (2) securing cover (3).



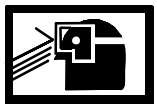
2. Open cover (3).
3. Disconnect and tag electrical wiring to terminal box.
4. Remove four hex nuts (4), four lock washers (5), eight flat washers (6), and four hex head cap screws (7).
5. Remove terminal box (8).

INSTALL MAIN MAST NAVIGATION ASSEMBLY TERMINAL BOX

WARNING



CHEMICAL



EYE PROTECTION

1. Apply antiseize compound to cap screws (7) and screws (1).
2. Position new terminal box (8).
3. Secure with four hex head cap screws (7), eight flat washers (6), four lock washers (5) and four hex nuts (4).
4. Connect electrical wiring, as tagged, to terminal box (8).
5. Remove tags from electrical wiring.
6. Close cover (3).

7. Position four clamps (2) on cover (3).

8. Install four screws (1) and tighten.

9. Install main mast navigation assembly. (WP 0328 00)

10. Perform operational check on the main mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
MAIN MAST NAVIGATION ASSEMBLY
TERMINAL BOX TERMINAL BLOCK
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Main Mast Navigation Assembly Terminal Box Removed. (WP 0333 00)

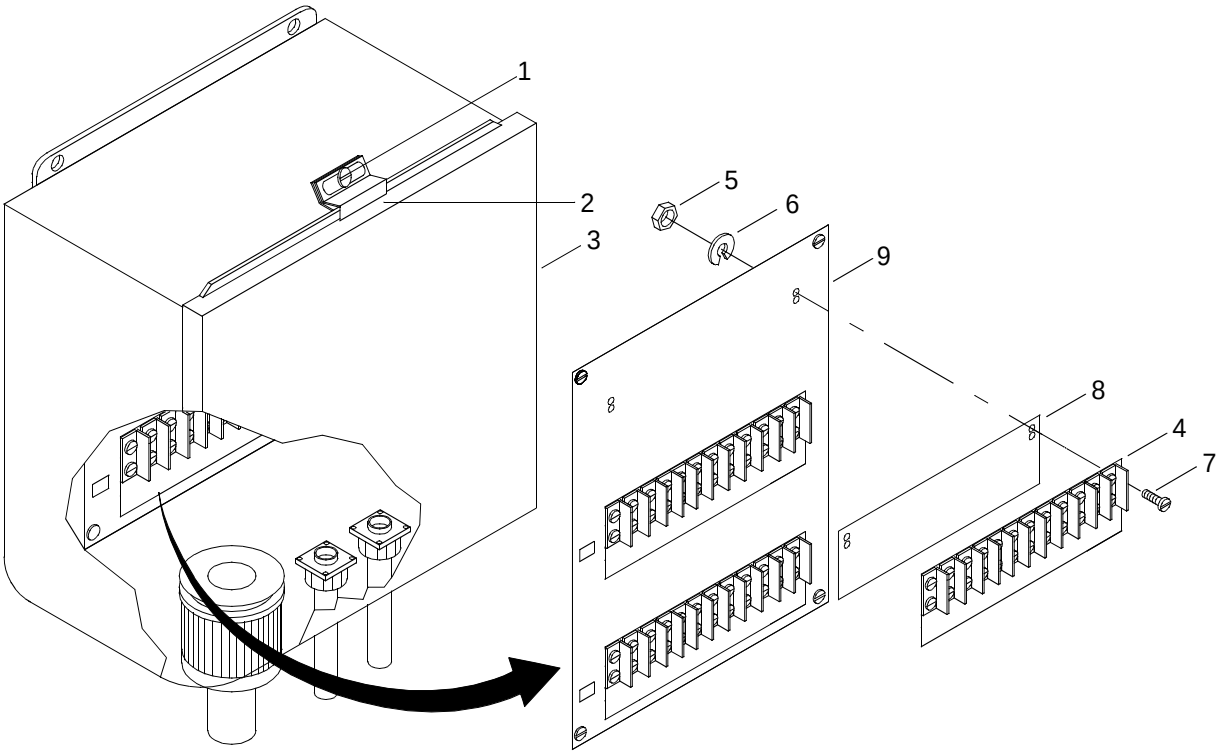
REMOVE MAIN MAST NAVIGATION ASSEMBLY TERMINAL BOX TERMINAL BLOCK

WARNING



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

1. Loosen screws (1) and rotate clamps (2) securing cover (3).



2. Open cover (3).
3. Disconnect and tag electrical wiring to terminal block (4).
4. Remove two nuts (5), lock washers (6) and panhead screws (7).
5. Remove terminal block (4) and marker strip (8) from panel (9).

INSTALL MAIN MAST NAVIGATION ASSEMBLY TERMINAL BOX

1. Position marker strip (8) and terminal block (4) on panel (9).

WARNING



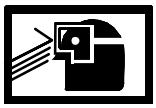
CHEMICAL EYE PROTECTION

2. Apply antiseize compound to threads of panhead screws (7).
3. Install two panhead screws (7), lock washers (6) and nuts (5).
4. Tighten nuts (5).
5. Connect electrical wiring, as tagged, to terminal block (4).
6. Remove tags from electrical wiring.
7. Close cover (3).

WARNING



CHEMICAL



EYE PROTECTION

8. Apply antiseize compound to threads of screws (1).
9. Rotate clamps (2) and tighten screws (1).
10. Install main mast navigation assembly terminal box. (WP 0333 00)
11. Perform operational check on the main mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
STERN LIGHT BULBS
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Bulb, Light
(61204)
PN 90400171

Personnel Required

Seaman 88K

Equipment Condition

Stub Mast Removed. (TM 55-1945-205-10-1)

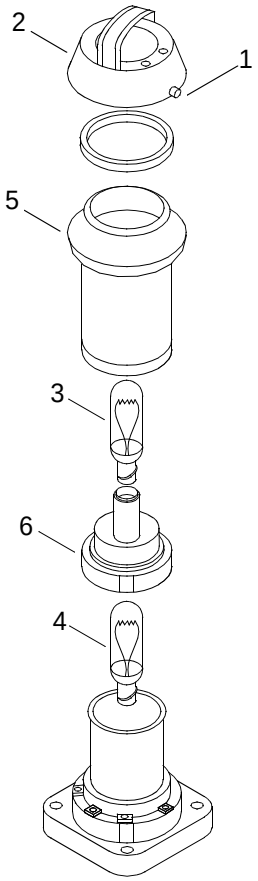
REMOVE STERN LIGHT BULB

WARNING



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

1. Loosen safety knob screw (1).



2. Turn cover (2) by its handle counterclockwise and remove.
3. Rotate bulb (3) ¼ of a turn counterclockwise, remove and discard.
4. To access bottom lamp bulb (4), remove lens (5) and mounting plate (6).
5. Turn bottom bulb (4) ¼ of a turn counterclockwise, remove and discard.

INSTALL STERN LIGHT BULBS

1. Align new bottom bulb (4) and rotate ¼ of a turn clockwise to install.
2. Install mounting plate (6) and lens (5).
3. Align new top bulb (3) and rotate ¼ of a turn clockwise to install.
4. Install cover (2).
5. Tighten safety knob screw (1).
6. Install stub mast. (TM 55-1945-205-10-1)
7. Perform operational check on the stub mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
STUB MAST ENCLOSURE ASSEMBLY
REMOVAL, INSPECTION, REPAIR AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Cloth, Cleaning (Item 6, WP 0382 00)

Personnel Required

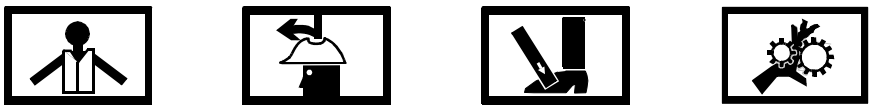
Engineer 88L

References

TM 55-1945-205-10-1

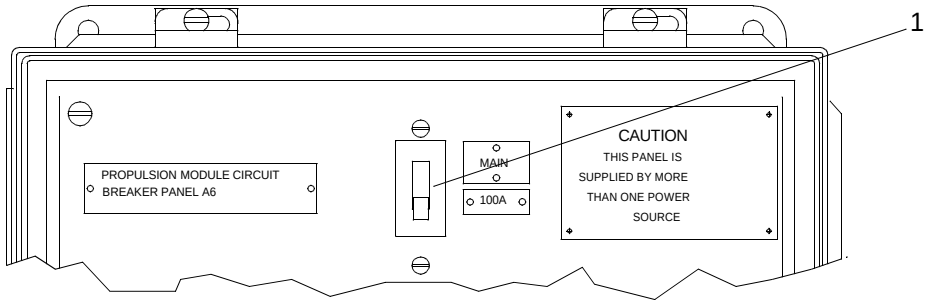
REMOVE STUB MAST ENCLOSURE ASSEMBLY

WARNING

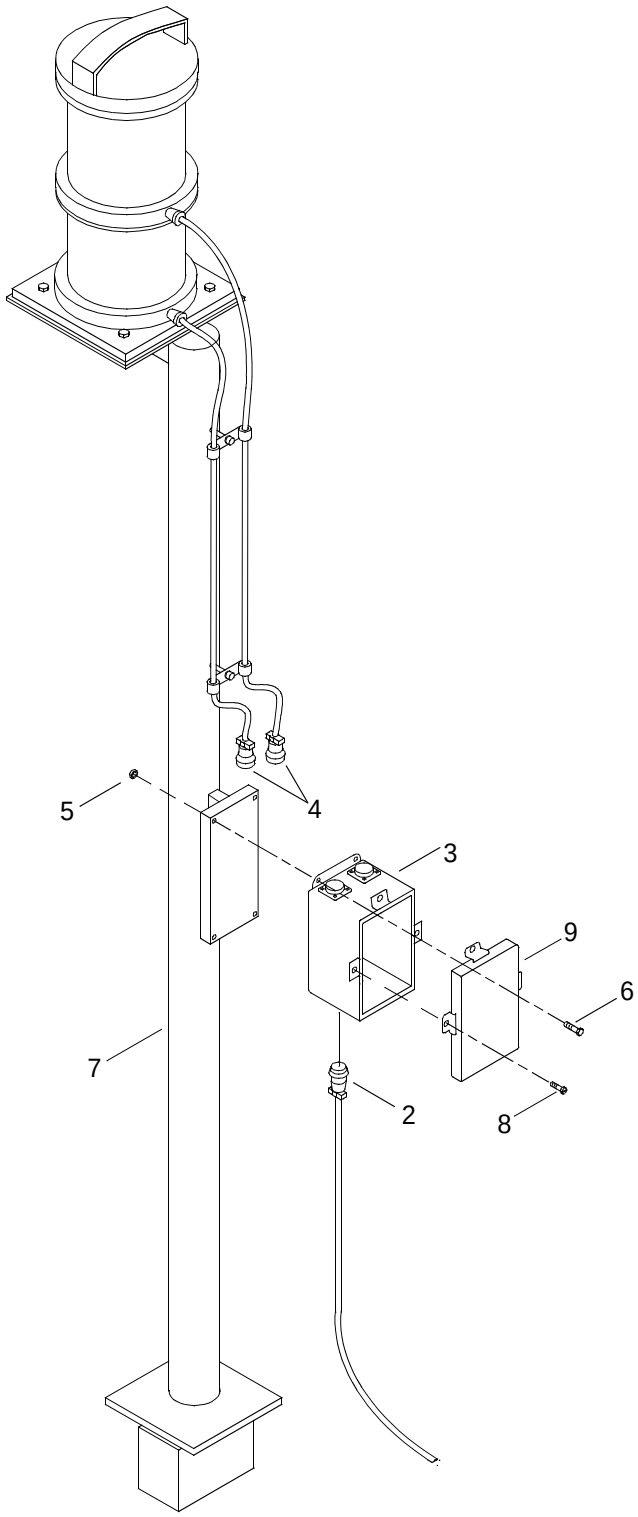


All personnel must wear personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Disconnect portable cable (2) from stub mast enclosure assembly (3).



3. Unscrew and disconnect pigtails (4) from the enclosure assembly (3).

4. Remove self-locking hex nuts (5) and cap screws (6) that secure the enclosure assembly (3) to the stub mast (7).

INSPECT STUB MAST ENCLOSURE ASSEMBLY

1. Remove three screws (8) from enclosure cover (9).
2. Remove enclosure cover (9) from enclosure assembly (3).
3. Visually inspect inside of enclosure (3) for moisture and broken wiring connections.
4. Inspect enclosure (3) connector receptacles for corrosion or bent pins.
5. Inspect pigtails (4) from stern light for corrosion, connection separation, insulation cracking, bent pins and dirty plugs.
6. Inspect portable cable assembly (2) for corrosion, connection separation, insulation cracking, bent pins and dirty plugs.

REPAIR STUB MAST ENCLOSURE ASSEMBLY

1. Resolder connections or replace wires if necessary.
2. Clean off corrosion, straighten pins and clean out plugs.

INSTALL STUB MAST ENCLOSURE ASSEMBLY

1. Position enclosure cover (9) and secure with screws (8).
2. Tighten screws (8).
3. Install enclosure assembly (3) and secure with cap screws (6) and hex nuts ().
4. Tighten hex nuts (5).
5. Connect and secure pigtails (4) to enclosure assembly (3).
6. Connect portable cable (2) to enclosure assembly (3).
7. Perform operational check on the stub mast. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX
ASSEMBLY JB1
REMOVAL AND INSTALLATION

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

Equipment Condition

Operators Cab Electrical System VHF/FM DSC Voltage Converter Removed. (WP 0340 00)

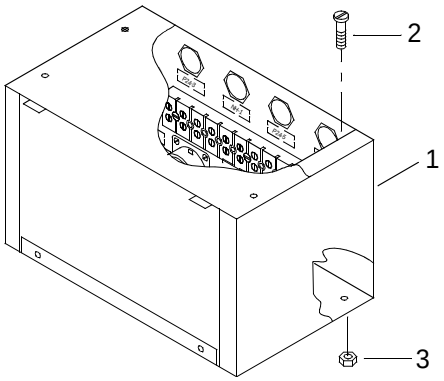
REMOVE OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX ASSEMBLY JB1

WARNING



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

1. Tag and disconnect all electrical wiring to junction box assembly JB1 (1).



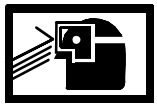
2. Remove four pan head cap screws (2) and hex nuts (3).
3. Remove junction box assembly JB1 (1).

INSTALL OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX ASSEMBLY JB1

1. Position junction box assembly JB1 (1) on operators cab upper shelf.

WARNING


CHEMICAL


EYE PROTECTION

2. Apply antiseize compound to four pan head cap screws (2).
3. Secure junction box (1) with four pan head cap screws (2) and four hex nuts (3).
4. Tighten hex nuts (3).
5. Connect all wiring to junction box (1) as previously tagged and remove tags.
6. Install the operators cab electrical system VHF/FM DSC voltage converter. (WP 0340 00)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX
ASSEMBLY JB1 TERMINAL BOARD
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Terminal Board
(75382)
PN 985-12
Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

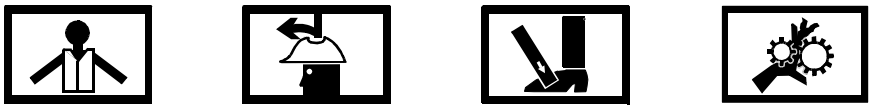
Engineer 88L

References

TM 55-1945-205-10-1

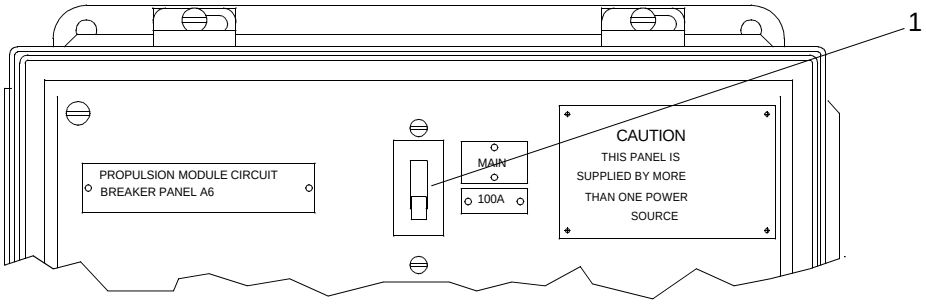
REMOVE OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX ASSEMBLY JB1 TERMINAL BOARD

WARNING

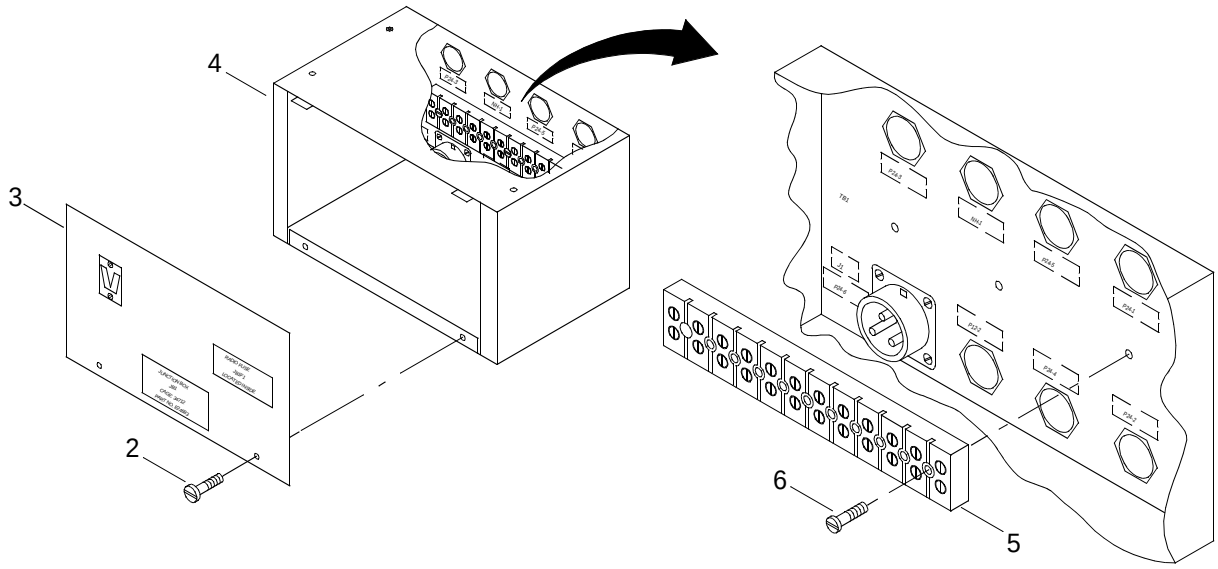


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen two door screws (2) securing junction box cover (3) to junction box (4).



3. Remove junction box cover (3).

4. Tag and disconnect electrical wiring to terminal board (5).

5. Remove three round head screws (6) securing terminal board (5) to junction box (4).

6. Remove and discard JB1 terminal board (5).

INSTALL OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX ASSEMBLY JB1 TERMINAL BOARD

1. Position new JB1 terminal board (5) on junction box JB1 (4).

WARNING



CHEMICAL **EYE PROTECTION**

2. Apply antiseize compound to three round head screws (6).

3. Install and secure terminal board (5) with three round head screws (6).

4. Tighten screws (6).

5. Connect wiring to terminal board (5) as previously tagged and remove tags.

6. Position junction box cover (3) on front of junction box (4) and secure with two door screws (2).

7. Tighten screws (2).

8. Perform operational check on the junction box assembly JB1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX
ASSEMBLY JB1 RECEPTACLE
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Receptacle
(96906)
PN MS3102A22-2S
Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

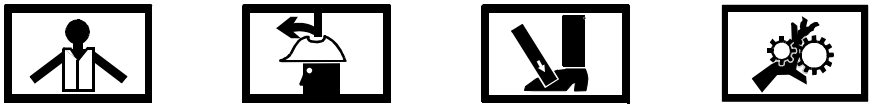
Engineer 88L

References

TM 55-1945-205-10-1

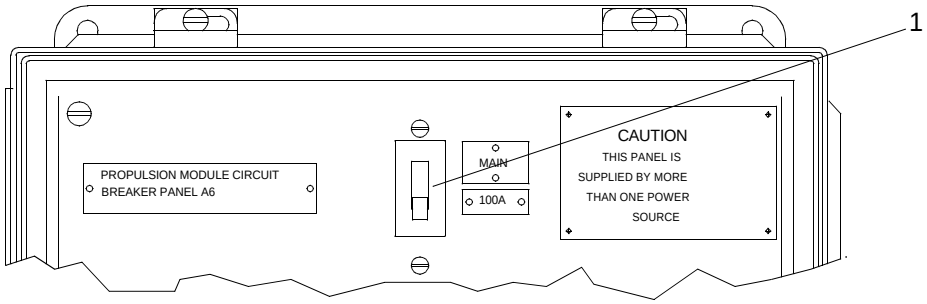
REMOVE OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX ASSEMBLY JB1 RECEPTACLE

WARNING

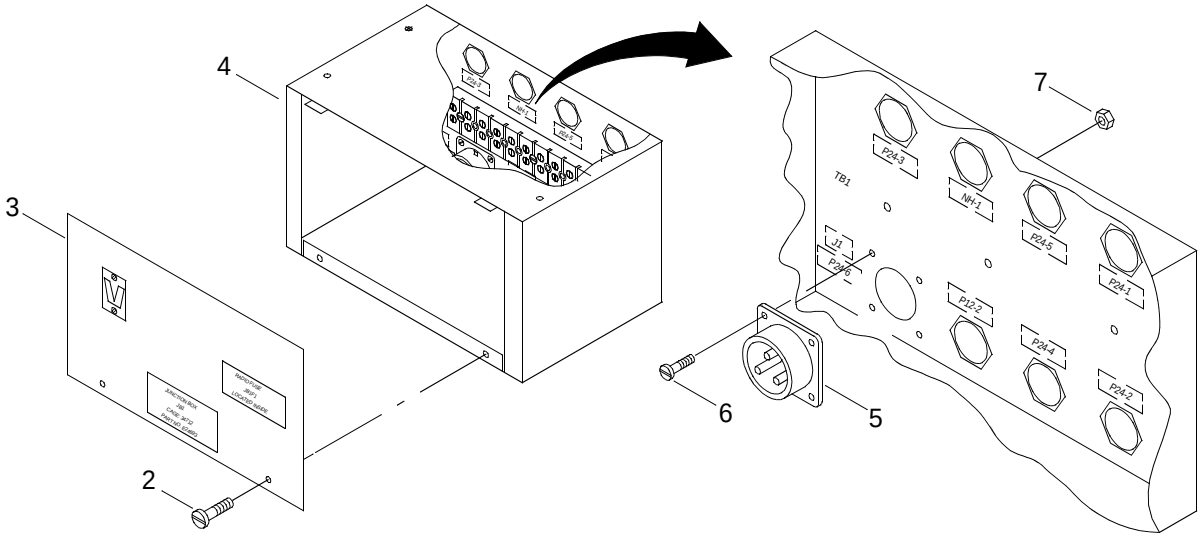


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Loosen two screws (2) securing junction box cover (3) to junction box (4).

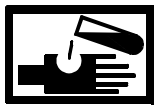


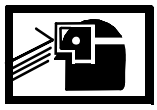
3. Remove junction box cover (3).
4. Tag and disconnect wiring from the receptacle (5).
5. Remove four pan head cap screws (6) and four hex nuts (7) securing receptacle (5) to junction box (5).
6. Pull receptacle (5) from junction box (4).
7. Remove and discard receptacle (5).

INSTALL OPERATORS CAB ELECTRICAL SYSTEM JUNCTION BOX ASSEMBLY JB1 RECEPTACLE

1. Connect wiring to new receptacle (5) as previously tagged and remove tags.
2. Position receptacle (5) on junction box (4).

WARNING


CHEMICAL


EYE PROTECTION

3. Apply antiseize compound to four pan head cap screws (6).
4. Secure receptacle (5) with four pan head cap screws (6) and four hex nuts (7).
5. Tighten hex nuts (7).
6. Position junction box cover (3) on front of junction box (4) and secure with two screws (2).
7. Tighten screws (2).
8. Perform operational check on the junction box assembly JB1. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ELECTRICAL SYSTEM
VHF/FM DSC VOLTAGE CONVERTER
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

VHF/FM DSC Voltage Converter
(34712)
PN E06508-3
Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

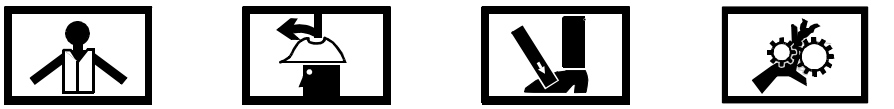
Engineer 88L

References

TM 55-1945-205-10-1

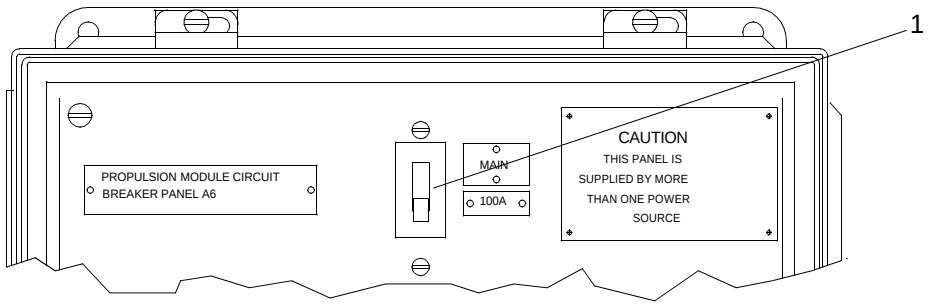
REMOVE OPERATORS CAB ELECTRICAL SYSTEM VHF/FM DSC VOLTAGE CONVERTER

WARNING

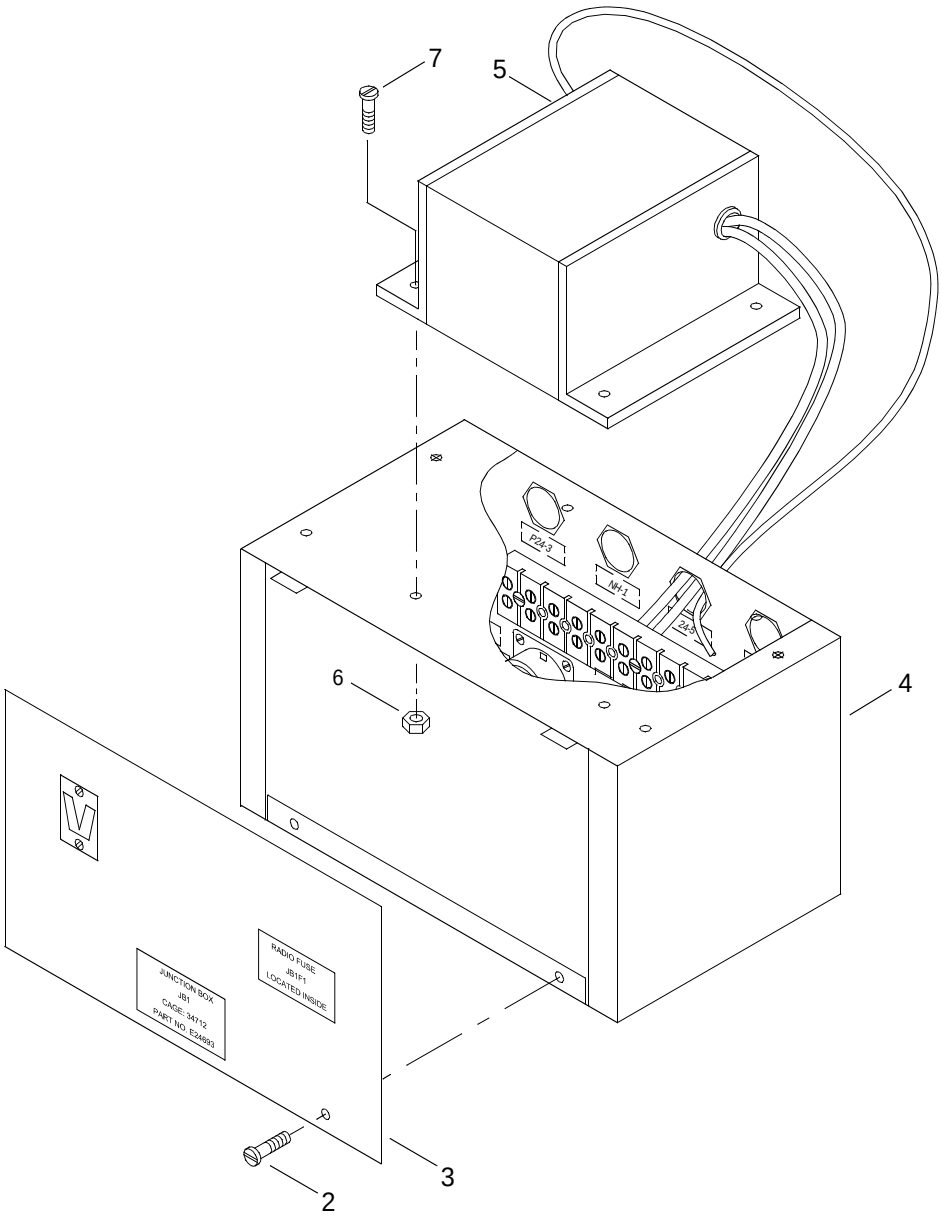


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove the two self-locking screws (2) securing the front cover (3) of junction box JB1 (4).



3. Remove the JB1 front cover (3).

4. Disconnect and tag all wiring associated with the voltage converter (5) inside JB1 (4).

5. Remove the voltage converter wiring from rear of JB1 (4).

6. Remove the four nuts (6) and bolts (7) securing the voltage converter (5) to the top of JB1 (4).

7. Remove and discard voltage converter (5).

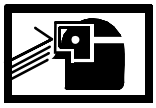
INSTALL OPERATORS CAB ELECTRICAL SYSTEM VHF/FM DSC VOLTAGE CONVERTER

1. Position new voltage converter (5) on top of junction box JB1 (4).

WARNING



CHEMICAL



EYE PROTECTION

2. Apply antiseize compound to four bolts (7).
3. Install bolts (7) and nuts (6) to secure the voltage converter to JB1 (4).
4. Tighten nuts (6).
5. Insert voltage converter (5) wiring into rear of JB1 (4).
6. Connect all wiring, as tagged, for voltage converter (1) into JB1 (3). Remove the tags.
7. Position the front cover (3) on the front of JB1 (4) and secure with two self-locking screws (2).
8. Tighten screws (2).
9. Perform operational check on the operators cab electrical system VHF/FM DSC voltage converter. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ELECTRICAL SYSTEM DC TO DC CONVERTER
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

DC to DC Converter
(0JDM6)
PN 50-200032

Personnel Required

Engineer 88L

References

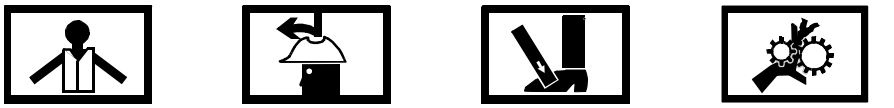
TM 55-1945-205-10-1

Equipment Condition

VHF/FM DSC Transceiver Microphone Removed. (WP 0302 00)
VHF/FM DSC Transceiver Removed. (WP 0303 00)
VHF/FM DSC Transceiver Mount Removed. (WP 0304 00)

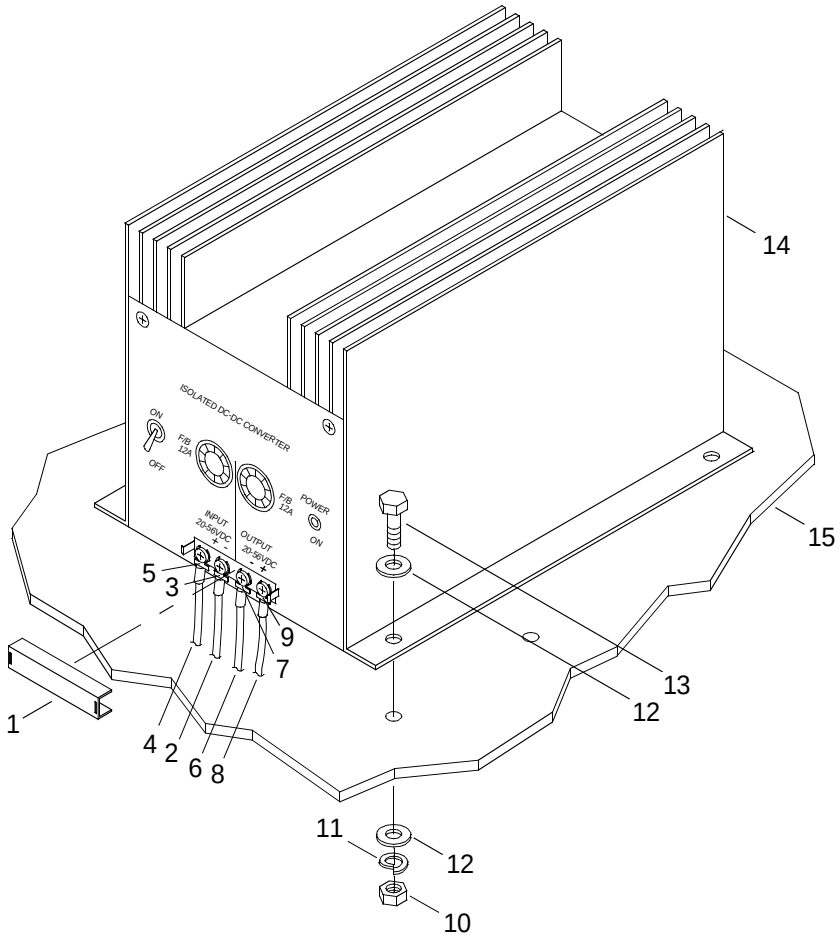
REMOVE OPERATORS CAB ELECTRICAL SYSTEM DC TO DC CONVERTER

WARNING



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

1. Unsnap and remove converter terminal cover (1).



2. Tag negative input electrical wire (2).
3. Loosen screw (3) and remove negative input electrical wire (2).
4. Tag positive input electrical wire (4).
5. Loosen screw (5) and remove positive input electrical wire (4).
6. Tag negative output electrical wire (6).
7. Loosen screw (7) and remove negative output electrical wire (6).
8. Tag positive output electrical wire (8).
9. Loosen screw (9) and remove positive output electrical wire (8).
10. Remove four nuts (10), four lock washers (11), eight flat washers (12) and four hex head screws (13).
11. Remove DC to DC converter (14).

INSTALL OPERATORS CAB ELECTRICAL SYSTEM DC TO DC CONVERTER

1. Align new DC to DC converter (14) with holes in shelf (15).
2. Install four hex head screws (13) and flat washers (12) through holes in converter (14) and shelf (15).
3. Install four flat washers (12), lock washers (11) and nuts (10).
4. Tighten nuts (10).
5. Install positive output electrical wire (8) and tighten screw (9).
6. Install negative output electrical wire (6) and tighten screw (7).
7. Install positive input electrical wire (4) and tighten screw (5).
8. Install negative input electrical wire (2) and tighten screw (3).
9. Remove tags from installed wiring.
10. Install terminal cover (1).
11. Install VHF/FM DSC transceiver mount. (WP 0304 00)
12. Install VHF/FM DSC transceiver. (WP 0303 00)
13. Install VHF/FM transceiver microphone. (WP 0302 00)
14. Perform operational check on the DC to DC converter. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ELECTRICAL SYSTEM
DC TO DC CONVERTER JUNCTION BOX
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

DC to DC Converter Junction Box
(0JDM6)
PN 20-200037

Personnel Required

Engineer 88L

References

TM 55-1945-205-10-1

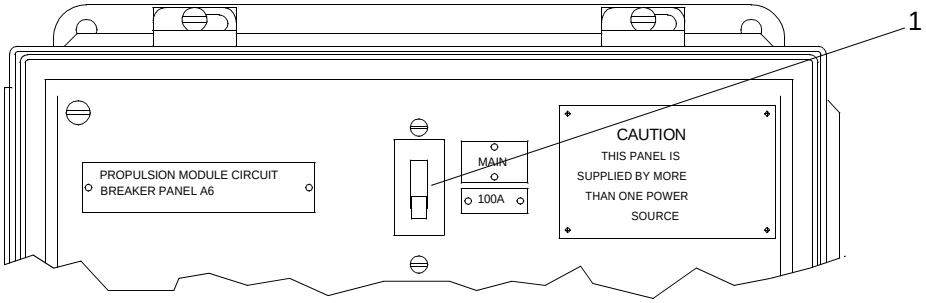
REMOVE OPERATORS CAB ELECTRICAL SYSTEM DC TO DC CONVERTER JUNCTION BOX

WARNING

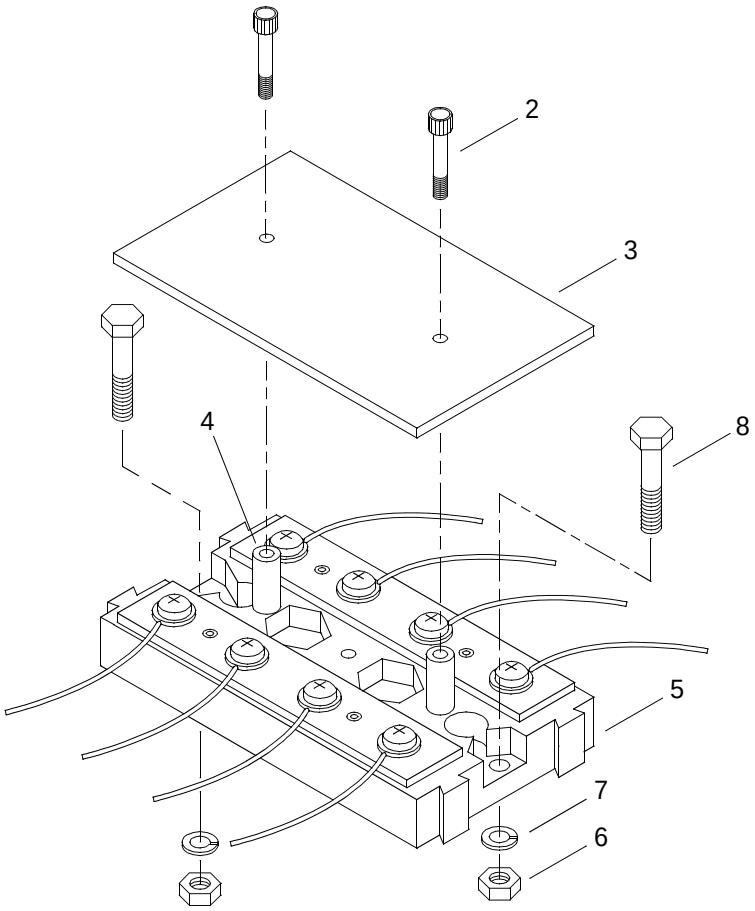


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1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove two plastic cap screws (2) securing plastic cover (3) to the standoffs (4).



3. Remove and tag all wiring attached to top of junction box (5).

4. Remove two nuts (6), lock washers (7) and bolts (8) securing junction box (5) to upper shelf.

5. Remove the DC to DC converter junction box (5) and discard.

INSTALL OPERATORS CAB ELECTRICAL SYSTEM DC TO DC CONVERTER JUNCTION BOX

1. Position new DC to DC junction box (4) in place and secure with two bolts (8), lock washers (7) and nuts (6).

2. Tighten nuts (6).

3. Attach all electrical wiring on junction box (5) and remove tags.

4. Position cover (3) on the standoffs (4) and secure with two plastic screws (2).

5. Tighten screws (2).

6. Perform operational check on the DC to DC converter junction box. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
OPERATORS CAB ELECTRICAL SYSTEM VHF/FM HANDHELD TRANSCEIVER TERMINAL BLOCK REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Materials/Parts

Terminal Block
(0JDM6)
PN 20-200036

Personnel Required

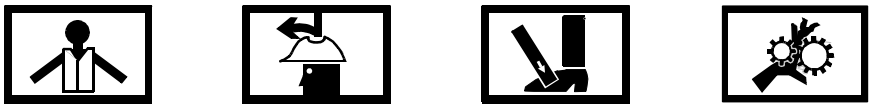
Engineer 88L

References

TM 55-1945-205-10-1

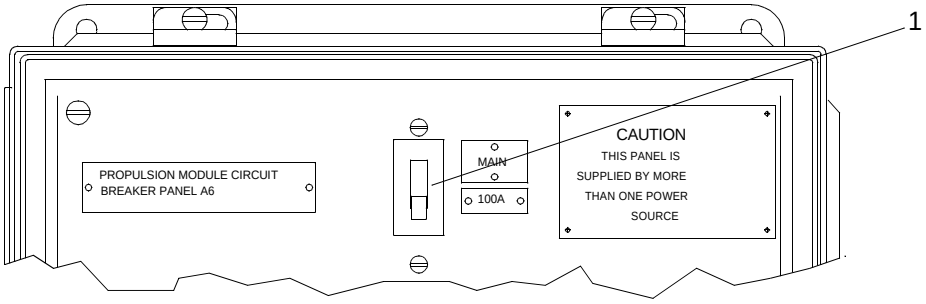
REMOVE OPERATORS CAB ELECTRICAL SYSTEM VHF/FM HANDHELD TRANSCEIVER TERMINAL BLOCK

WARNING

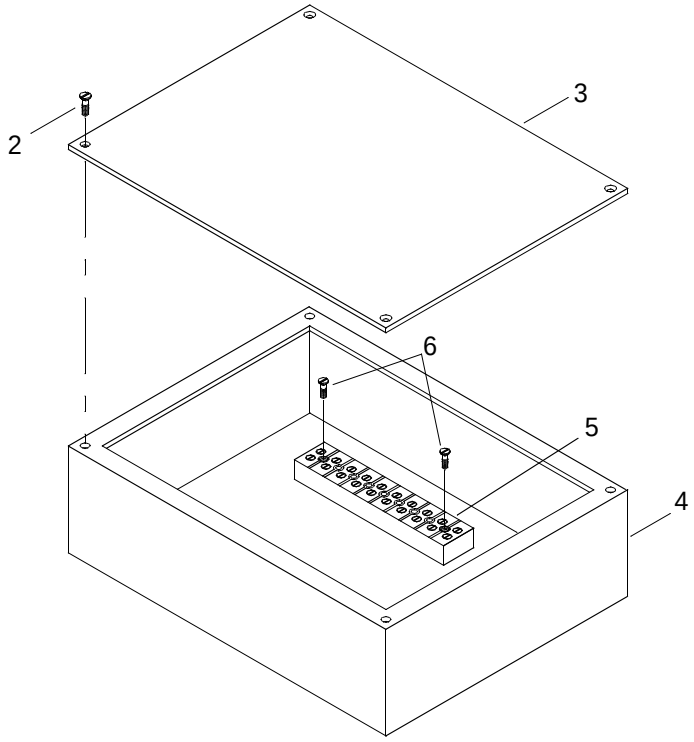


All personnel must wear a personal flotation device, hard hat, safety shoes and gloves during CF operations and maintenance. Failure to observe these precautions could result in serious injury or death to personnel.

1. Verify MAIN circuit breaker (1) on propulsion module circuit breaker panel A6 is off.



2. Remove four screws (2) securing cover (3) to junction box (4).



3. Remove junction box cover (3).
4. Disconnect and tag wiring to terminal block (5).
5. Remove two screws (6) securing terminal block (5) to junction box (4).
6. Remove and discard terminal block (5).

INSTALL OPERATORS CAB ELECTRICAL SYSTEM VHF/FM HANDHELD TRANSCEIVER TERMINAL BLOCK

1. Position new terminal block (5) in junction box (4).
2. Secure terminal block (5) with two screws (6).
3. Tighten screws (6).
4. Connect wiring, as tagged, to terminal block (5).
5. Remove tags.
6. Position junction box cover (3) on junction box (4).
7. Install four screws (2) securing cover (3) to junction box (4).
8. Tighten screws (1).
9. Perform operational check on the VHF/FM handheld transceiver terminal block. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
ANCHORBOARD ASSEMBLY
INSPECTION AND REPAIR

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Blue) (Item 17, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)

Personnel Required

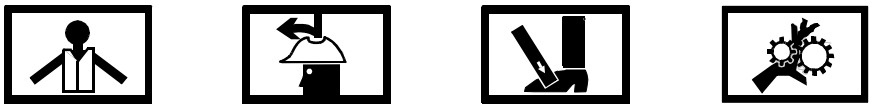
Engineer 88L

Equipment Condition

Anchorboard Assembly Removed. (TM 55-1945-205-10-1)

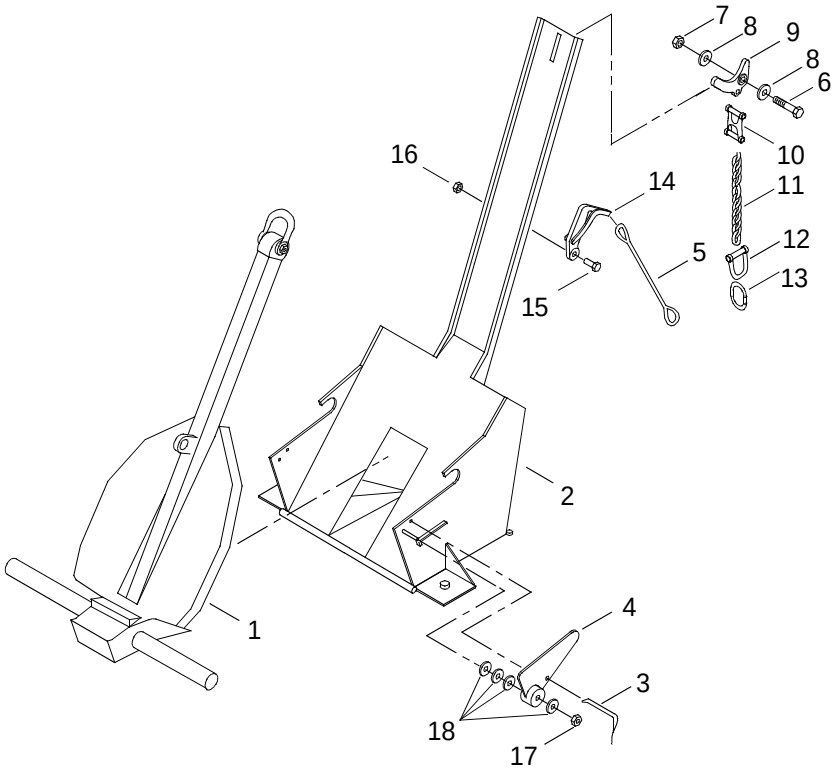
DISASSEMBLE ANCHORBOARD ASSEMBLY

WARNING



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

1. Remove rope securing anchor (1) to anchorboard (2).



2. Remove two locking pins with attached sash chains (3) from ramp extensions (4).
3. Rotate right and left ramp extensions (4) to release bottom part of anchor (1) from anchorboard (2).
4. Pull hook release rope (5) to release upper part of anchor (1) from anchorboard (2).

WARNING



HEAVY PARTS

5. Using crane and cable, remove anchor (1) from anchorboard (2).
6. Remove hex head cap screw (6), self-locking hex nut (7) and two flat washers (8) from trip hook (9).
7. Remove trip hook (9).
8. Remove twin link clevis (10) securing coil chain (11) to trip hook (9).
9. Remove shackle (12) and master link (13) securing coil chain (11) to release hook (14).
10. Remove hex head cap screw (15) and self-locking hex nut (16) from release hook (14).
11. Remove release hook (14).

12. Remove self-locking hex nuts (17) and four flat washers (18) securing right and left ramp extensions (4) to anchorboard (2).

13. Remove right and left ramp extensions (4).

INSPECT ANCHORBOARD ASSEMBLY

NOTE

Repair is limited to replacement of piece parts.

1. Inspect trip hook (9) and release hook (14) for damage or cracks. Replace as necessary.

2. Inspect two toggle pins and sash chains (11) for damage. Replace as necessary.

3. Inspect trip hook rope (5) for kinks, separated strands or other damage. Replace as necessary.

ASSEMBLE ANCHORBOARD ASSEMBLY

1. Position right and left ramp extensions (4) on anchorboard (2).

2. Secure right and left ramp extensions (4) on anchorboard (2) with hex nuts (17) and four flat washers (18).

3. Position release hook (14) on anchorboard (2).

4. Secure release hook (14) on anchorboard (2) with hex head cap screw (15) and self-locking hex nut (16).

5. Position trip hook (9) on anchorboard (2) and secure with hex head cap screw (6), self-locking hex nut (7) and two flat washers (8).

6. Attach shackle (12) and master link (13) to coil chain (11) and secure to trip hook (9).

7. Attach twin link clevis (10) to coil chain (11) and secure to trip hook (9).

WARNING



HEAVY PARTS

8. Using crane and cable, lift and position anchor (1) on anchorboard (2).

9. Rotate right and left ramp extensions (4) to secure bottom part of anchor (1) in anchorboard (2) and secure with locking pins (11).

10. Rotate trip hook (9) to secure upper part of anchor (1) in anchorboard (2).

11. Secure anchor (1) to anchorboard (2) with rope.

12. Install anchorboard assembly. (TM 55-1945-205-10-1)

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
INTERMEDIATE SECTION NON-POWERED MODULE
MARINE GROWTH REMOVAL

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Hose Assembly, Rubber (Item 19, WP 0383 00)
Cleaner Power Washer (Item 6, WP 0383 00)
Scraper, Ship (Copper Alloy) (Item 32, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)

Personnel Required

Seaman 88K

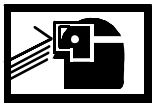
Equipment Condition

Intermediate Section Non-Powered Module Dry-Docked.

REMOVE INTERMEDIATE SECTION NON-POWERED MODULE MARINE GROWTH

1. Connect hose to power washer.

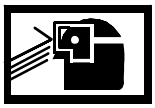
WARNING



EYE PROTECTION

2. Remove marine growth using a scraper.

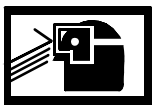
WARNING



EYE PROTECTION

3. Remove marine growth debris from the surface of the module using a hose with directed water spray.

WARNING



EYE PROTECTION

4. Remove marine growth from male and female connectors in both the extended and retracted position using a hose with directed water spray.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
INTERMEDIATE SECTION NON-POWERED MODULE
CLEANING AND PAINTING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Brush, Paint (Item 4, WP 0382 00)
Cloth, Cleaning (Item 6,WP 0382 00)
Paint, Amercoat 385 #27 Haze Grey (Item 17, WP 0382 00)
Paint, Amercoat 385 AS Mid Graphite Grey (Item 18, WP 0382 00)
Paint, Amercoat 385 PA Oxide Red Primer (Item 19, WP 0382 00)
Paper, Abrasive (Item 20, WP 0382 00)
Roller Kit, Paint (Item 22, WP 0382 00)
Tape, Pressure Sensitive Adhesive (Item 34, WP 0382 00)
Zinc, Inorganic, No. 531 (Item 40, WP 0382 00)

Personnel Required

Seaman 88K

References

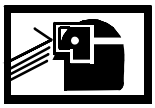
SSPC SP-2
DOD-PRF-24648
MIL-PRF-23236

Equipment Condition

Intermediate Section Non-Powered Module Dry-Docked.
Intermediate Section Non-Powered Module Marine Growth Removed. (WP 0345 00)

PREPARE AND CLEAN INTERMEDIATE SECTION NON-POWERED MODULE FOR PAINTING

WARNING



EYE PROTECTION

NOTE

This task is typical for exterior of modules. Power tools are not authorized for use when preparing modules for spot painting. Preparation procedures are in accordance with Steel Structures Painting Council, SP-2 Hand Tool Cleaning (SSPC SP-2).

The following steps will be preformed prior to module surface painting. Upon completion of rust and paint removal the substrate metal should have a faint metallic sheen and be free of oil, grease, dust, soil, salts and other contaminants.

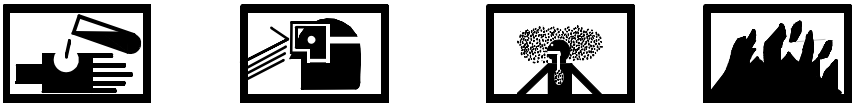
1. Remove all rust scale, mill scale, loose rust and loose paint to the degree specified by hand wire brushing, hand sanding, hand scraping, hand chipping or other hand impact tools or a combination of these methods.

2. Using clean lint free cloth wipe area clean in preparation for painting.

PAINT EXTERIOR INTERMEDIATE SECTION NON-POWERED MODULE STEEL SURFACES

1. Mask off areas to be painted.

WARNING



CHEMICAL EYE PROTECTION VAPOR FIRE

NOTE

Application temperature range limits are 40° - 120°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.

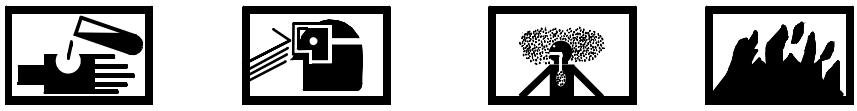
2. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours at 70°F.

WARNING



NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

5. Combine hardener with base paint and stir well.

WARNING



6. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

Cold temperatures or high humidity will retard drying time.

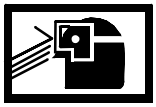
7. Allow topcoat to air dry hard, approximately 16 hours at 70°F.

APPLY DECK GRIP COATING TO EXTERIOR STEEL INTERMEDIATE SECTION NON-POWERED MODULE SURFACES

1. Mask off area to coated.

WARNING


CHEMICAL


EYE PROTECTION


VAPOR


FIRE

CAUTION

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

NOTE

Application temperature range limits are 40° - 120°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. Using nylon roller, paint tray and brush, apply one coat of Amercoat 385 AS anti-skid coating to deck surface.

3. Back roll each coat while wet at a 90° angle to evenly spread the texture.

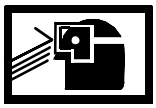
NOTE

Cold temperatures or high humidity will retard drying time.

4. Allow to dry tack free, approximately 3 hours at 70°F.

WARNING


CHEMICAL


EYE PROTECTION


VAPOR


FIRE

CAUTION

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

NOTE

Application temperature range limits are 40° - 120°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.

5. Apply a second coat of anti-skid coating, after the first coat is completely tack free.

NOTE

Cold temperatures or high humidity will retard drying time.

6. Allow anti-skid coating to dry 96 hours before heavy traffic or equipment is used on it.

PAINT INTERMEDIATE SECTION NON-POWERED MODULE CLEATS, D-RINGS, GUILLOTINE CONNECTORS AND FLEXOR ASSEMBLIES

CAUTION

Do not prime or paint rubber surfaces of flexor assemblies, damage to flexors will occur.

1. Mask off areas to be painted.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

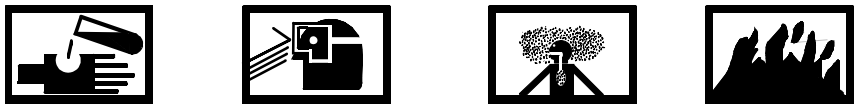
2. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours at 70°F.

WARNING

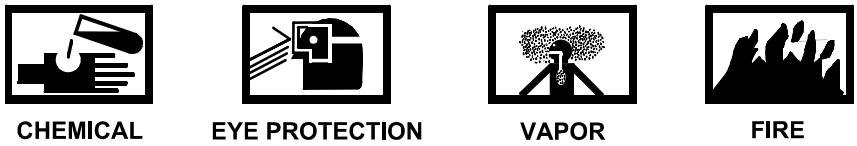


NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

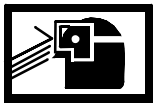
WARNING



5. Combine hardener with base paint and stir well.

WARNING


CHEMICAL


EYE PROTECTION


VAPOR


FIRE

CAUTION

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

NOTE

Application temperature range limits are 40° - 120°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.

6. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

Cold temperatures or high humidity will retard drying time.

7. Allow topcoat to air dry hard, approximately 16 hours at 70°F.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
INTERMEDIATE SECTION NON-POWERED MODULE
INSPECTION FOR WATER

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Sling, 53,000 lb 25 ft (Brown) (Item 36, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Seaman 88K

Equipment Condition

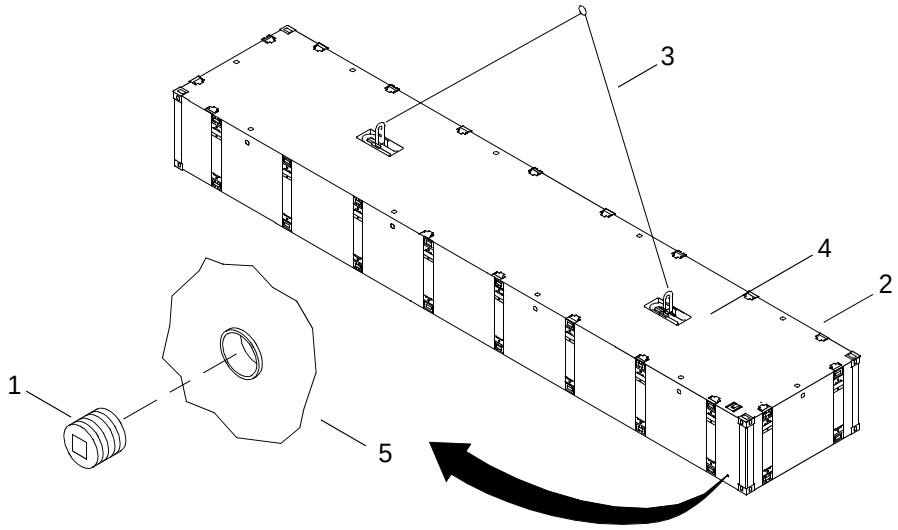
Intermediate Section Non-Powered Module Dry-Docked.

INSPECT INTERMEDIATE SECTION NON-POWERED MODULE FOR WATER

NOTE

The following procedure is typical for inspecting intermediate section non-powered modules for water and machine plug location.

1. Remove the machine plug (1) from the module (2).



WARNING



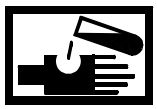
HEAVY PARTS

2. Using crane, attach a sling (3) to the lifting shackles (4) on the module (1) and tilt module to the side where the machine plug opening (5) is at its lowest point.

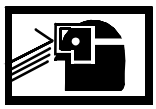
3. Remove machine plug (5). If water is present, allow to drain.

4. If water is found, pressure test the module (1). (WP 0348 00)

WARNING



CHEMICAL



EYE PROTECTION

5. Apply antiseize compound to threads of machine plug (1).

6. Install plug (1) into module (2).

7. Tighten plug (1).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
INTERMEDIATE SECTION NON-POWERED MODULE
PRESSURE TEST

INITIAL SETUP:

Test Equipment
Test Set, Compartment Air (Item 41, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Compressor Unit, Reciprocating, Power Drive (Item 7, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts
Sealing Compound (Item 24, WP 0382 00)

Personnel Required
Engineer 88L

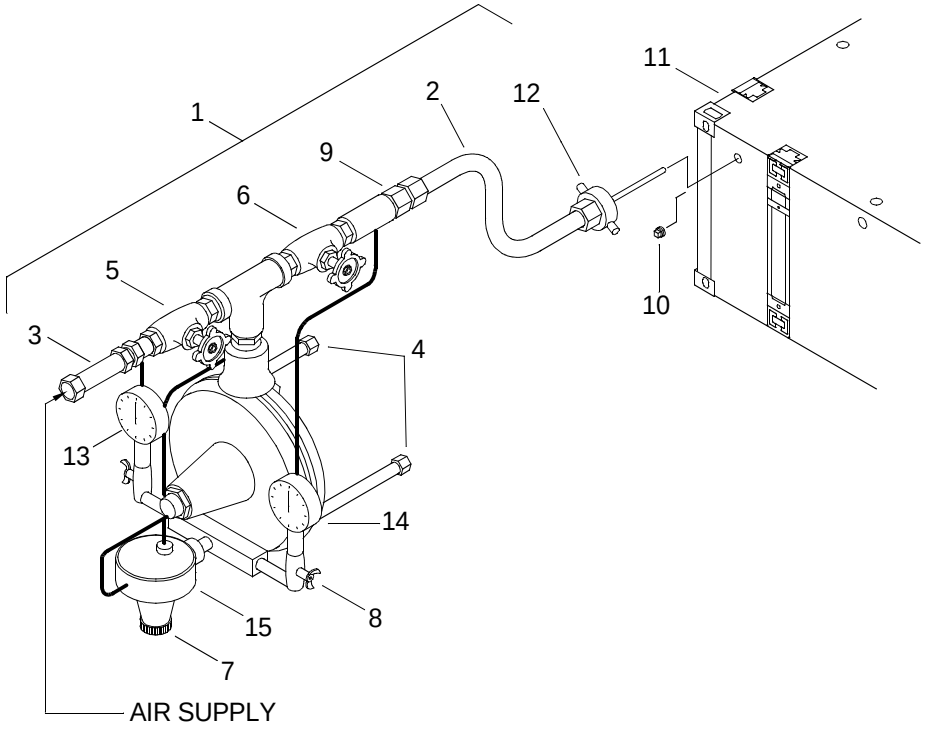
Equipment Condition
Intermediate Section Non-Powered Module Dry-Docked.

PRESSURE TEST INTERMEDIATE SECTION NON-POWERED MODULE

NOTE

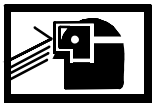
The following procedure is typical for pressure testing all intermediate section non-powered modules and for pipe plug location.

1. Remove test set (1), sensing line (2) and charging line extension hose (3) from storage box.



2. Attach two extension legs (4).
3. Ensure inlet (5) and outlet valves (6), set pressure knob (7) and gauges pet cocks (8) are closed.
4. Connect sensing line (2) to the outlet coupling fitting (9).
5. Remove pipe plug (10) from one of three locations at side of module (11).
6. Install test set sensing line (2) into module through chosen pipe plug (10) opening.
7. Using pipe to hose adaptors (12), as required, connect sensing line (2) to pipe plug (10) opening.
8. Adjust length of legs (4) to position test set (1) on module (11).
9. Connect 100 PSI air supply to inlet valve (3) connector.

WARNING



EYE PROTECTION

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

10. Rotate set pressure knob (7) counterclockwise eight turns.
11. Open both gauge pet cocks (8).
12. Open air supply valve, applying input pressure.
13. Open test set inlet valve (5).

WARNING



EXPLOSION

A module pressure must be regulated to 3 PSI pressure. Higher pressures may cause explosion. Failure to comply may result in serious injury or death to personnel.

14. Observe input pressure gauge (13) and rotate set pressure knob (7) clockwise until gauge reads 3 PSI.
15. When input pressure gauge (13) is stable at 3 PSI, open outlet valve (6).
16. When output pressure gauge reads 3 PSI, close outlet valve (6).
17. Observe any pressure drop on output pressure gauge (14).

CAUTION

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

18. Inspect all seams for evidence of leakage and mark observed leakage areas. Report any leakage to the next higher maintenance level.

19. Seams must be welded watertight before proceeding with assembly for mission.

20. To hold pressure while isolating a leak, open outlet valve (6) to allow regulator (15) to control air loss at a rate dependent upon the volume of the module and rate of leakage.

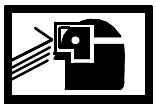
21. To shut down the test set (1), close air supply valve and remove charging line extension hose (3).

22. Remove test set sensing line (2) from pipe plug (10) opening and remove test set (1).

WARNING



CHEMICAL



EYE PROTECTION

23. Apply sealing compound on plug (10) threads.

24. Reinstall the plug (10) to the module (11) test location and tighten.

25. Close inlet (5) and outlet (6) valve, gauge pet cocks (8) and rotate set pressure knob (7) clockwise to end of travel.

26. Remove leg extensions (4) and stow in storage box.

27. Remove adaptor (12), if used, and stow in storage box.

28. With valve handles (5 and 6) facing down, place test set (1) in storage box.

29. Coil sensing line (2) and charging line extension hose (3) in storage box.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
INTERMEDIATE SECTION NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS
INSPECTION, REPAIR, LUBRICATION AND ADJUSTMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Crowbar (Item 9, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Wedge, Wood (Item 37, WP 0382 00)
Paint, Amercoat 385 #27 Haze Grey (Item 17, WP 0382 00)
Grease, Lubriplate (Item 9, WP 0382 00)
Sponge (Item 29, WP 0382 00)

Personnel Required

Seaman 88K

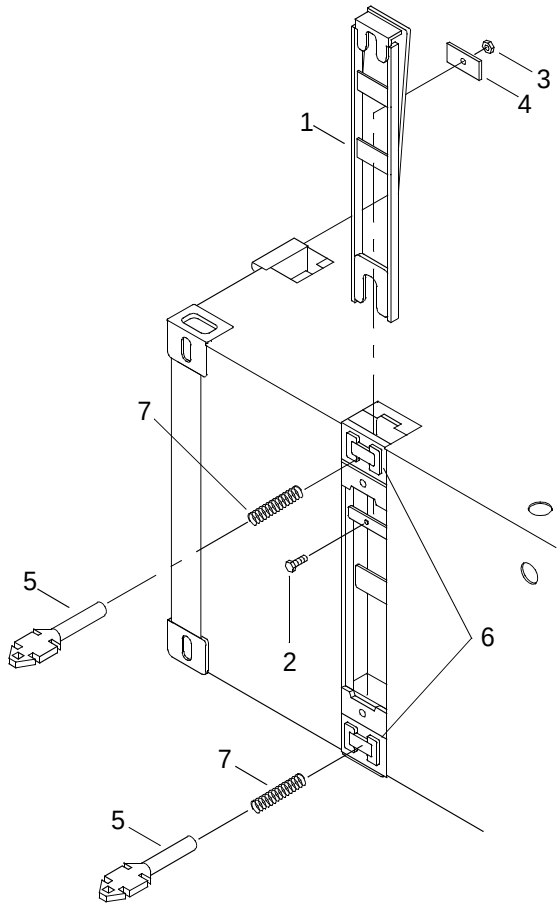
DISASSEMBLY OF INTERMEDIATE SECTION NON-POWERED MODULE GUILLOTINE CONNECTORS

WARNING



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

1. Disassemble the male guillotine connector assembly.

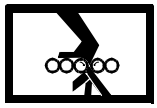


a. Remove the guillotine connector bar (1).

{1} Remove the bolt (2), nut (3) and friction plate (4).

{2} Pry up on the guillotine connector bar (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.

{3} Place a wood wedge under the upper “lip” of the guillotine connector bar (1) after it is raised to hold it in the up position.

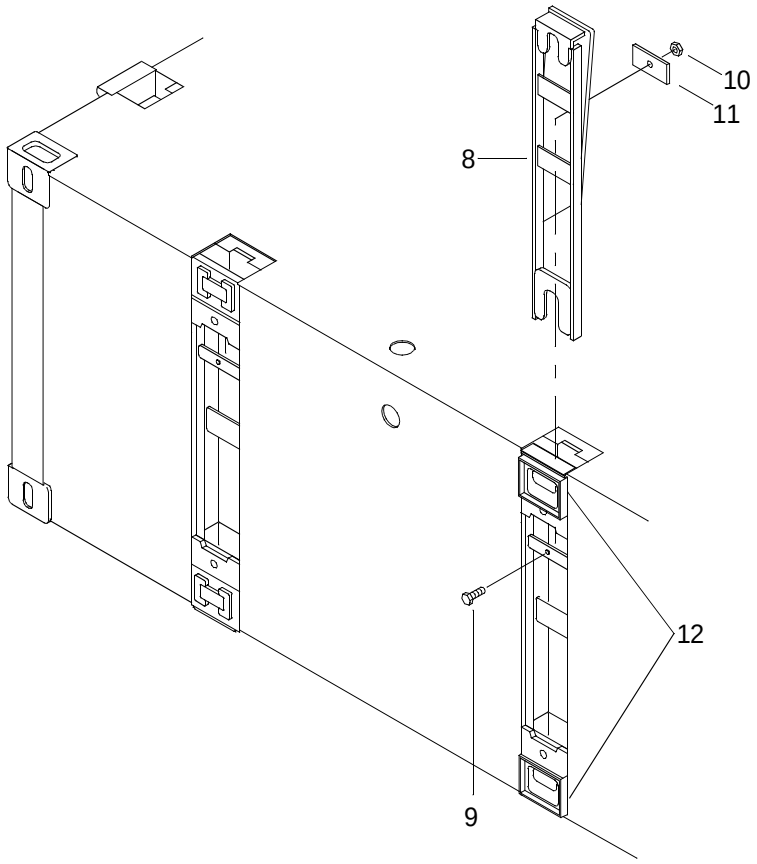
b. Push up on the retainer located on the underside of the male connector pin (5).

c. Remove male connector pin (5) from the guillotine connector lock housing (6).

d. Remove deployment spring (7).

e. Remove guillotine connector bar (1) from guillotine lock housing (6).

2. Disassemble the female guillotine connector assembly.



a. Remove the guillotine connector bar (8).

{1} Remove the bolt (9), nut (10) and friction plate (11).

{2} Pry up on the guillotine connector bar (8) using a crowbar.

b. Remove guillotine connector bar (8) from guillotine lock housing (12).

INSPECT AND REPAIR/REPLACE INTERMEDIATE SECTION NON-POWERED MODULE GUILLOTINE CONNECTORS

1. Inspect male connector pin (5) for cracks, cuts or corrosion. If damaged, replace connector pin.

2. Inspect deployment spring (7) for cracks, cuts or corrosion. If damaged, replace deployment spring.

3. Inspect guillotine connector bar (1, 8) for cracks, cuts or corrosion. If damaged, repair or replace guillotine connector bar (1, 8).

4. Inspect guillotine connector male and female lock housing (6, 12) for cracks, cuts or corrosion. If damaged, replace or replace guillotine connector lock housing (6, 12).

5. Inspect guillotine connector assembly friction plate (4, 11) for cracks, cuts or corrosion. If damaged, replace friction plate (4, 11).

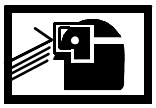
LUBRICATE INTERMEDIATE SECTION NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Lubricate the guillotine connector assemblies.

WARNING



CHEMICAL



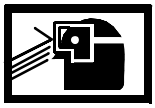
EYE PROTECTION

a. Lubricate connector bar assemblies with a light coat of Lubriplate grease.

WARNING



CHEMICAL



EYE PROTECTION

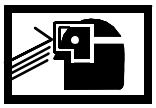
b. Lubricate deployment spring (3) with a light coat of Lubriplate grease.

2. Clean exposed or rusty surfaces with wire brush. (WP 0346 00)

WARNING



CHEMICAL



EYE PROTECTION

3. Spot paint exposed surfaces with Haze Grey Amercoat 385 #27 paint. (WP 0346 00)

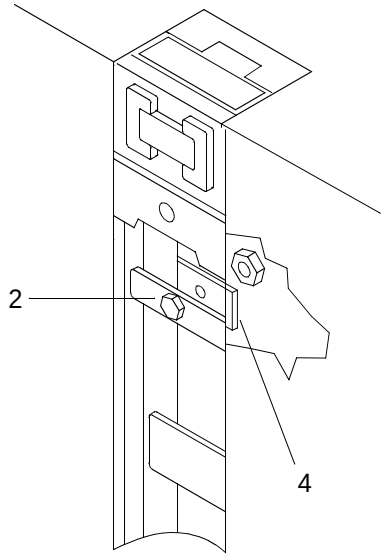
4. Remove standing water with a sponge from the guillotine connector assemblies.

ASSEMBLY OF INTERMEDIATE SECTION NON-POWERED MODULE GUILLOTINE CONNECTORS

1. Assemble the female guillotine connector assembly.
   a. Install guillotine connector bar (8) into guillotine lock housing (12).
   b. Install bolt (9) through friction plate (11) and nut (10).
2. Assemble the male guillotine connector assembly.
   a. Install guillotine connector bar (1) into guillotine lock housing (6).
   b. Install deployment spring (7) on male connector pin (5).
   c. Install male connector pin (5) into guillotine connector lock housing (6) by pushing down on the retainer located on the underside of the male connector pin (5) to lock pin in place.
   d. Install bolt (2) through friction plate (4) and nut (3).

ADJUST INTERMEDIATE SECTION NON-POWERED MODULE GUILLOTINE CONNECTORS

1. Locate the friction plate (4) on the guillotine connector assembly.



CAUTION

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

2. Tighten bolt (2) using two standard wrenches.
3. Remove wood wedge.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BEACH END SECTION NON-POWERED MODULE
MARINE GROWTH REMOVAL

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Hose Assembly, Rubber (Item 19, WP 0383 00)
Cleaner Power Washer (Item 6, WP 0383 00)
Scraper, Ship (Item 32, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Personnel Required

Seaman 88K

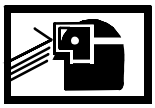
Equipment Condition

Beach End Section Non-Powered Module Dry-Docked.

REMOVE BEACH END SECTION NON-POWERED MODULE MARINE GROWTH

1. Connect hose to power washer.

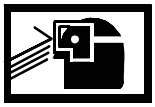
WARNING



EYE PROTECTION

2. Remove marine growth using a scraper.

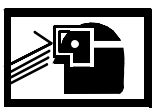
WARNING



EYE PROTECTION

3. Remove marine growth debris from the surface of the module using a hose with directed water spray.

WARNING



EYE PROTECTION

4. Remove marine growth from male and female connectors in both the extended and retracted position using a hose with directed water spray.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BEACH END SECTION NON-POWERED MODULE
CLEANING AND PAINTING

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Brush, Paint (Item 4, WP 0382 00)
Cloth, Cleaning (Item 6, WP 0382 00)
Rag, Wiping (Item 21, WP 0382 00)
Paint, Amercoat 385 #27 Haze Grey (Item 17, WP 0382 00)
Paint, Amercoat 385 AS Mid Graphite Grey (Item 18, WP 0382 00)
Paint, Amercoat 385 PA Oxide Red Primer (Item 19, WP 0382 00)
Paper, Abrasive (Item 20, WP 0382 00)
Zinc, Inorganic, No. 531 (Item 39, WP 0382 00)

Personnel Required

Seaman 88K

References

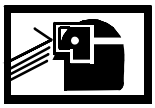
SSPC SP-2
DOD-PRF-24648
MIL-PRF-23236

Equipment Condition

Beach End Section Non-Powered Module Dry-Docked.
Beach End Section Non-Powered Module Marine Growth Removed. (WP 0350 00)

PREPARE AND CLEAN BEACH END SECTION NON-POWERED MODULE FOR PAINTING

WARNING



EYE PROTECTION

NOTE

This task is typical for exterior of modules. Power tools are not authorized for use when preparing modules for spot painting. Preparation procedures are in accordance with Steel Structures Painting Council, SP-2 Hand Tool Cleaning (SSPC SP-2).

The following steps will be preformed prior to module surface painting. Upon completion of rust and paint removal the substrate metal should have a faint metallic sheen and be free of oil, grease, dust, soil, salts and other contaminants.

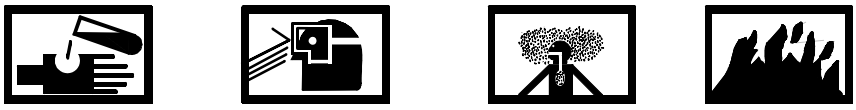
1. Remove all rust scale, mill scale, loose rust and loose paint to the degree specified by hand wire brushing, hand sanding, hand scraping, hand chipping or other hand impact tools or a combination of these methods.

2. Using clean lint free cloth wipe area clean in preparation for painting.

PAINT EXTERIOR BEACH END SECTION NON-POWERED MODULE STEEL SURFACES

1. Mask off areas to be painted.

WARNING



CHEMICAL EYE PROTECTION VAPOR FIRE

NOTE

Application temperature range limits are 40° - 120°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.

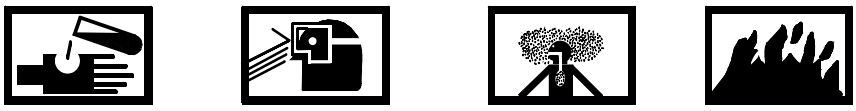
2. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours at 70°F.

WARNING



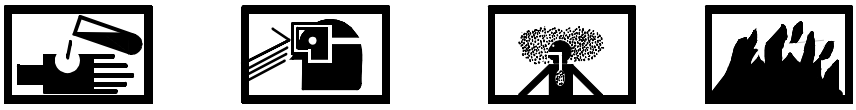
NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

5. Combine hardener with base paint and stir well.

WARNING



6. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

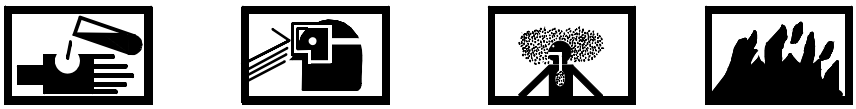
Cold temperatures or high humidity will retard drying time.

7. Allow topcoat to air dry hard, approximately 16 hours at 70°F.

APPLY DECK GRIP COATING TO EXTERIOR STEEL BEACH END SECTION NON-POWERED MODULE SURFACES

1. Mask off area to coated.

WARNING



CHEMICAL EYE PROTECTION VAPOR FIRE

CAUTION

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

NOTE

Application temperature range limits are 40° - 120°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. Using nylon roller, paint tray and brush, apply one coat of Amercoat 385 AS anti-skid coating to deck surface.

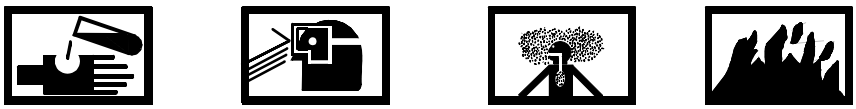
3. Back roll each coat while wet at a 90° angle to evenly spread the texture.

NOTE

Cold temperatures or high humidity will retard drying time.

4. Allow to dry tack free, approximately 3 hours at 70°F.

WARNING



CHEMICAL EYE PROTECTION VAPOR FIRE

CAUTION

Do not apply anti-skid coating to air test plug ports, lift casting, shackles and connector castings, damage to equipment will occur.

NOTE

Application temperature range limits are 40° - 120°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.

5. Apply a second coat of anti-skid coating, after the first coat is completely tack free.

NOTE

Cold temperatures or high humidity will retard drying time.

6. Allow anti-skid coating to dry 96 hours before heavy traffic or equipment is used on it.

PAINT BEACH END SECTION NON-POWERED MODULE CLEATS, D-RINGS, GUILLOTINE CONNECTORS AND FLEXOR ASSEMBLIES

CAUTION

Do not prime or paint rubber surfaces of flexor assemblies, damage to flexor will occur.

1. Mask off areas to be painted.

WARNING



NOTE

Application temperature range limits are 40° - 120°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.

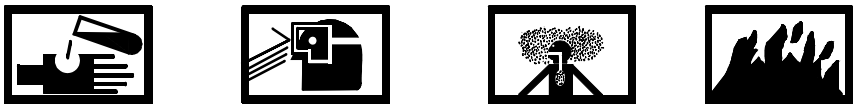
2. Using brush, apply one coat of Amercoat 385 PA oxide red primer paint, Type I, Class I, Composition B in accordance with procedures contained in DOD-PRF-24648.

NOTE

Cold temperatures or high humidity will retard drying time.

3. Allow primer paint to air dry to touch, approximately 2 hours at 70°F.

WARNING

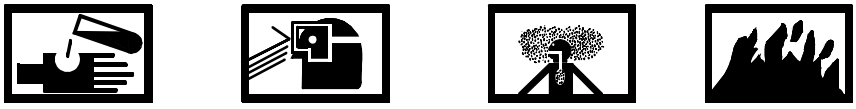


NOTE

Amercoat 385 #27 haze grey is supplied in two parts.

4. Stir base paint (Amercoat 385 #27) and hardener containers separately.

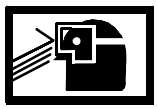
WARNING



5. Combine hardener with base paint and stir well.

WARNING


CHEMICAL


EYE PROTECTION


VAPOR


FIRE

CAUTION

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

NOTE

Application temperature range limits are 40° - 120°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.

6. Apply one coat of Amercoat 385 #27 haze gray epoxy paint (topcoat) in accordance with procedures outlined in MIL-PRF-23236.

NOTE

Cold temperatures or high humidity will retard drying time.

7. Allow topcoat to air dry hard, approximately 16 hours at 70°F.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BEACH END SECTION NON-POWERED MODULE
INSPECTION FOR WATER

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Sling, 53,000 lb 25 ft (Brown) (Item 36, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Antiseize Compound (Item 3, WP 0382 00)

Personnel Required

Seaman 88K

Equipment Condition

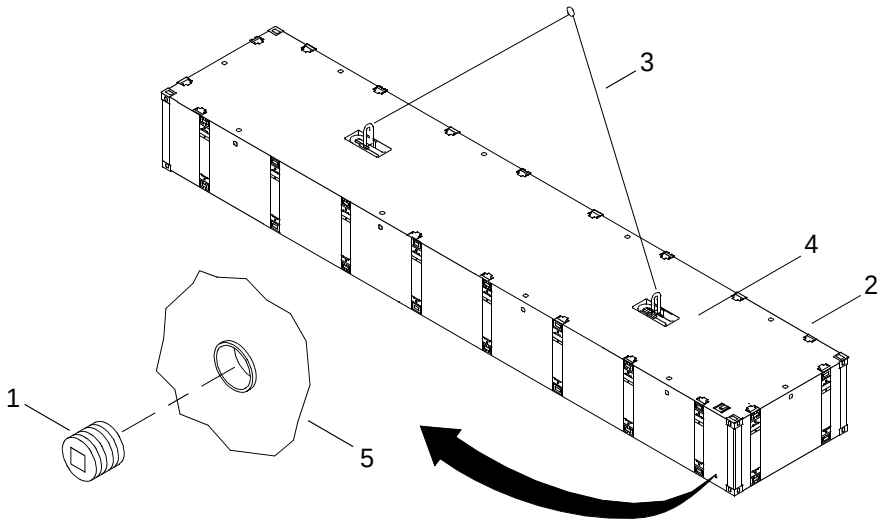
Beach End Section Non-Powered Module Dry-Docked.

INSPECT BEACH END SECTION NON-POWERED MODULE FOR WATER

NOTE

The following procedure is typical for inspecting intermediate section non-powered modules for water and machine plug location.

1. Remove the machine plug (1) from the module (2).



WARNING



HEAVY PARTS

2. Using crane, attach a sling (3) to the lifting shackles (4) on the module (1) and tilt module to the side where the machine plug opening (5) is at its lowest point.

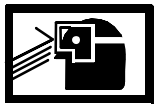
3. Remove machine plug (5). If water is present, allow to drain.

4. If water is found, pressure test the module (1). (WP 0353 00)

WARNING



CHEMICAL



EYE PROTECTION

5. Apply antiseize compound to threads of machine plug (1).

6. Install plug (1) into module (2).

7. Tighten plug (1).

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BEACH END SECTION NON-POWERED MODULE
PRESSURE TEST

INITIAL SETUP:

Test Equipment
Test Set, Compartment Air (Item 41, WP 0383 00)

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Industrial (Chipping, Chemical) (Item 14, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Compressor Unit, Reciprocating, Power Drive (Item 7, WP 0383 00)

Materials/Parts
Sealing Compound (Item 24, WP 0382 00)

Personnel Required
Engineer 88L

Equipment Condition

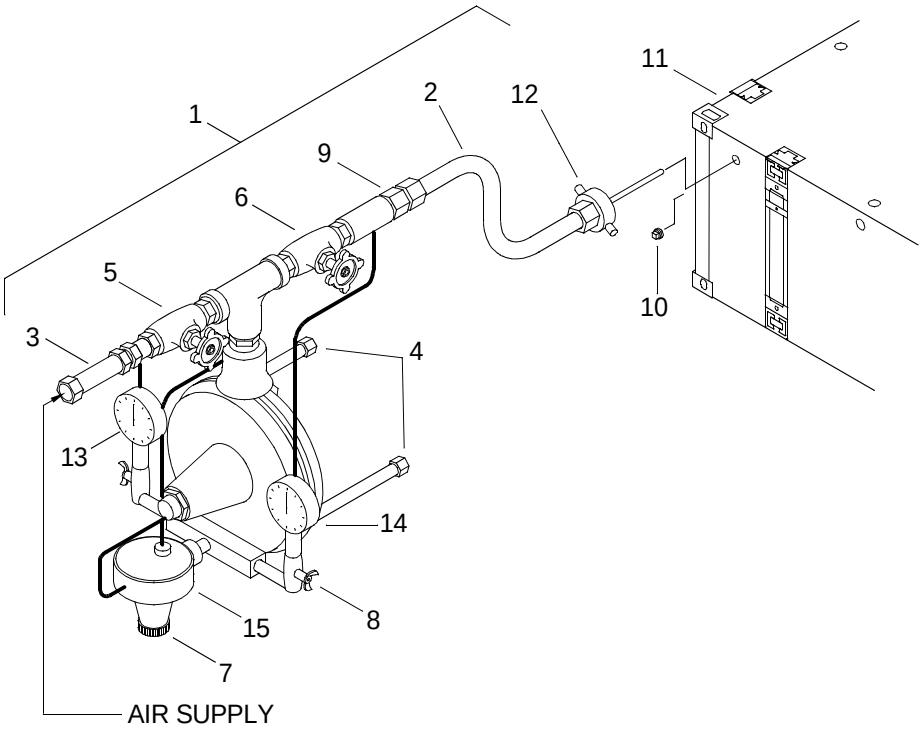
Beach End Section Non-Powered Module Dry-Docked.

PRESSURE TEST BEACH END SECTION NON-POWERED MODULE

NOTE

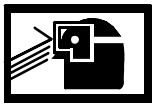
The following procedure is typical for pressure testing all intermediate section non-powered modules and for pipe plug location.

1. Remove test set (1), sensing line (2) and charging line extension hose (3) from storage box.



2. Attach two extension legs (4).
3. Ensure inlet (5) and outlet valves (6), set pressure knob (7) and gauges pet cocks (8) are closed.
4. Connect sensing line (2) to the outlet coupling fitting (9).
5. Remove pipe plug (10) from one of three locations at side of module (11).
6. Install test set sensing line (2) into module through chosen pipe plug (10) opening.
7. Using pipe to hose adaptors (12), as required, connect sensing line (2) to pipe plug (10) opening.
8. Adjust length of legs (4) to position test set (1) on module (11).
9. Connect 100 PSI air supply to inlet valve (3) connector.

WARNING



EYE PROTECTION

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

10. Rotate set pressure knob (7) counterclockwise eight turns.
11. Open both gauge pet cocks (8).
12. Open air supply valve, applying input pressure.

13. Open test set inlet valve (5).

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.

14. Observe input pressure gauge (13) and rotate set pressure knob (7) clockwise until gauge reads 2 PSI.

15. When input pressure gauge (13) is stable at 2 PSI, open outlet valve (6).

16. When output pressure gauge reads 2 PSI, close outlet valve (6).

17. Observe any pressure drop on output pressure gauge (14).

CAUTION

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

18. Inspect all seams for evidence of leakage and mark observed leakage areas. Report any leakage to the next higher maintenance level.

19. Seams must be welded watertight before proceeding with assembly for mission.

20. To hold pressure while isolating a leak, open outlet valve (6) to allow regulator (15) to control air loss at a rate dependent upon the volume of the module and rate of leakage.

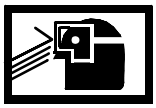
21. To shut down the test set (1), close air supply valve and remove charging line extension hose (3).

22. Remove test set sensing line (2) from pipe plug (10) opening and remove test set (1).

WARNING



CHEMICAL



EYE PROTECTION

23. Apply sealing compound on plug (10) threads.

24. Reinstall the plug (10) to the module (11) test location and tighten.

25. Close inlet (5) and outlet (6) valve, gauge pet cocks (8) and rotate set pressure knob (7) clockwise to end of travel.

26. Remove leg extensions (4) and stow in storage box.

27. Remove adaptor (12), if used, and stow in storage box.

28. With valve handles (5 and 6) facing down, place test set (1) in storage box.

29. Coil sensing line (2) and charging line extension hose (3) in storage box.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BEACH END SECTION NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS
INSPECTION, REPAIR, LUBRICATION AND ADJUSTMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Helmet, Safety (Brown) (Item 18, WP 0383 00)
Life Preserver, Vest (Item 21, WP 0383 00)
Apron, Utility (Item 1, WP 0383 00)
Crowbar (Item 9, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)

Materials/Parts

Paint, Amercoat 385 #27 Haze Grey (Item 17, WP 0382 00)
Grease, Lubriplate (Item 9, WP 0382 00)
Sponge (Item 29, WP 0382 00)
Wedge, Wood (Item 37, WP 0382 00)

Personnel Required

Seaman 88K

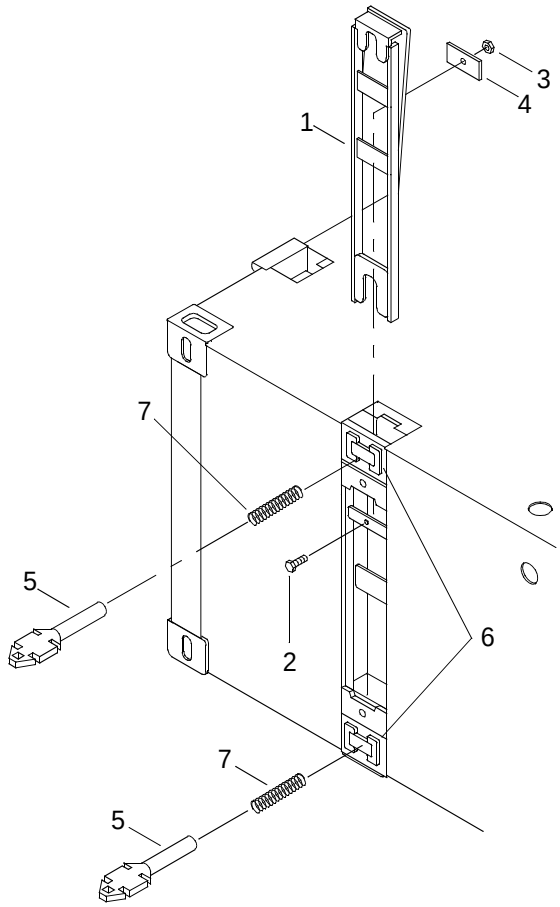
DISASSEMBLY OF BEACH END SECTION NON-POWERED MODULE GUILLOTINE CONNECTORS

WARNING



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

1. Disassemble the male guillotine connector assembly.

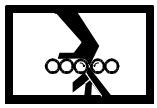


a. Remove the guillotine connector bar (1).

{1} Remove the bolt (2), nut (3) and friction plate (4).

{2} Pry up on the guillotine connector bar (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.

{3} Place a wood wedge under the upper “lip” of the guillotine connector bar (1) after it is raised to hold it in the up position.

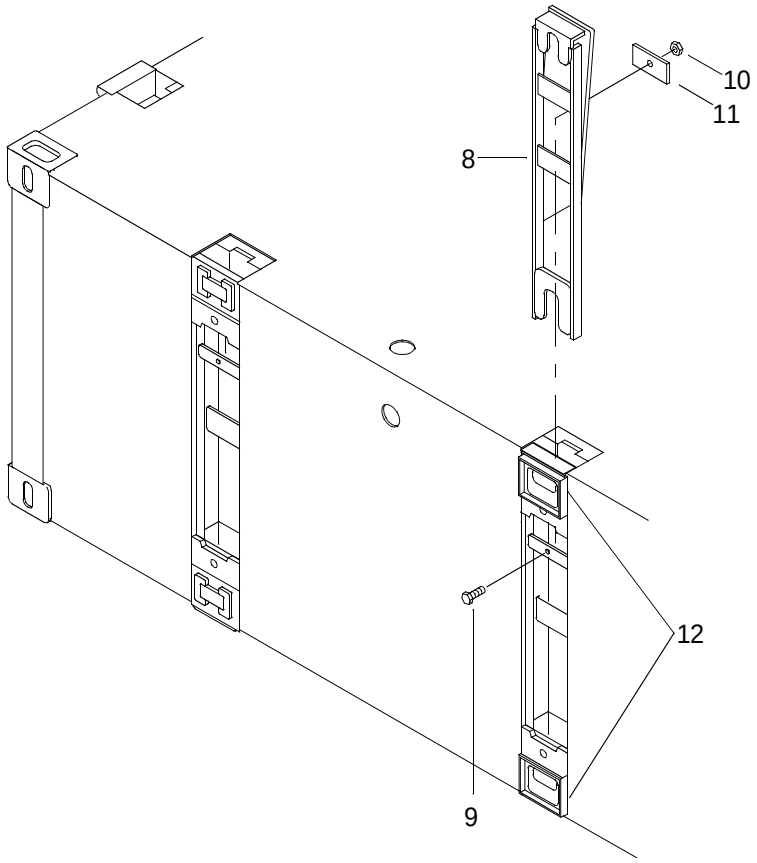
b. Push up on the retainer located on the underside of the male connector pin (5).

c. Remove male connector pin (5) from the guillotine connector lock housing (6).

d. Remove deployment spring (7).

e. Remove guillotine connector bar (1) from guillotine lock housing (6).

2. Disassemble the female guillotine connector assembly.



a. Remove the guillotine connector bar (8).

{1} Remove the bolt (9), nut (10) and friction plate (11).

{2} Pry up on the guillotine connector bar (8) using a crowbar.

b. Remove guillotine connector bar (8) from guillotine lock housing (12).

INSPECT AND REPAIR/REPLACE BEACH END SECTION NON-POWERED MODULE GUILLOTINE CONNECTORS

1. Inspect male connector pin (5) for cracks, cuts or corrosion. If damaged, replace connector pin.

2. Inspect deployment spring (7) for cracks, cuts or corrosion. If damaged, replace deployment spring.

3. Inspect guillotine connector bar (1, 8) for cracks, cuts or corrosion. If damaged, repair or replace guillotine connector bar (1, 8).

4. Inspect guillotine connector male and female lock housing (6, 12) for cracks, cuts or corrosion. If damaged, replace or replace guillotine connector lock housing (6, 12).

5. Inspect guillotine connector assembly friction plate (4, 11) for cracks, cuts or corrosion. If damaged, replace friction plate (4, 11).

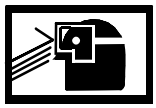
LUBRICATE BEACH END SECTION NON-POWERED MODULE MALE AND FEMALE GUILLOTINE CONNECTORS

1. Lubricate the guillotine connector assemblies.

WARNING



CHEMICAL



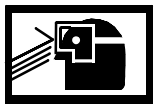
EYE PROTECTION

a. Lubricate connector bar assemblies with a light coat of Lubriplate grease.

WARNING



CHEMICAL

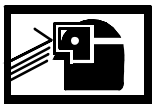


EYE PROTECTION

b. Lubricate deployment spring (3) with a light coat of Lubriplate grease.

2. Clean and/or paint exposed or rusty surfaces. (WP 0351 00)

WARNING



EYE PROTECTION

a. Wire brush exposed or rusting surfaces.

b. Spot paint exposed surfaces with Haze Grey Amercoat 385 #27 paint.

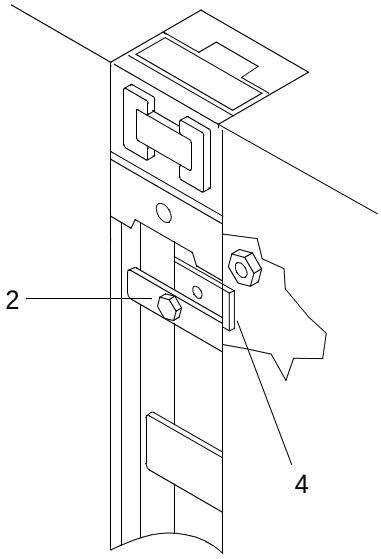
3. Remove standing water with a sponge from the guillotine connector assemblies.

ASSEMBLY OF BEACH END SECTION NON-POWERED MODULE GUILLOTINE CONNECTORS

1. Assemble the female guillotine connector assembly.
   a. Install guillotine connector bar (8) into guillotine lock housing (12).
   b. Install bolt (9) through friction plate (11) and nut (10).
2. Assemble the male guillotine connector assembly.
   a. Install guillotine connector bar (1) into guillotine lock housing (6).
   b. Install deployment spring (7) on male connector pin (5).
   c. Install male connector pin (5) into guillotine connector lock housing (6) by pushing down on the retainer located on the underside of the male connector pin (5) to lock pin in place.
   d. Install bolt (2) through friction plate (4) and nut (3).

ADJUST BEACH END SECTION NON-POWERED MODULE GUILLOTINE CONNECTORS

1. Locate the friction plate (4) on the guillotine connector assembly.



CAUTION

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

2. Tighten bolt (2) using two standard wrenches.
3. Remove wood wedge.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HAND LANTERN INCANDESCENT BULB REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Lamp, Incandescent
(96906)
NSN 6240-00-866-4143
PN MS16524-2

Personnel Required

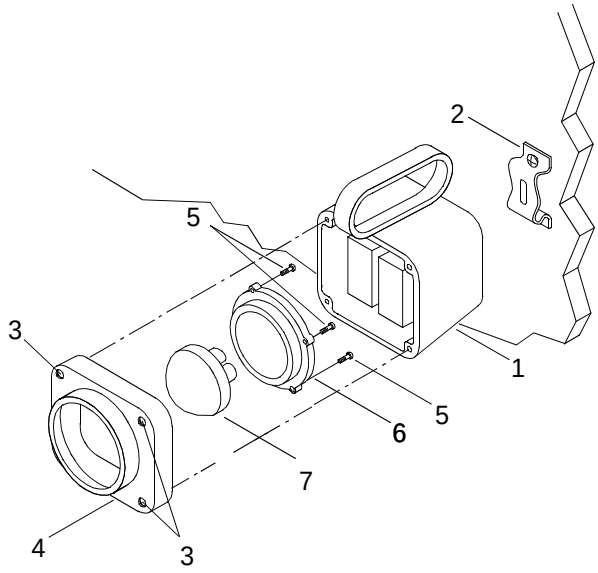
Engineer 88L

REMOVE HAND LANTERN INCANDESCENT BULB

NOTE

This task is typical for the removal and installation of the hand lantern bulb.

1. Rotate hand lantern (1) 90° and remove from mounting bracket (2).



2. Loosen four captive screws (3) on cover (4).
3. Remove cover (4).
4. Place cover (4) face down on the work bench.
5. Remove four retaining screws (5) securing the retaining ring (6) over the bulb (7).
6. Remove the retaining ring (6) and bulb (7).
7. Discard bulb (7).

INSTALL HAND LANTERN INCANDESCENT BULB

1. Position new bulb (7) into cover (4).
2. Position retaining ring (6) over bulb (7).
3. Install four retaining screws (5) to secure retaining ring (6) over the bulb (7). Tighten screws (5).
4. Position cover (4) on hand lantern (1).
5. Tighten four captive screws (3) to secure cover (4) to hand lantern (1).
6. Position hand lantern (1) on mounting bracket (2) and rotate 90°.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HAND LANTERN BATTERIES
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Battery, Nonrecharge
(81349)
NSN 6135-00-050-3280
PN BA200U
Qty 2

Personnel Required

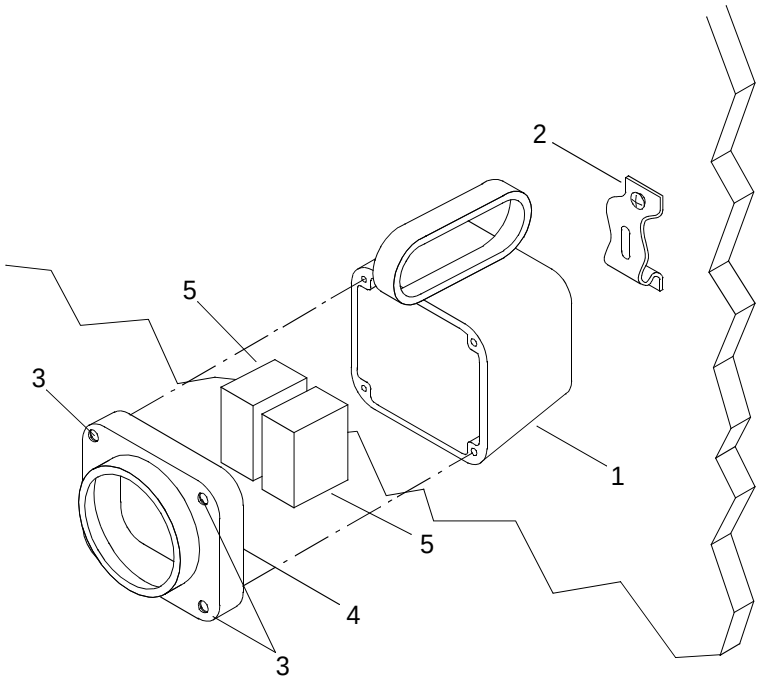
Engineer 88L

REMOVE HAND LANTERN BATTERIES

NOTE

This task is typical for the removal and installation of hand lantern batteries.

1. Rotate hand lantern (1) 90° and remove from mounting bracket (2).



2. Loosen four captive screws (3) on cover (4).

3. Remove cover (4).

4. Place hand lantern (1) face up on the work bench.

5. Remove batteries (5) and dispose of in accordance with local procedures.

INSTALL HAND LANTERN BATTERIES

1. Install new batteries (5) in hand lantern (1).
2. Position cover (4) on hand lantern (1).
3. Install four screws (3) through cover (4) and into hand lantern (1).
4. Tighten four captive screws (3).
5. Position hand lantern (1) on mounting bracket (2) and rotate 90°.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HAND LANTERN MOUNTING BRACKET
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Materials/Parts

Assembly, Bracket
(81349)
NSN 6230-00-968-7831
PN M16377-53-003

Holder, Light
(81349)
NSN 6230-00-578
PN M16377/54-2438

O-Ring
(96906)
NSN 5331-00-582-2133
PN MS28775-001
Qty 2

Personnel Required

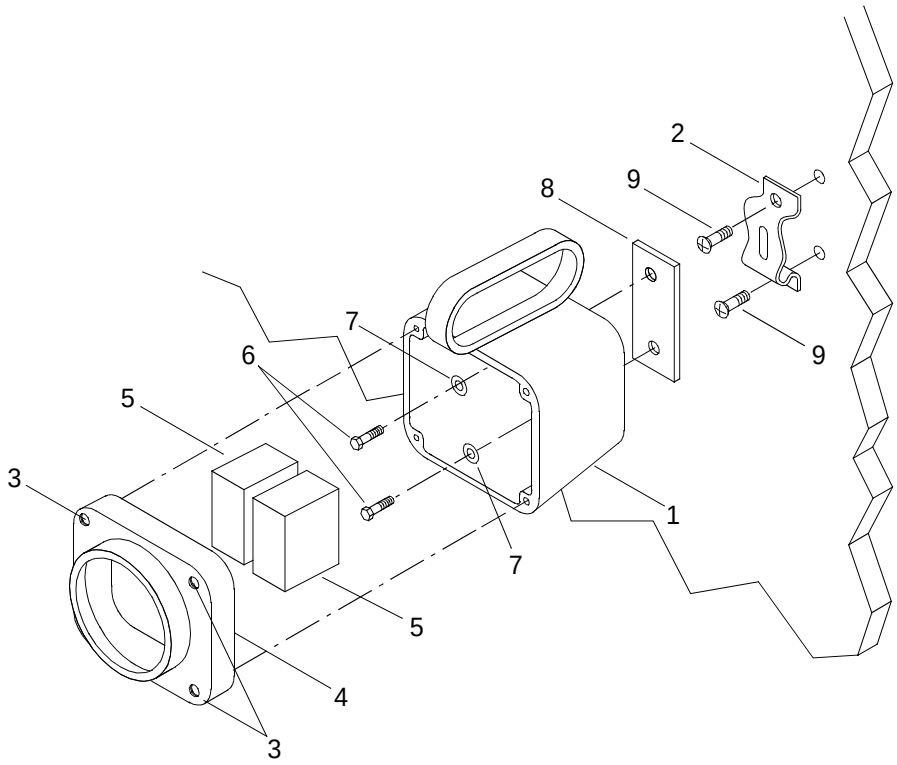
Engineer 88L

REMOVE HAND LANTERN MOUNTING BRACKET

NOTE

This task is typical for the removal and installation of hand lantern mounting brackets.

1. Rotate hand lantern (1) 90° and remove from mounting bracket (2).



2. Loosen four captive screws (3) on cover (4).
3. Remove cover (4).
4. Place hand lantern (1) face up on the work bench.
5. Remove batteries (5).
6. Remove two hex head bolts (6) and o-rings (7) from bracket (8).
7. Discard o-rings (7) and bracket (8).
8. Remove two screws (9) securing mounting bracket (2) to bulkhead.
9. Discard mounting bracket (2).

INSTALL HAND LANTERN MOUNTING BRACKET

1. Position new mounting bracket (2) on bulkhead.
2. Install two screws (9) securing mounting bracket (2) to the wall
3. Tighten screws (9).
4. Position new bracket (8) on the back of hand lantern (1).
5. Install two hex head bolts (6) and new o-rings (7) through hand lantern (1) into bracket (8).
6. Tighten hex head bolts (6).
7. Install batteries (5).
8. Position cover (4) on hand lantern (1).
9. Install four screws (3) through cover (4) and into hand lantern (1).
10. Tighten four captive screws (3).
11. Position hand lantern (1) on mounting bracket (2) and rotate 90°.

END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
WEIGHT LIFTING DEVICES
INSPECTION

INITIAL SETUP:

Personnel Required
Seaman 88K

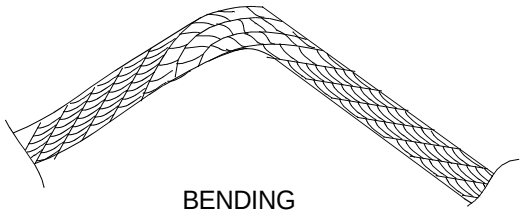
THREE LEG WIRE ROPE AND CHAIN SLINGS

WARNING

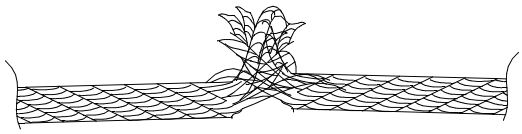
All damaged or defective slings and ropes shall be immediately removed from service as serious injury to personnel and damage to equipment could occur.

A visual inspection of slings and all fastenings and attachments shall be conducted before each use using the following minimum criteria.

1. Rope diameter reduction of below nominal value.
2. Rope for broken outside wires.
3. Rope for worn outside wires.
4. Rope for corroded, broken or frayed wires at end connections.
5. Rope for corroded, cracked, bent, worn, improperly sized or improperly applied end connections.
6. Rope for evidence of damage due to welding arc or other heat sources.
7. Rope for severe bending, kinking, crushing, caging or a popped core.



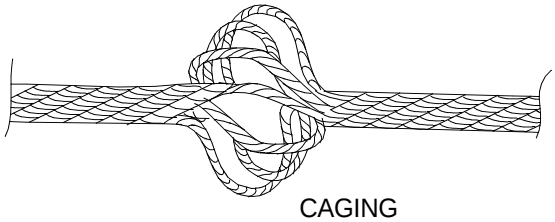
BENDING



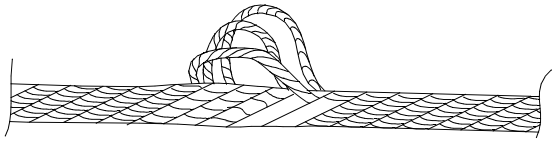
KINKING



CRUSHING



CAGING

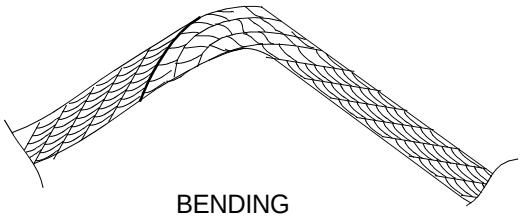


POPPED CORE

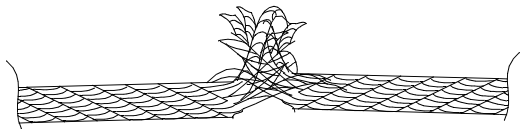
8. Chain for excessive wear or stretch.
9. Chain for bent or twisted links.
10. Chain for defective welds.
11. Chain for nicks and gouges.
12. All attaching shackles and hardware for corrosion, nicks, cuts, scratches or breaks.
13. Distortion of hoist attachment or terminal ring.

TWO LEG LIFTING SLING

1. Rope diameter reduction of below nominal value.
2. Rope for broken outside wires.
3. Rope for worn outside wires.
4. Rope for corroded, broken or frayed wires at end connections.
5. Rope for corroded, cracked, bent, worn, improperly sized or improperly applied end connections.
6. Rope for evidence of damage due to welding arc or other heat sources.
7. Rope for severe bending, kinking, crushing, caging, or a popped core.



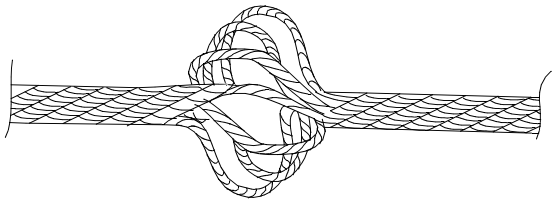
BENDING



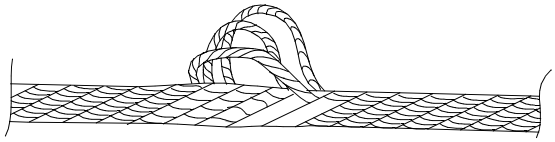
KINKING



CRUSHING



CAGING



POPPED CORE

8. All attaching shackles and hardware for corrosion, nicks, cuts, scratches or breaks.
9. Distortion of hoist attachment or terminal ring.

SPREADER BEAM LIFTING SLING

1. Rope diameter reduction of below nominal value.
2. Rope for broken outside wires.
3. Rope for worn outside wires.
4. Rope for corroded, broken or frayed wires at end connections.
5. Rope for corroded, cracked, bent, worn, improperly sized or improperly applied end connections.
6. Rope for evidence of damage due to welding arc or other heat sources.
7. Rope for severe bending, kinking, crushing, caging or a popped core.
8. All attaching shackles and hardware for excessive wear or corrosion.
9. Spreader beam for proper assembly.
10. Spreader beam for cracked or broken welds.
11. Spreader beam for bent or loose bolts, rivets, pins and other attaching devices.
12. Spreader beam for distortion of hoist attachment or terminal ring.

ROPE (NATURAL AND SYNTHETIC)

The existence of any of the following conditions will require that the rope be immediately removed from service.

1. Abnormal wear.
2. Powdered fiber between strands.
3. Broken or cut fibers.
4. Variation in the size or roundness of strands.
5. Discoloration or rotting.

END OF WORK PACKAGE

GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
WEIGHT LIFTING DEVICES
TESTING

INITIAL SETUP:

Personnel Required
Engineer 88L (29 CFR 1919.6)

References
29 CFR

TEST WEIGHT LIFTING DEVICES

Refer to 29 CFR, Sections 1919.6, 1919.15, 1919.28, 1919.30 and 1919.31.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
DIODES
REPLACEMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Gloves, Men's and Women's (Leather Palm) (Item 13, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Soldering Iron, Electric (Item 40, WP 0383 00)
Respirator, Air Filtering (Item 30, WP 0383 00)

Materials/Parts
Kit Solder, Aluminum (Item 13, WP 0382 00)

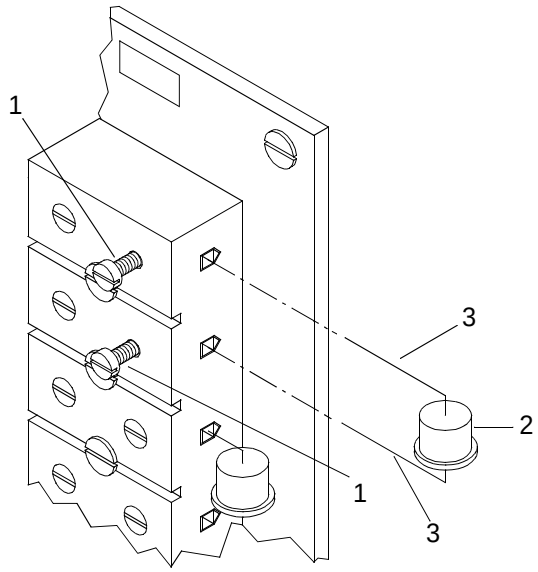
Personnel Required
Engineer 88L

REMOVE SCREW DOWN MOUNT DIODE

NOTE

The following procedure is typical for the removal of screw down mount diodes.

1. Loosen two screws (1).



2. Remove diode (2) with attached leads (3).

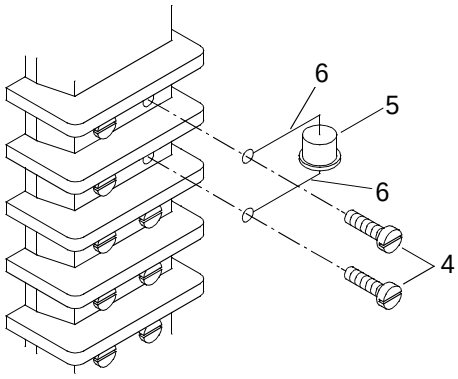
3. Discard diode (2) with attached leads.

REMOVE LUG MOUNT DIODE

NOTE

The following procedure is typical for the removal of lug mount diodes.

1. Remove two screws (4).



2. Remove diode (5) with attached leads (6).

3. Discard diode (5) with attached leads (6).

REMOVE SOLDER MOUNT DIODE

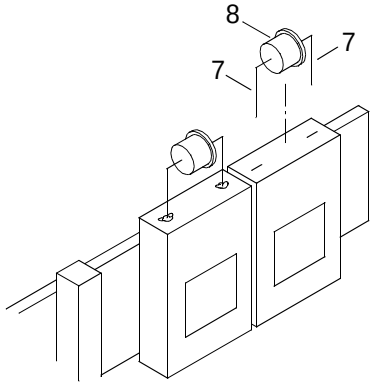
WARNING



NOTE

The following procedure is typical for the removal of solder mount diodes.

1. Using soldering iron, heat and loosen two diode leads (7).



2. Remove diode (8) with attached leads (7) and discard.

INSTALL SCREW DOWN MOUNT DIODE

NOTE

The following procedure is typical for the installation of screw down mount diodes.

1. Position new diode (3) with attached leads (2).
2. Tighten two screws (1).

INSTALL LUG MOUNT DIODE

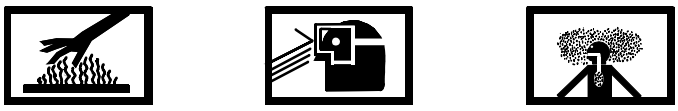
NOTE

The following procedure is typical for the installation of lug mount diodes.

1. Position new diode (5) with attached leads (6).
2. Install two screws (4) and tighten.

INSTALL SOLDER MOUNT DIODE

WARNING



NOTE

The following procedure is typical for the installation of solder mount diodes.

1. Position diode (8) with attached leads (7).
2. Using soldering iron, solder and flux attach two leads (7).

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
ELECTRICAL WIRING
REPAIR

INITIAL SETUP:

Personnel Required
Engineer 88L

References
46 CFR 129.340

REPAIR ELECTRICAL WIRING

For electrical wiring repair procedures, refer to 46 CFR 129.340.

END OF WORK PACKAGE

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
PIPE THREAD NIPPLES, ELBOWS, TEES AND REDUCERS
REPLACEMENT

INITIAL SETUP:

Tools

Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)
Gloves, Chemical (Item 12, WP 0383 00)
Goggles, Sun, Wind, and (Safety) (Item 15, WP 0383 00)
Pan, Drain (Item 24, WP 0383 00)
Goggles, Industrial (Chipping and Chemical) (Item 14, WP 0383 00)

Materials/Parts

Sealing Compound (Item 26, WP 0382 00)
Spill Clean-Up Kit, Hazardous Material (Item 28, WP 0382 00)

Personnel Required

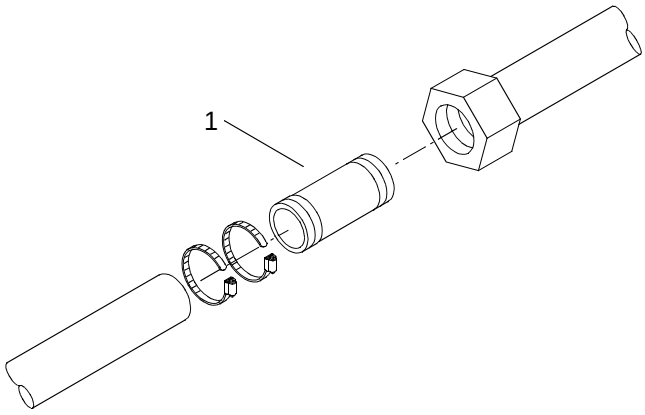
Engineer 88L

REMOVE PIPE THREAD NIPPLES, ELBOWS, TEES AND REDUCERS

NOTE

The following steps are typical for the removal of nipples.

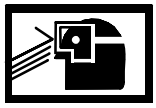
1. Remove nipple (1).



a. Place drain pan under the nipple (1).

WARNING


CHEMICAL

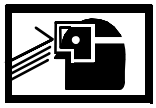

EYE PROTECTION

b. Disconnect associated hardware attached to nipple (1).

c. Remove nipple (1) and discard.

WARNING


CHEMICAL

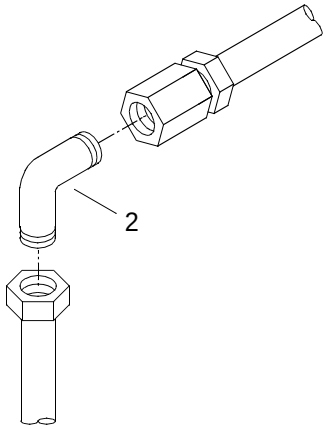

EYE PROTECTION

d. Remove drain pan and dispose of contents in accordance with local procedures.

NOTE

The following steps are typical for the removal of elbows.

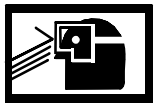
2. Remove elbow (2).



a. Place drain pan under the elbow (2).

WARNING


CHEMICAL


EYE PROTECTION

b. Disconnect associated hardware attached to elbow (2).

c. Remove elbow (2) and discard.

WARNING


CHEMICAL

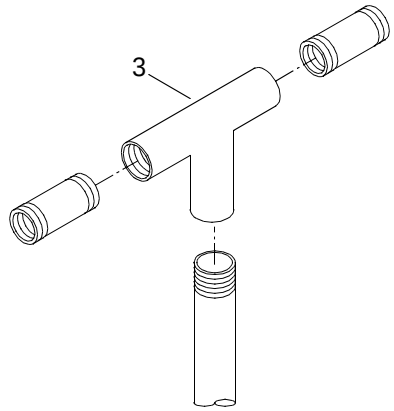

EYE PROTECTION

d. Remove drain pan and dispose of contents in accordance with local procedures.

NOTE

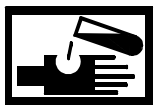
The following steps are typical for the removal of tees.

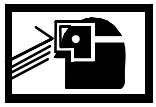
3. Remove tee (3).



a. Place drain pan under the tee (3).

WARNING



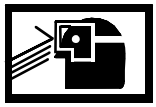


b. Disconnect associated hardware attached to tee (3).

c. Remove tee (3) and discard.

WARNING



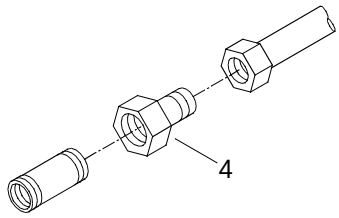


d. Remove drain pan and dispose of contents in accordance with local procedures.

NOTE

The following steps are typical for the removal of reducers.

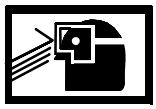
4. Remove reducer (4).



a. Place drain pan under the reducer (4).

WARNING


CHEMICAL


EYE PROTECTION

b. Disconnect associated hardware attached to reducer (4).

c. Remove reducer (4) and discard.

WARNING


CHEMICAL


EYE PROTECTION

d. Remove drain pan and dispose of contents in accordance with local procedures.

INSTALL PIPE THREAD NIPPLES, ELBOWS, TEES AND REDUCERS

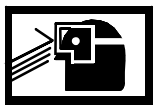
NOTE

The following steps are typical for the installation of reducers.

1. Install reducer (4).

WARNING


CHEMICAL


EYE PROTECTION

a. Apply sealing compound to threads on new reducer (4) and associated hardware.

b. Position new reducer (4) between associated hardware.

c. Connect associated hardware attached to reducer (4).

WARNING


CHEMICAL


EYE PROTECTION


SLICK FLOOR

d. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

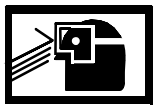
NOTE

The following steps are typical for the installation of tees.

2. Install tee (3).

WARNING


CHEMICAL


EYE PROTECTION

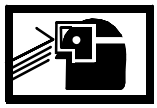
a. Apply sealing compound to threads on new tee (3) and associated hardware.

b. Position new tee (3) between associated hardware.

c. Connect associated hardware attached to tee (3).

WARNING


CHEMICAL


EYE PROTECTION


SLICK FLOOR

d. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

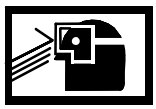
NOTE

The following steps are typical for the installation of elbows.

3. Install elbow (2).

WARNING


CHEMICAL


EYE PROTECTION

a. Apply sealing compound to threads on new elbow (2) and associated hardware.

b. Position new elbow (2) between associated hardware.

c. Connect associated hardware attached to elbow (2).

WARNING


CHEMICAL


EYE PROTECTION


SLICK FLOOR

d. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

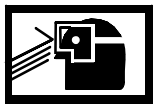
NOTE

The following steps are typical for the installation of nipples.

4. Install nipple (1).

WARNING


CHEMICAL


EYE PROTECTION

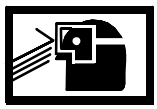
a. Apply sealing compound to threads on new nipple (1) and associated hardware.

b. Position new nipple (1) between associated hardware.

c. Connect associated hardware attached to nipple (1).

WARNING


CHEMICAL


EYE PROTECTION


SLICK FLOOR

d. Clean up spilled fluid with a spill kit and dispose of spill kit waste in accordance with local procedures.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
ILLUSTRATED LIST OF MANUFACTURED ITEMS

INTRODUCTION

Scope

This work package includes complete instructions for making items authorized to be manufactured or fabricated at the Operator, General Support, Direct Support and Unit Maintenance Level that is applicable.

How to Use the Index of Manufactured Items

A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the page which covers fabrication criteria.

Explanation of the Illustrations of Manufactured Items

All instructions needed by maintenance personnel to manufacture the item are included on the illustrations. *(When applicable, a reference to the associated RPSTL TM or RPSTL work package shall be entered here.)* All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustrations.

LIST OF ILLUSTRATED MANUFACTURED ITEMS

Work Package #	Part Number	Name
WP 0364 00	PN E11488	Fuel Hose
WP 0365 00	PN E11508-1	Fuel Hose
	PN E11508-2	Fuel Hose
	PN E11508-3	Fuel Hose
WP 0366 00	PN E11518-1	Fuel Hose
	PN E11518-2	Fuel Hose
	PN E11518-3	Fuel Hose
	PN E11518-4	Fuel Hose
WP 0367 00	PN 27778-1	Hose
	PN 27778-2	Hose
WP 0368 00	PN E19108-1	Hose
WP 0369 00	PN E13208-1	Hose Assembly
	PN E13208-2	Hose Assembly
	PN E13208-3	Hose Assembly
	PN E13208-4	Hose Assembly
	PN E13208-5	Hose Assembly
	PN E13208-6	Hose Assembly
	PN E13208-7	Hose Assembly
WP 0370 00	PN E27328	Hose

INDEX OF MANUFACTURED ITEMS (CONTINUED)

Work Package #	Part Number	Name
WP 0371 00	PN 0007211	Tube
WP 0372 00	PN 0007212	Tube
WP 0373 00	PN 0007213	Tube
WP 0374 00	PN 0007214	Tube
WP 0375 00	PN E28481	Battery Cushion
WP 0376 00	PN E28491	Battery Pad

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL HOSE PN E11488
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

FUEL HOSE PN E11488

NOTES:

FUEL HOSE-MAKE FROM 1 ½ ID SEAMLESS SYNTHETIC RUBBER, REINFORCED, PN 881-24-40.

CUT TO LENGTH.

ALL DIMENSIONS ARE IN INCHES.

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL HOSE PN E11508-1, E11508-2 AND E11508-3
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

FUEL HOSE PN E11508-1, E11508-2, E11508-3

DRAWING NUMBER	LENGTH
E11508-1	8 FT
E11508-2	4 FT
E11508-3	10 FT

NOTES:

FUEL HOSE-MAKE FROM FIRE RESISTANT, WIRE REINFORCED FUEL AND OIL HOSE, WITH BLUE AQP ELASTOMER COVER, O.D.=1.08 IN. ID = .63 IN., PN FC234-12.

CUT TO LENGTH.

ALL DIMENSIONS ARE IN FEET.

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
FUEL HOSE PN E11518-1, E11518-2, E11518-3, E11518-4
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

FUEL HOSE PN E11518-1, E11518-2, E11518-3, E11518-4

DRAWING NUMBER	LENGTH
E11518-1	12 FT
E11518-2	8 FT
E11518-3	6 FT
E11518-4	10 FT

NOTES:

FUEL HOSE-MAKE FROM FIRE RESISTANT, WIRE REINFORCED FUEL AND OIL HOSE, WITH BLUE

AQP ELASTOMER COVER, O.D.=1.27 IN. ID = .88 IN., PN FC234-16.

CUT TO LENGTH.

ALL DIMENSIONS ARE IN FEET.

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
HOSE ASSEMBLY PN E27778-1, E27778-2
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)

Personnel Required
Engineer 88L

HOSE ASSEMBLY PN E27778-1, E27778-2

DRAWING NUMBER	LENGTH
E27778-1	7 FT
E27778-2	6 FT

NOTES:

HOSE-MAKE FROM SYNTHETIC RUBBER TUBE, TEXTILE INNER BRAID, STEEL WIRE

REINFORCEMENT, TEXTILE BRAID COVER, ID = 1 1/8 IN., PN 201-20.

CUT TO LENGTH.

INSTALL HOSE FITTING PN 20620-20-20, ON EACH END OF HOSE.

ALL DIMENSIONS ARE IN FEET.

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
HOSE PN E19108-1
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)

Personnel Required
Engineer 88L

HOSE PN E19108-1

NOTES:

HOSE-MAKE FROM HEATER HOSE, POLYESTER REINFORCED, .75 IN. X 120 IN., PN 80-075.

CUT TO LENGTH.

INSTALL HOSE NIPPLE PN E19038-1, AND TWO HOSE CLAMPS PN E19028-1, TO EACH END

OF HOSE.

ALL DIMENSIONS ARE IN INCHES.

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HOSE PN E13208-1, E13208-2, E13208-3, E13208-4,
E13208-5, E13208-6, E13208-7
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

HOSE PN E13208-1, E13208-2, E13208-3, E13208-4, E13208-5, E13208-6, E13208-7

DRAWING NUMBER	LENGTH
E13208-1	34 in.
E13208-2	42 in.
E13208-3	96 in.
E13208-4	72 in.
E13208-5	18 in.
E13208-6	108 in.
E13208-7	132 in.

NOTES:

HOSE - MAKE FROM TWO PLY, WATER DISCHARGE HOSE, RATED W.P. (PSI) 100, O.D.=1.85 IN. ID =

1 1.5 IN., PN 37W OR EQUAL.

CUT TO LENGTH.

ALL DIMENSIONS ARE IN INCHES.

UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
HOSE PN E27328
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

HOSE PN E27328

NOTES:

HOSE-MAKE FROM 1 ¼ IN. ID HYDRAULIC SUCTION HOSE, SEAMLESS SYNTHETIC RUBBER TUBE, REINFORCED BY TWO TEXTILE BRAIDS OR A WOVEN PLY, SYNTHETIC RUBBER COVER, 18 FT LONG, PN 18FT-881-20.

CUT TO LENGTH.

ALL DIMENSIONS ARE IN FEET.

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
TUBE PN 0007211
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Bender, Tube, Hand (Item 2, WP 0383 00)

Personnel Required
Engineer 88L

TUBE PN 0007211

NOTES:

TUBE-MAKE FROM 1008/1017 STEEL TUBE, 10 MM O.D. X 1.5 MM WALL, PN 0007211.

CUT TO LENGTH.

BEND AS REQUIRED USING TUBE BENDER.

CUFFING SLEEVES ARE FURNISHED WITH LINES.

REUSE EXISTING FITTINGS.

ALL DIMENSIONS ARE IN MILLIMETERS.

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
TUBE PN 0007212
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Bender, Tube, Hand (Item 2, WP 0383 00)

Personnel Required
Engineer 88L

TUBE PN 0007212

NOTES:

TUBE-MAKE FROM 1008/1017 STEEL TUBE, 12 MM O.D. X 1.5 MM WALL, PN 0007212.

CUT TO LENGTH.

BEND AS REQUIRED USING TUBE BENDER.

CUFFING SLEEVES ARE FURNISHED WITH LINES.

REUSE EXISTING FITTINGS.

ALL DIMENSIONS ARE IN MILLIMETERS.

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
TUBE PN 0007213
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Bender, Tube, Hand (Item 2, WP 0383 00)

Personnel Required
Engineer 88L

TUBE PN 0007213

NOTES:

TUBE-MAKE FROM 1008/1017 STEEL TUBE, 15 MM O.D. X 2 MM WALL, PN 0007213.

CUT TO LENGTH.

BEND AS REQUIRED USING TUBE BENDER.

CUFFING SLEEVES ARE FURNISHED WITH LINES.

REUSE EXISTING FITTINGS.

ALL DIMENSIONS ARE IN MILLIMETERS.

DIRECT SUPPORT MAINTENANCE
CAUSEWAY FERRY
TUBE PN 0007214
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Item 44, WP 0383 00)
Bender, Tube, Hand (Item 2, WP 0383 00)

Personnel Required
Engineer 88L

TUBE PN 0007214

NOTES:

TUBE-MAKE FROM 1008/1017 STEEL TUBE, 18 MM O.D. X 2 MM WALL, PN 0007214.

CUT TO LENGTH.

BEND AS REQUIRED USING TUBE BENDER.

CUFFING SLEEVES ARE FURNISHED WITH LINES.

REUSE EXISTING FITTINGS.

ALL DIMENSIONS ARE IN MILLIMETERS.

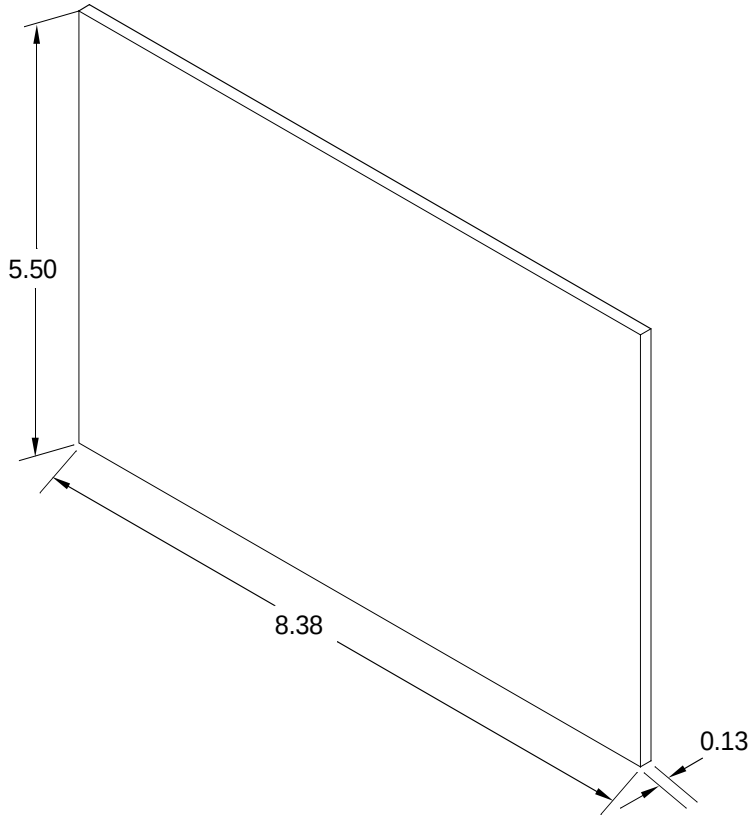
UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BATTERY CUSHION
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

BATTERY CUSHION PN E28481



NOTES:

BATTERY CUSHION - MAKE FROM NEOPRENE RUBBER, ASTM D1418 DESIGNATION CR, 70

DUROMETER.

CUT TO SIZE.

ALL DIMENSIONS ARE IN INCHES.

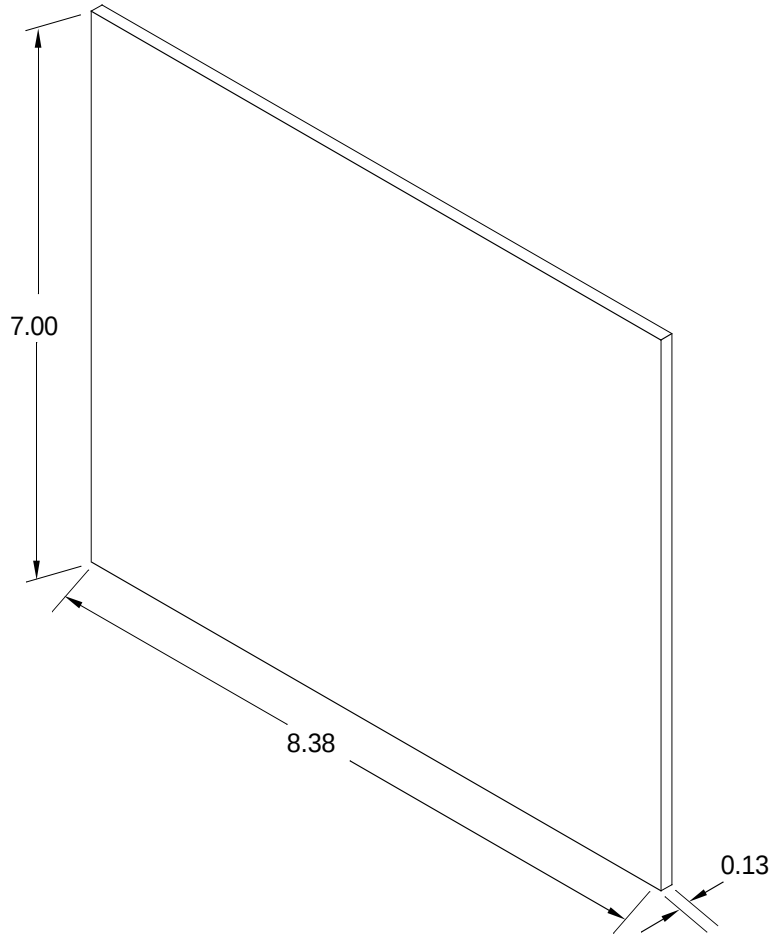
UNIT LEVEL MAINTENANCE
CAUSEWAY FERRY
BATTERY PAD
MANUFACTURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanic's (Rail and Marine) (Item 45, WP 0383 00)

Personnel Required
Engineer 88L

BATTERY PAD PN E28491



NOTES:

BATTERY PAD - MAKE FROM NEOPRENE RUBBER, ASTM D1418 DESIGNATION CR,

70 DUROMETER.

CUT TO SIZE.

ALL DIMENSIONS ARE IN INCHES.

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
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 adapters with torque wrenches.

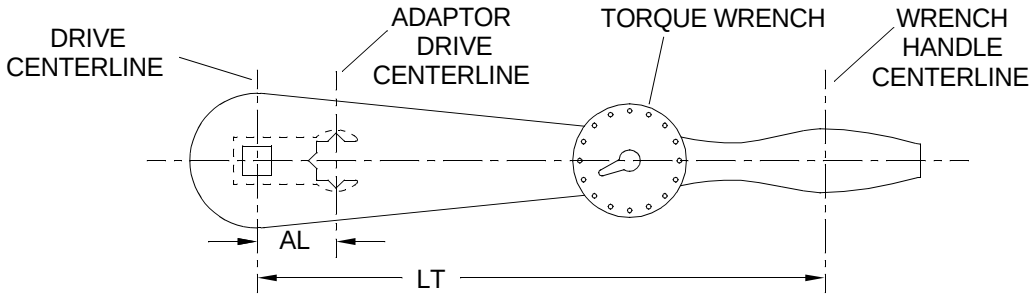
How To Use Adapters With Torque Wrenches

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

1. If the adaptor used decreases the distance between the center of the torque wrench handle and the center of the drive, first find the desired torque for the fitting, then calculate as follows:

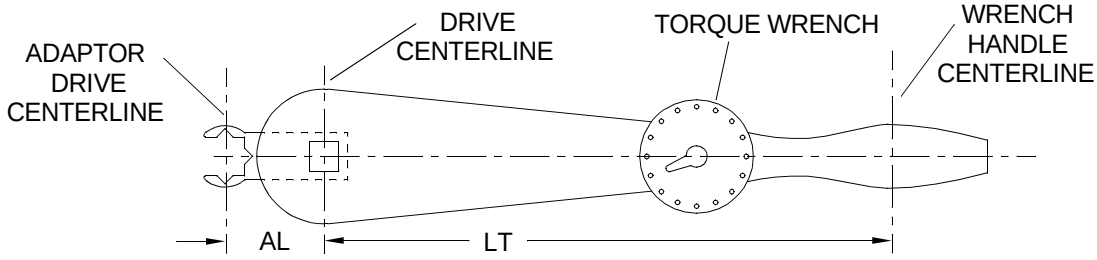


   a. Multiply DT by LT.

   b. Subtract AL from LT.

   c. Divide the first answer by the second answer to find AT.

2. If the adaptor used increases the distance between the center of the torque wrench handle and the center of the drive, first find the desired torque for the fitting, then calculate as follows:



a. Multiply DT by LT.

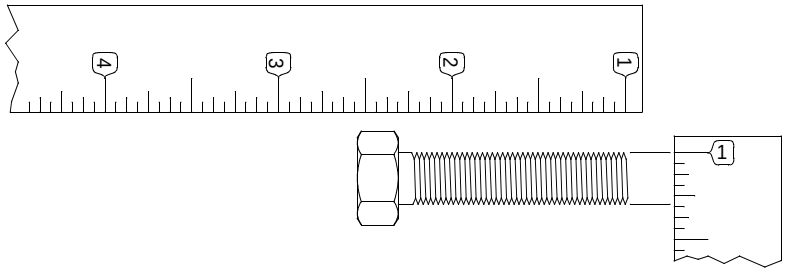
b. Add AL and LT.

c. Divide the first answer by the second answer to find AT.

TORQUE TABLES

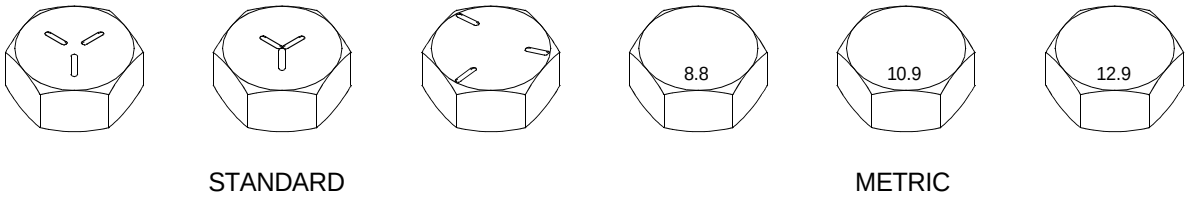
How To Use Torque Tables

1. Measure the diameter of the bolt to be torqued.



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.

3. Determine the type of markings on the bolt you are torquing by comparing the markings on the head of the bolt with the chart below.



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 table 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. Slide across the table to the proper grade.

   d. Choose wet or dry.

   e. Slide down the proper column and across the proper row until they intersect, this is the proper torque value.

Table 1. SAE Standard Torque Table.

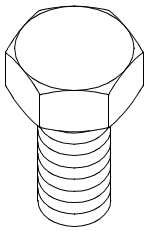
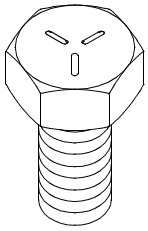
		SAE GRADE NO. 2				SAE GRADE NO. 5				SAE GRADE NO. 8			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA IN.	THREADS PER INCH	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m
1/4	20	66	7.46	49	5.54	101	11.41	76	8.58	143	16.15	107	12.09
1/4	28	75	8.47	56	6.33	116	13.10	87	9.83	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 Torque Table.

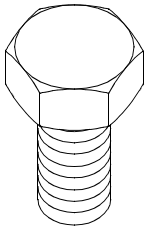
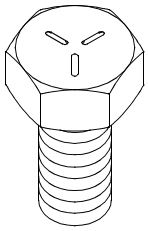
		SAE GRADE NO. 2				SAE GRADE NO. 5				SAE GRADE NO. 8			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA IN.	THREADS PER INCH	FT LBS	N-m	FT LBS	N-m	FT LBS	N-m	FT LBS	N-m	FT LBS	N-m	FT LBS	N-m
9/16	12	70	94.92	53	71.87	109	147.80	82	111.19	154	208.82	115	155.94
9/16	18	78	105.77	59	80.00	121	164.08	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 Torque Table.

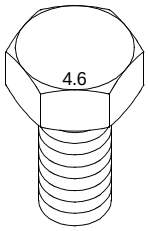
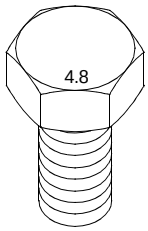
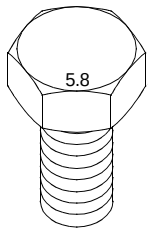
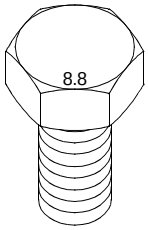
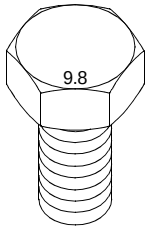
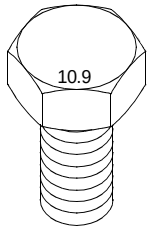
		CLASS 4.6 				CLASS 4.8 				CLASS 5.8 			
		DRY		WET		DRY		WET		DRY		WET	
DIA MM	THREAD PITCH	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS	N-m	IN. LBS
3.0	0.5	.50	4	.40	4	.70	6	.50	4	-	-	-	-
3.5	0.6	.80	7	.60	5	1.10	10	.80	7	-	-	-	-
4.0	0.7	1.20	11	.90	8	1.60	14	1.20	11	-	-	-	-
5.0	0.8	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 Torque Table.

		CLASS 8.8				CLASS 9.8				CLASS 10.9			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA MM	THREAD PITCH	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

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
WIRING DIAGRAMS

INITIAL SETUP:

Personnel Required
Engineer 88L

CABLE AND WIRING DIAGRAMS INTRODUCTION

Scope

This work package provides the cable lists, wiring lists and illustrations necessary for maintenance, troubleshooting and repair of the Causeway Ferry (CF). 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.

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LIST OF ABBREVIATIONS/ACRONYMS

The abbreviations used in this work package are in accordance with ASME Y14.38-1999, except when the abbreviation stands for a marking actually found in the equipment.

Abbreviation/Acronym	Name
A or AMPS	Amperes
AC	Alternating Current
ACT.	Actuator
AM	Ammeter
ANT	Antenna
ASSY	Assembly
AUX	Auxiliary
AWG	American Wire Gage
BATT or BT	Battery
BLK or BK	Black
BNC	Bayonet Connector
BRN	Brown
BU	Blue
CB	Circuit Board
CCW	Counterclockwise
CW	Clockwise
CF	Causeway Ferry
CO2	Carbon Dioxide
COND.	Condition
CONN	Connection or Connector
D	Diode
DC	Direct Current
DET	Detector
DIR	Direction
DSC	Digital Selective Caller
EMER.	Emergency
EMI	Electromagnetic Interference
ENCL.	Enclosure
ENG.	Engine
E-STOP	Emergency Stop
FLD	Field
FO PRESS.	Fuel Oil Pressure
FT	Foot or Feet
FWD	Forward
ga	Gauge
GFE	Government Furnished Equipment
GN or GRN	Green
GND	Ground
GOV.	Governor
HTR	Heater
HYD.	Hydraulic
IAW	In Accordance With
IN.	Inch
IND.	Indicator
IS.	Isolator
J or JUNC.	Junction
JB	Junction Box

LIST OF ABBREVIATIONS/ACRONYMS (CONTINUED)

Abbreviation/Acronym	Name
LH	Left Hand
LT.	Light
M	Meter
MALF	Malfunction
MAN.	Manual
MAX.	Maximum
MCS	Modular Causeway System
MOD	Module
MT	Meter Transducer
N/A	Not Applicable
NATO	North Atlantic Treaty Organization
NAV	Navigation
NEG.	Negative
NMEA	National Marine Electronic Association
NO. or NOS.	Number or Numbers
O.	Oil
OC	Operators Cab
O.D.	Outside Diameter
O.P	Oil Pressure
OP CAB or OPER CAB	Operators Cab
OR or ORG	Orange
OT	Oil Temperature
OUT.	Outlet
(P)	Port
POS.	Positive
POS	Position
PRESS.	Pressure
PROP.	Proportioning
PWR	Power
RD	Red
RECEPT.	Receptacle
REF	Reference
REG	Regulator
REQ’D	Required
RET	Return
RFI	Radio Frequency Interference
RH	Right Hand
RM.	Room
RPM	Revolutions Per Minute
RT	Right
RT ANG	Right Angle
S or SW.	Switch
SH	Shunt
SHLD	Shield
SHT	Sheet
SINCGARS	Single Channel Ground and Airborne Radio
SOL	Solenoid
(S) or STBD.	Starboard
STD	Standard
SW	Switch
SYNCHRO.	Synchronization

LIST OF ABBREVIATIONS/ACRONYMS (CONTINUED)

Abbreviation/Acronym	Name
TACH	Tachometer
TB	Terminal Board
TEMP	Temperature
TERM	Terminal
TERM. BD.	Terminal Board
THRSTR	Thruster
V	Volts
VDC	Volts Direct Current
VF	Vent Fan
VHF-FM	Very High Frequency/Frequency Modulation
VR	Voltage Regulator
W.	Water
W/	With
WH or WHT	White
WSHLD	Windshield
WT	Water Temperature

OPERATORS CAB WIRING LIST

CABLE LIST	
CABLE NUMBER: P24-1	
CABLE TYPE: LSMHOF-14	
O.D.: .635 INCH	
CABLE LENGTH: 10 FEET	
CABLE ENTRY FROM: A4/A3	**FROM:** CONTROL CONSOLE - A4/A3
CABLE ENTRY TO: JB1	**TO:** RADIO SHELF JUNCTION BOX - JB1
BULKHEAD FITTINGS: T & B	**NOTES:** 1. CABLE CONNECTS TO BRANCH CABLES IN JB1/TB1

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	A4TB05-20	COMPRESSION	TB1-1
2	386	WHITE	TERMINAL LUG	A4TB05-3	COMPRESSION	TB1-2
3	0	RED	WIRE	A4TB11	COMPRESSION	TB1-3
4	388	GREEN	TERMINAL LUG	A4TB05-6	COMPRESSION	TB1-4
5	0	ORG	WIRE	A4TB11	COMPRESSION	TB1-5
6	383	BLUE	TERMINAL LUG	A4TB05-5	COMPRESSION	TB1-6
7	0	WH/BK	WIRE	A4TB11	COMPRESSION	TB1-7
8	392	RD/BK	TERMINAL LUG	A3CB6-2	COMPRESSION	TB1-8
9	0	GN/BK	WIRE	A4TB11	COMPRESSION	TB1-9
10	393	OR/BK	TERMINAL LUG	A3CB7-2	COMPRESSION	TB1-10
11	0	BU/BK	WIRE	A4TB11	COMPRESSION	TB1-11
12	442	BK/WH	TERMINAL LUG	A4TB05-15	COMPRESSION	TB1-12
13	SPARE	RD/WH				
14	SPARE	GN/WH				

Figure 1. Sheet 1 Operators Cab Cable List
(Sheet 1 of 16)

CABLE LIST		
CABLE NUMBER: P24-2		
CABLE TYPE: 16-2S0 (SHIELD)		
O.D.: .360 INCH		
CABLE LENGTH: 3 FEET		
CABLE ENTRY FROM: JB1 (IT.133)	**FROM:** RADIO SHELF - JB1	
CABLE ENTRY TO: B3	**TO:** DEFROSTER FAN MOTOR - B3	
BULKHEAD FITTINGS: SIZE B STUFFING TUBE @ SHELF T& B LIQUIDTIGHT AT JB1	**NOTES:** 1. CABLE SHIELD GROUNDED AT STUFFING TUBE IN SHELF REFER TO LSI DWG. E13441, DETAIL A-7. 2. CONNECTIONS TO MOTOR SHALL BE MADE IN DEFROSTER CASE. DISCONNECT MOTOR LEAD FROM CASE AND TERMINATE TO LEAD (0) OF THIS CABLE.	

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	442	BLACK	COMPRESSION	TB1-12	WIRE NUT	B3-1
2	0	WHITE	COMPRESSION	TB1-11	WIRE NUT	B3-2

Figure 1. Sheet 2 Operators Cab Cable List
(Sheet 2 of 16)

CABLE LIST						
CABLE NUMBER: P24-3						
CABLE TYPE: LS2SJ-16						
O.D.: .310 INCH						
CABLE LENGTH: 6 FEET						
CABLE ENTRY FROM: JB1			**FROM:** RADIO SHELF - JB1			
CABLE ENTRY TO: J5			**TO:** SPOTLIGHT, RECEPTACLE ON TOP OF OPERATORS CAB			
BULKHEAD FITTINGS: ROOF RECEPTACLE AND T & B LIQUIDTIGHT AT JB-1			**NOTES:**			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	COMPRESSION	TB1-5	SOLDER	J5-B
2	383	WHITE	COMPRESSION	TB1-6	SOLDER	J5-A
3	SHIELD	SHIELD			SHIELD TO	BACKSHELL

Figure 1. Sheet 3 Operators Cab Cable List
(Sheet 3 of 16)

CABLE LIST						
CABLE NUMBER: P24-5						
CABLE TYPE: SWE						
O.D.: N/A						
CABLE LENGTH: 8 INCHES						
CABLE ENTRY FROM: VR 1			**FROM:** DC/DC CONVERTER, RADIO SHELF			
CABLE ENTRY TO: JB1, J2			**TO:** RADIO SHELF JUNCTION BOX, RADIO RECEPT. - JB1			
BULKHEAD FITTINGS: T & B LIQUIDTIGHT AT JB-1			**NOTES:** DC/DC CONVERTER FURNISHED WITH VHF-FM RADIO AND MOUNTED ON TOP OF JB1			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	(0)	BLACK	WIRE	COMMON	WIRE NUT	TB1-7
2	392	ORG	WIRE	+24 VDC INPUT	WIRE NUT	TB1-8
3	392A	RED	WIRE	+12 VDC OUTPUT	WIRE NUT	NOTE BELOW
			RED WIRE FROM CONVERTER (W/N 392A) IS CONNECTED TO RED WIRE GOING TO VHF/FM DSC RADIO PLUG WITH A WIRE COMPRESSION NUT IN JB1. RELOCATE CONVERTER FUSE TO INSIDE OF JB1. USE BUTT SPLICE TO ADD LENGTH OF WIRE AS NECESSARY. LOOP WIRE 392A TWICE THROUGH FERRITE CORE INSIDE JB1. SECURE WITH TIEDOWN STRAPS .			

Figure 1. Sheet 4 Operators Cab Cable List
(Sheet 4 of 16)

CABLE LIST

CABLE NUMBER: P24-6

CABLE TYPE: SWE

O.D.: N/A

CABLE LENGTH: 3 FEET

CABLE ENTRY FROM: JB1	**FROM:** RADIO SHELF - JB1
CABLE ENTRY TO: J1	**TO:** SINCGARS, AN/VRC-94A, MOUNTING BASE
BULKHEAD FITTINGS: T & B LIQUIDTIGHT AT JB-1	**NOTES:** 1. CONNECT FURNISHED CABLE TGO J1 ON JB1 AND TO SINCGARS RADIO.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	(0)	N/A		J1-B	PLUG (J-3)	SINCGARS
2	393	N/A		J1-A	PLUG (J-3)	SINCGARS
			RED WIRE FROM CONVERTER (W/N 392A) IS CONNECTED TO RED WIRE GOING TO VHF/FM DSC RADIO PLUG WITH A WIRE COMPRESSION NUT IN JB1. RELOCATE CONVERTER FUSE NO. JB1 F1 TO INSIDE OF JB1. USE BUTT SPLICE TO ADD LENGTH OF WIRE AS NECESSARY. LOOP WIRE 392A TWICE THROUGH FERRITE CORE INSIDE JB1. SECURE WITH TIEDOWN STRAPS .			

Figure 1. Sheet 5 Operators Cab Cable List
(Sheet 5 of 16)

CABLE LIST						
CABLE NUMBER: P12-2						
CABLE TYPE: FURNISHED						
O.D.: N/A						
CABLE LENGTH: 3 FEET						
CABLE ENTRY FROM: JB1			**FROM:** RADIO SHELF, JUNCTION BOX - JB1			
CABLE ENTRY TO: VHF-FM			**TO:** RADIO SHELF, VHF-FM TRANSCEIVER			
BULKHEAD FITTINGS: T & B LIQUIDTIGHT AT JB1			**NOTES:** 1. CABLE AND CONNECTOR FURNISHED WITH RADIO. 2. REFER TO OWNER/OPERATORS MANUAL FOR DETAILED INSTALLATION INSTRUCTIONS. 3. W/N 392A RED CONNECTS WITH WIRE COMPRESSION NUT TO RED WIRE FROM DC/DC CONVERTER, P24-5.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
(-)	0	BLACK	COMPRESSION	TB1-7	WIRE	(-) OUT (J2-COM)
(+)	392A	RED	WIRE NUT	SEE NOTE 3	WIRE	(+) OUT (J2-+)

Figure 1. Sheet 6 Operators Cab Cable List
(Sheet 6 of 16)

CABLE LIST						
CABLE NUMBER: R-RA1						
CABLE TYPE: RG-58/U						
O.D: .195 INCH						
CABLE LENGTH: 6 FEET						
CABLE ENTRY FROM: VHF-FM			**FROM:** RADIO SHELF, VHF-FM TRANSCEIVER - ANTENNA CABLE			
CABLE ENTRY TO: JB2			**TO:** OP CAB INTERIOR, AFT STARBOARD UPPER CORNER - JB2			
BULKHEAD FITTINGS: TERMINAL TUBE ON JB-2			**NOTES:** 1. CABLE FURNISHED WITH ANTENNA. 2. GROUND CABLE SHIELD AT TERMINAL TUBE ENTRANCE TO JB-2 IAW LSI DWG. E13441. 3. COAXIAL CONNECTORS TO BE INSTALLED BY EXPERIENCED TECHNICIAN			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
	R-RA1	BLACK	PL-259 COAXIAL PLUG	VHF-FM TRANSCEIVER (ANT)	PL-259 COAXIAL PLUG	J-1 (INSIDE) JB-2

Figure 1. Sheet 7 Operators Cab Cable List
(Sheet 7 of 16)

CABLE LIST						
CABLE NUMBER: R-RA1/1						
CABLE TYPE: RG-58/U						
O.D.: .195 INCH						
CABLE LENGTH: 18 INCHES						
CABLE ENTRY FROM: JB-2 J-1			**FROM:** OP CAB EXTERIOR UPPER AFT STARBOARD CORNER, J-1 OF JB-2			
CABLE ENTRY TO: RA-1			**TO:** OP CAB ROOF AFT STARBOARD CORNER, VHF-FM ANTENNA			
BULKHEAD FITTINGS:			**NOTES:** 1. CABLE IS FURNISHED WITH AND CONNECTED TO ANTENNA. 2. CUT EXCESS LENGTH FROM CABLE AND USE FOR R-RA1. 3. COAXIAL CONNECTOR TO BE INSTALLED BY EXPERIENCED TECHNICIAN.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
	R-RA1	BLACK	PL-259 COAXIAL PLUG	JB-2 J-1	COAXIAL CABLE	ANTENNA

Figure 1. Sheet 8 Operators Cab Cable List
(Sheet 8 of 16)

CABLE LIST						
CABLE NUMBER: R-RA2						
CABLE TYPE: RG-58/U						
O.D.: .195 INCH						
CABLE LENGTH: 6 FEET						
CABLE ENTRY FROM: J-1			**FROM:** RADIO SHELF, SINCGARS TRANSCEIVER, RT			
CABLE ENTRY TO: J-1			**TO:** AFT LEFT CORNER OF CAB ROOF, AS-3900/VRC ANTENNA			
BULKHEAD FITTINGS: SIZE C STUFFING TUBE ON AFT OPERATORS CAB BULKHEAD			**NOTES:** 1. CABLE AND CONNECTORS FURNISHED (GFE) WITH RADIO INSTALLATION KIT. 2. CONNECTOR INSTALLATION AND REMOVAL SHALL BE DONE BY EXPERIENCED TECHNICIAN. 3. INSTALL RIGHT ANGLE CONNECTOR AT TOP RIGHT SIDE OF TRANSCEIVER FRONT PANEL TO MATE WITH J-1 ON RADIO. 4. GROUND CABLE SHIELD AT BULKHEAD PENETRATION.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
	R-RA2	BLACK	BNC (RT ANG)	RT J-1	BNC STRAIGHT	AS-3900 J-1

Figure 1. Sheet 9 Operators Cab Cable List
(Sheet 9 of 16)

CABLE LIST						
CABLE NUMBER: P24-7						
CABLE TYPE: LSDHOF-3						
O.D.: .425 INCH						
CABLE LENGTH: 4 FEET						
CABLE ENTRY FROM: COMPASS			**FROM:** CONSOLE TOP, CENTER, MAGNETIC COMPASS			
CABLE ENTRY TO: A4TB5			**TO:** CONTROL CONSOLE INTERIOR, TERMINAL BOARD ASSEMBLY			
BULKHEAD FITTINGS: GROMMET @ CONSOLE TOP (JOINS CABLE P12-1)			**NOTES:** 1. CABLE FURNISHED WITH COMPASS IS 18 INCHES LONG. USE BUTT CONNECTORS TO CONNECT TO VESSEL CABLING INSIDE CONSOLE.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	(0)	BLACK	WIRE	COMPASS CABLE	TERMINAL LUG	A4TB5-20
2	375A	WHITE	WIRE	COMPASS CABLE	TERMINAL LUG	A4TB5-17
			INSTALL SUPPLIED RESISTOR BETWEEN A4TB5-19 AND A4TB5-17.			

Figure 1. Sheet 10 Operators Cab Cable List
(Sheet 10 of 16)

CABLE LIST	
CABLE NUMBER: P24-8	
CABLE TYPE: LSDHOF-4	
O.D.: .460 INCH	
CABLE LENGTH: 8 FEET	
CABLE ENTRY FROM: A3/A4	**FROM:** CONTROL CONSOLE INTERIOR, CB PANEL & TERM. BD. ASSY
CABLE ENTRY TO: A7	**TO:** MAST ENCL. ASSY A7 (NAV. LIGHT SW. BOX)
BULKHEAD FITTINGS:	**NOTES:** W/N 381 FROM A3 CB1-2 TO A4TB9-10

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	(0)	BLACK	WIRE	A4TB11	TERM LUG	TB6-A11
2	381	WHITE	TERMINAL LUG	A4TB9-10	TERM LUG	TB6-A12

Figure 1. Sheet 11 Operators Cab Cable List
(Sheet 11 of 16)

CABLE LIST	
CABLE NUMBER: P24-9	
CABLE TYPE: LSTHOF-3	
O.D.: .450 INCH	
CABLE LENGTH: 5 FEET	
CABLE ENTRY FROM: A4TB05	**FROM:** CONTROL CONSOLE, TERMINAL BOARD ASSY.
CABLE ENTRY TO: B1A/B1B	**TO:** CONTROL CONSOLE INTERIOR, HEATER FAN MOTORS
BULKHEAD FITTINGS:	**NOTES:** 1. TERMINATE CABLE DIRECTLY TO MOTOR LEADS. DISCONNECT MOTOR LEADS TO (INTERNAL) CASE OF HEATER. CONNECT THESE LEADS TO (0) OF CABLE -24-9.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	(0)	BLACK	COMPRESSION	A4TB11	WIRE NUT	B1A/B COMMON
2	390	WHITE	TERMINAL LUG	A4TB05-07	WIRE NUT	B1A POSITIVE
3	391	RED	TERMINAL LUG	A4TB05-08	WIRE NUT	B1B POSITIVE

Figure 1. Sheet 12 Operators Cab Cable List
(Sheet 12 of 16)

CABLE LIST						
CABLE NUMBER: NH-1						
CABLE TYPE: 14-2S0 (SHIELD)						
O.D.: .445 INCH						
CABLE LENGTH: 6 FEET						
CABLE ENTRY FROM: JB-1			**FROM:** RADIO SHELF - JB1			
CABLE ENTRY TO: LS1			**TO:** NAV. HORN TOP OF OPERATORS CAB			
BULKHEAD FITTINGS: METAL STUFFING TUBES S/W HORN FIXTURE T & B LIQUIDTIHGT AT JB-1			**NOTES:** 1. GROUND CABLE SHIELDED AT FIXTURE AND CAB TOP STUFFFING TUBES.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	(0)	BLACK	COMPRESSION	TB1-1	TERMINAL LUG	LS1 TB1-1
2	386	WHITE	COMPRESSOIN	TB1-2	TERMINAL LUG	LS1 TB1-2

Figure 1. Sheet 13 Operators Cab Cable List
(Sheet 13 of 16)

CABLE LIST						
CABLE NUMBER: P24-4						
CABLE TYPE: 16-2S0 (SHIELD)						
O.D.: .360 INCH						
CABLE LENGTH: 3 FEET						
CABLE ENTRY FROM: JB1			**FROM:** RADIO SHELF - JB-1			
CABLE ENTRY TO: B2			**TO:** WINDSHIELD WIPER MOTOR			
BULKHEAD FITTINGS: T & B LIQUIDTIGHT AT JB1			**NOTES:** 1. GROUND SHIELD TO CABINET AT CONNECTOR.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	COMPRESSION	TB1-3	TERMINAL LUG	B2-2
2	388	WHITE	COMPRESSION	TB1-4	TERMINAL LUG	B2-1

Figure 1. Sheet 14 Operators Cab Cable List
(Sheet 14 of 16)

CABLE LIST	
CABLE NUMBER: P24-10	
CABLE TYPE: LSMSCS-24	
O.D.:	
CABLE LENGTH: 10 FEET	
CABLE ENTRY FROM: A7	**FROM:** MAST ENCL. ASSY. A7 (NAV. LIGHT SW. BOX)
CABLE ENTRY TO: J1	**TO:** OPERATORS CAB RECEPTACLE J1
BULKHEAD FITTINGS:	**NOTES:** ***** COMPRESSION TYPE FITTINGS

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	501	BLACK		TB1-A11	PINS	J1-1
2	503	WHITE		TB1-B14	PINS	J1-2
3	504	RED		TB2-A3	PINS	J1-3
4	506	GREEN		TB2-B6	PINS	J1-4
5	507	ORG		TB2-A14	PINS	J1-5
6	509	BLUE		TB2-B17	PINS	J1-6
7	510	WH/BK		TB3-A4	PINS	J1-7
8	512	RD/BK		TB3-B7	PINS	J1-8
9	513	GN/BK		TB3-A15	PINS	J1-9
10	518	OR/BK		TB4-B8	PINS	J1-10
11	518B	BU/BK		TB4-A16	PINS	J1-11
12	520	BK/WH		TB4-B19	PINS	J1-12
13	520B	RD/WH		TB5-A7	PINS	J1-13
14	522	GN/WH		TB5-B10	PINS	J1-14
15	522B	BL/WH		TB5-A18	PINS	J1-15
16	SPARE	BK/RD		---	PINS	J1-16
17	SPARE	WH/RD		---	PINDS	J1-17
18	0	OR/RD		TB6-A8	PINS	J1-18
19	0	BL/RD		TB6-A8	PINS	J1-19
20	0	RD/GN		TB6-A9	PINS	J1-20

CABLE LIST (Continued)						
CABLE NUMBER: P24-10						
CABLE TYPE: LSMSCS-24						
O.D.:						
CABLE LENGTH: 10 FEET						
CABLE ENTRY FROM: A7			**FROM:** MAST ENCL. ASSY. A7 (NAV. LIGHT SW. BOX)			
CABLE ENTRY TO: J1			**TO:** OPERATORS CAB RECEPTACLE J1			
BULKHEAD FITTINGS:			**NOTES:** ***** COMPRESSION TYPE FITTINGS			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
21	0	OR/GN		TB6-A10	PINS	J1-21
22	SPARE	BK/WH/RD		---	PINS	J1-22
23	SPARE	WH/BK/RD		---	PINS	J1-23
24	SPARE	RD/BK/WH		---	PINS	J1-24
25	SHLD	SHLD			SHLD TO	BACKSHELL
5						

Figure 1. Sheet 15 Operators Cab Cable List
(Sheet 15 of 16)

CABLE LIST	
CABLE NUMBER: P24-11	
CABLE TYPE: LS3SJ-16	
O.D.: .340 INCH	
CABLE LENGTH: 15 FEET	
CABLE ENTRY FROM: LT. SW. BOX A7	**FROM:** MAST ENCL. ASSY. A7 (NAV. LIGHT SW. BOX)
CABLE ENTRY TO: J2	**TO:** AFT MAST RECEPTACLE J2
BULKHEAD FITTINGS:	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	COMPRESSION	TB6-A7	PINS	3J2-B
2	515	WHITE	COMPRESSION	TB3-B18	PINS	3J2-A
3	516	RED OR GREEN	COMPRESSION	TB4-A5	PINS	3J2-C
4	SHLD	SHLD	---	---	SHLD TO	BACKSHELL

Figure 1. Sheet 16 Operators Cab Cable List
(Sheet 16 of 16)

CABLE LIST						
CABLE NUMBER: P24-1						
CABLE TYPE: SWE						
O.D.:						
CABLE LENGTH: 4 FEET						
CABLE ENTRY FROM: G1			**FROM:** ALTERNATOR			
CABLE ENTRY TO: VR1/A9			**TO:** VOLTAGE REGULATOR/A9 JUNCTION BOX			
BULKHEAD FITTINGS: NONE			**NOTES:** CABLE IS FURNISHED WITH VOLTAGE REGULATOR - BROWN LEAD IS BROKEN OUT AND ROUTED TO ENG. JUNC. BOX (A4) IN CABLE P24-2. RED WIRE AND OTHER LEADS FURNISHED ARE CONNECTED TO ALTERNATOR.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
	124	BRN	SEE SHT.3	A4 (TB1-13)	COMPRESSION	TB1-4
	+24	RED	E20908-1	G1-OUT(+)	COMPRESSION	TB1-5
	131	BLUE	FURNISHED	G1-F	COMPRESSION	TB1-1
	130	ORANGE	FURNISHED	G1-AC	COMPRESSION	TB1-2
	0	BLACK	FURNISHED	G1-GND	COMPRESSION	TB1-3
	132	WHITE	20909-1	G1-AC	COMPRESSION	TB1-6
			NOTE: G1 TERMINALS NOT MARKED.			

Figure 2. Propulsion Module Wiring List
(Sheet 1 of 43)

CABLE LIST	
CABLE NUMBER: P24-2	
CABLE TYPE: LSDHOF-4	
O.D.:.460 INCH	
CABLE LENGTH: 12 FEET	
CABLE ENTRY FROM: VR1/G1	**FROM:** VOLTAGE REGULATOR/ALTERNATOR (A9)
CABLE ENTRY TO: A4	**TO:** ENGINE JUNCTION BOX
BULKHEAD FITTINGS: #2 NYLON TUBE AT A4, 2E PACKING	**NOTES:** BROWN CONDUCTOR SUPPLIED AS PART OF VOLTAGE REGULATOR/ALTERNATOR WIRING HARNESS IS CONNECTED TO BLACK CONDUCTOR.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	124	BLACK	E13258	TB1-4(BROWN)	E11028-21	TBE-13
2	132	WHITE	E11028-10	TB1-6(WHITE)	E11028-21	TB2-10

Figure 2. Propulsion Module Wiring List
(Sheet 2 of 43)

CABLE LIST	
CABLE NUMBER: P24-3	
CABLE TYPE: 1/0	
O.D.: .910 INCH	
CABLE LENGTH: SEE BELOW	
CABLE ENTRY FROM: A9	**FROM:** THRUSTER DIR/AUX BATT./VOLTAGE REG/ISOLATOR
CABLE ENTRY TO: A1B1	**TO:** ENG. STARTER, A1B1
BULKHEAD FITTINGS:	**NOTES:** MAIN WIRES FOR ALTERNATOR CHARGING CURRENT TO +24 VDC SYSTEM

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	E11028-23	ALT GND	E20908-2	STARTER NEG. POST
2	+24	RED	E11028-23	IS1-1	E20908-2	STARTER POS. POST
			NOTES: RED = 96 INCHES BLACK = 60 INCHES			

Figure 2. Propulsion Module Wiring List
(Sheet 3 of 43)

CABLE LIST						
CABLE NUMBER: P24-4						
CABLE TYPE: LSDNW-50						
O.D.: .910 INCH						
CABLE LENGTH: 14 FEET						
CABLE ENTRY FROM: BT&A9			**FROM:** BATTERY BANK AND A9 JUNCTION BOX			
CABLE ENTRY TO: A6			**TO:** POWER MODULE CIRCUIT BREAKER BOX			
BULKHEAD FITTINGS: #5 NYLON TUBE AT A6, 5D PACKING			**NOTES:** CONDUCTORS ARE CLAMPED IN TERMINAL BLOCK AS AT A6.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	E20838-2	BT2 NEG	WIRE	TB4-(*)
2	+24	WHITE	E20838-2	A95H1-L+	WIRE	TB1-1
			NOTE: (*) TB4 TERMINAL BLOCK CONNECTIONS TO (0) CONNECT TO AN OPEN TERMINAL POINT.			

Figure 2. Propulsion Module Wiring List
(Sheet 4 of 43)

CABLE LIST	
CABLE NUMBER: P24-5	
CABLE TYPE: LSDHOF-4	
O.D.: .460 INCH	
CABLE LENGTH: 5 FEET	
CABLE ENTRY FROM: A6	**FROM:** POWER MODULE CIRCUIT BREAKER PANEL
CABLE ENTRY TO: A4	**TO:** ENG. JUNCTION BOX
BULKHEAD FITTINGS: 2 NYLON STUFFING TUBE 2E PACKING ASSEMBLY-BOTH ENDS	**NOTES:** LOAD SIDE OF MAIN CB FOR +24 VDC FEED TO ENG JUNCTION BOX.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB4	E11028-1	TB1-20
2	105	WHITE	WIRE	TB2-1	E11028-1	TB1-17

Figure 2. Propulsion Module Wiring List
(Sheet 5 of 43)

CABLE LIST						
CABLE NUMBER: P24-6						
CABLE TYPE: LSDHOF-30						
O.D.: .960 INCH						
CABLE LENGTH: 8 FEET						
CABLE ENTRY FROM: A8			**FROM:** VENT FAN RELAY, A8			
CABLE ENTRY TO: A6			**TO:** CIRCUIT BREAKER PANEL, A6			
BULKHEAD FITTINGS: 5 NYLON TUBE 5E PACKING ASSEMBLY-BOTH ENDS			**NOTES:** FEED FOR VENT FAN MOTOR CIRCUIT.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB1	WIRE	TB4
2	133	WHITE	WIRE	K1-1	WIRE	TB2-02
			NOTE: USE TB1 LARGE LUG IN A8 FOR “0” WIRE FOR THIS CABLE. SEE CABLE VF-1.			

Figure 2. Propulsion Module Wiring List
(Sheet 6 of 43)

CABLE LIST	
CABLE NUMBER: P24-7-1 & 7-2	
CABLE TYPE: LSFNW-9	
O.D.: .630 INCH	
CABLE LENGTH: 12 FEET	
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL
CABLE ENTRY TO: A6	**TO:** PM CIRCUIT BREAKER PANEL
BULKHEAD FITTINGS: 4 NYLON TUBE 4E INSERT BOTH ENDS	**NOTES:** TWO CABLES RUN TO SAME LOCATIONS. POWER FEED TO ENGINE COMPARTMENT BILGE PUMP CIRCUIT AND FLOOD ALARM.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
(7-1) 1	0	BLACK	WIRE	TB3-1	WIRE	TB4
(7-1) 2	0	WHITE	WIRE	TB3-1	WIRE	TB4
(7-1) 3	137	RED	WIRE	TB1-8	WIRE	TB3-3
(7-1) 4	147	GREEN	WIRE	TB2-3	WIRE	TB3-5
(7-2) 1	152	BLACK	WIRE	TB2-8	WIRE	TB3-6
(7-2) 2	157	WHITE	WIRE	TB4-3	WIRE	TB3-7
(7-2) 3	162	RED	WIRE	TB4-8	WIRE	TB3-8
(7-2) 4	167	GREEN	WIRE	TB3-8	WIRE	TB3-9

Figure 2. Propulsion Module Wiring List
(Sheet 7 of 43)

CABLE LIST	
CABLE NUMBER: P24-8	
CABLE TYPE: LSDHOF-4	
O.D.: .460 INCH	
CABLE LENGTH: 20 FEET	
CABLE ENTRY FROM: A9	**FROM:** THRUSTER DIR/AUX BATT. JUNCTION BOX ASSEMBLY
CABLE ENTRY TO: A6	**TO:** PM CIRCUIT BREAKER PANEL
BULKHEAD FITTINGS:	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	202	BLACK	WIRE	TB2-3	WIRE	TB2-4
2	203	WHITE	WIRE	TB2-4	WIRE	TB2-5

Figure 2. Propulsion Module Wiring List
(Sheet 8 of 43)

CABLE LIST	
CABLE NUMBER: P24-9	
CABLE TYPE: LSTHOF-4	
O.D.: .480 INCH	
CABLE LENGTH: 20 FEET	
CABLE ENTRY FROM: A6	**FROM:** PM CIRCUIT BREAKER PANEL
CABLE ENTRY TO: A3	**TO:** PM JUNCTION BOX
BULKHEAD FITTINGS: #4 NYLON TUBE #4B PACKING ASSEMBLY BOTH ENDS	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
0	0	BLACK	WIRE	TB4	E11028-21	TB2-13
1	110	WHITE	WIRE	TB3-1	E11028-21	TB1-3
2	173	RED	WIRE	TB3-10	E11028-21	TB1-10

Figure 2. Propulsion Module Wiring List
(Sheet 9 of 43)

CABLE LIST	
CABLE NUMBER: P24-10	
CABLE TYPE: LSDNW-9	
O.D.: .545 INCH	
CABLE LENGTH: 17 FEET	
CABLE ENTRY FROM: A6	**FROM:** PM CIRCUIT BREAKER PANEL
CABLE ENTRY TO: A7	**TO:** FWD BILGE PUMP CONTROL
BULKHEAD FITTINGS: #4 NYLON TUBE #4B PACKING ASSEMBLY BOTH ENDS	**NOTES:** CONDUCTOR 1 IS CLAMPED IN TERMINAL BLOCK 4 AT CIRCUIT BREAKER PANEL.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB4	WIRE	TB1-6
2	142	WHITE	WIRE	TB3-4	WIRE	TB1-3

Figure 2. Propulsion Module Wiring List
(Sheet 10 of 43)

CABLE LIST						
CABLE NUMBER: P24-11						
CABLE TYPE: LS2SJ-18						
O.D.: .310 INCH						
CABLE LENGTH:						
CABLE ENTRY FROM: A2jb2			**FROM:** THRUSTER CONTROL JUNCTION BOX			
CABLE ENTRY TO: A6			**TO:** PM CIRCUIT BREAKER PANEL			
BULKHEAD FITTINGS:			**NOTES:**			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	COMPRESSION	TB1-2	COMPRESSION	TB4-(*)
2	176	WHITE	COMPRESSION	TB1-1	COMPRESSION	TB3-11
3	SH	SHIELD	COMPRESSION	TB1-SH		NONE
			NOTE: (*)TB4 TERMINAL BLOCK ALL CONNECTIONS (0) CONNECT TO AN OPEN TERMINAL POINT.			

Figure 2. Propulsion Module Wiring List
(Sheet 11 of 43)

CABLE LIST	
CABLE NUMBER: P24-12	
CABLE TYPE: 1/0 RED	
O.D.:	
CABLE LENGTH: 8 FEET	
CABLE ENTRY FROM: ALT/G1	**FROM:** ALTERNATOR
CABLE ENTRY TO: A9	**TO:** THRUSTER DIR/AUX BATT. JUNCTION BOX A9
BULKHEAD FITTINGS: A9 BOX NO. 2 STUFFING TUBE NO. 2E PACKING	**NOTES:** CABLE PART NO. E20828-2 1A CABLE IS A JUMPER FROM (+) LH SIDE TO (+) RH SIDE G1.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	200	RED	E20908-3	G1 (+)	E20908-3	1S1-A
1A	200	RED	E20908-3	G1 (+)	E20908-3	G1 (+)

Figure 2. Propulsion Module Wiring List
(Sheet 12 of 43)

CABLE LIST	
CABLE NUMBER: P24-13	
CABLE TYPE: LSDNW-9	
O.D.: .545 INCH	
CABLE LENGTH: 15 FEET	
CABLE ENTRY FROM: A9	**FROM:** THRUSTER JUNCTION BOX DIR/BATTERY A9
CABLE ENTRY TO: A3	**TO:** POWER MODULE JUNCTION BOX A3
BULKHEAD FITTINGS: #4 TUBE #4B	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	220	BLACK	E11028-19	SH1-B+	E11028-19	TB4-10
2	221	WHITE	E11028-19	SH1-L+	E11028-19	TB4-11

Figure 2. Propulsion Module Wiring List
(Sheet 13 of 43)

CABLE LIST	
CABLE NUMBER: P24-14	
CABLE TYPE: I/O	
O.D.:	
CABLE LENGTH: 10 FFET	
CABLE ENTRY FROM: BT	**FROM:** MAIN BATTERY BOX
CABLE ENTRY TO: JB3	**TO:** NATO RECEPTICAL JUNCTION BOX
BULKHEAD FITTINGS:	**NOTES:** FOR COLD WEATHER STARTING.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	E20838-1	-BT4	COMPRESSION	+
2	+24V	RED	E20838-1	+BT3	COMPRESSION	-

Figure 2. Propulsion Module Wiring List
(Sheet 14 of 43)

CABLE LIST						
CABLE NUMBER: B1, B2						
CABLE TYPE: 5JBX-1011-02P & 03P						
O.D.: .491 INCH						
CABLE LENGTH: SEE BELOW						
CABLE ENTRY FROM: BT			**FROM:** BATTERY BT 1/BT 2			
CABLE ENTRY TO: A1B1			**TO:** STARTER/SOLENOID A1 B1			
BULKHEAD FITTINGS:			**NOTES:** MAIN WIRES FOR ENGINE STARTER.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
B1	+24	RED 5’	E20838-1	BT1-POS.	320838-1	SOLENOID POS. POST
B2	0	BLACK 4’	E20838-1	BT2-NEG.	E20838-1	STARTER NEG. POST
			NOTE: BLACK = 4’ RED = 5’			

Figure 2. Propulsion Module Wiring List
(Sheet 15 of 43)

CABLE LIST	
CABLE NUMBER: B3 THRU B6	
CABLE TYPE: 1/0	
O.D.: .491 INCH	
CABLE LENGTH: AS NEEDED	
CABLE ENTRY FROM: SEE NOTES	**FROM:** SEE NOTES
CABLE ENTRY TO: SEE NOTES	**TO:** SEE NOTES
BULKHEAD FITTINGS:	**NOTES:** INTERNAL CABLING ON BATTERY BANK SEE BELOW. REFERENCE E26573 SHT. 8. LABEL ENDS OF CABLES WITH TERMINATION POINT.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
B3	SEE NOTE	RED	E20838-1	BT1-POS	E20838-1	BT3-POS
B4	SEE NOTE	BLACK	E20838-1	PT1-NEG	E20838-1	BT2-POS
B5	SEE NOTE	BLACK	E20838-1	PT3-NEG	E20838-1	BT4-POS
B6	SEE NOTE	BLACK	E20838-1	BT2-NEG	E20838-1	BT4-NEG
			NOTE: B3 7FT LONG B4 2FT LONG B5 2FT LONG B6 7FT LONG			

Figure 2. Propulsion Module Wiring List
(Sheet 16 of 43)

CABLE LIST						
CABLE NUMBER: KMB-1						
CABLE TYPE: SWE						
O.D.:						
CABLE LENGTH: 20 FEET						
CABLE ENTRY FROM: A1			**FROM:** MAIN ENGINE			
CABLE ENTRY TO: A4			**TO:** ENGINE JUNCTION BOX			
BULKHEAD FITTINGS: TWO SCREW CONNECTOR AT A4			**NOTES:** KMB-1 IS WIRING HARNESS FURNISHED ON ENGINE SHIELD ON W/NO. 122 & 123 CONNECT TO SHIELD ON KMB-3 W/NO. 119, 120, & 121 AND TO TB1-8.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
0	0	BLACK		SWE	E11028-17	A4TB1-20
103	103	PURPLE		SWE	E11028-17	A4TB1-10
105	105	WHITE		SWE	E11028-17	A4TB1-17
106	106	WHITE		SWE	E11028-17	A4TB1-18
111	111	RED		SWE	E11028-17	A4TB2-1
113	113	ORANGE		SWE	E11028-17	A4TB2-2
115	115	BROWN		SWE	E11028-17	A4TB2-6
116	116	BROWN		SWE	E11028-17	A4TB1-1
117	117	RED		SWE	E11028-17	A4TB1-2
118	118	BLACK		SWE	E11028-17	A4TB1-3
122	122	WHITE	TIE SHIELD TO TB1-8 FOR W/N 122 & 123	SWE	E11028-17	A4TB1-8
123	123	BLACK		SWE	E11028-17	A4TB1-9
124	124	GREEN		SWE	E11028-17	A4TB1-12
125	125	RED		SWE	E11028-17	A4TB2-7
126	126	GRAY		SWE	E11028-17	A4TB2-8
127	127	BLUE		SWE	E11028-17	A4TB2-9
128	128	YELLOW		SWE	E11028-17	A4TB1-14

Figure 2. Propulsion Module Wiring List
(Sheet 17 of 43)

CABLE LIST	
CABLE NUMBER: KMB-2	
CABLE TYPE: LSMHOF-14	
O.D.: .635 INCH	
CABLE LENGTH: 20 FEET	
CABLE ENTRY FROM: A4	**FROM:** ENGINE JUNCTION BOX, A4
CABLE ENTRY TO: A3	**TO:** POWER MODULE JUNCTION BOX, A3
BULKHEAD FITTINGS: #4 NYLON TUBE 4E INSERT BOTH ENDS	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	104	BLACK	E11028-1	TB1-16	E11028-1	TB1-8
2	111	WHITE	E11028-1	TB2-1	E11028-1	TB1-4
3	113	RED	E11028-1	TB2-2	E11028-1	TB1-2
4	115	GREEN	E11028-1	TB2-06	E11028-1	TB1-6
5	124	ORANGE	E11028-1	TB1-13	E11028-1	TB1-7
6	125	BLUE	E11028-1	TB2-7	E11028-1	TB3-14
7	126	WHITE/ BLACK	E11028-1	TB2-8	E11028-1	TB3-15
8	127	RED/ BLACK	E11028-1	TB2-9	E11028-1	TB3-16
9	129	GREEN/ BLACK	E11028-1	TB1-15	E11028-1	TB1-9
10	132	ORANGE/ BLACK	E11028-1	TB2-10	E11028-1	TB3-17
11	133	BLUE/ BLACK	E11028-1	TB-2-3	E11028-1	TB2-20
12	134	BLACK/ WHITE	E11028-1	TB2-4	E11028-1	TB1-14
13	180	RED/ WHITE	E11028-1	TB2-5	E11028-1	TB2-11
14	178	GREEN/ WHITE	E11028-1	TB1-11	E11028-1	TB2-15

Figure 2. Propulsion Module Wiring List
(Sheet 18 of 43)

CABLE LIST	
CABLE NUMBER: KMB-3	
CABLE TYPE: LS3SJ-18	
O.D.: .325 INCH	
CABLE LENGTH: 20 FEET	
CABLE ENTRY FROM: A4	**FROM:** ENGINE JUNCTION BOX
CABLE ENTRY TO: A3	**TO:** POWER MODULE JUNCTION BOX
BULKHEAD FITTINGS: 2 NYLON TUBE 2B PACKING BOTH ENDS	**NOTES:** THROTTLE CONTROL

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	119	BLACK	E11028-9	TB1-4	E11028-9	TB3-2
2	121	WHITE	E11028-9	TB1-7	E11028-9	TB3-3
3	120	RED	E11028-9	TB1-6	E11028-9	TB3-4
4	122	SHIELD	E11028-9	TB1-8	E11028-9	TB3-1

Figure 2. Propulsion Module Wiring List
(Sheet 19 of 43)

CABLE LIST						
CABLE NUMBER: CF-1						
CABLE TYPE: LSTHOF-3						
O.D.: .450 INCH						
CABLE LENGTH: 3 FEET						
CABLE ENTRY FROM: A5			**FROM:** BILGE PUMP CONTROL PANEL			
CABLE ENTRY TO: S9			**TO:** ENGINE ROOM FIRE DETECTOR			
BULKHEAD FITTINGS: #2 NYLON TUBE 2E PACKING TWO SCREW CONN AT S9			**NOTES:** 1. CABLE CF-1 CONNECTS IN S9 TO THE SWITCH. 2. REMOVE INSULATORS AND INSTALL HEAT SHRINK TUBING FOR WATERPROOF CONNECTIONS.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	137	BLACK	WIRE	TB1-9	E23808-1	S9-1 (WHITE)
2	SPARE	WHITE				
3	140	RED	WIRE	TB2-5	E23808-1	S9-2 (BLACK)
			NOTE: CONNECT BOTH WHITE WIRES TOGETHER FROM S9 (S9-1) TO W/N 137 OCNNECT BOTH BLACK WIRES TOGETHER FROM S9 (S9-2) TO W/N 140			

Figure 2. Propulsion Module Wiring List
(Sheet 20 of 43)

CABLE LIST	
CABLE NUMBER: CF-2	
CABLE TYPE: LSTHOF3	
O.D.: .450 INCH	
CABLE LENGTH: 25 FEET	
CABLE ENTRY FROM: A7	**FROM:** FORWARD COMPARTMENT BILGE PUMP CONTROL
CABLE ENTRY TO: A5	**TO:** BILGE PUMP CONTROL PANEL
BULKHEAD FITTINGS: NO. 2 STUFFING TUBE NO. 2E PACKING BOTH ENDS	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	138	BLACK	WIRE	TB1-7	WIRE	TB1-2
2	SPARE	WHITE				
3	146	RED	WIRE	TB1-4	WIRE	TB1-7

Figure 2. Propulsion Module Wiring List
(Sheet 21 of 43)

CABLE LIST	
CABLE NUMBER: CF-5	
CABLE TYPE: LSTHOF-3	
O.D.: .450 INCH	
CABLE LENGTH: 25 FEET	
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL
CABLE ENTRY TO: S8	**TO:** AFT COMPARTMENT FIRE DETECTOR S8
BULKHEAD FITTINGS: #2 NYLON TUBE, 2E PACKING AT A5. TWO SCREW CONNECTOR AT JB7.	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	140	BLACK	WIRE	TB1-5	E23808-1	S8-2
2	137	WHITE	WIRE	TB1-9	E23808-1	S8-1
3	SPARE	RED			--	--

Figure 2. Propulsion Module Wiring List
(Sheet 22 of 43)

CABLE LIST	
CABLE NUMBER: CCBP-1	
CABLE TYPE: LSMHOF-14	
O.D.: .635 INCH	
CABLE LENGTH: 20 FEET	
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL A5
CABLE ENTRY TO: A3	**TO:** POWER MODULE JUNCTION BOX A3
BULKHEAD FITTINGS: #4 NYLON STUFFING TUBE 4E PACKING BOTH ENDS	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	SPARE	BLACK				
2	SPARE	WHITE				
3	139	RED	WIRE	TB1-10	E11028-1	TB1-16
4	141	GREEN	WIRE	TB1-6	E11028-1	TB1-17
5	148	ORANGE	WIRE	TB2-5	E11028-1	TB1-20
6	150	BLUE	WIRE	TB2-1	E11028-1	TB2-1
7	153	WHITE/ BLACK	WIRE	TB2-10	E11028-1	TB2-2
8	155	RED/ BLACK	WIRE	TB2-6	E11028-1	TB2-3
9	158	GREEN/ BLACK	WIRE	TB4-5	E11028-1	TB2-4
10	160	ORANGE/ BLACK	WIRE	TB4-1	E11028-1	TB2-5
11	163	BLUE/ BLACK	WIRE	TB4-10	E11028-1	TB2-6
12	165	BLACK/ WHITE	WIRE	TB4-6	E11028-1	TB2-7
13	168	RED/ WHITE	WIRE	TB3-10	E11028-1	TB2-8
14	170	GREEN/ WHITE	WIRE	TB3-6	E11028-1	TB2-9

Figure 2. Propulsion Module Wiring List
(Sheet 23 of 43)

CABLE LIST						
CABLE NUMBER: CFD-1						
CABLE TYPE: LSDHOF-3						
O.D.: .425 INCH						
CABLE LENGTH: 12 FEET						
CABLE ENTRY FROM: A3			**FROM:** P.M. JUNCTION BOX			
CABLE ENTRY TO: A7			**TO:** FORWARD COMPARTMENT BILGE PUMP CONTROL			
BULKHEAD FITTINGS: #2 NYLON TUBE 2E PACKING AT BOTH ENDS			**NOTES:**			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	143	BLACK	E11028-1	TB1-18	WIRE	TB1-5
2	145	WHITE	E11028-1	TB1-19	WIRE	TB1-1

Figure 2. Propulsion Module Wiring List
(Sheet 24 of 43)

CABLE LIST	
CABLE NUMBER: CFD-2	
CABLE TYPE: LSTNW-9	
O.D.: .625 INCH	
CABLE LENGTH: 5 FEET	
CABLE ENTRY FROM: A7	**FROM:** FORWARD COMPARTMENT BILGE PUMP CONTROL
CABLE ENTRY TO: JB1	**TO:** FWD. COMPARTMENT JUNCTION BOX, BILGE PUMP, SWITCH
BULKHEAD FITTINGS: #4 NYLON TUBE 4E PACKING AT A7. USE TWO SCREW CONNECTOR AT JD1.	**NOTES:** IN JB1, CFD-2 CONNECTS TO WIRES FROM BILGE PUMP B2, & FLOAT SWITCH S10. OBSERVE POLARITY OF B2, S10 IS NON-POLARIZED.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB1-6	E23808-2	B2-1 (BLACK) S10-2
2	143	WHITE	WIRE	TB1-5	E23808-2	B2-2 (BROWN)
3	146	RED	WIRE	TB1-4	E23808-2	S10-1

Figure 2. Propulsion Module Wiring List
(Sheet 25 of 43)

CABLE LIST	
CABLE NUMBER: CFD-3	
CABLE TYPE: LSTNW-9	
O.D.: .625 INCH	
CABLE LENGTH: 32 FEET	
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL, A5
CABLE ENTRY TO: JB2	**TO:** FWD. STBD. ENG. RM. JUNTION BOX 2, B4, S12
BULKHEAD FITTINGS: #4 NYLON TUBE, 4E PACKING AT A5 TWO SCREW CONNECTOR AT JB2.	**NOTES:** IN JB2, CFD-3 CONNECTS TO WIRES FROM BILGE PUMP B4, & BILGE SW. S12. OBSERVE POLARITY OF B4, S12 IS NON-POLARIZED.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB3-4	E23808-2	B4-1 (BLACK) S12-2
2	153	WHITE	WIRE	TB2-10	E23808-2	B4-2 (BROWN)
3	156	RED	WIRE	TB2-9	E23808-2	S12-1

Figure 2. Propulsion Module Wiring List
(Sheet 26 of 43)

CABLE LIST		
CABLE NUMBER: CFD-4		
CABLE TYPE: LSTNW-9		
O.D.: .625 INCH		
CABLE LENGTH: 25 FEET		
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL	
CABLE ENTRY TO: A9	**TO:** FWD PORT ENG. RM. THRUSTER JUNCTION BOX, A9	
BULKHEAD FITTINGS: #4 NYLON TUBE, 4E PACKING BOTH ENDS. #1 NYLON TUBE, 1B PACKING ON PUMP/FLOAT SWITCH.	**NOTES:** A9 JUNCTION BOX IS USED AS A PASS THROUGH FOR B3-S11 PUMP/FLOAT SWITCH.	

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB3-2	E23808-2	TB2-18
2	148	WHITE	WIRE	TB2-5	E23808-2	TB2-19
3	151	RED	WIRE	TB2-4	E23808-2	TB2-20
			NOTE: FROM A9 TO PUMP/PUMP FLOAT SWITCH. THE FOLLOWING CONNECTIONS SHALL BE USED.			
1	0		WIRE	TB2-18	E23808-2	B3-1 (BLACK) S11-2
2	148		WIRE	TB2-19	E23808-2	B3-2 (BROWN)
3	151		WIRE	TB2-20	E23808-2	S11-1

Figure 2. Propulsion Module Wiring List
(Sheet 27 of 43)

CABLE LIST	
CABLE NUMBER: CFD-5	
CABLE TYPE: LSTNW-9	
O.D.: .625 INCH	
CABLE LENGTH: 25 FEET	
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL
CABLE ENTRY TO: JB5	**TO:** AFT. STBD. ENG. RM. JUNCTION BOX, B6, S14
BULKHEAD FITTINGS: #4 NYLON TUBE, 4E PACKING AT A5. TWO SCREW CONNECTOR AT JB5.	**NOTES:** IN JB5 CFD-5 CONNECTS TO WIRES FROM BILGE PUMP B6 AND BILGE SWITCH S14, OBSERVE POLARITY OF B6, S14 IS NON-POLARIZED**.**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB3-2	E23808-2	B6-1 (BLACK) S14-2
2	163	WHITE	WIRE	TB4-10	E23808-2	B6-2 (BROWN)
3	166	RED	WIRE	TB4-9	E23808-2	S14-1

Figure 2. Propulsion Module Wiring List
(Sheet 28 of 43)

CABLE LIST	
CABLE NUMBER: CFD-6	
CABLE TYPE: LSTNW-9	
O.D.: .625 INCH	
CABLE LENGTH: 18 FEET	
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL, A5
CABLE ENTRY TO: JB6	**TO:** AFT. COMPARTMENT, JUNCTION BOX, JB8
BULKHEAD FITTINGS: #4 NYLON TUBE 4E PACKING AT A5. TWO SCREW CONNECTOR AT JB6.	**NOTES:** IN JB6 CFD-6 CONNECTS TO WIRE FROM BILGE PUMP B7 & BILGE SWITCH S15. OBSERVE POLARITY OF B7, S15 IS NON-POLARIZED.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB3-5	E23808-2	B7-1 (BLACK) S15-2
2	168	WHITE	WIRE	TB3-10	E23808-2	B7-2 (BROWN)
3	171	RED	WIRE	TB3-9	E23808-2	S15-1

Figure 2. Propulsion Module Wiring List
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CABLE LIST	
CABLE NUMBER: CFD-7	
CABLE TYPE: LSTNW-9	
O.D.: .625 INCH	
CABLE LENGTH: 19 FEET	
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL
CABLE ENTRY TO: JB8	**TO:** AFT. PORT ENGINE RM. JUNCTION BOX, B5, S13
BULKHEAD FITTINGS: #4 NYLON TUBE 4E PACKING AT A5. TWO SCREEN CONNECTORS AT JB8.	**NOTES:** IN JB8, CFD-7 CONNECTS TO WIRES FROM BILGE PUMP B5, & BILGE SWITCH S13. OBSERVE POLARITY OF B5, S13 IS NON-POLARIZED.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	WIRE	TB3-3	E23808-2	B5-1 (BLACK) S13-2
2	158	WHITE	WIRE	TB4-5	E23808-2	B5-2 (BROWN)
3	161	RED	WIRE	TB4-4	E23808-2	S13-1

Figure 2. Propulsion Module Wiring List
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CABLE LIST	
CABLE NUMBER: CFD-8	
CABLE TYPE: LSMHOF-14	
O.D.: .635 INCH	
CABLE LENGTH: 25 FEET	
CABLE ENTRY FROM: A5	**FROM:** BILGE PUMP CONTROL PANEL
CABLE ENTRY TO: A3	**TO:** PM JUNCTION BOX
BULKHEAD FITTINGS: #4 STUFFING TUBE #4E PACKING BOTH ENDS	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	146	BLACK	WIRE	TB1-7	E11028-21	TB4-1
2	151	WHITE	WIRE	TB2-4	E11028-21	TB4-2
3	156	RED	WIRE	TB2-9	E11028-21	TB4-3
4	161	GREEN	WIRE	TB4-4	E11028-21	TB4-4
5	166	ORANGE	WIRE	TB4-9	E11028-21	TB4-5
6	171	BLUE	WIRE	TB3-9	E11028-21	TB4-6
7	138	WHITE/ BLACK	WIRE	TB1-2	E11028-21	TB4-7
8	138	RED/ BLACK	WIRE	TB5-1	E11028-21	TB4-8
9	138	GREEN/ BLACK	WIRE	TB6-1	E11028-21	TB4-9
10	SPARE	ORANGE/ BLACK	--	--	--	--
11	SPARE	BLUE/ BLACK	--			
12	SPARE	BLACK/ WHITE	--			
13	SPARE	RED/ WHITE	--			
14	SPARE	GREEN/ WHITE	--	--	--	--

Figure 2. Propulsion Module Wiring List
(Sheet 31 of 43)

CABLE LIST						
CABLE NUMBER: CFR-1						
CABLE TYPE: LSFNW-4						
O.D.: .513 INCH						
CABLE LENGTH: 30 FEET						
CABLE ENTRY FROM: A4			**FROM:** ENGINE JB			
CABLE ENTRY TO: S2			**TO:** CO_2 RELEASE SWITCH, FWD. COMPARTMENT			
BULKHEAD FITTINGS: #4			**NOTES:** THIS CABLE IS CONNECTED TO ONE POLE OF THE CO_2 RELEASE SWITCH.			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	133	BLACK	RING TONGUE	TB2-3	RING TONGUE	S2A COM
2	134	WHITE	RING TONGUE	TB2-4	RING TONGUE	S2A N/C
3	104	RED	RING TONGUE	TB1-16	RING TONGUE	S2B-COM
4	124	GREEN	RING TONGUE	TB1-12	RING TONGUE	S2B-N/O
			NOTE: USE RING TONGUE TERMINALS			

Figure 2. Propulsion Module Wiring List
(Sheet 32 of 43)

CABLE LIST	
CABLE NUMBER: KEH-1	
CABLE TYPE: LS2SJ-18	
O.D.: .310 INCH	
CABLE LENGTH: 14 FEET	
CABLE ENTRY FROM: A3	**FROM:** POWER MODULE JUNCTION BOX
CABLE ENTRY TO: L2	**TO:** CLUTCH SOLENOID (L2)
BULKHEAD FITTINGS: 2A PACKING, #2 NYLON TUBE @A3 1C PACKING, #1 NYLON TUBE @ SOL. CONNECTION	**NOTES:** COORDINATOR WITH HYDRAULIC SYSTEM MECHANICS TO IDENTIFY ENGAGE CONNECTIONS.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	E11028-1	TB1-13	PLUG	L2-2 (0)
2	174	WHITE	E11028-1	TB1-11	PLUG	L2-1 (+)

Figure 2. Propulsion Module Wiring List
(Sheet 33 of 43)

CABLE LIST	
CABLE NUMBER: KEH-2	
CABLE TYPE: LS2SJ-18	
O.D.: .31 INCH	
CABLE LENGTH: 14 FEET	
CABLE ENTRY FROM: A3	**FROM:** POWER MODULE JUNCTION BOX
CABLE ENTRY TO: L3	**TO:** CLUTCH SOLENOID L3
BULKHEAD FITTINGS: POWER MODULE NO. 2 PACKING NO. 2A PACKING CLUTCH = PLUG CONNECTIONS. NO. 1 STUFFING TUBE NO. 1C PACKING	**NOTES:** COORDINATE WITH HYDRAULIC SYSTEM MECHANICS TO IDENTIFY DISENGAGE CONNECTION.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	E11028-1	TB1-13	PLUG	L3-2 (0)
2	175	WHITE	E11028-1	TB1-11	PLUG	L3-1 (+)
3	SHIELD		WIRE LUG	SHIELD CONNECTIONS		

Figure 2. Propulsion Module Wiring List
(Sheet 34 of 43)

CABLE LIST	
CABLE NUMBER: KL-2	
CABLE TYPE: LS4SJ-20	
O.D.: .360 INCH	
CABLE LENGTH: 16 FEET	
CABLE ENTRY FROM: A3	**FROM:** POWER MODULE J BOX
CABLE ENTRY TO: A2jb1	**TO:** ON THRUSTER - SYNCHRO, A2jb1
BULKHEAD FITTINGS: #4 NYLON TUBE, 4B PACKING AT A2, TBD AT A2jb1.	**NOTES:** EQUIPMENT FURNISHED AS PART OF THRUSTER. CONSULT MANUFACTURER'S DATA TO CONFIRM CONNECTIONS.

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	182	BLACK	E11028-1	TB3-10	COMPRESSION	1
2	183	WHITE	E11028-1	TB3-11	COMPRESSION	2
3	185	RED	E11028-1	TB3-6	COMPRESSION	3
4	186	GREEN	E11028-1	TB3-7	COMPRESSION	4
5	SHIELD	SHIELD	E11028-1	TB3-13		

Figure 2. Propulsion Module Wiring List
(Sheet 35 of 43)

CABLE LIST	
CABLE NUMBER: KL-3	
CABLE TYPE: LS2SJ-18	
O.D.: .310 INCH	
CABLE LENGTH: 15 FEET	
CABLE ENTRY FROM: A9	**FROM:** THRUSTER DIR/AUX. BATT./VOLTAGE REG.
CABLE ENTRY TO: A3	**TO:** POWER MODULE JUNCTION BOX
BULKHEAD FITTINGS: STUFFING TUBE #2 PACKING #2A BOTH ENDS	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	205	BLACK	E11028-1	TB2-6	E11028-1	TB2-18
2	206	WHITE	E11028-1	TB2-7	E11028-1	TB2-19
3	SHIELD	--				

Figure 2. Propulsion Module Wiring List
(Sheet 36 of 43)

CABLE LIST	
CABLE NUMBER: KL-4	
CABLE TYPE: LS3SJ-18	
O.D.: .325 INCH	
CABLE LENGTH: 25 FEET	
CABLE ENTRY FROM: A2jb2	**FROM:** THRUSTER/JUNCTION BOX (A2jb2)
CABLE ENTRY TO: A3	**TO:** POWER MODULE JUNCTION BOX A3
BULKHEAD FITTINGS: NO. 2 STUFFING TUBE, NO. 2A PACKING, BOTH ENDS	**NOTES:** INTERFACE CABLING TO CAB FOR THRUSTER CONTROL

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	210	BLACK	COMPRESSION	TB1-3	E11028-1	TB3-12
2	211	WHITE	COMPRESSION	TB1-4	E11028-1	TB3-19
3	212	RED	COMPRESSION	TB1-5	E11028-1	TB3-18
4	SHIELD	SHIELD	COMPRESSION	SHIELD	E11028-1	TB3-13

Figure 2. Propulsion Module Wiring List
(Sheet 37 of 43)

CABLE LIST	
CABLE NUMBER: KL-5	
CABLE TYPE: LS2SJ-18	
O.D.: .310 INCH	
CABLE LENGTH: 8 FEET	
CABLE ENTRY FROM: A2jb1	**FROM:** HYD. CONTROL/SOL. A
CABLE ENTRY TO: A2jb2	**TO:** THRUSTER CONTROL
BULKHEAD FITTINGS: HYD. CONTROL PLUG SOL. A THRUSTER CONTROL NO. 2 STUFFING TUBE NO 2A PACKING	**NOTES:** THRUSTER ROTATION

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	PLUG	L5-2	COMPRESSION	TN1-9
2	177	WHITE	PLUG	L5-1	COMPRESSION	TB1-8
3	SHIELD	SHIELD	--	--	COMPRESSION	TB1-9/SH

Figure 2. Propulsion Module Wiring List
(Sheet 38 of 43)

CABLE LIST	
CABLE NUMBER: KL-6	
CABLE TYPE: LS2SJ-18	
O.D.: .310 INCH	
CABLE LENGTH: 8 FEET	
CABLE ENTRY FROM: A2jb1	**FROM:** HYD. CONTROL/SOL. A
CABLE ENTRY TO: A2jb2	**TO:** THRUSTER CONTROL
BULKHEAD FITTINGS: HYD. CONTROL SOL. B	**NOTES:** THRUSTER ROTATION

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	0	BLACK	PLUG	L4-2	COMPRESSION	TB1-7
2	179	WHITE	PLUG	L4-1	COMPRESSION	TB1-6
3	SHIELD	SHIELD	--	--	COMPRESSION	TB1-7/SH

Figure 2. Propulsion Module Wiring List
(Sheet 39 of 43)

CABLE LIST						
CABLE NUMBER: KL-7						
CABLE TYPE: LSDHOF-3						
O.D.: .425 INCH						
CABLE LENGTH: 21 FEET						
CABLE ENTRY FROM: A4			**FROM:** ENGINE JUNCTION BOX, A4			
CABLE ENTRY TO: L1			**TO:** COLD START SOLENOID, L1			
BULKHEAD FITTINGS: #2 NYLON TUBE, 2E PACKING AT A4			**NOTES:**			
			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	103	BLACK	E11028-1	TB1-10	E11028-1	BLUE SOL. POS
2	0	WHITE	E11028-1	TB1-19	E11028-1	BLACK SOL. NEG

Figure 2. Propulsion Module Wiring List
(Sheet 40 of 43)

CABLE LIST	
CABLE NUMBER: KL-8	
CABLE TYPE: LS35J-18	
O.D.: .370 INCH	
CABLE LENGTH: 25 FEET	
CABLE ENTRY FROM: A4	**FROM:** ENGINE BOX A4
CABLE ENTRY TO: A2S2	**TO:** THRUSTER GEARCASE OIL LEVEL
BULKHEAD FITTINGS:	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	180	RED	RING TONGUE	TB2-5	PLUG	C
2	0	BLACK	RING TONGUE	TB1-19	PLUG	B
3	105	WHITE	RING TONGUE	TB1-17	PLUG	A

Figure 2. Propulsion Module Wiring List
(Sheet 41 of 43)

CABLE LIST	
CABLE NUMBER: HPU-1	
CABLE TYPE: LSDHOF-3	
O.D.: .425 INCH	
CABLE LENGTH: 25 FEET	
CABLE ENTRY FROM: A2jb1	**FROM:** HYD. TANK A2jb1-S1
CABLE ENTRY TO: A4	**TO:** ENGINE BOX A4
BULKHEAD FITTINGS: #2 STUFFING TUBE #2E PACKING @ A4 #1 PACKING #1C PACKING @ HPU CONN.	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
1	178	BLACK	SPLICE	RED WIRE	E11028-1	TB1-11
2	105	WHITE	SPLICE	RED WIRE	E11028-1	TB1-17

Figure 2. Propulsion Module Wiring List
(Sheet 42 of 43)

CABLE LIST	
CABLE NUMBER: VF-1	
CABLE TYPE: LSDHOF-3	
O.D.: .425 INCH	
CABLE LENGTH: 30 FEET	
CABLE ENTRY FROM:	**FROM:** A3 - PWR MOD JUNCTION BOX - LOCATED FWD (STBD)
CABLE ENTRY TO:	**TO:** A8 - VENT FAN RELAY ENCL. LOCATED AFT (PORT)
BULKHEAD FITTINGS:	**NOTES:**

			TERMINATION DATA			
WIRE NO.	**WIRE LABEL**	**COLOR**	**FROM TERM METHOD**	**FROM TERM POINT**	**TO TERM METHOD**	**TO TERM POINT**
	135	BLACK	RING TONGUE	TB1-15	WIRE	K1-5
	133	WHITE	RING TONGUE	TB2-20	WIRE	K1-1

Figure 2. Propulsion Module Wiring List
(Sheet 43 of 43)

Table 1: Circuit Breaker Panel A6 and Rear View, External Connections Wiring List (A).

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
TB1	1	-	+24	6	CB1	1	66	-
TB1	2	-	105	8	CB3	1	49	-
TB1	2	-	105	8	CB11	1	49	-
TB1	2	-	105	8	TB2	1	-	-
CB1	2	66	105	6	TB1	2	-	-
CB3	1	49	105	8	CB2	1	49	JUMPER
CB2	1	49	105	8	CB4	1	49	JUMPER
CB4	1	49	105	8	CB5	1	49	JUMPER
CB5	1	49	105	8	CB6	1	49	JUMPER
CB6	1	49	105	8	CB7	1	49	JUMPER
CB11	1	49	105	8	CB13	1	49	JUMPER
CB13	1	49	105	8	CB12	1	49	JUMPER
CB12	1	49	105	8	CB10	1	49	JUMPER
CB10	1	49	105	8	CB9	1	49	JUMPER
CB9	1	49	105	8	CB8	1	49	JUMPER
CB2	2	44	110	14	TB3	1	-	-
CB3	2	49	133	8	TB2	2	-	-
CB4	2	44	137	14	TB3	3	-	-
CB5	2	44	142	14	TB3	4	-	-
CB6	2	44	147	14	TB3	5	-	-
CB7	2	44	152	14	TB3	6	-	-
CB8	2	44	157	14	TB3	7	-	-
CB9	2	44	162	14	TB3	8	-	-
CB10	2	44	167	14	TB3	9	-	-
CB11	2	49	172	8	TB2	3	-	-
CB12	2	44	173	14	TB3	10	-	-
CB13	2	44	176	14	TB3	11	-	-
CB14	1	44	202	14	TB2	4	-	-
CB14	2	44	203	14	TB2	5	-	-

Table 2: Circuit Breaker Panel A6 and Rear View, External Connections Wiring List (B).

WIRE #	FROM	TERM	EQUIPMENT	NOTES
0	TB4	ALL	NEGATIVE	ALL GROUNDS TIE HERE
+24	TB1	2	+24 IN	-
105	TB2	1	EMER SHUT DOWN	-
110	TB3	1	ENGINE POWER	-
133	TB2	2	VENT FAN	-
137	TB3	3	ALARMS	-
142	TB3	4	BILGE PUMP 1	-
147	TB3	5	BILGE PUMP 2	-
152	TB3	6	BILGE PUMP 3	-
157	TB3	7	BILGE PUMP 4	-
162	TB3	8	BILGE PUMP 5	-
167	TB3	9	BILGE PUMP 6	-
172	TB2	3	OPERATORS CAB	-
173	TB3	10	CLUTCH CONTROL	-
176	TB3	11	THRUSTER	-
202	TB2	4	THRUSTER INDICATOR	-
203	TB2	5	THRUSTER INDICATOR	-

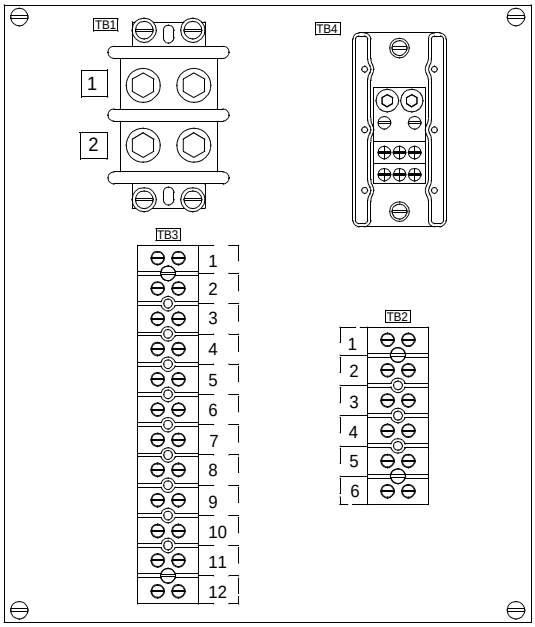


Table 2: Circuit Breaker Panel A6 and Rear View, External Connections Wiring List (B).

WIRE #	FROM	TERM	EQUIPMENT	NOTES

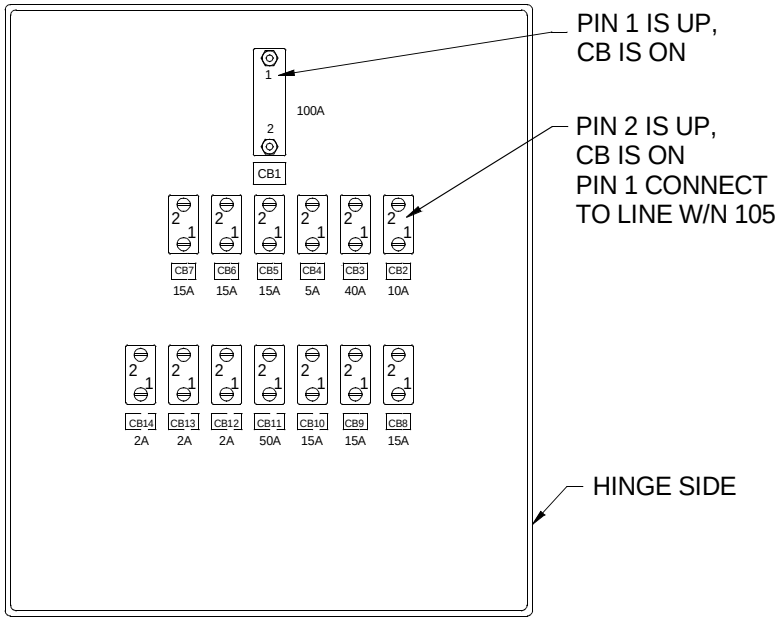


Table 3: Bilge Pump Control Assembly A5 and Rear View, Internal Wiring List.

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
TB6	3	-	138	16	TB6	1	-	JUMPER
TB6	1	-	138	16	TB5	1	-	JUMPER
TB5	1	-	138	16	TB5	3	-	JUMPER
TB5	3	-	138	16	TB1	2	-	JUMPER
TB1	2	-	138	16	TB1	3	-	JUMPER
TB1	3	-	138	-	D12	A	29	D12-A
TB1	4	-	171	-	D12	K	29	D12-K
TB1	5	-	140	-	D2	A	29	D2-A
TB1	6	-	141	-	D2	K	29	D2-K
TB1	9	-	137	-	D1	A	29	D1-A
TB1	10	-	139	-	D1	K	29	D1-K
K2	30	8	147	16	TB2	3	-	-
K2	87	8	149	16	TB2	2	29	D3-A
K2	86	8	150	16	TB2	1	29	D3-K

Table 3: Bilge Pump Control Assembly A5 and Rear View, Internal Wiring List. (Continued)

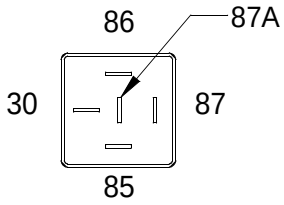
FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
K2	85	8	151	16	TB2	4	-	-
S1	1	32	147	16	TB2	3	-	-
S1	2	32	148	16	TB2	5	-	-
S1	3	32	149	16	TB2	2	-	-
K3	30	8	152	16	TB2	8	-	-
K3	87	8	154	16	TB2	7	29	D4-A
K3	86	8	155	16	tb2	6	29	D4-K
K3	85	8	156	16	TB2	9	-	-
S2	1	32	152	16	TB2	8	-	-
S2	2	32	153	16	TB2	10	-	-
S2	3	32	154	16	TB2	7	-	-
K4	30	8	157	16	TB4	3	-	-
K4	87	8	159	16	TB4	2	29	D5-A
K4	86	8	160	16	TB4	1	29	D5-K
K4	85	8	161	16	TB4	4	-	-
S3	1	32	157	16	TB4	3	-	-
S3	2	32	258	16	TB4	5	-	-
S3	3	32	159	16	TB4	2	-	-
K5	30	8	162	16	TB4	8	-	-
K5	87	8	164	16	TB4	7	29	D6-A
K5	86	8	165	16	TB4	6	29	D6-K
K5	85	8	166	16	TB4	9	-	-
S4	1	32	162	16	TB4	8	-	-
S4	2	32	163	16	TB4	10	-	-
S4	3	32	164	16	TB4	7	-	-
TB1	8	-	137	16	TB1	9	-	JUMPER
TB3	1	-	0	16	TB3	2	-	JUMPER
TB3	2	-	0	16	TB4	3	-	JUMPER

Table 3: Bilge Pump Control Assembly A5 and Rear View, Internal Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
TB3	3	-	0	16	TB4	4	-	JUMPER
TB3	4	-	0	16	TB4	5	-	JUMPER
K6	30	8	167	16	TB3	8	-	-
K6	87	8	169	16	TB3	7	29	D7-A
K6	86	8	170	16	TB3	6	29	D7-K
K6	85	8	171	16	TB3	9	-	-
S5	1	32	167	16	TB3	8	-	-
S5	2	32	168	16	TB3	10	-	-
S5	3	32	169	16	TB3	7	-	-
TB5	1	-	138	-	D8	A	29	D8-A
TB5	2	-	151	-	D8	K	29	D8-K
TB5	3	-	138	-	D9	A	29	D9-A
TB5	4	-	156	-	D9	K	29	D9-K
TB6	1	-	138	-	D10	A	29	D10-A
TB6	2	-	161	-	D10	K	29	D10-K
TB6	3	-	138	-	D11	A	29	D11-A
TB6	4	-	166	-	D11	K	29	D11-K
TB2	4	-	151	16	TB5	2	-	JUMPER
TB2	9	-	156	16	TB5	4	-	JUMPER
TB4	4	-	161	16	TB6	2	-	JUMPER
TB4	9	-	166	16	TB6	4	-	JUMPER
TB3	9	-	171	16	TB1	4	-	JUMPER

Table 3: Bilge Pump Control Assembly A5 and Rear View, Internal Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES



NOTES:

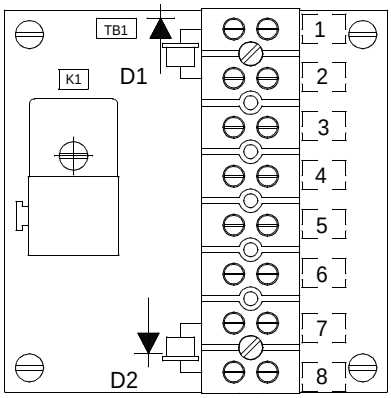
1. POLARITY OF DIODES, TERMINAL BLOCK DESIGNATIONS, TERMINAL NUMBERS, AND COMPONENT DESIGNATORS AS INDICATED BY SHALL BE PERMANENTLY STAMPED IN INK, LOCATED APPROXIMATELY AS SHOWN.
2. THE BILGE PUMP CONTROL PANEL ASSY IS UNIT A5.
3. MARK ENDS OF INTERNAL WIRES WITH WIRE NUMBERS USING HEAT SHRINK TUBING. COVER TERMINAL LUG BARREL WITH HEAT SHRINK TUBING.
4. RELAY DESIGNATION K1 IS NOT USED IN THIS ASSEMBLY.
5. USE TIE WRAPS AND CABLE TIE MOUNTS TO SECURE WIRE BUNDLES.
6. CONNECT DIODES AS LISTED IN NOTES COLUMN. FOR EXAMPLE D1-A IS THE DIODE WHICH CONNECTS TO DB1-9 D1-K IS THE DIODE CATHODE WHICH CONNECTS TO TB1-10.

Table 4: Single Bilge Pump Control A7, Internal Wiring List.

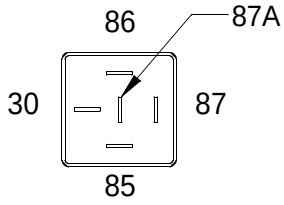
FROM	TERM #	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
K1	30	6	142	16	TB1	3	-	-
K1	87	6	144	16	TB1	2	-	-
K1	86	6	145	16	TB1	1	-	-
K1	85	6	146	16	TB1	8	-	-
K1	85	6	146	16	TB1	4	-	-
S1	1	22	142	16	TB1	3	-	-
S1	2	22	143	16	TB1	5	-	-
S1	3	22	144	16	TB1	2	-	-
D1	A	-	144	16	TB1	2	-	DIODE ANODE
D1	K	-	145	16	TB1	1	-	DIODE CATHODE
-	-	-	0	-	TB1	6	-	TIE POINT (EXTERNAL WIRES)
D2	A	-	138	-	TB1	7	-	DIODE ANODE

Table 4: Single Bilge Pump Control A7, Internal Wiring List.

FROM	TERM #	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
D2	K	-	146	16	TB1	8	-	DIODE CATHODE



TERMINAL LAYOUT



TERMINAL IDENTIFICATION
FOR K1

NOTES:

1 POLARITY OF DIODES, TERMINAL NUMBERS AND COMPONENT DESIGNATORS AS INDICATED BY [ ] SHALL BE PERMANENTLY STAMPED IN INK, LOCATED APPROXIMATELY AS SHOWN.

2 THE SINGLE BILGE PUMP CONTROL ASSY' IS UNIT A7 LOCATED IN THE FORWARD COMPARTMENT. UNIT PREFIX IS "1" FOR THE STBD POWER MODULE, "2" FOR THE PORT POWER MODULE. BILGE PUMP ASSY' FOR STBD POWERED MODULE IS "1A7" AND FOR PORT POWOWERED MODULE "2A7".

4 LABEL ALL INTERNAL WIRE ENDS WITH WIRE NUMBERS USING HEAT SHRINK TUBING, ITEM 24. COVER TERMINAL LUG BARREL WITH HEAT SHRINK TUBING.

Table 5: Engine Junction Box Assembly A4, Internal Wiring List.

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
S1	1	17	116	16	TB1	1	17	-
S1	2	17	0	16	TB1	20	17	-
S1	4	17	117	16	TB1	2	17	-
S1	5	17	118	16	TB1	3	17	-
S1	6	17	119	-	TB1	4	17	-
S1	8	17	120A	-	TB1	5	17	-
R1	-	17	120A	-	TB1	5	17	-

Table 5: Engine Junction Box Assembly A4, Internal Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
R1	-	17	120	-	TB1	6	17	-
S1	7	17	121	-	TB1	7	17	-
S1	10	17	122	-	TB1	8	17	-
S1	11	17	123	-	TB1	9	17	-
K1	30	6	105	14	TB1	17	17	-
K1	87	6	106	14	TB1	18	17	-
K1	86	6	104	16	TB1	16	17	-
K1	85	6	0	16	TB1	19	17	-
K2	86	6	124	16	TB1	13	17	-
K2	30	6	124	16	TB1	13	17	-
K2	85	6	128	16	TB1	14	17	-
K2	87	6	129	16	TB1	15	17	-
TB1	19	18	0	16	TB1	20	18	JUMPER
TB1	12	18	124	-	TB1	13	18	JUMPER
S2	1	-	105	16	TB1	17	17	-
S2	2	-	106	16	TB1	18	17	-

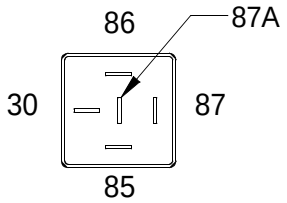


Table 6: Engine Junction Box Assembly A4, External Wires (Reference Only).

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM #	ITEM #	NOTES
-	-	-	0	-	TB1	20	-	-
-	-	-	0	-	TB1	19	-	-
-	-	-	103	-	TB1	10	-	-
-	-	-	104	-	TB1	16	-	-
-	-	-	105	-	TB1	17	-	-
-	-	-	106	-	TB1	18	-	-
-	-	-	111	-	TB2	1	-	-

Table 6: Engine Junction Box Assembly A4, External Wires (Reference Only). (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM #	ITEM #	NOTES
-	-	-	113	-	TB2	2	-	-
-	-	-	115	-	TB2	06	-	-
-	-	-	116	-	TB1	01	-	-
-	-	-	117	-	TB1	02	-	-
-	-	-	118	-	TB1	03	-	-
-	-	-	119	-	TB1	04	-	-
-	-	-	120	-	TB1	06	-	-
-	-	-	121	-	TB1	07	-	-
-	-	-	122	-	TB1	08	-	-
-	-	-	123	-	TB1	09	-	-
-	-	-	124	-	TB1	12	-	-
-	-	-	124	-	TB1	13	-	-
-	-	-	125	-	TB2	07	-	-
-	-	-	126	-	TB2	08	-	-
-	-	-	127	-	TB2	09	-	-
-	-	-	128	-	TB1	14	-	-
-	-	-	129	-	TB1	15	-	-
-	-	-	132	-	TB2	10	-	-
-	-	-	133	-	TB2	3	-	-
-	-	-	134	-	TB2	4	-	-
-	-	-	178	-	TB1	11	-	-
-	-	-	180	-	TB2	5	-	-
-	-	-	SHEILD	-	TB1	8	-	-

Table 7: Power Module Junction Box A3, Internal Wiring List.

TO	TERM	ITEM #	CABLE COND #	WIRE #	CONN	PIN	NOTES
TB1	01	10	1	112	P2	01	-
TB1	02	10	2	113	P2	02	-
TB1	03	10	3	110	P2	03	-
TB1	04	10	4	111	P2	04	-

Table 7: Power Module Junction Box A3, Internal Wiring List. (Continued)

TO	TERM	ITEM #	CABLE COND #	WIRE #	CONN	PIN	NOTES
TB1	05	10	5	114	P2	05	-
TB1	06	10	6	115	P2	06	-
TB1	07	10	7	124	P2	07	-
TB1	08	10	8	104	P2	08	-
TB1	09	10	9	129	P2	09	-
TB1	10	10	10	173	P2	10	-
TB1	11	10	11	174	P2	11	-
TB1	12	10	12	175	P2	12	-
TB1	13	-	13	-	-	-	-
TB1	14	10	14	134	P2	14	-
TB1	15	10	15	135	P2	15	-
TB1	16	10	16	139	P2	16	-
TB1	17	10	17	141	P2	17	-
TB1	18	10	18	143	P2	18	-
TB1	19	10	19	145	P2	19	-
TB1	20	10	20	148	P2	20	-
TB2	01	10	21	150	P2	21	-
TB2	02	10	22	153	P2	22	-
TB2	03	10	23	155	P2	23	-
TB2	04	10	24	158	P2	24	-
TB2	05	10	25	160	P2	25	-
TB2	06	10	26	163	P2	26	-
TB2	07	10	27	165	P2	27	-
TB2	08	10	28	168	P2	28	-
TB2	09	10	29	170	P2	29	-
TB2	10	10	30	181	P2	30	-
TB2	11	10	31	180	P2	31	-
TB2	12	10	32	-	P2	32	SPARE
TB1	13	10	33	0	P2	33	-
TB2	14	10	34	190	P2	34	-

Table 7: Power Module Junction Box A3, Internal Wiring List. (Continued)

TO	TERM	ITEM #	CABLE COND #	WIRE #	CONN	PIN	NOTES
TB2	15	10	35	178	P2	35	-
TB2	16	10	36	187	P2	36	-
TB2	17	10	37	-	P2	37	SPARE
TB2	18	10	6-BK	205	P3	21	-
TB2	19	10	6-WH	206	P3	22	-
TB2	20	-	-	133	-	-	-
TB3	01	10	1-SHD		P3	01	SHIELD
TB3	02	10	1-BK	119	P3	02	-
TB2	03	10	1-WH	121	P3	03	-
TB2	04	10	1-RD	120	P3	04	-
TB2	06	10	2-BK	185	P3	05	-
TB2	07	10	2-WH	186	P3	06	-
TB3	05	10	2-SHD	0	P3	07	SHIELD
TB3	08	10	2-RD		P3	08	SPARE
TB3	10	10	3-BK	182	P3	09	-
TB3	14	10	4-BK	125	P3	10	-
TB3	15	10	4-WH	126	P3	11	-
TB3	16	10	4-RD	127	P3	12	-
TB3	09	10	3-SHD	0	P3	13	SHIELD
TB3	11	10	3-WH	183	P3	14	-
TB3	12	10	6-RD	210	P3	27	-
TB3	13	10	4-SHD	0	P3	16	SHIELD
TB3	17	10	5-BK	132	P3	17	-
TB3	18	10	5-WH	212	P3	18	-
TB3	19	10	5-RD	211	P3	19	-
TB3	20	10	6-SHD	0	P3	20	SHIELD
TB4	01	10	1	146	P4	01	-
TB4	02	10	2	151	P4	02	-
TB4	03	10	3	156	P4	03	-
TB4	04	10	4	161	P4	04	-

Table 7: Power Module Junction Box A3, Internal Wiring List. (Continued)

TO	TERM	ITEM #	CABLE COND #	WIRE #	CONN	PIN	NOTES
TB4	05	10	5	166	P4	05	-
TB4	06	10	6	171	P4	06	-
TB4	07	10	7	138	P4	07	-
TB4	08	10	8	SPARE	P4	08	-
TB4	09	10	9	SPARE	P4	09	-
TB4	10	10	10	220	P4	10	-
TB4	11	10	11	221	P4	11	-
TB4	12	10	12	SPARE	P4	12	-
TB4	13	10	13	SPARE	P4	13	-
TB4	14	10	14	SPARE	P4	14	-

Table 8: Vent Fan Relay Assembly A8, Wire Internal Connections.

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM #	ITEM #	NOTES
P5	A	21	0	5AWG		LARGE SCREW	8	NO. 4
P5	A	21	136	5AWG	K1	3	4	NO. 4
K1	4	4	0	1AWG	TB1	SMALL SCREW	8	NO. 4

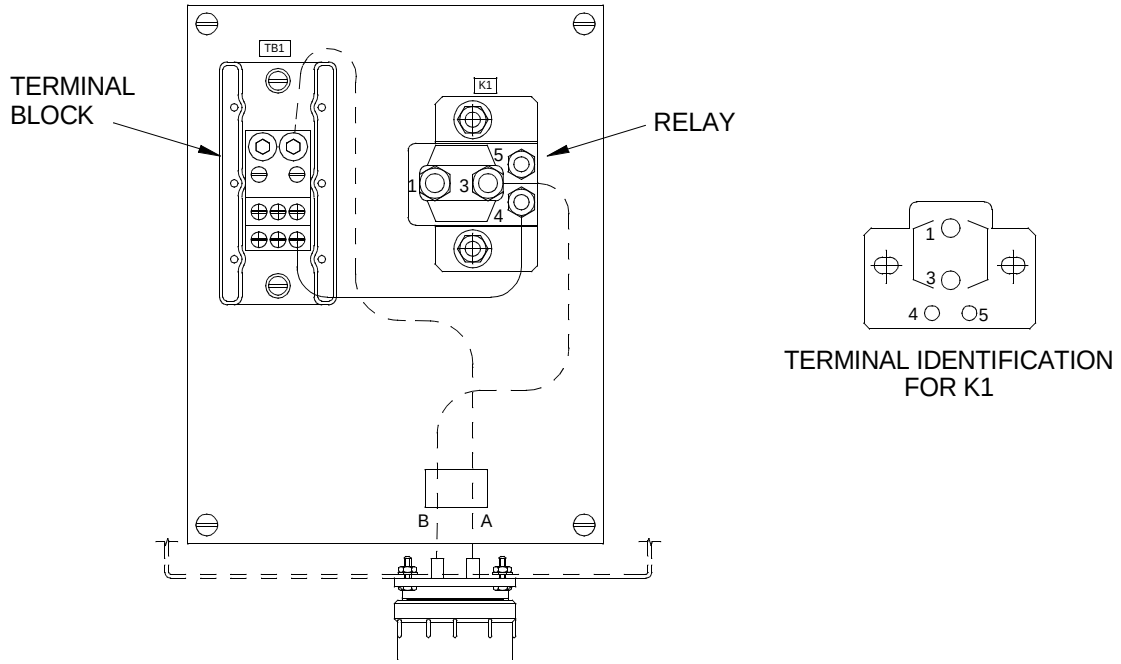


Table 9: Mast Enclosure, Wiring List.

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
TB6	A5	-	O	16	TB6	A6	-	JUMPERS
TB6	A6	-	O	16	TB6	A7		JUMPERS
TB6	A7	-	O	16	TB6	A8	-	JUMPERS
TB6	A8	-	O	16	TB6	A9	-	JUMPERS
TB6	A9	-	O	16	TB6	A10	-	JUMPERS
TB6	A10	-	O	16	TB6	A11	-	JUMPERS
TB6	B5	-	O	20	DS1	(-)	-	JUMPERS
DS1	(-)	-	O	20	DS11	(-)	-	JUMPERS
DS11	(-)	-	O	20	DS10	(-)	-	JUMPERS
DS10	(-)	-	O	20	DS2-A	(-)	-	JUMPERS

Table 9: Mast Enclosure, Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
DS2-A	(-)	-	O	20	DS2-B	(-)	-	JUMPERS
DS2-B	(-)	-	O	20	DS9	(-)	-	JUMPERS
DS9	(-)	-	O	20	DS8	(-)	-	JUMPERS
TB6	B6	-	O	20	DS5-1	(-)	-	JUMPERS
DS5-A	(-)	-	O	20	DS5-B	(-)	-	JUMPERS
DS5-B	(-)	-	O	20	DS4-A	(-)	-	JUMPERS
DS4-A	(-)	-	O	20	DS4-B	(-)	-	JUMPERS
DS4-B	(-)	-	O	20	DS12-A	(-)	-	JUMPERS
DS12-A	(-)	-	O	20	DS12-B	(-)	-	JUMPERS
DS12-B	(-)	-	O	20	LS1	(-)	-	JUMPERS
TB6	B2	-	532	10	TB5	B17	-	JUMPERS
TB5	B17	-	532	10	TB5	B6	-	JUMPERS
TB5	B6	-	532	10	TB4	B15	-	JUMPERS
TB4	B15	-	532	10	TB4	B4	-	JUMPERS
TB4	B4	-	532	10	TB3	B14	-	JUMPERS
TB3	B14	-	532	10	TB3	B3	-	JUMPERS
TB3	B3	-	532	10	TB2	B13	-	JUMPERS
TB2	B13	-	532	10	TB2	B2	-	JUMPERS
TB2	B2	-	532	10	TB1	B10	-	JUMPERS
TB1	B10	-	532	10	TB1	A13	-	JUMPERS
TB1	A13	-	532	10	TB2	A5	-	JUMPERS
TB2	A5	-	532	10	TB2	A16	-	JUMPERS
TB2	A16	-	532	10	TB3	A6	-	JUMPERS
TB3	A6	-	532	10	TB3	A17	-	JUMPERS
TB3	A17	-	532	10	TB4	A7	-	JUMPERS
TB4	A7	-	532	10	TB4	A18	-	JUMPERS
TB4	A18	-	532	10	TB5	A9	-	JUMPERS
TB6	A12	-	381	14	F1	1	-	#8
F1	1	-	381	14	F2	1	-	#8
F2	1	-	381	14	F3	1	-	#8

Table 9: Mast Enclosure, Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
F3	1	-	381	14	F4	1	-	#8
F4	1	-	381	14	F5	1	-	#8
F5	1	-	381	14	F6	1	-	#8
F6	1	-	381	14	F7	1	-	#8
F7	1	-	381	14	F8	1	-	#8
F8	1	-	381	14	F9	1	-	#8
F1	2	-	500	18	S1	2	44	-
F2	2	-	502	18	S2	2	44	-
F3	2	-	505	18	S3	2	44	-
F4	2	-	508	18	S4	2	44	-
F5	2	-	511	18	S5	2	44	-
F6	2	-	517	18	S6	2	44	-
F7	2	-	519	18	S7	2	44	-
F8	2	-	514	18	S8	2	44	-
F9	2	-	521	18	S9	2	44	-
S1	3	44	501A	18	TB1	B9	-	-
K1	2	-	501A	-	TB1	A9	-	#9
K1	4	-	501	-	TB1	A11	-	#9
K1	1	-	531	-	TB1	A16	-	#9
TB1	A16	-	531	-	D1	1	-	10
D1	2	-	532	-	TB1	A10	-	10
K1	3	-	530	-	TB1	A15	-	#9
TB1	B15	-	530	20	DS1	(+)	-	-
S2	3	44	503A	18	TB1	A12	-	-
K2	2	-	503A	-	TB1	B12	-	#9
K2	4	-	503	-	TB1	B14	-	#9
K2	1	-	533	-	TB1	B19	-	#9
TB1	B19	-	533	-	D2	1	-	#10
D2	2	-	532	-	TB1	B13	-	#10
K2	3	-	534	-	TB1	B18	-	#9
TB1	A18	-	534	20	DS2-A	(+)	-	-

Table 9: Mast Enclosure, Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
S2	1	44	504A	18	TB2	B1	-	-
K3	2	-	504A	-	TB2	A1	-	#9
K3	4	-	504	-	TB2	A3	-	#9
K3	1	-	536	-	TB2	A8	-	#9
TB2	A8	-	536	-	D3	1	-	#10
D3	2	-	532	-	TB2	A2	-	#10
K3	3	-	535	-	TB2	A7	-	#9
TB2	B7	-	535	20	DS2-B	(+)	-	-
S3	3	44	506A	18	TB2	A4	-	-
K4	2	-	506A	-	TB2	B4	-	#9
K4	4	-	506	-	TB2	B6	-	#9
K4	1	-	537	-	TB2	B11	-	#9
TB2	B11	-	537	-	D4	1	-	#10
D4	3	-	532	-	TB2	B5	-	#10
K4	3	-	538	-	TB2	B10	-	#9
TB2	A10	-	538	20	DS3-A	(+)	-	-
S3	1	44	507A	18	TB2	B12	-	-
K5	2	-	507A	-	TB2	A12	0	#9
K5	4	-	507	-	TB2	A14	-	#9
K5	1	-	540	-	TB2	A19	-	#9
TB2	A19	-	540	-	D5	1	-	#10
D5	2	-	532	-	TB2	A13	-	#10
K5	3	-	539	-	TB2	A18	-	#9
TB2	B18	-	539	20	DS3-B	(+)	-	-
S4	3	44	509A	18	TB2	A15	-	-
K6	2	-	509A	-	TB2	B15	-	#9
K6	4	-	509	-	TB2	B17	-	#9
K6	1	-	541	-	TB3	B1	-	#9
TB3	B1	-	541	-	D6	1	-	#10
D6	2	-	532	-	TB2	B16	-	#10

Table 9: Mast Enclosure, Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
K6	3	-	542	-	TB2	B20	-	#9
TB2	A20	-	542	20	DS4-A	(+)	-	-
S4	1	44	510A	18	TB3	B2	-	-
K7	2	-	510A	-	TB3	A2	-	#9
K7	4	-	510	-	TB3	A4	-	#9
K7	1	-	544	-	TB3	A9	-	#9
TB3	A9	-	544	-	D7	1	-	#10
D7	2	-	532	-	TB3	A3	-	#10
K7	3	-	543	-	TB3	A8	-	#9
TB3	B8	-	543	20	DS4-B	(+)	-	-
S5	3	44	512A	18	TB3	A5	-	-
K8	2	-	512A	-	TB3	B5	-	#9
K8	4	-	512	-	TB3	B7	-	#9
K8	1	-	545	-	TB3	B12	-	#9
TB3	B12	-	545	-	D8	1	-	#10
D8	2	-	532	-	TB3	B6	-	#10
K8	3	-	546	-	TB3	B11	-	#9
TB3	A11	-	546	20	DS5-A	(+)	-	-
S5	1	44	513A	18	TB3	B13	-	-
K9	2	-	513A	-	TB3	A13	-	#9
K9	4	-	513	-	TB3	A15	-	#9
K9	1	-	548	-	TB3	A20	-	#9
TB3	A20	-	548	-	D9	1	-	#10
D9	2	-	532	-	TB3	A14	-	#10
K9	3	-	547	-	TB3	A19	-	#9
TB3	B19	-	547	20	DS5-B	(+)	-	-
S8	3	44	515A	18	TB3	A16	-	-
K10	2	0	515A	-	TB3	B16	-	#9
K10	4	-	515	-	TB3	B18	-	#9
K10	1	-	549	-	TB4	B2	-	#9

Table 9: Mast Enclosure, Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
TB4	B2	-	549	-	D10	1	-	#10
D10	2	-	532	-	TB3	B17	-	#10
K10	3	-	550	-	TB4	B1	-	#9
TB4	A1	-	550	20	DS12-A	(+)	-	-
S8	1	44	516A	18	TB4	B3	-	-
K11	2	-	516A	-	TB4	A3	-	#9
K11	4	-	516	-	TB4	A5	-	#9
K11	1	-	552	-	TB4	A10	-	#9
TB4	A10	-	552	-	D11	1	-	#10
D11	2	-	532	-	TB4	A4	-	#10
K11	3	-	551	-	TB4	A9	-	#9
TB4	B9	-	551	20	DS12-B	(+)	-	-
S6	3	44	518A	18	TB4	A6	-	-
K12	2	-	518A	-	TB4	A14	-	-
K12	4	-	518	-	TB4	B8	-	#9
K12	1	-	553	-	TB4	B13	-	#9
TB4	B13	-	553	-	D12	1	-	#10
D12	2	-	532	-	TB4	B7	-	#10
K12	3	-	554	-	TB4	B12	-	#9
TB4	A12	-	554	20	DS6	(+)	-	-
K13	2	-	518A	-	TB4	A14	-	#9
K13	4	-	518B	-	TB4	A16	-	#9
K13	1	-	556	-	TB5	A1	-	#9
TB5	A1	-	556	-	D13	1	-	#10
D13	2	-	532	-	TB4	A15	-	#10
K13	3	-	555	-	TB4	A20	0	#9
TB4	B20	-	555	20	DS7	(+)	-	-
S7	3	44	520A	18	TB4	A17	-	-
TB4	A17	-	520A	18	TB5	A5	-	-
K14	2	-	520A	-	TB4	B17	-	#9

Table 9: Mast Enclosure, Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
K14	4	-	520	-	TB4	B19	-	#9
K14	1	-	557	-	TB5	B3	-	#9
TB5	B3	-	557	-	D14	1	-	#10
D14	2	-	532	-	TB4	B18	-	#10
K14	3	-	558	-	TB5	B2	-	#9
TB5	A2	-	558	20	DS8	(+)	-	-
K15	2	-	520A	-	TB5	A5	-	#9
K15	4	-	520B	-	TB5	A7	-	#9
K15	1	-	560	-	TB5	A12	-	#9
TB5	A12	-	560	-	D15	1	-	#10
D15	2	-	532	-	TB5	A6	-	#10
K15	3	-	559	-	TB5	A11	-	#9
TB6	B11	-	559	20	DS9	(+)	-	-
S9	3	44	522A	18	TB5	A8	-	-
TB5	A8	-	522A	18	TB5	A16	-	-
K16	2	-	522A	-	TB5	B8	-	#9
K16	4	-	522	-	TB5	B10	-	#9
K16	1	-	561	-	TB5	B15	-	#9
TB5	B15	-	561	-	D16	1	-	#10
D16	2	-	532	-	TB5	B9	-	#10
K16	3	-	562	-	TB5	B14	-	#9
TB5	A14	-	562	20	DS10	(+)	-	-
K17	2	-	522A	-	TB5	A16	-	#9
K17	4	-	522B	-	TB5	A18	-	#9
K17	1	-	564	-	TB6	A1	-	#9
TB6	A1	-	564	-	D17	1	-	#10
D17	2	-	532	-	TB5	A17	-	#10
K17	3	-	563	-	TB5	A20	-	#9
TB5	B20	-	563	20	DS11	(+)	-	-

Table 9: Mast Enclosure, Wiring List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
TB6	A2	-	532	20	S10	2	-	-
S10	1	-	565	20	LS1	(+)	-	-

Table 10: Navigation Lights Terminal Box Wiring List and Rear View.

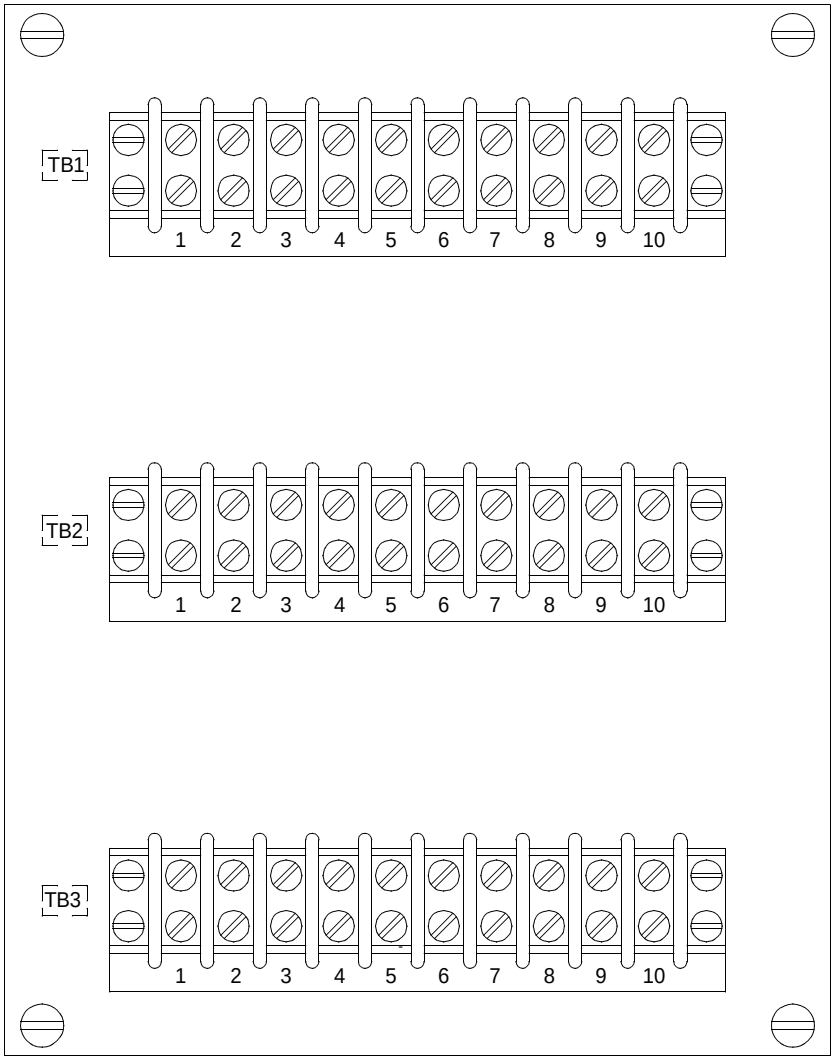
FROM	TERM	ITEM #	COLOR	WIRE #	SIZE	TO	TERM	NOTES
P1	1	5	BLK	501	18	TB1	1	-
P1	2	5	WHT	503	18	TB	2	-
P1	3	5	RED	504	18	TB1	3	-
P1	4	5	GRN	506	18	TB1	4	-
P1	5	5	ORG	507	18	TB1	5	-
P1	6	5	BLU	509	18	TB1	6	-
P1	7	5	WHT/ BLK	510	18	TB1	7	-
P1	8	5	RED/BLK	512	18	TB1	8	-
P1	9	5	GRN/BLK	513	18	TB1	9	-
P1	10	5	OR/BLK	518	18	TB1	10	-
P1	11	5	BLU/BLK	518B	18	TB2	1	-
P1	12	5	BLK/ WHT	520	18	TB2	2	-
P1	13	5	RED/ WHT	520B	18	TB2	3	-
P1	14	5	GRN/ WHT	522	18	TB2	4	-
P1	15	5	BLU/ WHT	522B	18	TB2	5	-
P1	16	5	BLK/RED	-	-	-	-	SPARE
P1	17	5	WHT/ RED	-	-	-	-	SPARE
P1	18	5	OR/RED	0	18	TB3	1	-
P1	19	5	BLU/RED	0	18	TB3	3	-
P1	20	5	RED/GRN	0	18	TB3	5	-
P1	21	5	OR/GRN	0	18	TB3	7	-

Table 10: Navigation Lights Terminal Box Wiring List and Rear View. (Continued)

FROM	TERM	ITEM #	COLOR	WIRE #	SIZE	TO	TERM	NOTES
P1	22	5	BLK/ WHT/ RED	-	-	-	-	SPARE
P1	23	5	WHT/ BLK/RED	-	-	-	-	SPARE
P1	24	5	RED/ BLK/ WHT	-	-	-	-	SPARE
TB3	1	29	-	-	-	TB3	2	JUMPER
TB3	2	29	-	-	-	TB3	3	JUMPER
TB3	3	29	-	-	-	TB3	4	JUMPER
TB3	4	29	-	-	-	TB3	5	JUMPER
TB3	5	29	-	-	-	TB3	6	JUMPER
TB3	6	29	-	-	-	TB3	7	JUMPER
TB3	7	29	-	-	-	TB3	8	JUMPER
TB3	8	29	-	-	-	TB3	9	JUMPER
TB3	9	29	-	-	-	TB3	10	JUMPER
J2	A	3	WHT	509	16	TB1	6	1
J2	B	3	WHT	0	16	TB3	8	-
J2	C	3	WHT	510	16	TB1	8	-
J3	A	3	WHT	512	16	TB1	8	-
J3	B	3	WHT	0	16	TB3	7	-
J3	C	3	WHT	513	16	TB1	9	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

Table 10: Navigation Lights Terminal Box Wiring List and Rear View. (Continued)

FROM	TERM	ITEM #	COLOR	WIRE #	SIZE	TO	TERM	NOTES



BOARD VIEW

Table 11: Middle Control Panel, Wiring Diagram and Lists.

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
TAP	0	-	0	16	A4TB10	4	-	NOTE 1
M1	(-)	35	0	16	(0)	TAP	34	NOTE 6
M1	2	35	0	16	(0)	TAP	34	NOTE 6
M10	(-)	35	0	16	(0)	TAP	34	NOTE 6
M10	2	35	0	16	(0)	TAP	34	NOTE 6
-	-	-	-	-	-	-	-	-

Table 11: Middle Control Panel, Wiring Diagram and Lists. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
M2	2	35	0	16	(0)	TAP	34	NOTE 6
M3	(-)	35	0	16	(0)	TAP	34	NOTE 6
M3		35	0	16	(0)	TAP	34	NOTE 6
M4	(-)	35	0	16	(0)	TAP	34	NOTE 6
M4	2	35	0	16	(0)	TAP	34	NOTE 6
M5	(-)	35	0	16	(0)	TAP	34	NOTE 6
M5	2	35	0	16	(0)	TAP	34	NOTE 6
M6	2	35	0	16	(0)	TAP	34	NOTE 6
M6	(-)	35	0	16	(0)	TAP	34	NOTE 6
M7	2	35	0	16	(0)	TAP	34	NOTE 6
M7	(-)	35	0	16	(0)	TAP	34	NOTE 6
-	-	-	-	-	-	-	-	-
M8	2	35	0	16	(0)	TAP	34	NOTE 6
M9	(-)	35	0	16	(0)	TAP	34	NOTE 6
M9	2	35	0	16	(0)	TAP	34	NOTE 6
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
M2	/	65	301	10	A45B5	16	66	NOTE 1
M2	+	65	301A	10	A4TB5	18	66	NOTE 1
M8	/	65	302	10	A45B9	7	66	NOTE 1
M8	+	65	302A	10	A4TB9	9	66	NOTE 1
S8	1	-	303	16	(303)	TAP	34	NOTE 6
S8	1	-	303	14	A4TB5	14	-	NOTE 1
S5	11	-	303	16	(303)	TAP	34	NOTE 6
S5	1	-	303	16	(303)	TAP	34	NOTE 6
S4	1	-	303	16	(303)	TAP	34	NOTE 6
S14	11	-	303	16	(303)	TAP	34	NOTE 6

Table 11: Middle Control Panel, Wiring Diagram and Lists. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
S14	1	-	303	16	S4	1	34	NOTE 6
S14	10	-	303e	16	S14	4	34	NOTE 6
S5	10	-	303D	16	S5	4	34	NOTE 6
S4	2	-	304	14	A4TB1	6	34	NOTE 6
S8	2	-	305	16	A4TB3	6	-	NOTE 1
S3	2	-	306	16	A4TB1	7	-	NOTE 1
S1	2	55	308	16	A4TB1	10	-	NOTE 1
S15	1	55	308	16	S1	2	55	-
S1	3	55	309	16	A4TB1	11	-	NOTE 1
S3	1	-	309	16	S1	3	55	-
S2	1	-	310	16	A4TB1	8	-	NOTE 1
S2	2	-	312	16	A4TB1	9	-	NOTE 1
M1	S	35	313	16	A4TB1	2	-	NOTE 1
M4	S	35	314	16	A4TB1	3	-	NOTE 1
M3	S	35	315	16	A4TB1	1	-	NOTE 1
S15	2	55	316	16	(316)	TAP	34	NOTE 5,6
M1	R1/+	35	316	16	(316)	TAP	34	NOTE 5,6
M3	R2/+	35	316	16	(316)	TAP	34	NOTE 5,6
M4	R3/+	35	316	16	(316)	TAP	34	NOTE 5,6
M5	R4/+	35	316	16	S15	2	-	NOTE 1,5,6
S15	2	55	316	16	A4TB1	5	55	NOTE 1
M5	S	35	317	16	A4TB1	4	-	NOTE 1
S6	2	-	320	16	A4TB3	10	-	NOTE 1
S13	1	55	320	16	S6	2	55	-
S7	1	-	321	16	A4TB3	9	-	NOTE 1
S13	2	55	324	16	(324)	TAP	34	NOTE 6
M10	R8/+	35	324	16	(324)	TAP	34	NOTE 5,6
M6	R5/+	35	324	16	(324)	TAP	34	NOTE 5,6
M7	R6/+	35	324	16	(324)	TAP	34	NOTE 5,6
M9	R7/+	35	324	16	(324)	TAP	34	NOTE 5,6
S13	2	55	324	16	A4TB3	5	55	NOTE 1

Table 11: Middle Control Panel, Wiring Diagram and Lists. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
M7	S	35	325	16	A4TB3	2	-	NOTE 1
M10	S	35	326	16	A4TB3	3	-	NOTE 1
M9	S	35	327	16	A4TB3	4	-	NOTE 1
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
S5	6	55	365A	16	S5	3	55	-
S5	3	55	365A	16	A4TB3	12		NOTE 1
S14	3	-	365	16	S14	6	34	NOTE 6
S14	6	-	365	16	A4TB1	12	-	NOTE 1
S9	2	-	366	16	A4TB1	7	-	NOTE 1
S6	3	-	367	16	A4TB3	11	-	NOTE 1
S9	1	-	367	16	S6	3	55	-
-	-	-	-	-	-	-	-	-
S5	5	-	368	16	A4TB10	10	-	NOTE 1
S14	5	-	368A	16	A4TB10	9	-	NOTE 1
DS1	1	55	369	16	S5	2	55	NOTE 4
DS2	1	-	369A	16	S14	2	34	NOTE 6
TAP	375	-	375	16	A4TB5	19	-	NOTE 1
M1	1	35	375	16	(375)	TAP	34	NOTE 6
M10	1	35	375	16	(375)	TAP	34	NOTE 6
M2	1	35	375	16	(375)	TAP	34	NOTE 6
M3	1	35	375	16	(375)	TAP	34	NOTE 6
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
M4	1	35	375	16	(375)	TAP	34	NOTE 6
M5	1	35	375	16	(375)	TAP	34	NOTE 6
M6	1	35	375	16	(375)	TAP	34	NOTE 6
M7	1	35	375	16	(375)	TAP	34	NOTE 6

Table 11: Middle Control Panel, Wiring Diagram and Lists. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
M8	1	35	375	16	(375)	TAP	34	NOTE 6
M9	1	35	375	16	(375)	TAP	34	NOTE 6
S11	2	-	382	14	A3CB2	2	-	NOTE 1
S11	3	-	383	14	A4TB5	5	-	NOTE 1
S10	1	-	384	16	A4TB5	2	-	NOTE 1
S10	2	-	385	16	A4TB5	4	-	NOTE 1
S12	2	55	387	16	A3CB4	2	-	NOTE 1
S12	3	55	388	16	A4TB5	6	-	NOTE 1
-	-	-	-	-	-	-	-	-
P12	TB-3	42	409	16	A4TB6	1	-	-
P12	TB-5	42	410	16	A4TB6	2	-	-
P12	TB-1	42	411	16	A4TB6	4	-	-
P12	TB-2	2	412	16	A4TB6	5		-
-	-	-	SHLD	-	A4TB6	3	-	-
P12	(+)	42	407	16	A4TB7	3	-	-
P12	(-)	42	408	16	A45B7	6	-	-
-	-	-	SHLD	-	A4TB7	5	-	-
P12	LT-1	42	375	16	(375)	TAP	34	NOTE 6
P12	LT-2	42	0	16	(0)	TAP	34	NOTE 6
-	-	-	-	-	-	-	-	-
P11	TB-3	42	423	16	A4TB8	1	-	-
P11	TB-5	42	424	16	A4TB8	2	-	-
P11	TB-1	42	427	16	A4TB8	4	-	-
P11	TB-2	42	428	16	A4TB8	5	-	-
-	-	-	SHLD	-	A4TB10	3	-	
P11	(+)	42	422	16	A4TB9	3	-	-
P11	(-)	42	434	16	A4TB9	6	-	-
-	-	-	SHLD	-	A4TB9	5	-	-
P11	LT-1	42	375	16	(375)	TAP	34	NOTE 6
P11	LT-2	42	0	16	(0)	TAP	34	NOTE 6

Table 11: Middle Control Panel, Wiring Diagram and Lists. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
DS1	2	36	461	16	A4TB10	6		NOTE 1
DS2	2	-	461A	16	A4TB10	7		NOTE 1

Table 12: Lower Control Panel, Wiring Diagram and List.

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
S2	1	47	0	16	S2	11	47	-
S2	11	47	-	16	DS9	2	47	-
R1	BLACK	52	0	16	(0)	TAP	50	NOTE 6
D17	2	SOLDER	0	14	A4TB10	3	47	-
DS8	2	47	0	16	D17	2	47	-
DS8	2	47	0	16	DS9	2	47	-
S2	3	47	138	16	S2	6	47	-
S2	6	47	138	16	A4TB5	10	47	-
S13	1	44	303	16	(303)	TAP	50	NOTE 6
S18	1	44	303	16	(303)	TAP	50	NOTE 6
S1	1	44	303	16	(303)	TAP	50	NOTE 6
S20	1	44	303	16	(303)	TAP	50	NOTE 6
S1	11	47	303	16	A4TB5	13	47	NOTE 6
S17	1	44	303	16	(303)	TAP	50	NOTE 6
S12	1	44	303	16	(303)	TAP	50	NOTE 6
S15	1	44	303	16	(303)	TAP	50	NOTE 6
S16	1	44	303	16	(303)	TAP	50	NOTE 6
S19	1	44	303	16	(303)	TAP	50	NOTE 6
S3	1	44	303	16	(303)	TAP	50	NOTE 6
S14	1	44	303	16	(303)	TAP	50	NOTE 6

Table 12: Lower Control Panel, Wiring Diagram and List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
S11	1	44	303	16	(303)	TAP	50	NOTE 6
S10	1	44	303	16	(303)	TAP	50	NOTE 6
S9	1	44	303	16	(303)	TAP	50	NOTE 6
DS10	1	89	303	16	S1	1	47	-
DS10	1	89	303	16	DS11	1	89	-
DS11	1	89	303	20	DS20	(+)	SOLDER	-
DS20	(+)	SOLDER	303	20	DS19	(+)	SOLDER	-
DS19	(+)	SOLDER	303	20	DS17	(+)	SOLDER	-
DS17	(+)	SOLDER	303	20	DS15	(+)	SOLDER	-
DS15	(+)	SOLDER	303	20	DS16	(+)	SOLDER	-
DS16	(+)	SOLDER	303	20	DS18	(+)	SOLDER	-
DS18	(+)	SOLDER	303	20	DS26	(+)	SOLDER	-
DS26	(+)	SOLDER	303	20	DS25	(+)	SOLDER	-
DS25	(+)	SOLDER	303	20	DS23	(+)	SOLDER	-
DS23	(+)	SOLDER	303	20	DS21	(+)	SOLDER	-
DS21	(+)	SOLDER	303	20	DS22	(+)	SOLDER	-
DS22	(+)	SOLDER	303	20	DS24	(+)	SOLDER	-
S1	11	44	303	16	S1	1	47	-
S3	11	44	303	16	S3	1	47	-
S3	10	44	303A	16	S3	4	47	-
S1	10	44	303B	16	S1	4	47	-
S2	10	44	303C	16	S2	4	47	-
DS4	1	47	311	16	A4TB2	16	47	NOTE 1
DS5	1	47	323	16	ARTB4	16	47	NOTE 1
R1	WHITE	52	329	16	D16	2	SOLDER	-
D16	2	52	329	16	D15	2	SOLDER	JUMPER
D15	2	52	329	16	D14	2	SOLDER	JUMPER
D14	2	52	329	16	D13	2	SOLDER	JUMPER
D13	2	52	329	16	D12	2	SOLDER	JUMPER
D12	2	52	329	16	D11	2	SOLDER	JUMPER
D11	2	52	329	16	D10	2	SOLDER	JUMPER

Table 12: Lower Control Panel, Wiring Diagram and List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
D10	2	52	329	16	D9	2	SOLDER	JUMPER
D9	2	52	329	16	D8	2	SOLDER	JUMPER
D8	2	52	329	16	D7	2	SOLDER	JUMPER
D7	2	52	329	16	D6	2	SOLDER	JUMPER
D6	2	52	329	16	D5	2	SOLDER	JUMPER
D5	2	52	329	16	D4	2	SOLDER	JUMPER
D4	2	52	329	16	D3	2	SOLDER	JUMPER
D3	2	52	329	16	D2	2	SOLDER	JUMPER
D2	2	52	329	16	D1	2	SOLDER	JUMPER
S9	2	44	330	16	A4TB2	1	47	NOTE 1
S9	A	44	331	16	A4TB2	2	47	NOTE 1
S10	2	44	332	16	A4TB2	3	47	NOTE 1
S10	A	44	333	16	A4TB2	4	47	NOTE 1
S11	2	44	334	16	A4TB2	5	47	NOTE 1
S11	A	44	335	16	A4TB2	6	47	NOTE 1
S12	2	44	336	16	A4TB2	7	47	NOTE 1
S12	A	44	337	16	A4TB2	8	47	NOTE 1
S13	2	44	338	16	A4TB2	9	47	NOTE 1
S13	A	44	339	16	A4TB2	10	47	NOTE 1
S14	2	44	340	16	A4TB2	11	47	NOTE 1
S14	A	44	341	16	A4TB2	12	47	NOTE 1
S15	2	44	342	16	A4TB2	1	47	NOTE 1
S15	A	44	343	16	A4TB2	2	47	NOTE 1
S16	2	44	344	16	A4TB2	3	47	NOTE 1
S16	A	44	345	16	A4TB2	4	47	NOTE 1
S17	2	44	346	16	A4TB2	5	47	NOTE 1
S17	A	44	347	16	A4TB2	6	47	NOTE 1
S18	2	44	348	16	A4TB2	7	47	NOTE 1
S18	A	44	349	16	A4TB2	8	47	NOTE 1
S19	2	44	350	16	A4TB2	9	47	NOTE 1
S19	A	44	351	16	A4TB2	10	47	NOTE 1

Table 12: Lower Control Panel, Wiring Diagram and List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
S20	2	44	352	16	A4TB2	11	47	NOTE 1
S20	A	44	353	16	A4TB2	12	47	NOTE 1
DS2	2	47	354	16	LS1	(+)	47	-
LS1	(+)	476	354	16	A4TB4	18	47	-
-	-	-	-	-	-	-	-	-
S2	5	47	355	16	LS1	(-)	47	-
DS2	1	47	356	16	S2	2	47	NOTE 4
S3	3	47	357	16	A4TB4	17	47	NOTE 1
S3	6	47	357	16	S3	3	47	-
S3	5	47	358	16	A4TB5	9	47	NOTE 1
DS3	1	47	360	16	S3	2	47	NOTE 4
DS3	2	52	360A	16	A4TB10	1	47	NOTE 1
S1	6	47	361	16	S1	3	47	-
S1	3	47	361	16	A4TB2	17	47	NOTE 1
S1	5	47	3621	16	A4TB5	11	47	NOTE 1
DS1	1	37	363	16	S1	2	47	NOTE 4
S21	2	47	370	16	A4TB1	13	47	NOTE 1
S21	3	47	371	16	A4TB1	14	47	NOTE 1
S21	3	47	371	16	DS6	1	47	NOTE 4
S22	2	47	372	16	A4TB3	13	47	NOTE 1
S22	3	47	373	16	A4TB3	14	47	NOTE 1
S22	3	47	272	16	DS7	1	47	NOTE 4
R1	RED	52	374	16	A3CB9	2	45	NOTE 1
R1	BLUE	52	375	16	A4TB5	19	47	NOTE 1
S4	5	47	389	16	S4	2	47	-
S4	2	47	389	16	A3CB5	2	45	NOTE 1
S25	2	47	389	16	S4	5	47	-
S4	1	47	390	16	S4	3	47	-
S4	3	47	390	16	A4TB5	7	47	NOTE 1
S4	6	47	391	A6	A4TB5	8	47	NOTE 1
R2	L	47	395	A6	A4TB1	15	47	NOTE 1

Table 12: Lower Control Panel, Wiring Diagram and List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
R2	R	47	396	A6	A4TB1	A6	47	NOTE 1
R2	C	47	397	16	A4TB1	17	47	NOTE 1, WIPER
R3	L	47	398	16	A4TB3	A5	47	NOTE 1
R3	R	47	399	16	A4TB3	A6	47	NOTE 1
R3	C	47	400	16	A4TB3	17	47	NOTE 1, WIPER
S5	2	47	401	16	S5	5	47	-
S5	2	47	401	16	A4TB2	14	47	NOTE 1
S5	3	47	402	16	A4TB2	15	47	NOTE 1
S6	1	47	403	16	A4TB2	14	47	NOTE 1
S6	2	47	404	16	S6	5	47	-
S6	2	47	404	16	A4TB4	14	47	NOTE 1
S6	3	47	405	16	A4TB4	15	47	NOTE 1
S6	1	47	406	16	A4TB4	13	47	NOTE 1
DS10	2	89	416	16	A4TB7	8	47	-
S23	23	47	417	16	A4TB7	8	47	-
DS8	1	47	418	16	4TB7	1	47	NOTE 1,10
S23	14	47	419	16	A4TB7	2	47	NOTE 1,10
S23	3	47	420	16	A4TB6	7	47	NOTE 1,10
S23	3	47	420	16	S23	24	47	-
S5	6	47	425	16	A4TB2	19	47	NOTE 1
S5	4	47	425	16	S5	6	47	JUMPER
S6	6	47	426	16	A4TB2	20	47	NOTE 1
S6	4	47	426	16	S6	6	47	JUMPER
DS11	2	89	433	16	A4TB9	8	47	-
S24	23	47	435	16	A4TB9	1	47	NOTE 1,10
DS9	1	47	436	16	A4TB9	4	47	-
S24	14	47	437	16	A4TB9	2	47	NOTE 1,10
S24	13	47	438	16	A4TB8	8	47	NOTE 1,10
S24	13	47	438	16	S24	24	47	-
S25	3	47	442	16	A4TB5	15	47	NOTE 1
DS1	2	51	460	16	D17	1	SOLDER	-

Table 12: Lower Control Panel, Wiring Diagram and List. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
DS7	2	51	462	16	D16	1	SOLDER	-
DS6	2	51	463	16	D15	1	SOLDER	-
S20	B	52	464	16	D14	1	SOLDER	-
S19	B	52	465	16	D13	1	SOLDER	-
S18	B	52	466	16	D12	1	SOLDER	-
S17	B	52	467	16	D11	1	SOLDER	-
S16	B	52	468	16	D10	1	SOLDER	-
S15	B	52	469	16	D9	1	SOLDER	-
S14	B	52	470	16	D8	1	SOLDER	-
S13	B	52	471	16	D7	1	SOLDER	-
S12	B	52	472	16	D6	1	SOLDER	-
S11	B	52	473	16	D5	1	SOLDER	-
S10	B	52	474	16	D4	1	SOLDER	-
S9	B	52	475	16	D3	1	SOLDER	-
DS5	2	52	476	16	D2	1	SOLDER	-
DS4	2	52	477	16	D1	1	SOLDER	-
DS15	(-)	SOLDER	500	20	A4TB1	19	97	-
DS16	(-)	SOLDER	501	20	A4TB1	20	97	-
DS17	(-)	SOLDER	502	20	A4TB3	19	97	-
DS18	(-)	SOLDER	503	20	A4TB3	20	97	-
DS19	(-)	SOLDER	504	20	A4TB4	19	97	-
DS20	(-)	SOLDER	505	20	A4TB4	20	97	-
DS21	(-)	SOLDER	506	20	A4TB6	6	97	-
DS22	(-)	SOLDER	507	20	A4TB7	7	97	-
DS23	(-)	SOLDER	508	20	A4TB7	9	97	-
DS24	(-)	SOLDER	509	20	A4TB7	10	97	-
DS25	(-)	SOLDER	510	20	A4TB8	6	97	-
DS26	(-)	SOLDER	511	20	A4TB8	7	97	-

Table 13: Terminal Strip A4 Assembly, Wiring List.

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB01	1	315	A1M3	S	-
TB01	1	315	A6J3	12	-
TB01	2	313	A1M3	S	-
TB01	2	313	A6J3	10	-
TB01	3	314	A1M4	S	-
TB01	3	314	A6J3	11	-
TB01	4	317	A1M5	S	-
TB01	4	317	AA6J3	S	-
TB01	5	316	A1S15	2	-
TB01	5	316	A6J2	7	-
TB01	6	304	A1S4	2	-
TB01	6	304	A6J2	8	-
TB01	7	306	A1S3	2	-
TB01	7	306	A6J2	6	-
TB01	8	310	A1S2	1	-
TB01	8	310	K2	87A	-
TB01	9	312	A1S2	2	-
TB01	9	312	A6J2	2	-
TB01	10	308	A1S1	2	-
TB01	10	308	A3J2	3	-
TB01	11	309	A1S1	3	-
TB01	11	309	A6H2	4	-
TB01	11	309	K2	30	-
TB01	12	365	A6J2	9	-
TB01	12	365	A1S14	6	-
TB01	13	370	A2S21	2	-
TB01	13	370	A6J2	14	-
TB01	14	371	A2S21	3	-
TB01	14	371	A6J2	15	-
TB01	15	395	A2R2	L	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB01	15	385	A6J3	2	-
TB01	16	396	A2R2	R	-
TB01	16	396	A6J3	3	-
TB01	17	397	A2R2	C	-
TB01	17	397	A3TB2	5	-
TB01	17	397	A6J3	4	-
TB01	18	0	A2R2		SHIELD
TB01	18	0	TB11	-	-
TB01	19	500	A2DS15	(-)	-
TB01	19	500	A6J4	1	-
TB01	20	501	A2DS16	(-)	-
TB01	20	501	A6J4	2	-
TB02	1	330	A2S9	2	-
TB02	1	330	A6J2	19	-
TB02	2	331	A2S9	A	-
TB02	2	331	A6J2	18	-
TB02	3	332	A2S10	2	-
TB02	3	332	A6J2	21	-
TB02	4	333	A2S10	A	-
TB02	4	333	A6J2	20	-
TB02	5	334	A2S11	2	-
TB02	5	334	A6J2	23	-
TB02	6	335	A2S11	A	-
TB02	6	335	A6J2	22	-
TB02	7	336	A2S12	2	-
TB02	7	336	A6J2	25	-
TB02	8	337	A2S12	A	-
TB02	8	337	A6J2	24	-
TB02	9	338	A2S13	2	-
TB02	9	338	A6J2	27	-
TB02	10	339	A2S13	A	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB02	10	339	A6J2	26	-
TB02	11	340	A2S14	2	-
TB02	11	340	A6J2	29	-
TB02	12	341	A2S14	A	-
TB02	12	341	A6J2	28	-
TB02	13	403	A2S5	1	-
TB02	13	403	A6J2	12	-
TB02	14	401	A2S5	2	-
TB02	14	401	A6J2	10	-
TB02	15	402	A2S5	3	-
TB02	15	402	A6J2	11	-
TB02	16	311	A2DS4	1	-
TB02	16	311	K2	87	-
TB02	17	361	A2S1	3	-
TB02	17	361	A6J2	17	-
TB02	18	354	A6J2	16	-
TB02	18	354	TB04	18	14 GA. WIRE
-	-		-	-	-
TB02	19	425	A2S5	6	-
TB02	19	425	K2	85	-
TB02	20	426	A2S6	85	-
TB02	1	426	A1M9	6	-
TB03	1	327	A5J3	12	-
TB03	2	325	A1M7	S	-
TB03	2	325	A5J3	10	-
TB03	3	326	A1M10	S	-
TB03	3	326	A5J3	11	-
TB03	4	328	A1M6	S	-
TB03	4	328	A5J3	17	-
TB03	5	324	A1S13	12	-
TB03	5	324	A5J2	7	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB03	6	305	A1S8	2	-
TB03	6	305	A5J2	8	-
TB03	7	366	A1S9	2	-
TB03	7	366	A5J2	6	-
TB03	8	321	A1S7	1	-
TB03	8	321	K3	87A	-
TB03	9	322	A1S7	2	-
TB03	9	322	A5J2	2	-
TB03	10	320	A1S6	2	-
TB03	10	320	A5J2	3	-
TB03	11	367	A1S6	3	-
TB03	11	367	A5J2	4	-
TB03	11	367	K3	30	-
TB03	12	365A	A1S5	3	-
TB03	12	365A	A5J2	9	-
TB03	13	372	A2S22	2	-
TB03	13	372	A5J2	14	-
TB03	14	373	A2S22	3	-
TB03	14	373	A5J2	15	-
TB03	15	398	A2R3	L	-
TB03	15	398	A5J3	2	-
TB03	16	399	A2R3	R	-
TB03	16	399	A5J3	3	-
TB03	17	400	A2R3	C	-
TB03	17	400	A3TB2	4	-
TB03	17	400	A5J3	4	-
TB03	18	0	A2R3	-	SHIELD
TB03	18	0	TB11	-	-
TB03	19	502	A2DS17	(-)	-
TB03	19	502	A6J4	3	-
TB03	20	503	A2DS18	(-)	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB03	20	503	A6J4	4	-
TB04	1	342	A2S15	2	-
TB04	1	342	A5J2	19	-
TB04	2	343	A2S15	A	-
TB04	2	343	A5J2	18	-
TB04	3	344	A2S16	2	-
TB04	3	344	A5J2	21	-
TB04	4	345	A2S16	A	-
TB04	4	345	A5J2	20	-
TB04	5	346	A2S17	2	-
TB04	5	346	A5J2	23	-
TB04	6	347	A2S17	A	-
TB04	6	347	A5J2	22	-
TB04	7	348	A2S18	2	-
TB04	7	348	A5J2	25	-
TB04	8	349	A2S18	A	-
TB04	8	349	A5J2	24	-
TB04	9	350	A2S19	2	-
TB04	9	350	A5J2	27	-
TB04	10	351	A2S19	A	-
TB04	10	351	A5J2	26	-
TB04	11	352	A2S20	2	-
TB04	11	352	A5J2	29	-
TB04	12	353	A2S20	A	-
TB04	12	353	A5J2	28	-
TB04	13	406	A2S6	1	-
TB04	13	406	A5J2	12	-
TB04	14	404	A2S6	2	-
TB04	14	404	A5J2	10	-
TB04	15	405	A2S6	3	-
TB04	15	405	A5J2	11	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB04	16	323	A2DS5	1	-
TB04	16	323	K3	87	-
TB04	17	357	A2S3	3	-
TB04	17	357	A5J2	17	-
TB04	18	354	A2LS1	(+)	-
TB04	18	354	A5J2	16	-
TB04	18	354	TB02	18	-
TB04	19	504	A2DS19	(-)	-
TB04	19	504	A6J4	5	-
TB04	20	505	A2DS20	(-)	-
TB04	20	505	A6J4	6	-
TB05	1	394	A3CB8	2	-
TB05	1	394	VR1	+IN	+24V J4 CHARGER
TB05	2	384	A3CB3	2	-
TB05	2	384	A1S10	1	-
TB05	2	384	K1	87	14 GA. WIRE
TB05	3	386	JB1TB1	2	NAV HORN
TB05	3	386	K1	30	14 GA. WIRE
TB05	4	385	A1S10	2	-
TB05	4	385	K1	86	-
TB05	5	383	A1S11	3	-
TB05	5	383	JB1TB1	6	SPOTLIGHT
TB05	6	388	A1S12	3	-
TB05	6	388	JB1TB1	4	WINDSHIELD WIPER
TB05	7	390	A2S4	3	-
TB05	7	390	B1A	1	HEATER
TB05	8	391	A2S4	6	-
TB05	8	391	B1B	1	HEATER
TB05	9	358	A2S3	5	-
TB05	9	358	D1	A	CONNECT DIODE LEAD TO TERM
TB05	10	138	A2S2	6	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB05	10	138	A5J4	7	-
TB05	10	138	A6J4	7	-
TB05	11	362	A2S1	5	-
TB05	11	362	D2	Q	CONNECT DIODE LEAD TO TERM
TB05	12	359	D1	K	CONNECT DIODE LEAD TO TERM
TB05	12	359	D2	K	CONNECT DIODE LEAD TO TERM
TB05	12	359	LS2	1	-
TB05	13	303	A2S1	11	-
TB05	13	303	A3CB10	2	-
TB05	13	303	TB05	14	JUMPER
TB05	14	303	A1S8	1	-
TB05	14	303	TB05	13	-
TB05	15	442	A2S25	3	-
TB05	15	442	JB1TB1	12	DEFROSTER
TB05	16	301	A1M2	/	-
TB05	16	301	A6J4	11	-
TB05	17	375A	COMPASS	1	-
TB05	17	375A	-	LEAD	COMPASS RESISTOR
TB05	18	301A	A6J4	10	-
TB05	18	301A	A1M2	+	-
TB05	19	375	A1M10	1	SEE RESISTOR
TB05	19	375	A2R1	BLUE	-
TB05	19	375	-	LEAD	COMPASS RESISTOR
TB05	20	0	JB1TB1	1	NAV HORN
TB05	20	0	A1M10	2	-
TB05	20	0	TB11	-	-
TB05	20	0	K1	85	-
TB06	1	409	A1-12	TB03	-
TB06	1	409	A6J3	5	-
TB06	2	410	A1-12	TB05	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB06	2	410	A6J3	6	-
TB06	3	0	A1P12	-	SHIELD
TB06	3	0	A6J3	7	-
TB06	3	0	A6J3	13	-
TB06	3	0	A6J3	1	-
TB06	3	0	TB11	-	-
TB06	4	411	A1-12	TB01	-
TB06	4	411	A6J3	9	-
TB06	5	412	A1P12	TB02	-
TB06	5	412	A6J3	14	-
TB06	6	506	A2DS21	(-)	-
TB06	6	506	A5J4	1	-
TB06	7	420	A2S23	13	-
TB06	7	420	A6J3	27	-
TB06	8	0	A6J3	20	SHIELD
TB06	8	0	TB07	5	-
TB06	8	0	TB06	9	JUMPER
TB06	9	0	TB06	10	JUMPER
TB06	9	0	A5J3	16	SHIELD
TB06	10	0	A5J3	20	SHIELD
TB06	10	0	TB11	-	-
TB07	1	417	A2S23	23	-
TB07	1	417	A6J3	18	-
TB07	2	419	A2S23	14	-
TB07	2	419	A6J3	19	-
TB07	3	407	A1P12	TB (+)	-
TB07	3	407	A3TB2	7	-
TB07	3	407	A6J3	21	-
TB07	4	418	A2DS8	1	-
TB07	4	418	A6J2	35	-
TB07	5	0	A1P12	SHLD	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB07	5	0	TB06	8	-
TB07	5	0	A6J3	28	SHIELD
TB07	6	408	A1P12	TB (-)	-
TB07	6	408	A6J3	22	-
TB07	6	408	A3TB2	11	-
TB07	7	507	A2DS22	(-)	-
TB07	7	507	A5J4	2	-
TB07	8	416	A2DS10	2	-
TB07	8	416	A6J2	31	-
TB07	9	508	A5J4	3	-
TB07	10	509	A2DS24	(-)	-
TB07	10	509	A5J4	4	-
TB08	1	423	A1P11	TB03	-
TB08	1	423	A5J3	5	-
TB08	2	424	A1P11	TB05	-
TB08	2	424	A5J3	6	-
TB08	3	0	A5J3	1	-
TB08	3	0	A5J3	7	-
TB08	3	0	A5J3	13	-
TB08	3	0	TB11	-	-
TB08	4	427	A1P11	TB-1	-
TB08	4	427	A5J3	13	-
TB08	5	428	A1P11	TB-2	-
TB08	5	428	A5J3	14	-
TB08	6	510	A2DS25	10	-
TB08	6	510	A5J4	5	-
TB08	7	511	A2DS26	(-)	-
TB08	7	511	A5J4	6	-
TB08	8	438	A2S24	13	-
TB08	8	438	A5J3	27	-
TB08	9	440	VR1	+12 OUT	VOLTAGE REGULATOR

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB08	9	440	J4	+12 OUT	CHARGER
TB08	10	0	A4K2	86	-
TB08	10	0	A4K3	86	-
TB08	10	0	TB11	-	-
TB09	1	435	A2S24	23	-
TB09	1	435	A5J3	18	-
TB09	2	437	A2S24	14	-
TB09	2	437	A5J3	19	-
TB09	3	422	A1P11	TB (+)	-
TB09	3	422	A3TB2	6	-
TB09	3	422	AA5J3	21	-
TB09	4	436	A2DS9	1	-
TB09	4	436	A5J2	35	-
TB09	5	0	A5J3	28	SHIELD
TB09	5	0	A1P11	SHLD	-
TB09	5	0	TB11	-	-
TB09	6	434	A1P11	TB (-)	-
TB09	6	4334	A5J3	22	-
TB09	6	434	A3TB2	12	-
TB09	7	302	A5J4	11	-
TB09	7	302	A1M8	/	-
TB09	8	433	A2DS11	2	-
TB09	8	433	A5J2	31	-
TB09	9	302A	A5J4	10	-
TB09	9	302A	A1M8	+	-
TB09	10	381	A7TB6	A12	NAV LIGHT SWITCH BOX
TB09	10	381	A3CB1	2	-
TB10	1	360A	A2DS3	2	-
TB10	1	360A	D4	A	-
TB10	2	0	TB10	3	JUMPER
TB10	2	0	D4	K	-

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

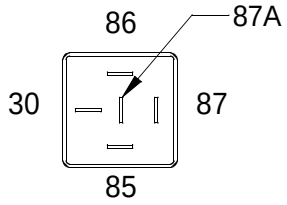
CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB10	3	0	A2D17	2	-
TB10	3	0	TB10	4	JUMPER
TB10	3	0	A1P12	-	SHIELD
TB10	3	0	LS2	2	-
TB10	4	0	A1MA0	(-)	-
TB10	4	0	TB10	5	JUMPER
TB10	4	0	LS1	2	-
TB10	5	0	TB11	-	-
TB10	5	0	D3	K	CONNECT DIODE LEAD TO TERM
TB10	5	0	D7	K	-
TB10	6	461	A1DS1	2	-
TB10	6	461	D3	2	CONNECT DIODE LEAD TO TERM
TB10	7	461A	A1DS2	2	-
TB10	7	461A	D7	A	-
TB10	8	368B	LS1	1	-
TB10	8	368B	D5	K	-
TB10	8	368B	D6	K	-
TB10	9	368A	A1S14	5	-
TB10	9	368A	D6	A	-
TB10	10	368	D5	A	-
TB10	10	368	A1S5	5	-
TB11	-	0	A5J1	B	-
TB11	-	0	A6J1	B	-
TB11	-	0	B1A/B	2	HEATER
TB11	-	0	B2	2	WINDSHIELD WIPER
TB11	-	0	B3	2	DEFROSTER
TB11	-	0	DS1	2	SPOTLIGHT
TB11	-	0	JB1TB1	3	-
TB11	-	0	JB1TB1	5	-
TB11	-	0	JB1TB1	11	SINCGARS
TB11	-	0	A7TB6	A11	NAV. LT. SW. BOX 14 GA. WIRE

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES
TB11	-	0	A3TB2	A	COMMON FOR TEST SW.
TB11	-	0	JB1TB1	9	-
TB11	-	0	JB1TB1	7	VHF-FM
TB11	-	0	A5J2	33	-
TB11	-	0	A5J3	16	-
TB11	-	0	A5J3	20	-
TB11	-	0	A6J3	16	-
TB11	-	0	A6J3	20	-
TB11	-	0	VR1	(-)	-
TB11	-	0	TB01	18	-
TB11	-	0	TB03	18	-
TB11	-	0	TB05	20	-
TB11	-	0	TB06	3	-
TB11	-	0	TB06	10	-
TB11	-	0	TB08	3	-
TB11	-	0	TB08	10	-
TB11	-	0	TB09	5	-
TB11	-	0	TB10	5	14 GA. WIRE

Table 13: Terminal Strip A4 Assembly, Wiring List. (Continued)

CONNECTION	TERM	WIRE #	FROM	TERM	NOTES



TERMINAL IDENTIFICATION
FOR K1, K2 AND K3 RELAYS

NOTES:

1. EXTERNAL WIRES PROVIDED AS PART OF OTHER ASSEMBLY HARNESSES, OR OPERATOR CAB WIRING. USE TERMINAL LUGS, ITEM 22, FOR CONNECTION TO TB01 THROUGH TB10, WIRES TO TB11 ONLY REQUIRE STRIPPING. LABEL ALL WIRE ENDS WITH WIRE NUMBER USING HEAT SHRINK TUBING, ITEM 27.
2. WIRING COMING FROM A5 AND A6 RECEPTACLE ASSEMBLIES TO TERMINATE ON RIGHT HAND SIDE OF TERMINAL STRIPS. WIRING FROM OTHER DEVICES TO TERMINATE ON LEFT HAND OF TERMINAL STRIPS.
3. ALL INTERNAL WIRES ARE 16 GA. EXCEPT AS NOTED.
4. TB11 IS MAIN NEGATIVE SIDE TIE POINT FOR 24 VOLT DISTRIBUTION IN THE OPERATOR'S CAB.
5. ALL POINT TO POINT WIRING ON THE "A4" ASSEMBLY, IS TO BE COMPLETED PRIOR TO TERMINATING WIRES FROM OFF PANEL, EXTERNAL, DEVICES.

Table 14: Operators Cab Circuit Breaker Panel A3, Internal Connections.

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
J1(-)	1	SOLDER	0	16	TB2	1	63	-
-	-	-	-	-	-	-	-	-
TB1	3	-	300A	-	D2	A	-	DIODE LEAD
-	-	-	-	-	-	-	-	-
TB1	2	-	300B	-	D1	A	-	DIODE LEAD
D1	K	50	300	10	D2	K	50	ISOLATE FROM HEAT SINK
D2	K	50	300	10	CB7	1	51	-
CB7	1	51	300	10	CB8	1	51	-
CB7	1	51	300	10	CB1	1	51	-
CB1	1	51	300	10	CB2	1	51	-
CB2	1	51	300	10	CB3	1	51	-

Table 14: Operators Cab Circuit Breaker Panel A3, Internal Connections. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
CB3	1	51	300	10	CB4	1	51	-
CB4	1	51	300	10	CB5	1	51	-
CB5	1	51	300	10	CB6	1	51	-
CB8	1	51	300	10	CB9	1	51	-
CB9	1	51	300	10	CB10	1	51	-
-	-	-	-	-	-	-	-	-
-	-	SOLDER	-	-	-	63		-
S1	COMMON	SOLDER	+	LEAD	R1 [12]	1	SOLDER	SWITCH TO R1
R1	2	SOLDER	+	LEAD	J2(+)	1	SOLDER	R1 TO JACK (+)
S1	POS 1	SOLDER	300B	16	TB1	2	56	-
S1	POS 2	SOLDER	300A	16	TB1	3	56	-
S1	POS 3	SOLDER	400	16	TB2	4	17	-
S1	POS 4	SOLDER	397	16	TB2	5	17	-
S1	POS 5	SOLDER	422	16	TB2	6	17	-
S1	POS 6	SOLDER	407	16	TB2	7	17	-
S1	POS 7	SOLDER	N/A [13]	16	TB2	8	17	-
S1	POS 8	SOLDER	N/A	16	TB2	9	17	-
S1	POS 9	SOLDER	N/A	16	TB2	10	17	-
J3	1	SOLDER	408	16	TB2	11	17	-
J4	1	SOLDER	434	16	TB2	12	17	-

Table 15: Operators Cab Circuit Breaker Panel A3, External Connections.

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
TB2	1	17	0	16	MTB11	-	NOT REQ'D	COMMON FOR TEST SW
TB1	2	80	300A	8	A6J1	A	CRIMP PINS	PORT+24VDC POWER
TB1	2	80	300B	8	A5J1	A	CRIMP PINS	STBD +24VDC POWER
CB10	2	81	303	14	A4TB5	13	17	CONTROL PANEL ALARMS

Table 15: Operators Cab Circuit Breaker Panel A3, External Connections. (Continued)

FROM	TERM	ITEM #	WIRE #	SIZE	TO	TERM	ITEM #	NOTES
CB9	2	REF	374	14	A2R1	RED	REF	PANEL LIGHTS-NOTE [14]
CB1	2	81	381	14	A4TB9	10	17	NAVIGATION LIGHTS
CB2	2	REF	382	14	A1S11	2	REF	SPOTLIGHT-NOTE [15]
CB3	2	81	384	14	A4TB5	2	17	NAVIGATION HORN
CB4	2	REF	387	16	A1S12	2	REF	WSHLD WIPER-NOTE [15]
CB5	2	REF	389	16	A2S4	2	REF	HTR/DEFROSTER-NOTE [14]
CB6	2	81	392	16	3JB1TB1	8	17	VHF-FM RADIO
CB7	2	81	393	16	3JB1TB1	10	17	SINCGARS
CB8	2	81	394	16	A4TB5	1	17	VOLTAGE CONVERTER
TB2	5	17	397	16	A4TB1	17	17	THROTTLE CONTROL (P)
TB2	4	17	400	16	A4TB3	17	17	THROTTLE CONTROL (S)
TB2	7	17	407	16	A4TB7	3	17	THRUST INDICATOR (P)
TB2	11	17	408	16	A4TB7	6	17	THRUST INDICATOR (P)
TB2	6	17	422	16	A4TB9	3	17	THRUST INDICATOR (S)

Table 16: Thruster Direction/Auxiliary Battery Junction Box A9, Pass Through Terminations.

WIRE SIZE	FROM	WIRE #	TERM	TO	WIRE #	TERM
14	A4TB2-10	132	14 GA TER LUG	TB1-6	132	COMPRESSION
14	TB1-6	132	COMPRESSION	G1-AC	132	E11028-24
10	B3-1	0	10 GA TER LUG	TB2-18	0	E23808-2
10	S11-2	0	10 GA TER LUG	TB2-18	0	E23808-2
10	B3-2	148	10 GA TER LUG	TB2-19	148	E23808-2
10	S11-1	151	10 GA TER LUG	TB2-20	151	E23808-2

Table 17: Thruster Direction/Auxiliary Battery Junction Box A9, Electrical Internal Wire Connections.

WIRE SIZE	FROM	WIRE #	TERM	TO	WIRE #	TERM
FURNISHED	VR1 BLUE	131	PLUG	TB1-1	131	COMPRESSION
FURNISHED	VR1 ORANGE	130	PLUG	TB1-2	130	COMPRESSION
FURNISHED	VR1 BLACK	0	PLUG	TB1-3	0	COMPRESSION
FURNISHED	VR1 BROWN	124	PLUG	TB1-4	124	COMPRESSION
FURNISHED	VR1 RED	221	PLUG	TB1-5	221	COMPRESSION
FURNISHED	TB1-5	221	COMPRESSION	1S1-1	221	14 GA TER LUG
16	TB1-4	124	COMPRESSION K1-85	124	RELAY TER LUG	
14	TB2-1	0	14 GA TER LUG	K1-86	0	TERM LUG
14	TB2-1	0	14 GA TER LUG	TB2-2	0	14 GA TER LUG
14	TB2-2	0	14 GA TER LUG	TB1-3	0	COMPRESSION
1/0	1S1-1	221	1/0 TER LUG	SH1-L+	221	1/0 TER LUG
1/0	SH1-B+	+24V	1/0 TER LUG	FIELD CONNEC -TIONS		-
1/0	1S1-A	200	1/0 TER LUG	FIELD CONNEC -TION		-
14	1S1-2	202	14 GA TER LUG	TB2-3	202	14 GA TER LUG
14	TB2-3	202	.250 WIRE CLIP	BT5 +	202	14 GA TER LUG
14	BT5-	201	.187 WIRE CLIP	BT6 +	201	.250 WIRE CLIP
14	K1-30	203	TER LUG	TB2-4	203	14 GA TER LUG
16	K1-K7	204	TER LUG	VR2-5	204	COMPRESSION
14	V42-1	0	COMPRESSION	TB2-1	0	14 GA TER LUG
16	VR2-6	205	COMPRESSION	TB2-6	205	14 GA TER LUG
16	VR2-2	206	COMPRESSION	TB207	206	14 GA TER LUG
14	BT6-	0	.187 WIRE CLIP	TB2-2	0	14 GA TER LUG
10	SH1-B+	220	10 GA TER LUG	TB2-16	220	10 GA TER LUG
10	SH1-L+	221	10 GA TER LUG	TB2-17	221	10 GA TER LUG

Table 18: Starboard Receptacle A5 Assembly.

CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J1	A	S	-	8	300B	A3TB1	2	-	+24VDC
J1	B	S	-	8	0	A4TB11	1	-	24 VDC RET
J2	01	C	-	16	-	-	-	-	SPARE
J2	02	C	-	16	322	A4TB3	9	B19	NOTE 2
J2	03	C	-	16	320	A4TB3	10	B19	-
J2	04	C	-	16	367	A4TB3	11	B19	-
J2	05	C	-	16	-	-	-	-	SPARE
J2	06	C	-	16	366	A4TB3	7	B19	-
J2	07	C	-	16	324	A4TB3	5	B19	-
J2	08	C	-	16	305	A4TB3	6	B19	-
J2	09	C	-	16	365A	A4TB3	12	B19	-
J2	10	C	-	16	404	A4TB4	14	B19	-
J2	11	C	-	16	405	A4TB4	15	B19	-
J2	12	C	-	16	406	A4TB4	13	B19	-
J2	13	C	N/C	16	-	-	-	-	SPARE
J2	14	C	-	16	372	A4TB3	13	B19	-
J2	15	C	-	16	373	A4TB3	14	B19	-
J2	16	C	-	16	354	A4TB4	18	B19	-
J2	17	C	-	16	357	A4TB4	17	B19	-
J2	18	C	-	16	343	A4TB4	2	B19	-
J2	19	C	-	16	342	A4TB4	4	1	B19
J2	20	C	-	16	345	A4TB4	4	B19	-
J2	21	C	-	16	344	A4TB4	3	B19	-
J2	22	C	-	16	347	A4TB4	6	B19	-
J2	23	C	-	16	346	A4TB4	5	B19	-
J2	24	C	-	16	349	A4TB4	8	B19	-
J2	25	C	-	16	348	A4TB4	7	B19	-
J2	26	C	-	16	351	A4TB4	10	B19	-
J2	27	C	-	16	350	A4TB4	9	B19	-
J2	28	C	-	16	353	A4TB4	12	B19	-

Table 18: Starboard Receptacle A5 Assembly. (Continued)

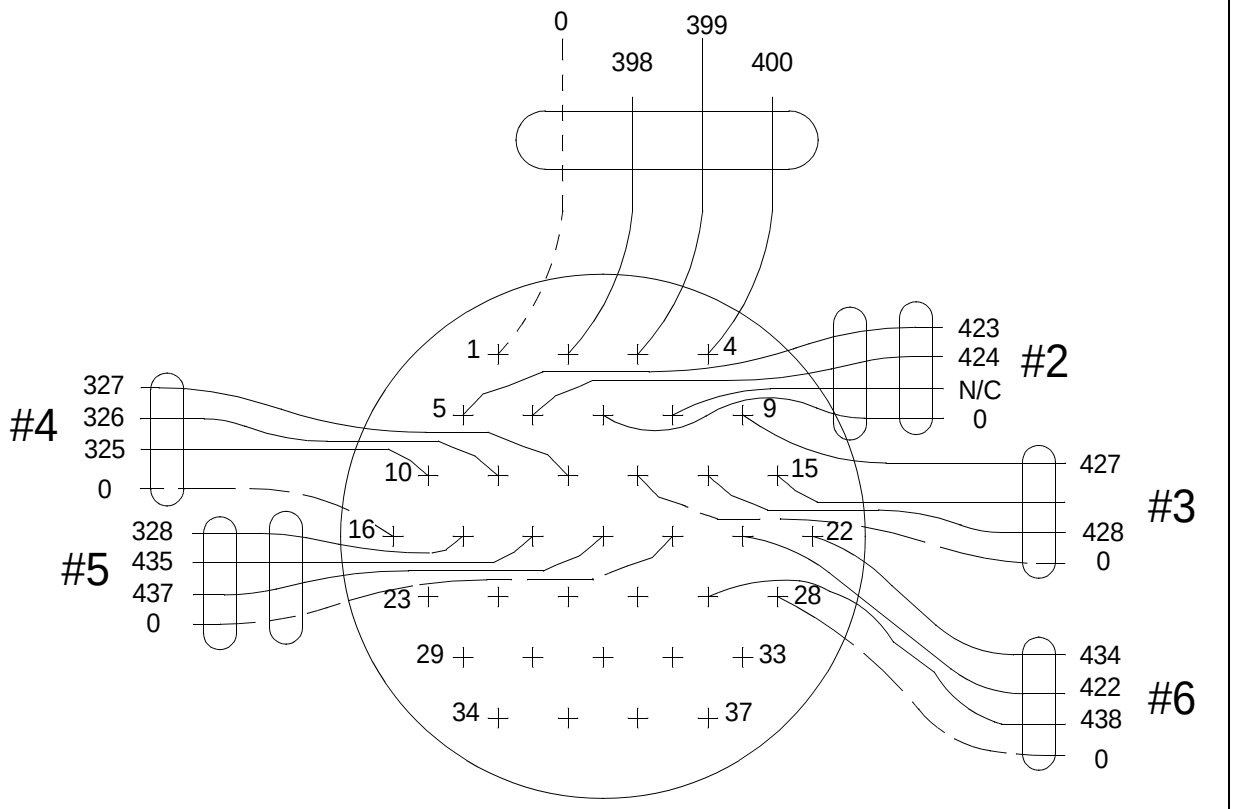
CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J2	29	C	-	16	352	A4TB4	11	B19	-
J2	30	C	N/C	-	-	-	-	-	-
J2	31	C	-	16	433	A4TB9	8	B19	-
J2	32	-	N/C	-	-	-	-	-	SPARE
J2	33	C	-	16	0	A4TB11	2	B19	-
J2	34	C	N/C	-	-	-	-	-	-
J2	35	C	-	16	436	A4TB9	4	B19	-
J2	36	C	N/C	-	-	-	-	-	-
J2	37	C	N/C	-	-	-	-	-	-
J3	1	C	1-SHD	16	0	A4TB8	3	B19	SHIELD
J3	2	C	1-BK	16	398	A4TB3	15	B19	-
J3	3	C	1-WH	16	399	A4TB3	16	B19	-
J3	4	C	1-RD	16	400	A4TB3	17	B19	-
J3	5	C	2-BK	16	423	A4TB8	1	B19	-
J3	6	C	2-WH	16	424	A4TB8	2	B19	-
J3	7	C	2-SHD	16	0	A4TB8	3	B19	SHIELD
J3	8	C	2-RD	16	-	N/C			SPARE
J3	9	C	3-BK	16	427	A4TB8	4	B19	-
J3	10	C	4-BK	16	325	A4TB3	2	B19	-
J3	11	C	4-WH	16	326	A4TB3	3	B19	-
J3	12	C	4-RD	16	327	A4TB3	1	B19	-
J3	13	C	3-SHD	16	0	A4TB8	3	B19	SHIELD
J3	14	C	3-WH	16	428	A4TB8	5	B19	-
J3	15	C	3-RD	-	-	N/C	-	-	SPARE
-	-	-	-	-	-	-	-	-	-
J3	16	C	4-SHD	16	0	A4TB11	-	B19	SHIELD
J3	17	C	5-BK	16	328	A4TB3	4	B19	
J3	18	C	5-WH	16	435	A4TB9	1	B19	
J3	19	C	5-RD	16	437	A4TB9	2	B19	
J3	20	C	5-SHD	16	0	A4TB11	-		SHIELD

Table 18: Starboard Receptacle A5 Assembly. (Continued)

CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J3	21	C	6-BK	16	422	A4TB9	3	B19	SPARE
J3	22	C	6-WH	16	434	A4TB9	6	B19	SPARE
J3	23	C	7-BK	16	-	N/C	-	-	SPARE
J3	24	C	7-WH	16	-	N/C	-	-	SPARE
J3	25	C	7-RD	16	-	N/C	-	-	SPARE
J3	26	C	7-SHD	16	0	-	-	-	SPARE
J3	27	C	6-RD	16	438	A4TB8	8	B19	-
J3	28	C	6-SHD	16	0	A4TB9	5	-	SHIELD
J3	29	C	N/C	-	-	-	-	-	-
J3	30	C	N/C	-	-	-	-	-	-
J3	31	C	N/C	-	-	-	-	-	-
J3	32	C	N/C	-	-	-	-	-	-
J3	33	C	N/C	-	-	-	-	-	-
J3	34	C	N/C	-	-	-	-	-	-
J3	35	C	N/C	-	-	-	-	-	-
J3	36	C	N/C	-	-	-	-	-	-
J3	37	C	N/C	-	-	-	-	-	-
J4	1	C	-	16	506	A4TB6	6	B19	-
J4	2	C	-	16	507	A4TB7	7	B19	-
J4	3	C	-	16	508	A4TB7	9	B19	-
J4	4	C	-	16	509	A4TB7	10	B19	-
J4	5	C	-	16	510	A4TB8	6	B19	-
J4	6	C	-	16	511	A4TB8	7	B19	-
J4	7	C	-	16	138	A4TB5	10	B19	-
J4	8	C	-	-	-	-	-	-	SPARE
J4	9	C	-	-	-	-	-	-	SPARE
J4	10	C	-	16	302A	A4TB9	9	B19	-
J4	11	C	-	16	302	A4TB9	7	B19	-
J4	12	C	-	-	-	-	-	-	SPARE
J4	13	C	-	-	-	-	-	-	SPARE

Table 18: Starboard Receptacle A5 Assembly. (Continued)

CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J4	14	C	-	-	-	-	-	-	SPARE
J4	15	C	-	-	-	-	-	-	SPARE
J4	16	C	-	-	-	-	-	-	SPARE



J-3 CONNECTION DETAILS
PIN-MATING FACE OF CONNECTOR
SOCKET-WIRING SIDE OF CONNECTOR

Table 19: Port Receptacle A6 Assembly.

CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J1	A	S		8	300A	A3TB1	3	-	+24VDC
J1	B	S		8	0	A4TB11	1	-	24 VDC RET
J2	01	C		16	-	-	-		SPARE
J2	02	C		16	312	A4TB1	9	B19	NOTE 2
J2	03	C		16	308	A4TB1	10	B19	-

Table 19: Port Receptacle A6 Assembly. (Continued)

CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J2	04	C		16	309	A4TB1	11	B19	-
J2	05	C		16	-	-	-	-	SPARE
J2	06	C		16	306	A4TB1	7	B19	-
J2	07	C	-	16	316	A4TB1	5	B19	-
J2	08	C	-	16	304	A4TB1	6	B19	-
J2	09	C	-	16	365	A4TB1	12	B19	-
J2	10	C	-	16	401	A4TB2	14	B19	-
J2	11	C	-	16	402	A4TB2	15	B19	-
J2	12	C	-	16	403	A4TB2	13	B19	-
J2	13	C	N/C	16	-	-	-	-	-
J2	14	C	-	16	370	A4TB2	13	B19	-
J2	15	C	-	16	371	A4TB2	14	B19	-
J2	16	C	-	16	354	A4TB4	18	B19	-
J2	17	C	-	16	361	A4TB2	17	B19	-
J2	18	C	-	16	331	A4TB2	2	B19	-
J2	19	C	-	16	330	A4TB2	1	B19	-
J2	20	C	-	16	333	A4TB2	4	B19	-
J2	21	C	-	16	332	A4TB2	3	B19	-
J2	22	C	-	16	335	A4TB2	6	B19	-
J2	23	C	-	16	334	A4TB2	5	B19	-
J2	24	C	-	16	337	A4TB2	8	B19	-
J2	25	C	-	16	336	A4TB2	7	B19	-
J2	26	C	-	16	339	A4TB2	10	B19	-
J2	27	C	-	16	338	A4TB2	9	B19	-
J2	28	C	-	16	341	A4TB2	12	B19	-
J2	29	C	-	16	340	A4TB2	11	B19	-
J2	30	C	N/C	-	-	-	-	-	-

Table 19: Port Receptacle A6 Assembly. (Continued)

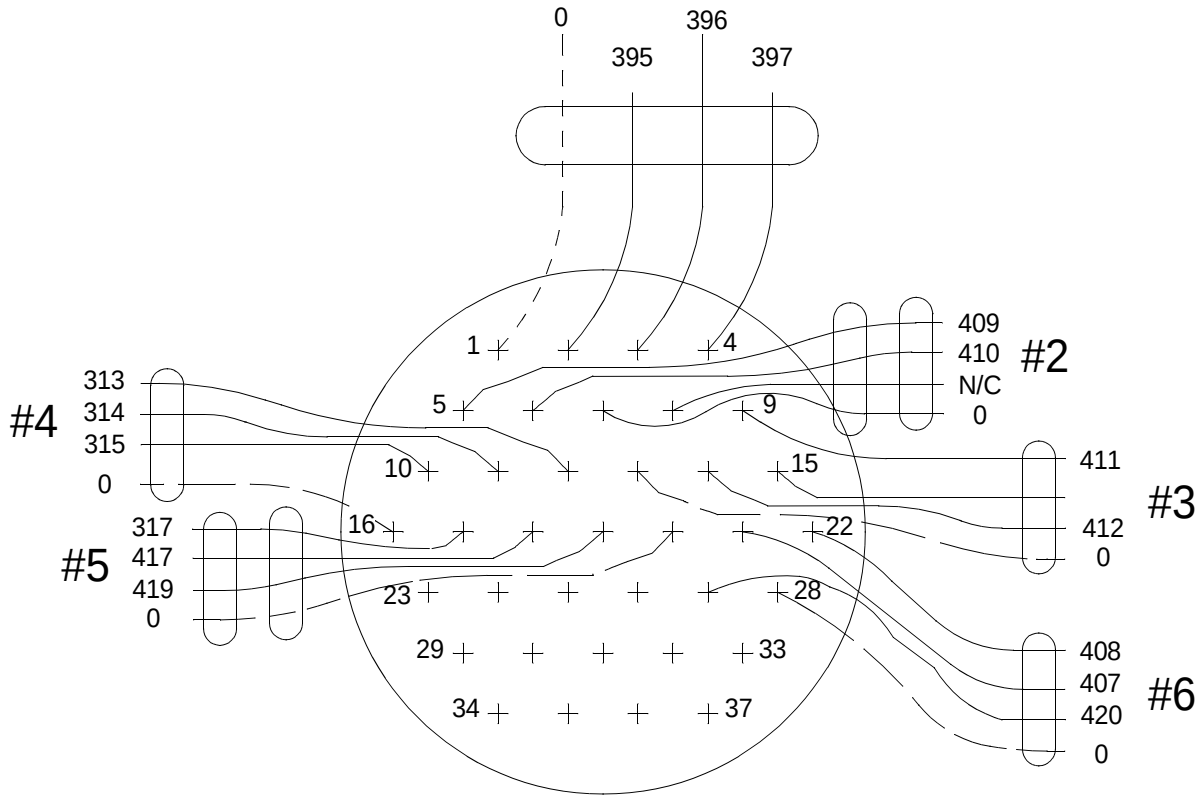
CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J2	31	C	-	16	416	A4TB7	8	B19	-
J2	32	-	N/C	-	-	-	-	-	SPARE
J2	33	C	-	16	0	A4TB11	2	B19	-
J2	34	C	N/C	-	-	-	-	-	-
J2	35	C		16	418	A4TB7	4	B19	-
J2	36	C	N/C	-	-	-	-	-	-
J2	37	C	N/C	-	-	-	-	-	-
J3	1	C	1-SHD	16	0	A4TB6	3	B19	SHIELD
J3	2	C	1-BK	16	395	A4TB1	15	B19	-
J3	3	C	1-WH	16	396	A4TB1	16	B19	-
J3	4	C	1-RD	16	397	A4TB1	17	B19	-
J3	5	C	2-BK	16	409	A4TB6	1	B19	-
J3	6	C	2-WH	16	410	A4TB6	2	B19	-
J3	7	C	2-SHD	16	0	A4TB6	3	B19	SHIELD
J3	8	C	2-RD	16	-	N/C	-	-	SPARE
J3	9	C	3-BK	16	411	A4TB6	4	B19	-
J3	10	C	4-BK	16	313	A4TB1	2	B19	-
J3	11	C	4-WH	16	314	A4TB1	3	B19	-
J3	12	C	4-RD	16	315	A4TB1	1	B19	-
J3	13	C	3-SHD	16	0	A4TB6	3	B19	SHIELD
J3	14	C	3-WH	16	412	A4TB6	5	B19	-
J3	15	C	3-RD	-	-	-	-	-	SPARE
J3	16	C	4-SHD	16	0	A4TB11	-		SHIELD
J3	17	C	5-BK	16	317	A4TB1	4	B19	-
J3	18	C	5-WH	16	417	A4TB7	1	B19	-
J3	19	C	5-RD	16	419	A4TB7	2	B19	-
J3	20	C	5-SHD	16	0	A4TB11	-	-	SHIELD

Table 19: Port Receptacle A6 Assembly. (Continued)

CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J3	21	C	6-BK	16	407	A4TB7	3	B19	SPARE
J3	22	C	6-WH	16	408	A4TB7	6	B19	SPARE
J3	23	C	7-BK	16	-	N/C	-	-	SPARE
J3	24	C	7-WH	16	-	N/C	-	-	SPARE
J3	25	C	7-RD	16	-	N/C	-	-	SPARE
J3	26	C	7-SHD	16	0	-	-	-	SPARE
J3	27	C	6-RD	16	420	A4TB6	7	B19	-
J3	28	C	6-SHD	16	0	A4TB7	5		SHIELD
J3	29	C	N/C	-	-	-	-	-	-
J3	30	C	N/C	-	-	-	-	-	-
J3	31	C	N/C	-	-	-	-	-	-
J3	32	C	N/C	-	-	-	-	-	-
J3	33	C	N/C	-	-	-	-	-	-
J3	34	C	N/C	-	-	-	-	-	-
J3	35	C	N/C	-	-	-	-	-	-
J3	36	C	N/C	-	-	-	-	-	-
J3	37	C	N/C	-	-	-	-	-	-
J4	1	C	-	16	500	A4TB1	19	B19	-
J4	2	C	-	16	501	A4TB1	20	B19	-
J4	3	C	-	16	502	A4TB3	19	B19	-
J4	4	C	-	16	503	A4TB3	20	B19	-
J4	5	C	-	16	504	A4TB4	19	B19	-
J4	6	C	-	16	505	A4TB4	20	B19	-
J4	7	C	-	16	138	A4TB5	10	B19	-
J4	8	C	-	-	-	-	-	-	SPARE
J4	9	C	-	-	-	-	-	-	SPARE
J4	10	C	-	16	301A	A4TB5	18	B19	-

Table 19: Port Receptacle A6 Assembly. (Continued)

CONNECTOR	PIN	TYPE	CABLE WIRE #	SIZE	OPER CAB WIRE #	TO	TERM	LUG	NOTES
J4	11	C	-	16	301	A4TB5	16	B19	-
J4	12	C	-	-	-	-	-	-	SPARE
J4	13	C	-	-	-	-	-	-	SPARE
J4	14	C	-	-	-	-	-	-	SPARE
J4	15	C	-	-	-	-	-	-	SPARE
J4	16	C	-	-	-	-	-	-	SPARE



J-3 CONNECTION DETAILS
PIN-MATING FACE OF CONNECTOR
SOCKET-WIRING SIDE OF CONNECTOR

Table 20: Module Electrical Interconnect Assembly.

CONN ITEM #	PIN/ITEM #	TYPE	CABLE COND #	WIRE #	SIZE/AWG
12	A	S	1 WHITE	172	6
12	B	S	2 BLACK	0	6
11	01	17	1	112	16
11	02	17	2	113	16
11	03	17	3	110	16
11	04	17	4	111	16
11	05	17	5	114	16
11	06	17	6	115	16
11	07	17	7	124	16
11	08	17	8	104	16
11	09	17	9	129	16
11	10	17	10	173	16
11	11	17	11	174	16
11	12	17	12	175	16
11	13	17	13	SPARE	16
11	14	17	14	134	16
11	15	17	15	135	16
11	16	17	16	139	17
11	17	17	17	141	16
11	18	17	18	143	16
11	19	17	19	145	16
11	20	17	20	148	16
11	21	17	21	150	16
11	22	17	22	153	16
11	23	17	23	155	16
11	24	17	24	158	16
11	25	17	25	160	16
11	26	17	26	163	16
11	27	17	27	165	16
11	28	17	28	168	16

Table 20: Module Electrical Interconnect Assembly. (Continued)

CONN ITEM #	PIN/ITEM #	TYPE	CABLE COND #	WIRE #	SIZE/AWG
11	29	17	29	170	16
11	30	17	30	181	16
11	31	17	31	180	16
11	32	17	32	SPARE	16
11	33	17	33	0	16
11	34	17	34	190	16
11	35	17	35	178	16
11	36	17	36	187	16
11	37	17	37	SPARE	16
13	01	18	1-SHD	0	18
13	02	18	1-BK	119	18
13	03	18	1-WH	121	18
13	04	18	1-RD	120	18
13	05	18	2-BK	185	18
13	06	18	2-WH	186	18
13	07	18	2-SHD	0	18
13	08	18	2-RD	SPARE	18
13	09	18	3-BK	182	18
13	10	18	4-BK	125	18
13	11	18	4-WH	126	18
13	12	18	4-RD	127	18
13	13	18	3-SHD	0	18
13	14	18	3-WH	183	18
13	15	18	3-RD	SPARE	18
13	16	18	R-SHD	0	18
13	17	18	5-BK	132	18
13	18	18	5-WH	212	18
18	19	18	5-RD	211	18
13	20	18	5-SHD	8	18
13	21	18	6-BK	205	18
13	22	18	6-WH	206	18

Table 20: Module Electrical Interconnect Assembly. (Continued)

CONN ITEM #	PIN/ITEM #	TYPE	CABLE COND #	WIRE #	SIZE/AWG
13	23	18	7-BK	SPARE	18
13	24	18	7-WH	SPARE	18
13	25	18	7-RD	SPARE	18
13	26	18	7-SHD	SPARE	18
13	27	18	6-RD	210	18
13	28	18	6-SHD	0	18
13	29	18	N/C	-	16
13	30	18	N/C	-	16
13	31	18	N/C	-	16
13	32	18	N/C	-	16
13	33	18	33	0	16
13	34	18	N/C	-	16
13	35	18	N/C	-	16
13	36	18	N/C	-	16
13	37	18	N/C	-	16
15	A	S	1 WHITE	172	6
15	B	S	2 BLACK	0	6
14	01	18	1	112	16
14	02	18	2	113	16
14	03	18	3	110	16
14	04	18	4	111	16
14	05	18	5	114	16
14	06	18	6	115	16
14	07	18	7	124	16
14	08	18	8	104	16
14	09	18	9	129	16
14	10	18	10	173	16
14	11	18	11	174	16
14	12	18	12	175	16
14	13	18	13	SPARE	16
14	14	18	14	134	16

Table 20: Module Electrical Interconnect Assembly. (Continued)

CONN ITEM #	PIN/ITEM #	TYPE	CABLE COND #	WIRE #	SIZE/AWG
14	15	18	15	135	16
14	16	18	16	139	16
14	17	18	16	141	16
14	18	18	18	143	16
14	19	18	19	145	16
14	20	18	20	148	16
14	21	18	21	150	16
14	22	18	22	153	16
14	23	18	23	155	16
14	24	18	24	158	16
14	25	18	25	160	16
14	26	18	26	163	16
14	27	18	27	165	16
14	28	18	28	168	16
14	29	18	29	170	16
14	30	18	30	181	16
14	31	18	31	180	16
14	32	18	32	SPARE	16
14	33	18	33	0	16
14	34	18	34	190	16
14	35	18	35	178	16
14	36	18	36	187	16
14	37	18	37	SPARE	16
16	01	17	1-SHD	0	18
16	02	17	1-BK	119	18
16	03	17	1-WH	121	18
16	04	17	1-RD	120	18
16	05	17	2-BK	185	18
16	06	17	2-WH	186	18
16	07	17	2-SHD	0	18
16	08	17	2-RD	SPARE	18

Table 20: Module Electrical Interconnect Assembly. (Continued)

CONN ITEM #	PIN/ITEM #	TYPE	CABLE COND #	WIRE #	SIZE/AWG
16	09	17	3-BK	182	18
16	10	17	4-BK	125	18
16	11	17	4-WH	126	18
16	12	17	4-RD	127	18
16	13	17	3-SHD	0	18
16	14	17	3-WH	183	18
16	15	17	3-RD	SPARE	18
16	16	17	4-SHD	0	18
16	17	17	5-BK	132	18
16	18	17	5-WH	212	18
16	19	17	5-RD	211	18
16	20	17	5-SHD	0	18
16	21	17	6-BK	205	18
16	22	17	6-WH	206	18
16	23	17	7-BK	SPARE	18
16	24	17	7-WH	SPARE	18
16	25	17	7-RD	SPARE	18
16	26	17	7-SHD	SPARE	18
16	27	17	6-RD	210	18
16	28	17	6-SHD	0	18
16	29	17	N/C	-	16
16	30	17	N/C	-	16
16	31	17	N/C	-	16
16	32	17	N/C	-	16
16	33	17	33	0	16
16	34	17	N/C	-	16
16	35	17	N/C	-	16
16	36	17	N/C	-	16
16	37	17	N/C	-	17
23	01	18	1	146	16
23	02	18	2	151	16

Table 20: Module Electrical Interconnect Assembly. (Continued)

CONN ITEM #	PIN/ITEM #	TYPE	CABLE COND #	WIRE #	SIZE/AWG
23	03	18	3	156	16
23	04	18	4	161	16
23	05	18	5	166	16
23	06	18	6	171	16
23	07	18	7	138	16
23	08	18	8	SPARE	16
23	09	18	9	SPARE	16
23	10	18	10	220	16
23	11	18	11	221	16
23	12	18	12	SPARE	16
23	13	18	13	SPARE	16
23	14	18	14	SPARE	16
23	15	18	15	SPARE	16
23	16	18	16	SPARE	16
23	N/C	-	17	SPARE	16
23	N/C	-	18	SPARE	16
23	N/C	-	19	SPARE	16
26	01	17	1	146	16
26	02	17	2	151	16
26	03	17	3	156	16
26	04	17	4	161	16
26	05	17	5	166	16
26	06	17	6	171	16
26	07	17	7	138	16
26	08	17	8	SPARE	16
26	09	17	9	SPARE	16
26	10	17	10	220	16
26	11	17	11	221	16
26	12	17	12	SPARE	16
26	13	17	13	SPARE	16
26	14	17	14	SPARE	16

Table 20: Module Electrical Interconnect Assembly. (Continued)

CONN ITEM #	PIN/ITEM #	TYPE	CABLE COND #	WIRE #	SIZE/AWG
26	15	17	15	SPARE	16
26	16	17	16	SPARE	16
26	N/C	-	17	SPARE	16
26	N/C	-	18	SPARE	16
26	N/C	-	19	SPARE	16

CHAPTER 4

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT SUPPORTING INFORMATION FOR MODULAR CAUSEWAY SYSTEM (MCS) CAUSEWAY FERRY (CF)

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
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	The Army Maintenance Management Systems (TAMMS)

FIELD MANUALS

FM 3-5	NBC, Decontamination
FM 55-502	Army Watercraft Safety

FORMS

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
DA Form 2404	Equipment Inspection and Maintenance Worksheet
SF 361	Transportation Discrepancy Report
SF 368	Product Quality Deficiency Report

MISCELLANEOUS

ASME Y14.38-1999	The American Society of Mechanical Engineers Abbreviations and Acronyms
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)
DOD-PRF-24648	Primer Coating, Zinc Dust Pigmented for Exterior Steel Surfaces
MIL-PRF-23236	Paint Coating Systems, Fuel and Salt Water Ballast Tanks (Metric)
SSPC SP-2	Steel Structures Painting Council, SP-2 Hand Tool Cleaning

SUPPLY CATALOG

SC 4910-95-A72	Shop Equipment, Automotive Equipment and Repair, Organizational Maintenance
SC 4920-99-A07	Sets, Kits and Outfits, Shop Set, Aircraft Maintenance, Fixed Base: Hydraulic, Set C, General Support
SC 4920-99-A16	Sets, Kits and Outfits, Shop Set, Aircraft Maintenance, Fixed Base: Electrical
SC 4940-95-A64	Sets, Kits and Outfits Shop Equipment, Welding, Shelter Mounted
SC 5180-90-N26	Tool Kit, General Mechanics
SC 5180-90-N55	Sets, Kits and Outfits for Tool Kit, General Mechanics, Diesel Engine

TECHNICAL BULLETIN

TB 9-6140-200-14	Operator's, Unit, Direct Support and General Support Maintenance Manual for Lead-Acid Storage Batteries
TB 55-1900-207-24	Treatment of Cooling Water in Marine Diesel Engines

TECHNICAL MANUALS

TM 5-2815-258-24	Unit, Direct Support and General Maintenance Manual for Detroit Diesel Engine Series 53
TM 9-6115-643-24	Unit, Direct Support and General Maintenance Manual for Generator Set, Skid Mounted, Tactical Quiet 15KW
TM 11-5820-890-10-8	SINCGARS Operators Manual
TM 11-5825-291-13	Operations and Maintenance Manual, Satellite Signals Navigation Sets
TM 55-1925-257-14&P	Operator, Unit, Direct Support and General Support Maintenance Manual for Incinerator Toilet/Urinal, Galley Equipment and Electric Water Heater
TM 55-1945-205-10-1	Operators Manual for the Modular Causeway System, Causeway Ferry
TM 55-1945-205-24-1-2	Unit, Direct Support and General Maintenance, Causeway Ferry Diesel Engine
TM 55-1945-205-24-1-3	Unit, Direct Support and General Maintenance, Causeway Ferry Marine Gear
TM 55-1945-205-24-1-4	Unit, Direct Support and General Maintenance, Causeway Ferry Transfer Case
TM 55-1945-205-24P-1	Unit, Direct Support and General Maintenance, Repair Parts and Special Tools List, Causeway Ferry
TM 750-244-6	Destruction of TACOM Equipment

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
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 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 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, if applicable, 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, if applicable, contain supplemental instructions and explanatory notes for a particular maintenance function.

Maintenance Functions

Maintenance functions are limited to and defined as follows:

1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination, e.g., by sight, sound or feel. This includes scheduled inspection and gaugings and evaluation of cannon tubes.

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

3. Service. Operations required periodically to keep an item in proper operating conditions; 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.

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

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

6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

7. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating or fixing into position a spare, repair part or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

8. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. “Replace” is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.

9. Repair. The application of the 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 (UUT).

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

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

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

11. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of 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 preformed 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 figures represent 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 (5) of the MAC.

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

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

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

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

Explanation of the 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
CAUSEWAY FERRY
MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

Table 1. MAC for Modular Causeway System. (MCS)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
0101	POWERED SECTION								
010101	POWERED MODULE								
01010101	DRIVE TRAIN								
0101010101	DIESEL ENGINE								A
0101010102	MARINE GEAR								B
0101010103	TRANSFER CASE								C
0101010104	PUMP-JET	Inspect	0.5						E
		Service		3.0				1	E
		Repair					10.0		D
		Replace					50.0		D
010101010401	HYDRAULIC SYSTEM	Inspect	1.0						E
		Service	1.0	3.0				1	E
		Repair			3.0			2, 4, 7	
		Replace			6.0			2, 4, 7	
01010101040101	HYDRAULIC PUMP	Test	0.5						E
		Inspect	1.0						E
		Repair				4.0		2, 4, 7	E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
01010101040101	HYDRAULIC PUMP (CONT'D)	Replace		6.0				1, 2, 4	
01010101040102	HYDRAULIC HAND PUMP	Inspect	1.0						E
		Repair					20.0		
		Replace		2.0				1, 2, 4	
01010101040103	HYDRAULIC WAY-VALVE	Repair				2.0		2, 4, 7	
		Replace		1.5				1, 2, 4	
010101010403	FEEDBACK UNIT	Inspect	1.0						E
		Repair				2.5		2, 4, 7	
		Replace			2.0			2, 4, 7	
0101010105	ALTERNATOR	Test			1.0			7, 14, 15	E
		Inspect	0.5						E
		Replace			2.0			7, 14, 15	
01010102	ENGINE EXHAUST SYSTEM	Clean		2.0				1, 3, 9	E
		Inspect		2.0				1, 3, 9	E
		Repair			6.0			3, 7, 9	
01010103	BILGE PUMP	Test		2.0				1	E
		Inspect	1.0						E
		Replace		8.0				1	F
01010104	FIRE SUPPRESSION SYSTEM	Test					3.0		E
		Inspect	2.0				3.0		E
		Repair					8.0		G
		Replace					24.0		G

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
01010105	FUEL SYSTEM	Test	1.0						E
		Inspect	1.0						E
		Repair			4.0			7	
		Replace			12.0			7	
0101010501	FUEL/WATER SEPARATOR	Clean	1.0						E
		Inspect	1.0						E
		Repair		2.0				1	
		Replace			4.0			7	
01010106	ELECTRICAL SYSTEM	Test			1.0			7, 14, 15	E
		Adjust			1.0			7, 14, 15	
		Repair			2.0			7, 14, 15	
		Replace			8.0			7, 14, 15	
01010107	EMERGENCY STEERING SYSTEM	Inspect	2.0						E
		Service	1.0						E
		Replace		4.0				1	
0101010701	STEERING UNIT	Inspect	0.5						E
		Replace		2.0				1, 2	
0101010702	STEERING ADAPTOR	Inspect	0.5						E
		Replace		1.5				1	
01010108	HULL								
0101010801	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0101010801	EXTERIOR (CONT'D)	Repair		4.0				1, 16	
		Overhaul					24.0		
0101010802	INTERIOR	Clean					4.0		
		Inspect					2.0		
		Test		8.0			5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
01010109	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace		1.0				1	
01010110	HATCHES & HINGES	Clean	1.0					8, 9, 23, 24	E
		Inspect	0.5						E
		Service	0.5						E
		Repair		2.0				1, 16	
		Replace		2.0				1	
0101010111	FLEXORS	Inspect	0.5						E
		Replace	4.0						
010102	NON-POWERED MODULES								
01010201	HULL								
0101020101	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
		Repair		4.0				1, 16	
		Overhaul					24.0		
0101020102	INTERIOR	Clean					4.0		
		Inspect					2.0		
		Test					5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
01010202	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace		1.0				1	
01010203	FLEXORS	Inspect	0.5						E
		Replace	4.0						
010103	OPERATORS CAB								
01010301	MIDDLE CONTROL PANEL	Test			2.0			7, 14, 15	E
		Inspect			2.0			7, 14, 15	E
		Repair			3.0			7, 14, 15	
		Replace			16.0			7, 14, 15	
01010302	LOWER CONTROL PANEL	Test			2.0			7, 14, 15	E
		Inspect			2.0			7, 14, 15	E
		Repair			3.0			7, 14, 15	
		Replace			16.0			7, 14, 15	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
01010303	CIRCUIT BREAKER PANEL	Test			1.0			7, 14, 15	E
		Inspect			1.0			7, 14, 15	E
		Repair			2.0			7, 14, 15	
		Replace			12.0			7, 14, 15	
01010304	TERMINAL STRIP A-4	Test			1.0			7, 14, 15	E
		Inspect			1.0			7, 14, 15	E
		Repair			2.0			7, 14, 15	
		Replace			10.0			7, 14, 15	
01010305	SPOTLIGHT	Adjust		1.0				1	
		Replace		1.0				1	
01010306	DEFROSTER	Inspect	1.0						E
		Replace			4.0			7, 14, 15	
01010307	HEATER	Inspect		2.0				1	
		Repair			4.0			7, 14, 15	
		Replace			6.0			7, 14, 15	
01010308	WINDSHIELD WIPER	Repair		1.0				1	
		Replace		2.0				1	
01010309	COMMUNICATIONS EQUIPMENT								
0101030901	VHF/FM HANDHELD TRANSCEIVER	Repair					8.0		
		Replace		1.0				1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
0101030902	AN/PSN-11 INTERFACE & SWITCHBOX	Repair					6.0		
		Replace			1.0			7, 14, 15	
0101030903	LOUDHAILER	Repair					8.0		
		Replace	0.5						
0101030904	SINCGARS RADIO								H
0101030905	VHF/FM DCS TRANSCEIVER	Repair					12.0		
		Replace		1.0				1	
01010310	NAVIGATION EQUIPMENT	Test	0.5						E
		Inspect	1.0						E
0101031001	COMPASS	Inspect	2.0.						E
		Replace		2.0				1	
		Calibrate		4.0				1	E
0101031002	PLGR								I
01010311	MAST	Inspect	3.0						E
		Repair		3.0				1	
0101031101	NAVIGATION LIGHTS	Repair		1.0				1	
		Replace		1.0				1	
0101312	OPERATORS CAB ELECTRICAL SYSTEM	Test			4.0			7, 14, 15	E
		Inspect			4.0			7, 14, 15	E
		Repair				6.0		7, 14, 15	
		Replace			10.0			7, 14, 15	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
010104	ANCHOR ASSEMBLY	Inspect	1.0						E
		Repair		1.0				1	
		Replace		1.0				1	
0102	INTERMEDIATE SECTION								
010201	NON-POWERED MODULES								
01020101	HULL								
0102010101	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E
		Repair		4.0				1, 16	
		Overhaul					24.0		
0102010102	INTERIOR	Clean					4.0		
		Inspect					2.0		
		Test		8.0			5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
01020102	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace		1.0				1	
01020103	FLEXORS	Inspect	0.5						E
		Replace	4.0						

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0103	CAUSEWAY FERRY BEACH- END SECTION								
010301	NON-POWERED MODULE								
01030101	HULL								
0103010101	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E
		Repair		4.0				1, 16	
		Overhaul					24.0		
0103010102	INTERIOR	Clean					4.0		
		Inspect					2.0		
		Test		8.0			5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
01030102	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace		1.0				1	
01030103	FLEXORS	Inspect	0.5						E
		Replace	4.0						
0104	CONTAINERS	Clean	1.0						E
		Inspect	2.0						E
		Repair			4.0			7	
		Replace					8.0		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
0101010101	DIESEL ENGINE	Inspect	4.0						E
		Service	4.0	4.0					E
		Repair				30.0		7, 27-218	
		Replace			120.0			7, 27-218	
		Overhaul					80.0		
010101010101	ENGINE BLOCK ASSEMBLY	Inspect	2.0						E, J
		Repair				6.0		7, 27-52	J
		Replace				120.0		7, 27-52	J
010101010102	CYLINDER HEAD ASSEMBLY	Clean				5.0		7, 53-85	E, K
		Repair				12.0		7, 53-85	K
		Inspect			6.0			7, 53-85	E, K
		Replace			8.0			7, 53-85	K
010101010103	CRANKSHAFT ASSEMBLY	Repair			16.0			7, 86-106	L
		Replace			24.0			7, 86-106	L
010101010104	CAMSHAFT ASSEMBLY	Repair				12.0		7, 131-141	
		Replace				16.0		7, 131-141	
010101010105	FLYWHEEL ASSEMBLY	Inspect			3.0			7, 107-112	M
		Replace			5.0			7, 107-112	M

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
010101010106	PISTON ASSEMBLY	Clean				2.0		7, 113-130	N
		Repair				3.0		7, 107-112	M
		Inspect				2.0		7, 113-130	N
		Rebuild				4.5		7, 113-130	N
		Replace				3.0		7, 113-130	N
010101010107	ENGINE BALANCE	Inspect				6.0		7, 131-141	O
		Adjust				3.0		7, 131-141	O
		Replace				8.0		7, 131-141	O
		Repair				8.0		7, 131-141	O
010101010108	FUEL SYSTEM	Inspect	0.5						E, P
01010101010801	FUEL PUMP	Inspect			1.0			7, 142-187	E
		Repair			4.0			7, 142-187	
		Replace			2.0			7, 142-187	
01010101010802	PRIMING PUMP	Inspect		1.5				1, 142-187	E
		Replace		2.0				1, 142-187	
010101010109	ELECTRIC GOVERNOR	Test			0.5				E
		Adjust		1.0				7, 142-187	
		Repair					5.0		
		Replace		2.0				1, 142-187	
		Inspect	0.5						E, Q
010101010110	AIR INTAKE SYSTEM	Clean		2.0				1, 188-195	E, Q
		Replace		3.0				1, 188-195	Q

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
01010101011001	BLOWER	Inspect			2.0	2.0		7, 188-195	E
		Adjust				4.0		7, 188-195	
		Repair				18.0		7, 188-195	
01010101011002	TURBOCHARGER	Inspect		2.0				1, 188-195	E, R
		Replace			8.0			7, 188-195	
		Repair					18.0		
		Replace			6.0			7, 188-195	
010101010111	LUBE OIL SYSTEM	Service	5.0	5.0					E, S
		Inspect	1.0						E
01010101011101	LUBE OIL PUMP	Inspect				3.0		7, 196-203	E
		Repair				4.0		7, 196-203	
		Replace				4.0		7, 196-203	
01010101011102	LUBE OIL COOLER	Clean			2.0			7	E
		Test			1.5			7, 25, 26	E
		Inspect			2.0			7	E
		Repair			4.0			7	E
		Replace			2.0			7	
010101010112	FRESH WATER COOLING SYSTEM	Inspect	1.0						E, T
		Clean		1.0				1	
01010101011201	FRESH WATER PUMP	Inspect			2.5			7, 212-215	E
		Repair			6.0			7, 212-215	
		Replace			3.0			7, 212-215	
		Test			2.0			7, 25, 26	E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
01010101011202	FRESH WATER COOLER	Clean			2.0			7	E
		Inspect			1.0			7	E
		Repair			4.0			7	
		Replace			3.0			7	
010101010113	RAW WATER COOLING SYSTEM	Inspect	1.0						E, U
01010101011301	RAW WATER PUMP	Inspect		2.0				1	E
		Clean		2.0				1	E, U
		Repair			4.0			7, 212-215	
		Replace		2.5				1, 212-215	
010101010114	ELECTRICAL SYSTEM	Test			4.0			7, 14, 15	E, V
		Inspect			2.0			7, 14, 15	E, V
		Repair			3.0			7, 14, 15	V
		Replace			16.0			1, 7, 14, 15	V
01010101011401	STARTER	Inspect	1.0						E
		Repair				6.0		7, 14, 15	
		Replace		3.0				1, 14, 15	
01010101011402	COLD PACK STARTER	Clean		1.0				1	E
		Inspect	0.5						E
		Adjust		1.0				1, 14, 15	
		Repair		2.5				1, 14, 15	
		Replace		3.0				1, 14, 15	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
010101010115	OVER SPEED GOVERNOR	Test				1.0		7	E
		Adjust				1.5		7, 184-187	
		Repair				5.0		7, 184-187	
		Replace				4.0		7, 184-187	
010101010116	AUTO SHUTDOWN SYSTEM	Test		1.0					E
		Adjust			2.0			7, 14, 15	
		Repair				6.0		7, 14, 15	
		Replace		4.0			8.0	1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
0101010102	MARINE GEAR	Inspect	1.0						E
		Align			2.0			7, 17	
		Service	1.0	4.0				1	E
		Rebuild					25.0		W
		Replace			28.0			4, 7, 17	
010101010201	OIL SYSTEM	Inspect	0.5						E, X
		Repair		.5				1, 11	X
01010101020101	OIL COOLER	Clean	1.0						E
		Inspect	1.0						E
		Replace		4.0				1	
01010101020102	LINES & HOSES	Inspect	0.5						E
		Repair		1.0				1	
01010101020103	OIL PUMP	Inspect	1.0						E
		Repair		2.0				1, 3	
01010101020104	ELECTRIC CONTROL VALVE	Repair					8.0		
		Replace			6.0			7, 14, 15	
010101010202	GEAR MOUNTS	Inspect	.05						E
		Replace			2.0			3,7	
010101010203	COUPLING BLOCKS	Clean			1.0			7	E
		Inspect			1.0			7	E
		Replace			4.0			3, 7	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
010101010204	OUTPUT FLANGE	Inspect	0.5						E
		Align			2.0			3, 7, 17	
		Replace			4.0			3, 7, 17	
010101010205	OUTPUT SEAL	Inspect			2.0			7	E
		Replace			2.0			3, 7	
010101010206	INPUT FLANGE (ENGINE CONNECTION)	Inspect	0.5						E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
0101010103	TRANSFER CASE	Clean		2.0				1	E
		Service	1.0	4.0				1	E
		Overhaul				24.0			
		Rebuild					24.0	2, 7, 17	Y
		Replace			24.0			2, 7, 17	
010101010301	OIL SYSTEM	Inspect	1.0						E
		Repair		2.5				1	
01010101030101	OIL PUMP	Inspect	4.0						E
		Replace		2.5				1	
01010101030102	HOSES & FITTINGS	Inspect	0.2						E
		Replace		2.0				1	
01010101030103	OIL COOLER	Inspect	0.2						E
010101010302	GEAR SHAFT	Inspect				5.0		7	E
		Replace		3.5				1	
		Repair				8.0		3, 7, 17	
		Replace				7.0		3, 7, 17, 19	
01010101030201	UPPER SHAFT	Inspect				5.0		7	X E
		Repair				8.0		3, 7, 17	
		Replace				7.0		3, 7, 17, 19	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0101010103020101	INPUT SEAL	Clean			2.0			7	E
		Inspect			2.0			7	E
		Replace			2.0			3, 7, 17, 19	
0101010103020102	OUTPUT SEAL	Clean			2.0			7	E
		Inspect			2.0			7	E
		Replace			2.0			3, 7, 17, 19	
01010101030202	INTERMEDIATE SHAFT	Inspect				2.5		7	E
		Repair				5.5		3, 7, 17	
		Replace				6.5		3, 7, 17, 19	
01010101030203	LOWER SHAFT	Inspect				4.0		7	E
		Repair				8.0		3, 7, 17	
		Replace				6.0		3, 7, 17, 19	
0101010103020301	INPUT SEAL	Clean			2.0			7	E
		Replace			2.0			3, 7, 17, 19	
		Inspect			2.0			7	E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
02	**ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF)**								
0201	INTERMEDIATE SECTION								
020101	NON-POWERED MODULE								
02010101	HULL								
0201010101	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Repair		4.0				1, 16	
		Service	1.5						E
		Overhaul					24.0		
		Inspect					2.0		
0201010102	INTERIOR	Clean					4.0		
		Test		6.0			5.0	1, 25, 26	E
		Repair					6.0		
02010102	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Overhaul					50.0		
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace		1.0				1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
02010103	FLEXORS	Inspect	0.5						E
		Replace	4.0						
0202	COMBINATION BEACH-END SECTION								
020201	NON-POWERED MODULE								
02020101	HULL								
0202010101	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E
		Repair		4.0				1, 16	
		Overhaul					24.0		
		Inspect					2.0		
0202010102	INTERIOR	Clean					4.0		
		Test		6.0			5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
02020102	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace		1.0				1	
02020103	FLEXORS	Inspect	0.5						E
		Replace	4.0						
0203	GENERATOR SHELTER			4.0				1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
020301	ARMY TACTICAL QUIET GENERATOR (ATQG)								AD
020302	FUEL SYSTEM	Inspect	1.0						E
		Repair			1.5			7	
		Replace		1.0				1	
02030201	MANUAL FUEL PUMP	Clean		1.0				1	E
		Inspect	1.0	1.0				1	E
		Repair		2.0				1	
		Replace		2.0				1	
020303	LOUVERS	Clean		1.0				1	E
		Inspect	1.0						E
		Service		1.0				1	E
		Repair		3.0				1	
		Replace		4.0				1	
020304	ELECTRICAL SYSTEM	Test			2.0			7, 14, 15	E
		Repair		2.0	3.0			1, 7, 14, 15	
		Replace			5.0			7, 14, 15	
020305	FIRE SUPPRESSION SYSTEM	Test					4.0		E, G
		Inspect	1.0						E
		Repair					4.0	1, 14, 15	G
		Replace					40.0		G
0204	PERSONNEL SHELTER								

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
020401	HEAT PUMP	Clean		4.0				1	E
		Inspect		1.0				1	E
		Service			3.0			7, 21	E
		Repair		2.0	4.0			1, 7,14, 15, 21	
		Replace			8.0			7,14, 15, 21	
		Rebuild				8.0		7,14, 15, 21	
020402	INCINOLET								AE
020403	ELECTRICAL SYSTEM	Inspect	2.0						E
		Repair		12.0	3.0			1, 7, 14, 15	
		Replace			12.0			7, 14, 15	
020404	COMMUNICATIONS EQUIPMENT								
02040401	VHF\FM HANDHELD TRANSCEIVER	Replace	1.0						
		Repair					8.0		
0205	LIGHT TOWER								
		Inspect			0.5			10, 15	E
020501	ELECTRICAL SYSTEM	Test			1.0			10, 15	E
		Repair			6.0			10, 15	
02050101	BATTERIES	Test			1.0			10, 13	E
		Inspect	0.5						E
		Replace		2.0				1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
02050102	OIL PRESSURE UNIT	Test			1.0			10	E
		Repair			1.0			10	
		Replace			1.5			10	
02050103	STARTING CIRCUIT	Repair			2.0			10, 15	
		Replace			3.0			10, 15	
02050104	ENGINE TEMPERATURE UNIT	Test			1.0			10, 18	E
		Replace			2.5			10, 18	
		Repair			2.0			10, 18	
02050105	HOURMETER UNIT	Repair			1.5			10	
		Replace			2.0			10	
02050106	SHUTDOWN CIRCUIT	Repair			2.0			10	
		Replace			4.0			10	
02050107	LAMP SYSTEM	Test	1.0						E
		Repair			2.0			10, 15	
		Replace			6.0			10, 15	
02050108	LAMP BALLAST SYSTEM	Test			0.5			10, 15	E
		Repair			2.0			10, 15	
		Replace			3.0			10, 15	
020502	GENERATOR	Clean		2.0				1	E
		Inspect					12.0		
		Repair					18.0		
		Replace					24.0		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
02050202	CONTROL PANEL	Inspect	1.0						E
		Repair			3.0			10, 15	
		Replace			4.5			10, 15	
02050205	DIESEL ENGINE	Service	4.0	2.0				1	E
		Adjust		3.0				1	
		Overhaul					16.0		
		Repair				16.0		10	
		Replace			16.0			10	
0205020501	ENGINE FUEL SYSTEM	Inspect	1.0						E
		Repair		4.0				1	
		Replace			8.0			10	
020502050101	FUEL PUMP	Inspect	1.0						E
		Repair				4.0		10	
		Replace			5.0			10	
020502050102	FUEL TANK	Clean	2.0						E
		Inspect	1.0						E
		Repair		2.0				1	
		Replace		2.0				1	
0205020502	ENGINE AIR SYSTEM	Inspect	1.0						E
		Repair		2.0				1	
		Replace		4.0				1	
0205020503	ENGINE COOLING SYSTEM	Inspect	1.0						E
		Repair		3.0				1	
		Replace		2.0		5.0		1, 10	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
020502050301	FAN ASSEMBLY	Inspect	0.5						E
		Repair		1.5				1	
		Replace		2.0				1	
020502050302	COOLING WATER PUMP	Inspect			1.0			10	E
		Repair				4.0		10	
		Replace			5.0			10	
020502050303	RADIATOR	Clean	1.0						E
		Inspect		1.0				1	E
		Service	2.0	4.0				1	E
		Repair				4.0		10	
		Replace		2.0	3.0			1, 10	
0205020504	CYLINDER HEAD	Inspect		1.0				1	E
		Adjust					2.0		
		Repair					8.0		
		Replace					5.0		
0205020505	VIBRATION DAMPER	Repair					4.0		
		Replace					4.0		
0205020506	EXHAUST SYSTEM	Clean	1.5						E
		Inspect	1.0						E
		Repair		3.0				1, 16	
		Replace		5.0				1	
0205020507	CRANKSHAFT	Inspect					4.0		
		Repair					8.0		
		Replace					8.0		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0205020508	PISTON	Inspect					4.0		
		Repair					4.0		
		Replace					4.0		
02050206	RUNNING GEAR	Service		2.0				1	E
		Repair		2.0		2.0		1, 10	
		Replace		18.0				1	
0205020601	TIRES	Inspect	0.5						E
		Repair				1.0		10	
		Replace				1.0		10	
02050207	SUPPORT TOWER	Inspect	0.5						E
		Service	1.0						E
		Repair			2.0			10	
		Replace			6.0			10	
02050208	TOWER RAISING ASSEMBLY	Inspect	0.5						E
		Repair			1.0			10	
		Replace			3.0			10	
02050209	ENCLOSURE	Inspect	0.5						E
		Repair			2.0			10	
		Replace			6.0			10	
0206	EASY ANCHOR	Inspect	2.0						E
		Service		1.0				1	E
		Repair			4.0			6, 7	
		Replace			6.0			6, 7	
0207	RHIB (ZODIAC)								

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
020701	STEERING & THROTTLE	Inspect	1.0						E
		Service	1.0						E
		Repair			4.0			10	
		Replace			8.0			10	
020702	CONTROL PANEL	Inspect			2.0			10, 15	E
		Repair			4.0			10, 15	
		Replace			6.0			10, 15	
020703	BOAT HULL	Inspect	1.0						E
		Repair		2.0		20.0		1, 219-230	
		Replace				18.0		1, 219-230	
020704	NAVIGATION SYSTEM	Repair			3.0		12.0	7	
		Replace		2.0				1	
020705	OUTBOARD ENGINE	Test		4.0					E
		Repair					12.0		
		Rebuild					12.0		
		Replace		4.0					
02070501	ENGINE COVER	Inspect	1.0						E
		Repair			2.0			10	
		Replace			2.0			10	
02070502	LOWER ENGINE COVER	Inspect	1.0						E
		Repair			2.0			10	
		Replace			2.0			10	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
02070503	ELECTRICAL STARTER	Repair			2.0			10, 15	
		Replace			3.0			10, 15	
02070504	POWER TRIM/TILT ELECTRICAL	Adjust		1.0				1	
		Repair			2.0			10, 15	
		Replace			2.5			10, 15	
02070505	IGNITION	Repair					8.0		
		Replace					8.0	2, 17	
02070506	INTAKE MANIFOLD	Inspect			1.0			10	E
		Repair			3.0			10	
		Replace			3.0			10	
02070507	CARBURETOR	Adjust		1.0				1	
		Repair			3.0			10	
		Replace			3.0			10	
02070508	ELECTRIC PRIMER SYSTEM	Repair			3.0			10, 15	
		Replace			2.0			10, 15	
02070509	FUEL TANK	Inspect	1.0						E
		Repair			3.0			10	
		Replace	2.0						
02070510	FUEL HOSE & PRIMER BULB	Repair		1.0				1	
		Replace	1.0						
02070511	FUEL PUMP	Repair			2.0			10	
		Replace			2.0			10	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
02070512	CRANKSHAFT & PISTON	Inspect					6.0		
		Repair					8.0		
		Replace					8.0		
02070513	CYLINDER & CRANKCASE	Inspect					6.0		
		Rebuild					16.0		
		Replace					8.0		
02070514	EXHAUST HOUSING	Inspect	1.0						E
		Repair			3.0			10	
		Replace			3.0			10	
02070515	POWER TRIM/TILT HYDRAULIC	Repair					4.0		
		Replace					3.0		
02070516	POWER TRIM/TILT MIDSECTION	Inspect					2.0		
		Repair					4.0		
		Replace					4.0		
02070517	GEARCASE	Inspect			3.0			10	E
		Repair					8.0		
		Replace					8.0		
0207051701	BEARING HOUSING ASSEMBLY	Inspect					2.0		
		Repair					3.0		
		Replace					3.0		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
0207051702	PROPELLER SHAFT ASSEMBLY	Inspect					2.0		
		Repair					4.0		
		Replace					3.0		
0207051703	IMPELLER ASSEMBLY	Inspect					4.0		
		Repair					4.0		
		Replace					4.0		
0207051704	WATER PUMP ASSEMBLY	Inspect					4.0		
		Repair					4.0		
		Rebuild					8.0		
		Replace					4.0		
02070518	STEERING LINK KIT	Inspect	1.0						E
		Repair		1.0				1	
		Replace		2.0				1	
02070519	BATTERY	Test			2.0			10, 13	
		Service			2.0			10	
		Replace			2.0			10	
0207051901	BATTERY CABLE	Clean	0.5						
		Inspect	0.5						E
		Repair		1.0				1	
		Replace		1.0				1	
020706	FIRE EXTINGUISHER	Inspect	0.5						E
		Replace	2.0						E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0208	CONTAINERS	Inspect	2.0						E
		Clean	1.0						E
		Repair			4.0			7	
		Replace					8.0		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
02	**ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF)**								
03	**MODULAR WARPING TUG (WT)**								
0301	POWERED SECTION								
030101	POWERED MODULE								
03010101	DRIVE TRAIN								
0301010101	DIESEL ENGINE								Z
0301010102	MARINE GEAR								AA
0301010103	TRANSFER CASE								AB
0301010104	PUMP-JET ASSEMBLY	Inspect	0.5						E
		Service		3.0				1	E
		Repair					10.0		D
		Replace					50.0		
030101010401	HYDRAULIC SYSTEM	Inspect	1.0					1	E
		Service	1.0	3.0				1	E
		Repair			3.0			2, 4, 7	
		Replace			6.0			2, 4, 7	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
03010101040101	HYDRAULIC PUMP	Test	0.5						E
		Inspect	1.0						E
		Repair				4.0		2, 4, 7	
		Replace		6.0				1, 2, 4	
03010101040102	HYDRAULIC HAND PUMP	Inspect	1.0						E
		Repair					20.0		
		Replace		2.0				1, 2, 4	
03010101040103	HYDRAULIC WAY-VALVE	Repair				2.0		2, 4, 7	
		Replace		1.5				1, 2, 4	
030101010402	FEEDBACK UNIT	Inspect	1.0						E
		Repair				2.5		2, 4, 7	
		Replace			2.0			2, 4, 7	
0301010105	ALTERNATOR	Test			1.0			7, 14, 15	E
		Inspect	0.5						E
		Replace			2.0			7, 14, 15	
03010102	ENGINE EXHAUST SYSTEM	Clean		2.0				1, 3, 9	E
		Inspect		2.0				1, 3, 9	E
		Repair			6.0			3, 7, 9	
03010103	BILGE PUMP SYSTEM	Test		2.0				1	E
		Inspect	1.0						E
03010104	FIRE SUPPRESSION SYSTEM	Test					3.0		E
		Inspect	2.0				3.0		E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
03010104	FIRE SUPPRESSION SYSTEM (CONT'D)	Repair					8.0		G
		Replace					24.0		G
03010105	FUEL SYSTEM	Test	1.0						E
		Inspect	1.0						E
		Repair			4.0			7	
		Replace			12.0			7	
0301010501	FUEL/WATER SEPARATOR	Clean	1.0						E
		Inspect	1.0						E
		Repair		2.0				1	
		Replace			4.0			7	
03010106	ELECTRICAL SYSTEM	Test			1.0			7, 14, 15	E
		Adjust			1.0			7, 14, 15	
		Repair			2.0			7, 14, 15	
		Replace			8.0			7, 14, 15	
03010107	EMERGENCY STEERING SYSTEM	Inspect	2.0						E
		Service	1.0						E
		Replace		4.0				1	
0301010701	STEERING UNIT	Inspect	0.5						E
		Replace		2.0				1	
0301010702	STEERING ADAPTOR	Inspect	0.5						E
		Replace		1.5				1	
03010108	HULL								

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0301010801	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E
		Repair		4.0				1, 16	
		Overhaul					24.0		
0301010802	INTERIOR	Clean					4.0		
		Inspect					2.0		
		Test					5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
03010109	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace		1.0				1	
03010110	HATCHES & HINGES	Clean	1.0						E
		Inspect	0.5					1	E
		Service	0.5						E
		Repair		2.0				1, 16	
		Replace		2.0				1	
03010111	FLEXORS	Inspect	0.5						E
		Replace	4.0						
030102	NON-POWERED MODULE								
03010201	HULL								

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0301020101	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E
		Repair		4.0				1, 16	
		Overhaul					24.0		
0301020102	INTERIOR	Clean					4.0		
		Inspect					2.0		
		Test		8.0			5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
03010202	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace	1.0					1	
030103	OPERATORS CAB								
03010301	MIDDLE CONTROL PANEL	Test			2.0			7, 14, 15	E
		Inspect			2.0			7, 14, 15	E
		Repair			3.0			7, 14, 15	
		Replace			16.0			7, 14, 15	
03010302	LOWER CONTROL PANEL	Test			2.0			7, 14, 15	E
		Inspect			2.0			7, 14, 15	E
		Repair			3.0			7, 14, 15	
		Replace			16.0			7, 14, 15	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
03010303	CIRCUIT BREAKER PANEL	Test			1.0			7, 14, 15	E
		Inspect			1.0			7, 14, 15	E
		Repair			2.0			7, 14, 15	
		Replace			12.0			7, 14, 15	
03010304	TERMINAL BOARD A-4	Test			1.0			7, 14, 15	E
		Inspect			1.0			7, 14, 15	E
		Repair			2.0			7, 14, 15	
		Replace			10.0			7, 14, 15	
03010305	SPOTLIGHT	Adjust		1.0				1	
		Replace		1.0				1	
03010306	DEFROSTER	Inspect	1.0						E
		Replace			4.0			7, 14, 15	
03010307	HEATER	Inspect		2.0				1	E
		Repair			4.0			7, 14, 15	
		Replace			6.0			7, 14, 15	
03010308	WINDSHIELD WIPER	Repair		1.0				1	
		Replace		2.0				1	
03010309	COMMUNICATIONS EQUIPMENT								
0301030901	VHF/FM HANDHELD TRANSCEIVER	Repair					8.0		
		Replace		1.0				1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
0301030902	AN/PSN-11 INTERFACE & SWITCHBOX	Repair					6.0		
		Replace			1.0			7, 14, 15	
0301030903	LOUDHAILER	Test	0.5						E
		Repair					8.0		
		Replace	0.5						
0301030904	SINCGARS RADIO								H
0301030905	VHF/FM DSC TRANSCEIVER	Repair					12.0		
		Replace		1.0				1	
03010310	NAVIGATION EQUIPMENT	Test	0.5						E
		Inspect	1.0						E
0301031001	COMPASS	Inspect	2.0						E
		Replace		2.0				1	
		Calibrate		4.0				1	
0301031002	PLGR								I
03010311	MAST	Inspect	3.0						E
		Repair		3.0				1	
0301031101	NAVIGATION LIGHTS	Repair		1.0				1	
		Replace		1.0				1	
03010312	OPERATORS CAB ELECTRICAL SYSTEM	Test			4.0			7, 14, 15	E
		Inspect			4.0			7, 14, 15	E
		Repair				6.0		7, 14, 15	
		Replace			10.0			7, 14, 15	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
030104	ANCHOR ASSEMBLY	Inspect	1.0						E
		Repair		1.0				1	
		Replace		1.0				1	
0302	CONTAINERS	Clean	1.0						E
		Inspect	2.0						E
		Repair			4.0			7	
		Replace					8.0		
0303	WINCH								AC
030301	WINCH DIESEL ENGINE								AD
030302	WINCH ASSEMBLY	Clean			8.0			7	E
		Test			4.0			7	E
		Inspect			4.0			7	E
		Service	4.0						
		Repair			4.0			7	
		Replace	3.0						

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
02	**ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF)**								
03	**MODULAR WARPING TUG (WT)**								
0301010101	DIESEL ENGINE	Inspect	4.0						E
		Service	4.0	4.0					E
		Repair				30.0		7, 27-218	
		Replace			120.0			7, 27-218	
		Overhaul					80.0		
030101010101	ENGINE BLOCK ASSEMBLY	Inspect	2.0						E, J
		Repair				6.0		7, 27-52	J
		Replace				120.0		7, 27-52	J
030101010102	CYLINDER HEAD ASSEMBLY	Clean				5.0		7, 53-85	K
		Inspect			6.0			7, 53-85	K
		Repair				12.0		7, 53-85	K
		Replace			8.0			7, 53-85	K
030101010103	CRANKSHAFT ASSEMBLY	Repair			16.0			7, 86-106	L
		Replace			24.0			7, 86-106	L
030101010104	CAMSHAFT ASSEMBLY	Repair				12.0		7, 131-141	
		Replace				16.0		7, 131-141	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
030101010105	FLYWHEEL ASSEMBLY	Inspect			3.0			7, 107-112	M
		Repair				3.0		7, 107-112	M
		Replace			5.0			7, 107-112	M
030101010106	PISTON ASSEMBLY	Clean				2.0		7, 113-130	N
		Inspect				2.0		7, 113-130	N
		Rebuild				4.5		7, 113-130	N
		Replace				3.0		7, 113-130	N
030101010107	ENGINE BALANCE	Inspect				6.0		7, 131-141	O
		Adjust				3.0		7, 131-141	O
		Repair				8.0		7, 131-141	O
		Replace				8.0		7, 131-141	O
030101010108	FUEL SYSTEM	Inspect	0.5						E, P
03010101010801	FUEL PUMP	Inspect			1.0			7, 142-187	E
		Repair			4.0			7, 142-187	
		Replace			2.0			7, 142-187	
03010101010802	PRIMING PUMP	Inspect		1.5				1, 142-187	E
		Replace		2.0				1, 142-187	
030101010109	ELECTRIC GOVERNOR	Test		0.5					E
		Adjust			1.0			7, 142-187	
		Repair					5.0		
		Replace		2.0				1, 142-187	
030101010110	AIR INTAKE SYSTEM	Clean		2.0				1, 188-195	E, Q
		Inspect	0.5						E, Q
		Replace		3.0				1, 188-195	Q

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
03010101011001	BLOWER	Inspect			2.0	2.0		7, 188-195	E
		Adjust				4.0		7, 188-195	
		Repair				18.0		7, 188-195	
		Replace			8.0			7, 188-195	
03010101011002	TURBOCHARGER	Inspect			2.0			1, 188-195	E, R
		Repair					18.0		
		Replace			6.0			7, 188-195	
030101010111	LUBE OIL SYSTEM	Service	5.0	5.0					E, S
		Inspect	1.0						E, S
03010101011101	LUBE OIL PUMP	Inspect				3.0		7, 196-203	E
		Repair				4.0		7, 196-203	
		Replace				4.0		7, 196-203	
03010101011102	LUBE OIL COOLER	Clean			2.0			7	E
		Test			1.5			7, 25, 26	E
		Inspect			2.0			7	E
		Repair			4.0			7	
		Replace			2.0			7	
030101010112	FRESH WATER COOLING SYSTEM	Inspect	1.0						E, T
		Clean		1.0				1	
03010101011201	FRESH WATER PUMP	Inspect			2.5			7, 212-215	E
		Repair			6.0			7, 212-215	
		Replace			3.0			7, 212-215	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
03010101011202	FRESH WATER COOLER	Clean			2.0			7	E
		Test			2.0			7, 25, 26	E
		Inspect			1.0			7	E
		Repair			4.0			7	
		Replace			3.0			7	
030101010113	RAW WATER COOLING SYSTEM	Clean	1.0						E, U
		Inspect		2.0				1	E, U
03010101011301	RAW WATER PUMP	Inspect		2.0				1	E
		Repair			4.0			7, 212-215	
		Replace		2.5				1, 211-215	
030101010114	ELECTRICAL SYSTEM	Test			4.0			7, 14, 15	E, V
		Inspect			2.0			7, 14, 15	E, V
		Repair			3.0			7, 14, 15	V
		Replace		4.0	16.0			1, 7, 14, 15	V
03010101011401	STARTER	Inspect	1.0						E
		Repair				6.0		7, 14, 15	
		Replace		3.0				1, 14, 15	
03010101011402	COLD PACK STARTER	Clean		1.0				1	E
		Inspect	0.5						E
		Adjust		1.0				1, 14, 15	
		Repair		2.5				1, 14, 15	
		Replace		3.0				1, 14, 15	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
030101010115	OVER SPEED GOVERNOR	Test				1.0		7	E
		Adjust				1.5		7, 184-187	
		Repair				5.0		7, 184-187	
		Replace				4.0		7, 184-187	
030101010116	AUTO SHUTDOWN SYSTEM	Test		1.0					E
		Adjust			2.0			7, 14, 15	
		Repair				6.0		7, 14, 15	
		Replace		4.0			8.0	1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
02	**ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF)**								
03	**MODULAR WARPING TUG (WT)**								
0301010102	MARINE GEAR	Inspect	1.0						E
		Align			2.0			7, 17	
		Service	1.0	4.0				1	E
		Replace			28.0			4, 7, 17	
		Rebuild					25.0		W
030101010201	OIL SYSTEM	Inspect	0.5						E, X
		Repair		0.5				1, 11	X
03010101020101	OIL COOLER	Clean	1.0						E
		Inspect	1.0						E
		Replace		4.0				1	
03010101020102	LINES & HOSES	Inspect	0.2						E
		Repair		0.5				1	
		Replace		2.0				1	
03010101020103	OIL PUMP	Inspect	1.0						E
		Replace			2.0			1, 3	
03010101020104	ELECTRIC CONTROL VALVE	Repair				8.0			
		Replace			6.0			7, 14, 15	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
030101010202	GEAR MOUNTS	Inspect	0.5						E
		Replace			2.0			3, 7	
030101010203	COUPLING BLOCKS	Clean			1.0			7	E
		Inspect			1.0			7	E
		Replace			4.0			3, 7	
030101010204	OUTPUT FLANGE	Inspect	0.5						E
		Align			2.0			3, 7, 17	
		Replace			4.0			3, 7, 17	
030101010205	OUTPUT SEAL	Inspect			2.0			7	E
		Replace			2.0			3, 7	
030101010206	INPUT FLANGE (ENGINE CONNECTION)	Inspect	0.5						E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
02	**ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF)**								
03	**MODULAR WARPING TUG (WT)**								
0301010103	TRANSFER CASE	Clean		2.0				1	E
		Service	1.0	4.0				1	E
		Overhaul				24.0			
		Rebuild					24.0	2, 7, 17	Y
		Replace			24.0			2, 7, 17	
030101010301	OIL SYSTEM	Inspect	1.0						E
		Repair		2.5				1	
03010101030101	OIL PUMP	Inspect	4.0						E
		Replace		2.5				1	
03010101030102	HOSES & FITTINGS	Inspect	0.2						E
		Replace		2.0				1	
03010101030103	OIL COOLER	Inspect	0.2						E
		Replace		3.5				1	
030101010302	GEAR SHAFT	Inspect				5.0		7	E
		Repair				8.0		3, 7, 17	
		Replace				7.0		3, 7, 17, 19	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
03010101030201	UPPER SHAFT	Inspect				5.0		7	E
		Repair				8.0		3, 7, 17	
		Replace				7.0		3, 7, 17, 19	
0301010103020101	INPUT SEAL	Clean			2.0			7	E
		Inspect			2.0			7	E
		Replace			2.0			3, 7, 17, 19	
0301010103020102	OUTPUT SEAL	Clean			2.0			7	E
		Inspect			2.0			7	E
		Replace			2.0			3, 7, 17, 19	
03010101030202	INTERMEDIATE SHAFT	Inspect				2.5		7	E
		Repair				5.5		3, 7, 17	
		Replace				6.5		3, 7, 17, 19	
03010101030203	LOWER SHAFT	Inspect				4.0		7	E
		Repair				8.0		3, 7, 17	
		Replace				6.0		3, 7, 17, 19	
0301010103020301	INPUT SEAL	Clean			2.0			7	E
		Inspect			2.0			7	E
		Replace			2.0			3, 7, 17, 19	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
00	**MODULAR CAUSEWAY SYSTEM (MCS)**								
01	**CAUSEWAY FERRY (CF)**								
02	**ROLL-ON/ROLL-OFF DISCHARGE FACILITY (RRDF)**								
04	**FLOATING CAUSEWAY (FC)**								
0401	INTERMEDIATE SECTION								
040101	NON-POWERED MODULE								
04010101	HULL								
0401010101	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E
		Repair		4.0				1, 16	
		Overhaul					24.0		
0401010102	INTERIOR	Clean					4.0		
		Inspect					2.0		
		Test		6.0			5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
04010102	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
04010102	GUILLOTINE FITTINGS (CONT'D)	Replace		1.0				1	
04010103	FLEXORS	Inspect	0.5						E
		Replace	4.0						
0402	COMBINATION BEACH-END SECTION								
040201	NON-POWERED MODULES								
04020101	HULL								
0402010101	EXTERIOR	Clean		4.0				8, 9, 23, 24	E
		Inspect	1.0						E
		Service	1.5						E
		Repair		4.0				1, 16	
		Overhaul					24.0		
0402010102	INTERIOR	Clean					4.0		
		Inspect					2.0		
		Test					5.0	1, 25, 26	E
		Repair					6.0		
		Overhaul					50.0		
04020102	GUILLOTINE FITTINGS	Clean		1.0				8, 9, 23, 24	E
		Inspect	0.5						E
		Repair		3.0				1, 16	
		Replace		1.0				1	
04020103	FLEXORS	Inspect	0.5						E
		Replace	4.0						

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0403	GENERATOR SHELTER	Repair		4.0				1	
040301	ARMY TACTICAL QUIET GENERATOR (ATQG)								
040302	FUEL SYSTEM	Clean					1.0		E
		Inspect					1.0	7	
		Repair					5.0	1	
04030201	MANUAL FUEL PUMP	Clean		1.0				1	E
		Inspect	1.0	1.0				1	E
		Repair		2.0				1	
		Replace		2.0				1	
040303	LOUVERS	Clean		1.0				1	E
		Inspect	1.0						E
		Service		1.0					E
		Repair		3.0				1	
		Replace		4.0				1	
040304	ELECTRICAL SYSTEM	Test			2.0			7, 14, 15	E
		Repair		2.0	3.0			1, 7, 14, 15	
		Replace			5.0			7, 14, 15	
040305	FIRE SUPPRESSION SYSTEM	Test					4.0		E, G
		Inspect	1.0						E
		Repair		2.0			4.0	1, 14, 15	G
		Replace					40.0		G

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
0404	PERSONNEL SHELTER								
040401	HEAT PUMP	Clean		4.0				1	E
		Inspect		1.0				1	E
		Service			3.0			7, 21	E
		Repair			4.0			1, 7,14, 15, 21	
		Rebuild				8.0		7,14, 15, 21	
		Replace			8.0			7,14, 15, 21	
040402	INCINOLET								AE
040403	ELECTRICAL SYSTEM	Inspect	2.0						E
		Repair		12.0	3.0			1, 7, 14, 15	
		Replace			12.0			7, 14, 15	
040404	COMMUNICATIONS EQUIPMENT								
04040401	VHF/FM HANDHELD TRANSCEIVER	Replace	1.0					1	
		Repair					8.0		
0405	LIGHT TOWER								
040501	ELECTRICAL SYSTEM	Test			1.0			10, 15	E
		Inspect			0.5			10, 15	E
		Repair			6.0			10, 15	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	REMARKS CODE
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
04050101	BATTERIES	Test			1.0			10, 13	E
		Inspect	0.5						E
		Replace		2.0				1	
04050102	OIL PRESSURE UNIT	Test			1.0			10	E
		Repair			1.0			10	
		Replace			1.5			10	
04050103	STARTING CIRCUIT	Repair			2.0			10, 15	
		Replace			3.0			10, 15	
04050104	ENGINE TEMPERATURE UNIT	Test			1.0			10, 18	E
		Repair			2.0			10, 18	
		Replace			2.5			10, 18	
04050105	HOUR METER UNIT	Repair			1.5			10	
		Replace			2.0			10	
04050106	SHUTDOWN CIRCUIT	Repair			2.0			10	
		Replace			4.0			10	
04050107	LAMP SYSTEM	Test	1.0						E
		Repair			2.0			10, 15	
		Replace			6.0			10, 15	
04050108	LAMP BALLAST SYSTEM	Test			0.5			10, 15	E
		Repair			2.0			10, 15	
		Replace			3.0			10, 15	
040502	GENERATOR	Clean		2.0				1	E
		Inspect					12.0		

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
040502	GENERATOR (CONT'D)	Repair					18.0		
		Replace					24.0		
04050202	CONTROL PANEL	Test	1.0						E
		Inspect	1.0						E
		Repair			3.0			10, 15	
		Replace			4.5			10, 15	
04050205	DIESEL ENGINE	Service	4.0	2.0				1	E
		Adjust		3.0				1	
		Repair				16.0		10	
		Overhaul					16.0		
		Replace			16.0			10	
0405020501	ENGINE FUEL SYSTEM	Inspect	1.0						E
		Repair		4.0				1	
		Replace			8.0			10	
040502050101	FUEL PUMP	Inspect	1.0						E
		Repair				4.0		10	
		Replace			5.0			10	
040502050102	FUEL TANK	Clean	2.0						E
		Inspect	1.0						E
		Repair		2.0				1	
		Replace		2.0				1	
0405020502	ENGINE AIR SYSTEM	Inspect	1.0						E
		Repair		2.0				1	
		Replace		4.0				1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
0405020503	ENGINE COOLING SYSTEM	Inspect	1.0						E
		Repair		3.0				1	
		Replace		7.0				1, 10	
040502050301	FAN ASSEMBLY	Inspect	0.5						E
		Repair		1.5				1	
		Replace		2.0				1	
040502050302	COOLING WATER PUMP	Inspect						10	E
		Repair				4.0		10	
		Replace			5.0			10	
040502050303	RADIATOR	Clean	1.0						E
		Inspect		1.0				1	E
		Service	2.0	4.0				1	E
		Repair				4.0		10	
		Replace		2.0	3.0			1, 10	
0405020504	CYLINDER HEAD	Inspect		1.0				1	E
		Adjust					2.0		
		Repair					8.0		
		Replace					5.0		
0405020505	VIBRATION DAMPER	Repair					4.0		
		Replace					4.0		
0405020506	EXHAUST SYSTEM	Inspect	0.5						E
		Clean	1.5						E
		Repair			3.0			1, 16	
		Replace			5.0			1	

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			UNIT		DS	GS	DEPOT	TOOLS AND EQUIP REF CODE	
GROUP NO.	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		REMARKS CODE
0405020507	CRANKSHAFT	Inspect					4.0		
		Repair					8.0		
		Replace					8.0		
0405020508	PISTON	Inspect					4.0		
		Repair					4.0		
		Replace					4.0		
04050206	RUNNING GEAR	Service		2.0				1	E
		Repair		2.0				1, 10	
		Replace		18.0				1	
0405020601	TIRES	Inspect	0.5						E
		Repair				1.0		10	
		Replace				1.0		10	
04050207	SUPPORT TOWER	Inspect	0.5						E
		Service	1.0						E
		Repair			2.0			10	
		Replace			6.0			10	
04050208	TOWER RAISING ASSEMBLY	Inspect	0.5						E
		Repair			1.0			10	
		Replace			3.0			10	
04050209	ENCLOSURE	Inspect	0.5						E
		Repair			2.0			10	
		Replace			6.0			10	
0406	OFFSHORE ANCHOR	Clean	1.0						E
		Inspect	1.0						E

Table 1. MAC for Modular Causeway System. (MCS) (Continued)

(1) GROUP NO.	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIP REF CODE	(6) REMARKS CODE
			UNIT		DS	GS	DEPOT		
			C	O	F	H	D		
0406	OFFSHORE ANCHOR (CONT'D)	Repair			4.0			7	
		Replace		2.0				1	
0407	ONSHORE ANCHOR	Clean	1.0						E
		Inspect	1.0						E
		Repair			4.0			7	
		Replace		2.0				1	
0408	CONTAINERS	Clean	1.0						E
		Inspect	2.0						E
		Repair			4.0			7	
		Replace					8.0		

Table 2. Remarks for Modular Causeway System. (MCS)

REMARKS CODE	REMARKS
A	See MAC Chart for Causeway Ferry Diesel Engine Group Number 0101010101.
B	See MAC Chart for Causeway Ferry Marine Gear Group Number 0101010102.
C	See MAC Chart for Causeway Ferry Marine Gear Group Number 0101010103.
D	All repairs to the pump-jet must be done at depot level due to lack of technical information provided by the manufacturer, Schottel of Germany.
E	Preventive Maintenance Checks and Services (PMCS).
F	Includes replacement of level sensors, pump and motor.
G	Most work needs to be done by an authorized manufacturer's technical representative.
H	Refer to Army Technical Manual TM 11-5820-890-10-8.
I	Refer to Army Technical Manual TM 11-5825-291-13.
J	Includes cylinder liner, crankcase, crankcase breather and engine mounts.
K	Includes valves, springs, rocker arm, push rods, etc.
L	Includes valves, main bearings, vibration damper and crankshaft pulley.

Table 2. Remarks for Modular Causeway System. (MCS) (Continued)

REMARKS CODE	REMARKS
M	Includes drive shaft flex coupling.
N	Includes rings, connecting rod and connecting rod bearings.
O	Includes gear train, camshaft, idler gear, idler gear bearing, crankshaft timing gear, blower drive gear, and front and rear accessory drive gears.
P	Includes fuel water separator, fuel lines, fuel filter/strainer, fuel cooler, fuel manifold, fuel injector, fuel injector tube and valves.
Q	Includes air shutdown housing and air box check valves.
R	Includes intercooler and after cooler.
S	Includes lube oil pump driving gear, lube oil pressure regulator, lube oil relief valves, lube oil filter by-pass valve, lube oil cooler by-pass valve, lube oil pan and lube oil ventilation system.
T	Includes fresh water manifold and thermostat.
U	Includes raw water duplex strainer.
V	Includes starting batteries.
W	Rebuild of the marine gear is a depot level function.
X	Includes oil filter screen, pressure gage, temperature gage, selector valve, oil pump drive, output seal and gear mounts.
Y	Rebuild of the transfer case is a depot level function.
Z	See MAC Chart for Modular Warping Tug Diesel Engine Group Number 0301010101.
AA	See MAC Chart for Modular Warping Tug Marine Gear Group Number 0301010102.
AB	See MAC Chart for Modular Warping Tug Transfer Case Group Number 0301010103.
AC	Refer to Army Technical Manual TM 55-3950-204-14 & P.
AD	Refer to Army Technical Manual TM 5-2815-258-24.
AE	Refer to Army Technical Manual TM 55-1925-257-14&P.

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O	General Mechanics Rail and Marine Tool Kit	5180-00-629-9783	
2	O	Torque Wrench, 30-150 in. lbs 3/8 in. Drive	5120-00-230-6380	
3	O	Torque Wrench, 30-150 ft lbs ½ in. Drive	5120-00-247-2540	
4	D	Torque Wrench, 100-500 ft lbs	5120-00-542-5577	
5	D	Pinch Pry Bar 60	5120-00-224-1384	
6	D	Hammer, Hand, (sledge hammer) 10 lb	5120-00-251-4489	
7	D	General Mechanics Tool Kit	5180-00-177-7033	
8	O	Hammer, Hand, Scaling	5120-00-224-4111	
9	O	Wire Brush	7920-00-291-5815	
10	D	Automotive Tool Kit	5810-00-177-7033	
11	O	Wrench, Strap	5120-00-776-1840	
12	D	Wrench, Monkey	5120-00-277-3120	
13	D	Electrolyte Solution Battery Tester	6630-00-171-5126	
14	O	Fuse Puller and Tester	5120-00-319-3295	
15	O	Multimeter	6625-00-171-5126	
16	O	Welder Tool Kit	5180-00-754-0661	
17	D	Dial Indicator	5120-00-402-9619	
18	D	Thermometer, Test	6685-00-056-3109	
19	G	Wheel Puller		
20	D	Pliers, Snap Ring		
21	D	Tool Kit, Compressor	5180-01-188-5075	
22		Megger	6625-01-015-1451	
23	O	Power Washer		
24	O	Scraper, Long Handle		

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
25	O	Air Tester		
26	O	Air Compressor		
27	D	Adaptor (1 5/8 in. Dia plugs) (Cylinder Block)		J21850
28	D	Aftercooler Adaptor Cup Plug Installer		J28711
29	D	Aftercooler Adaptor Plug Remover and Installer		J25275
30	D	Aftercooler Cup Plug Installer (2 ½ in. Dia)		J24597
31	D	Alignment Tool		J21799
32	D	Block Assembly Wrench Set		J25451-B
33	D	Block Thread Repair Kit		J29513
34	D	Cup Plug Installer (1 in. Dia)		J33420
35	D	Cylinder Block Air Box Plugging Tool		J29571
36	D	Cylinder Block Line Boring Tool		J29005
37	D	Cylinder Block Tap		J25384
38	D	Cylinder Diameter Checking Gage		J5347-B
39	D	Cylinder Hone Set (2½ in. to 5¾ in.)		J5902-01
40	D	Dial Bore Gage Master Setting Fixture		J23059-01
41	D	Dial Indicator Set		J22273-01
42	D	Diesel Engine Parts Dolly		J6387
43	D	Handle		J7079-02
44	D	Loctite “Chisel” Gasket Remover		PT7275
45	D	Master Ring Gage for Block Bore		J24564

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
46	D	Overhaul Stand (6V and 8V engines)		J29109
47	D	Overhaul Stand (12V and 16V engines)		J9384-04
48	D	Overhaul Stand Adaptor (6V and 8V engines)		J33850
49	D	Overhaul Stand Adaptor (12V and 16V engines)		J8650
50	D	Pipe Plug Remover/Installer (1/8 in. Dia)		J34650
51	D	Special Plug Remover (dry cylinder block)		J21995-01
52	D	Special Plug Remover		J23019
53	D	Load Cell Kit, Cam Follower Roller Fixture (Cylinder Head)		J33421-25
54	D	Cam Follower Service Fixture		J33421-A
55	D	Cylinder Head Bolt Hole Cleanout Tap		J25384
56	D	Cylinder Head Guide Studs (set of two)		J24748
57	D	Cylinder Head Holding Plate Set		J3087-01
58	D	Cylinder Head Lifting Fixture		J22062-01
59	D	Engine Barring Tool		J22582
60	D	Feeler Gage Set (.0015 in. to .015 in.)		J3172
61	D	Feeler Stock (.0015 in.)		J23185
62	D	Fuel Line Nut Wrench		J8932B
63	D	Injector Fuel Hole Brush		J8152
64	D	Pressure Checking Tool		J28454
65	D	Push Rod Remover (set of three)		J3092-01
66	D	Slide Hammer		J2619-01

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
67	D	Spring Tester		J22738-02
68	D	Valve Bridge Holding Fixture		J21772
69	D	Valve Bridge Gage Remover (broken)		J7453
70	D	Valve Bridge Guide Remover Set		J7091-01
71	D	Valve Bridge Guide Installer		J7482
72	D	Valve Guide Cleaner		J5437
73	D	Valve Guide Installer (machined)		J21520
74	D	Valve Guide Remover		J6569-A
75	D	Valve Seat Dial Gage		J8165-2
76	D	Valve Guide Oil Seal Installer		J35373
77	D	Valve Seat Grinder (Model VIP)		J7040-A
78	D	Valve Seat Grinder		J8165-1A
79	D	Valve Seat Grinder Adaptor Set		J24566
80	D	Valve Seat Insert Installer		J24357
81	D	Valve Seat Insert Remover Assembly		J23479-492
82	D	Valve Seat Insert Remover Collet		J23479-33
83	D	Valve Spring Checking Gage		J25076-B
84	D	Valve Spring Compressor		J7455-A
85	D	Water Nozzle Installer (intermediate)		J24857-A
86	D	Front Oil Seal Installer (6V and 8V) (Crankshaft)		J9783
87	D	Rear Oil Seal Installer (std and ovs seals)		J21112-B
88	D	Handle		J3154-A
89	D	Guide Studs (c/s with dowels)		J9727-2
90	D	Guide Studs (c/s without dowels)		J9727-5

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
91	D	Expander (std seal)		J4239
92	D	Handle		J8092
93	D	Guide Studs		J25002
94	D	Expander (ovs seal, no handle or guide studs)		J8682
95	D	Sleeve Installer (ovs seal)		J21983
96	D	Installer		J9727-A
97	D	Handle		J3154-1A
98	D	Expander (std seal, no handle)		J22425-A
99	D	Expander (ovs seal, no handle or guide studs)		J4195-01
100	D	Installer (ovs seal)		J4194-01
101	D	Dial Indicator Set		J5959-01
102	D	Engine Barring Tool		J22582
103	D	Flywheel Housing Alignment Studs		J1927-01
104	D	Micrometer Ball Attachment		J4757
105	D	Torque Wrench Adaptor (12V and 16V engines)		J22898-A
106	D	Universal Bar Type Puller		J24420-B
107	D	Flywheel Lifting Fixture (Flywheel)		J25026
108	D	Flywheel Lifting Tool		J6361-01
109	D	Oil Seal Removing and Replacing Tool Set		J3154-04
110	D	Slide Hammer Set		J5901-01
111	D	Flywheel Housing Aligning Studs (set of four) (Flywheel Housing)		J1927-01
112	D	Flywheel Housing Concentricity Gage Set		J9734-C

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
113	D	Connecting Rod Holding Fixture (Piston, Connecting Rod and Cylinder Liner)		J7632
114	D	Cylinder Liner Master Ring Gage		J24564
115	D	Cylinder Hone Set (2½ in. to 5¾ in. range)		J5902-01
116	D	Cylinder Liner Hold-Down Tool		J24565-02
117	D	Cylinder Liner Remover Set		J24563-A
118	D	Dial Bore Gage Setting Fixture		J23059-01
119	D	Dial Indicator Set		J24898
120	D	Feeler Gage Set		J3172
121	D	Micrometer Ball Attachment		J4757
122	D	Piston Crown Identification Gage		J25397-A
123	D	Piston Pin Alignment Tool		J24285
124	D	Piston Pin Retainer Installer		J23762-A
125	D	Piston Pin Retainer Leak Detector (plastic)		J23987-B
126	D	Piston Pin Retainer Leak Detector (all metal)		J35134
127	D	Piston Ring Compressor		J24227
128	D	Piston Ring Remover Installer		J8128
129	D	Piston to Liner Feeler Gage Set		J5438-01
130	D	Seal Ring Compressor		J24226
131	D	Accessory Drive Hub Oil Seal Aligning Tool (Camshaft)		J21166
132	D	Alternator Drive Step-Up Gear Aligning Gage		J29893
133	D	Balance Weight Cover Oil Seal Installer		J9791
134	D	Camshaft Gear Puller		J1902-B

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
135	D	Camshaft Gear Puller Adaptor Plate Set		J6202-01
136	D	Camshaft and Oil Pump Gear Installer		J1903
137	D	Dial Indicator and Attachment Set		J5959-01
138	D	Puller Adaptor		J7932
139	D	Slide Hammer Set		J6471-02
140	D	Spring Scale		J8129
141	D	Universal Bar Type Puller		J24420-B
142	D	Pullers (Fuel & Governors)		J6270-1
143	D	Oil Seal Remover and Installer		J6270-3
144	D	Buffing Wheel (brass wire)		J7944
145	D	Fuel Pipe Socket		J8932-B
146	D	Fuel System Primer		J5956
147	D	Injector Auxiliary Tester		J22640-A
148	D	Injector Body Reamer		J21089
149	D	Injector Calibrator		J22410
150	D	Injector Carbon Remover Set		J9418
151	D	Injector Holding Fixture		J22396
152	D	Injector Nut Seal Ring Installer		J29197
153	D	Injector Service Tool Set		J23435-C
154	D	Body Brush		J8152
155	D	Nut Socket Wrench		J4983-01
156	D	Rack Hole Brush		J8150
157	D	Spray Hole Cleaner Vice		J4298-1
158	D	Spray Tip Carbon Remover (high sack)		J9464-01

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
159	D	Spray Tip Carbon Remover (low sack)		J24838
160	D	Spray Tip Driver and Brushing Cleaner		J129101
161	D	Wire Sharpening Stone		J8170
162	D	Injector Tag Remover and Installer		J24767
163	D	Injector Test Oil (5, 10, 30 and 55 GAL)		J26400
164	D	Injector Tester		J23010-B
165	D	DDEC Injector Adaptor Kit		J23010-500
166	D	Lapping Block Set		J22090-A
167	D	Master Injector Calibrating Kit		J35369
168	D	Needle Valve Lift Gage		J9462-02
169	D	Polishing Compound		J23038
170	D	Polishing Stick Set		J22964
171	D	Spray Tip Cleaning Wire (.007 in. Dia holes)		J21462-01
172	D	Spray Tip Flow Gage		J25600-B
173	D	Field Modification Kit		J25600-103
174	D	Spring Tester		J29196
175	D	Tip Conical. Gage and Rack Freeness Tester		J29584
176	D	Cylinder Head Holding Plate Set		J3087-01
177	D	Cylinder Liner Depth Gage		J22273-01
178	D	Injector Protrusion Gage		J25521
179	D	Injector Tube Service Tool Set		J22525-B
180	D	Injector Tube Swaging Tool		J28611-A
181	D	Fuel Pump Tool Set		J1508-E

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
182	D	Fuel Pump Wrench		J4242
183	D	Control Link Operating Lever Bearing Remover and Installer		J8985
184	D	Governor Cover Bearing Installer		J21068
185	D	Governor Cover Bearing Remover and Installer		J21967-01
186	D	High Speed Spring Retainer and Installer		J5345-12
187	D	Governor Weight Shaft Retaining Ring Installer		J36840
188	D	Blower Alignment Tool (Air System)		J33001
189	D	Blower Clearance Feeler Set		J1698-02
190	D	Blower Service Tool Set		J6270-G
191	D	Installer, Lip Type Oil Seal/Water Sleeve		J35787-A
192	D	Dial Indicator Set (magnetic base)		J7872
193	D	Turbocharger Inlet Shield		J26554-A
194	D	Adaptor Cup Plug Installer		J28711
195	D	Adaptor Plug Remover and Installer		J25275
196	D	Bar Type Gear Puller (Lubrication System)		J24420
197	D	Oil Pump Drive Gear Installer (16V)		J9380
198	D	Oil Pump Drive Shaft Gear Installer (6V and 8V)		J22397
199	D	Oil Pump Driven Gear Installer (16V)		J9381
200	D	Oil Pump Driven Shaft Gear Installer (6V and 8V)		J22398

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
201	D	Oil Pump Driving Gear Installer (6V and 8V)		J22285
202	D	Spring Tester (1-125 lbs)		J29196
203	D	Strap Wrench (spin-on filter)		J24783
204	D	Cooling System Radiator Cap Pressure Tester (Cooling System)		J24460-01
205	D	Fingers, Fan Hub Nut Socket (16V)		J6534-8
206	D	Handle		J7079-2
207	D	Oil Seal Installer		J8501
208	D	Pliers		J4646
209	D	Puller		J24420-A
210	D	Socket, Fan Hub Nut (16V)		J22556-2
211	D	Thermostat Seal Installer		J8550
212	D	Water Pump Bearing and Gear Installer		J25257
213	D	Water Pump Impeller/Gear Slip Torque Tool		J33765
214	D	Water Pump Seal Remover Set		J22150-B
215	D	Water Pump Impeller Slip Checking Fixture		J34034
216	D	Slide Hammer (Electrical Equipment)		J23907-1
217	D	Tachometer Drive Alignment Tool Set		J23068
218	D	Tachometer Drive Shaft Remover		J5901-3
219	O	Coveralls, Eye Protection, Respirator, Gloves (Zodiac Boat Hull)		
220	O	Grease Pencil Or Chalk		

Table 3. Tools and Test Equipment for Modular Causeway System. (MCS) (Continued)

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
221	O	Saber Saw With Metal Cutting Blades		
222	D	Grinder or Disc Sander w/ Coarse Medium Grit		
223	O	Measuring Tape		
224	D	Scissors, Shears		
225	O	Cardboard, Kraft Paper		
226	D	Disposable Containers, Mixing Sticks		
227	D	Disposable Brushes, Putty Knife		
228	D	Polyethylene Sheet		
229	D	Heavy Cardboard, Thin Plywood, Sheet Metal		
230	D	Acetone		

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
EXPENDABLE AND DURABLE ITEMS LIST (EDIL)

INTRODUCTION

Scope

This work package lists expendable and durable items to help you will need to operate and maintain the Causeway Ferry. 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 listing and is referenced in the narrative instructions to identify the item (e.g., Use antiseize compound (Item 3, WP 0106 00)).

Column (2) - Level. This column identifies the lowest level of maintenance that requires the listed item. (C = Operator/Crew, O = Unit/AVUM, F = Direct Support/AVIM, H = General Support, D = Depot)

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

Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number (PN). This column provides the other information you need to identify the item.

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

EXPENDABLE AND DURABLE ITEMS LIST

Table 1. Expendable and Durable Items List. (EDIL)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE AND PART NUMBER	(5) U/M
1	O	8040-01-250-3969	Adhesive, general purpose, medium strength threadlocker (05972) 242	EA
2	O	8040-00-995-0590	Adhesive, general purpose silicone rubber RTV paste, MIL-A-46106 (71984) SILASTIC 732 RTV	TU
3	O	8030-00-251-3980	Antiseize Compound, 1 lb can thread compound (81349) MIL-A-907	LB
4	O	8020-00-200-3487	Brush, Paint, multipurpose, 4 in. brush (80244) GSAPD 8020-00-200-3487	EA
5	O	6850-01-431-9025	Cleaner, Type II, 50 lb container (81349) MIL-C-29602	CO
6	O	7920-00-044-9281	Cloth, Cleaning, contains 10 lbs, white, 12 in. X 16 in. (58536) A-A-59323	BX

Table 1. Expendable and Durable Items List. (EDIL) (Continued)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE AND PART NUMBER	(5) U/M
7	O	9140-01-412-1311	Diesel Fuel, winter grade, DF1, low sulphur (81348) A-A-52557	GL
8	O	9150-010197-7689	Grease, Automotive and Artillery, 6.5 lb can, conforms to PPP-C-96, Type V Class 2 (81399) MIL-10924-D	CN
9	C	9150-00-929-7946	Grease, lubriplate TU (73219) 1200-2	14 OZ
10	H	9150-00-235-5555	Grease, General Purpose, mineral oil and molybdenum disulfide, low evaporation, corrosive and salt water resistive (81349) MIL-G-23549	CN
11	O	9150-00-252-6383	Hydraulic Fluid, Petroleum Base, 1 qt can, conforms to PPP-C-96, Type 1 Class 3 (81349) MIL-H-5606	QT
12	O	5970-00-962-3335	Insulating Varnish, Electrical, 15 oz brush top can, rubber-textured electrical coating (D2607) 80-6100-3260-1	CN
13	F	3439-01-298-1121	Kit Solder, Aluminum, consists of solder and flux (70334) 29245	KT
14	O	9150-01-035-5392	Lubricating Oil, Gear, 1 qt can, 80W90 Grade (81349) M2-105-1-80W90	QT
15	O	9150-00-993-6621	Lubricating Oil, General Purpose, 55 gallon drum, conforms to PPP-D-729, Type 2 (19135) DTE-25	DR
16	O		Neoprene Rubber Strip, blended rubber sponge strip with pressure sensitive backing (39428) 8694K89	RL
17	O		Paint, Amercoat 385 #27 Haze Grey, epoxy (09869) 353-070	GL
18	O		Paint, Amercoat 385 AS Mid Graphite Grey, anti-skid (09869) 372-130	GL
19	O		Paint, Amercoat 385 PA Oxide Red Primer, Type I, Class I (09869) 373-930	GL

Table 1. Expendable and Durable Items List. (EDIL) (Continued)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE AND PART NUMBER	(5) U/M
20	O	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
21	O	7920-00-205-1711	Rag, Wiping cotton, contains 50 lbs, mixed colors (80244) 7920-00-205-1711	BE
22	O	8020-00-597-4759	Roller Kit, Paint, consists of paint tray and roller (81348) H-R-550	KT
23	O		Sealant, RTV Silicone, Tube (3M493) #6BC	EA
24	O	8030-00-339-0310	Sealing Compound, 50 cc bottle, brown liquid, hydraulic sealant (05972) 569-31	BX
25	F	8030-01-054-3968	Sealing Compound, 100 cc plastic squeeze bottle, Type 2, Grade M, purple liquid (05972) 222-21	BX
26	O	8030-00-204-9149	Sealing Compound, 250 cc collapsible tube paste, pipe thread sealant with teflon (05972) 592-41	TU
27	O	6505-01-053-2634	Sodium Bicarbonate Injection, USP, baking soda (32288) NDC00517-0639-25	BX
28	O	4235-01-416-8465	Spill Clean-Up Kit, Hazardous Material, sorbent pads with disposal bags used for petroleum spills (50378) P-SKFL31	KT
29	O	7920-00-057-2087	Sponge, rectangular sponge 6 in. X 4 in. X2 in. (18873) 8AF	EA
30	F	5975-00-156-3253	Strap, Tiedown, plastic 13.350 in. Comp A, Type 1 (56501) TY-28M	HD
31	O	8030-00-889-3535	Tape, Antiseize, white, 0.50 in wide X 260 in. long X .0035 in. thick (58536) AA50892-2-2	RL
32	O	5970-01-290-1623	Tape, Electrical, black linerless rubber splicing tape (75037) 130C1INX30FT	RL
33	O	5970-00-240-0617	Tape, Insulation, Electrical, (75037) SCOTCH 23 3/4 IN. BLACK	RL
34	O	7510-00-266-6710	Tape, Pressure Sensitive Adhesive, 60 yard roll (81346) ASTM D-6123	RL

Table 1. Expendable and Durable Items List. (EDIL) (Continued)

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGE AND PART NUMBER	(5) U/M
35	F	5970-01-124-7344	Tubing, Heat Shrink, black, 0.250 in. inside diameter, Class 2 (06090) MIL-LT-1/4	FT
36	O	6850-00-001-4194	Water Indicating Paste, 1 oz metal coated tube (81349) MILW83779	PG
37	O	6550-01-310-1677	Water, Reagent Distilled, four 1 gallon per package (07TA6) C4350-1A	PK
38	O	5510-00-268-3476	Wedge, Wood, shoring wedge, Type B1, 3 in. X 1.5 in. X 12 in (80064) S8800-461043	EA
39	F	9330-01-250-2958	Wrap, Spiral, 0.0240 in. wall thickness, 0.420 in. inside diameter, 250 ft long (06383) T50N	EA
40	O	8010-01-349-8055 8010-01-380-3306	Zinc, Inorganic, No. 531, paint, primer, (IC531) 0N4K0	4 GL 1 GL

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE
CAUSEWAY FERRY
TOOL IDENTIFICATION LIST (TIL)

INTRODUCTION

Scope

This work package lists all common tools and supplements and special tool/fixtures needed to maintain the Causeway Ferry.

Explanation of Columns in the Tool Identification List

Column (1) - Item Number. This number is assigned to the entry in the list and is referenced in the initial setup to identify the item (e.g., Respirator (Item 4, WP 0107 00)).

Column (2) - Item Name. This column lists the item by noun nomenclature and descriptive features (e.g. Gage, belt tension).

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

Column (4) - Part Number/CAGEC. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. The manufacturer's Commercial and Government Entity Code (CAGEC) is also included.

Column (5) - Reference. This column identifies the authorizing supply catalog or RPSTL for items listed in this work package.

TOOL IDENTIFICATION LIST

Table 1. Tool Identification List (TIL)

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER/CAGEC	(5) REFERENCE
1	Apron, utility	8415-00-082-6108	A-A-55063 (64067)	SC 4910-95-A72
2	Bender, tube, hand		GGG-B-191 (81348)	SC 4920-99-A07
3	Brush, stencil (soft bristle)	7520-00-223-8000	A-A2903 (58536)	SC 4910-95-A72
4	Brush, wire scratch	7920-00-291-5815	7920002915815 (83421)	SC 4910-95-A72
5	Charger, battery	6130-01-202-4084	141-142A (05884)	
6	Cleaner power washer	4940-01-086-2087	PVISM15HE-2R (56077)	

Table 1. Tool Identification List (TIL) (Continued)

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER/CAGEC	(5) REFERENCE
7	Compressor unit, reciprocating, power drive	4310-00-861-9820	MILC13874 (81349)	SC 4940-95-A64
8	Crimping tool, terminal hand	4920-00-944-0757	MIL-C-22520 (81349)	SC 4920-99-A16
9	Crowbar	5120-00-224-1392	9150189 (18876)	
10	Gage stick, petroleum	5210-00-092-8053	MW6010 (95145)	
11	Gage, pressure, dial indicating	6685-01-249-1147	MS17856-6 (96906)	
12	Gloves, chemical	8415-00-266-8677	ZZ-G-381 (81349)	
13	Gloves, men’s and women’s (leather palm)	8415-00-634-4658	A-A-50021 (58563)	
14	Goggles, industrial (chipping, chemical)	4240-00-052-3776	ANSI Z87.1 (80204)	
15	Goggles, sun, wind, and (safety)	8465-01-004-2893	MIL-G-43914 (81349)	
16	Heater, gun type, electric	4940-00-785-1162	MIL-H-45193 (81349)	SC 4920-99-A16
17	Helmet, safety (blue)	8415-00-279-2205	ISEA/ANSI Z89.1 (80204)	
18	Helmet, safety (brown)	8415-00-889-3768	ISEA/ANSI Z89-1 (80204)	
19	Hose assembly, nonmetallic	4720-00-203-3912	A-A-59270 (58536)	
20	Ladder, straight	5440-01-003-7342	FH1012 (01252)	
21	Life preserver, vest	4220-00-022-2518	MIL-L-17653 (81349)	
22	Lubricating gun, hand	4930-00-965-0288	30415 (77335)	
23	Multimeter	6625-01-265-6000	27/FM W/ACCE (89536)	

Table 1. Tool Identification List (TIL) (Continued)

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER/CAGEC	(5) REFERENCE
24	Pan, drain	4910-00-387-9592	MIL-P-45819 (81349)	
25	Pliers, (wire cutter, combination)	5110-01-423-8503	659ACP (55719)	
26	Press, arbor, hand operated	3444-00-243-2654	A-A-51199 (58536)	SC 4910-95-A72
27	Puller, battery terminal	5120-00-944-4268	54000 (36540)	
28	Puller, fuse	5120-00-224-9453	34-001 (30119)	
29	Pump, oil suction	4320-00-049-7564	D15-619-A-47 (90099)	
30	Respirator, air filtering	4240-00-883-6519	85556 (55799)	
31	Scale, tension	4910-00-779-6832	J 8129 (33287)	
32	Scraper, ship (copper alloy)	5110-00-224-9929	5110-00-224-9929 (80244)	
33	Shackle, ½ in. 2 ton			
34	Shackle, 1 ¾ in. 40 ton			
35	Siphon assembly fuel	4520-00-874-0429	13208E6234 (81337)	
36	Sling, 53,000 lb 25 ft (brown)			
37	Sling, 5300 lb 6 ft (green)			
38	Sling, 66,000 lb 30 ft (olive)			
39	Sling, 8400 lb 20 ft (yellow)			
40	Soldering iron, electric	3439-00-640-3760	MIL-S-4938 (81349)	SC 4920-99-A16
41	Test set, compartment air	6685-00-327-2957	805-1749233 (80064)	
42	Tester, antifreeze solutions (hydrometer)	6630-00-105-1418	7584L (78039)	

Table 1. Tool Identification List (TIL) (Continued)

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER/CAGEC	(5) REFERENCE
43	Tool kit, electrician's	5180-01-107-3976	WK-7 (08666)	
44	Tool kit, general mechanic's	5180-00-177-7033	SC5180-90-CL-N26 (50980)	SC 5180-90-N26
45	Tool kit, general mechanic's (rail and marine)	5180-00-629-9783	SC5180-90-CL-N55 (50980)	SC 5180-90-N55
46	Wrench, pipe (10 in.)	5120-00-277-1485	5120-00-277-1485 (83421)	SC 4910-95-A72
47	Wrench, torque (0-175 ft lbs)	5120-01-396-5751	1753LDF (08194)	
48	Wrench, torque (100-600 ft lbs)	5120-00-221-7983	SW130-301	
49	Wrench, torque (10-250 in. lbs)	5120-01-356-0743	J24405 (33287)	
50	Wrench, torque (150-750 in. lbs)	5120-01-374-1931	GGG-W-2843 (81348)	
51	Socket wrench set	5120-00-204-1999	B107.1 (05047)	
52	Socket, socket wrench	5130-00-227-6679	B107.2 (80204)	
53	Key, socket head screw (allen wrench)	5120-00-198-5387	57042 (74445)	

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  - Circuit Controlled By 3A3CB1-3A3CB10 Is Not Functioning, Troubleshooting Procedures 0059 00 001
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LEGEND:

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A1B1	ENGINE STARTER
A2	THRUSTER & COMPONENTS
A2B1	THRUSTER STEERING POSITION SYNCHRO
A2JB2	THRUSTER JUNCTION BOX
A2JB1	HYDRAULIC CONTROL
A2S2	THRUSTER GEAR BOX OIL LEVEL SW
A3	PROPULSION MODULE JUNCTION BOX
A4	ENGINE JUNCTION BOX & E STOP SW
A5	BILGE PUMP CONTROL PANEL
A6	CIRCUIT BREAKER PANEL
A7	SINGLE BILGE PUMP CONTROL PANEL
A8	VENT FAN RELAY ENCLOSURE
A9	THRUSTER DIR/ AUX. BATT. JUNCTION BOX ASSY. ENCLOSURE
B1	VENT FAN MOTOR (B1)
BT	BATTERY
G1	ALTERNATOR
JB1	JUNCTION BOX FOR #1 BILGE PUMP (B2)
JB2	JUNCTION BOX FOR #3 BILGE PUMP (B4)
JB3	NATO RECEPTACLE
JB5	JUNCTION BOX FOR #5 BILGE PUMP (B6)
JB6	JUNCTION BOX FOR #6 BILGE PUMP (B7)
JB8	JUNCTION BOX FOR #4 BILGE PUMP (B5)
L1	COLD START SOLENOID
L2/L3	CLUTCH ENGAGE FORWARD/ENGAGE BACKFLUSH SOLENOIDS
S2	CO2 PRESSURE SWITCH
S8	FIRE THERMAL DETECTOR LOCATED AFT
S9	FIRE THERMAL DETECTOR LOCATED MIDDLE
VR1	REGULATOR FOR ALTERNATOR

LEGEND NOTES: 1. ENGINE COMPONENTS INCLUDE ACTUATOR FOR SPEED GOVERNOR, ELECTRONIC OVERSPEED SWITCH, PRESSURE SWITCHES, TEMP & PRESS SENDING UNITS ETC. SEE SCHEMATIC E26554. THESE ARE WIRED TO ENGINE IN HARNESS KMB-1

2. HYD CONTROL BOX CONNECTS TO STEERING SOLENOIDS.

3. THIS LEGEND LISTS ONLY THOSE COMPONENTS CONNECTED IN PROPULSION MODULE & DOES NOT ADDRESS COMPONENTS WIRED ON SUBASSEMBLIES.

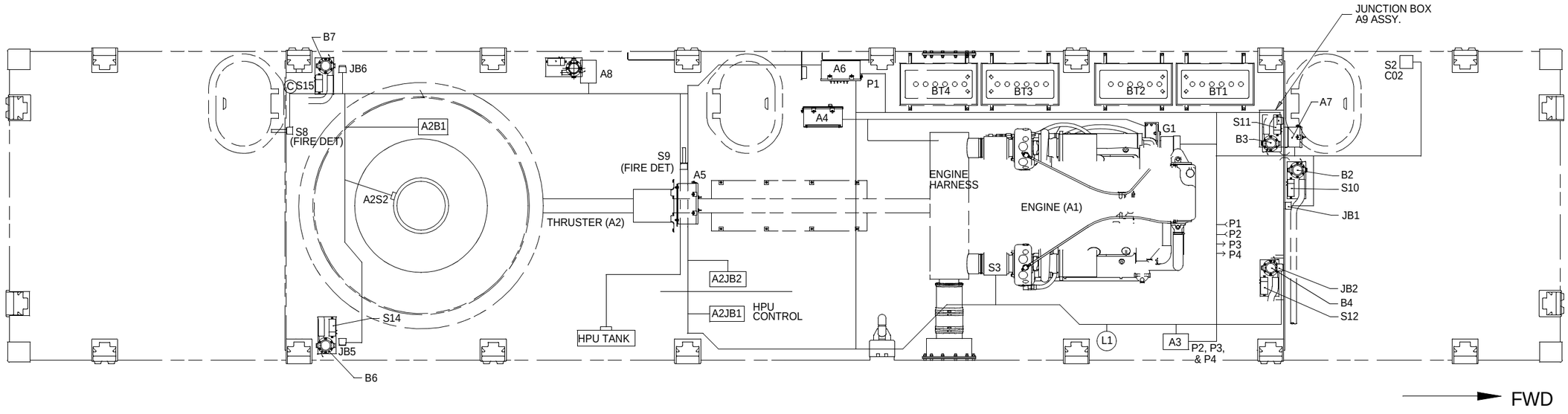


Figure 1. MCS Propulsion Module Electrical Assembly Wiring Diagram (Sheet 1).

CABLE LEGEND

CABLE ID.	DESCRIPTION
P24	24VDC DISTRIBUTION
KEH	CLUTCH CONTROL
KMB	ENGINE CONTROL
KL	STEERING CONTROL
CFR	FIRE CO2 RELEASE SWITCH
CBP	BILGE PUMP AND INDICATION CONTROL
CF	FIRE/FLOOD DETECTORS
CFD	BILGE PUMPS/SWITCHES
HPU	HYD. POWER UNIT
VF	VENT FAN
SWE	CABLE/HARNESS "SUPPLIED WITH EQUIP"
P1	24V PLUG/CABLE ASSEMBLY
P2	PLUG/CABLE ASSEMBLY
P3	PLUG/SHIELDED CABLE ASSEMBLY
P4	PLUG/CABLE ASSEMBLY
P5	PLUG/CABLE ASSEMBLY

DESIGNATION	TYPE	DESCRIPTION	O.D.
D3	LSDHOF-3	2/C 16 AWG	.425
D4	LSDHOF-4	2/C 14 AWG	.460
D9	LSDNW-9	2/C 10 AWG	.545
D30	LSDHOF-30	2/C 5 AWG	.960
D50	LSDNW-50	2/C 3 AWG	.910
T3	LSTHOF-3	3/C 16 AWG	.450
T4	LSTHOF-4	3/C 14 AWG	.480
T9	LSTNW-9	3/C 10 AWG	.625
F4	LSFNW-4	4/C 14 AWG	.513
F9	LSFNW-9	4/C 10 AWG	.630
4SJ20	LS4SJ-20	4/C 20 AWG	.320
2SJ18	LS2SJ-18	2/C 18 AWG	.310
I/O	I/O CABLE	1/C I/O AWG	.910

DESIGNATION	TYPE	DESCRIPTION	O.D.
-	-	-	-
M19	LSMHOF-19	19/C 16 AWG	.705
M14	LSMHOF-14	14/C 16 AWG	.635
M37	LSMHOF-37	37/C 16 AWG	.925
3SJ18	LS3SJ18	3/C SHLD 18 AWG	.325
3SU-7	LS3SU-7	7 SHLD TRIADS	.910
SWE	VARIOUS	SUPPLIED WITH EQUIP.	-
S06	2S0-6	2/C 6 AWG	.825
BATT	5JBX-1011-02P	1/C 1/O BK	.491
BATT	5JBX-1011-03P	1/C 1/O RED	.491

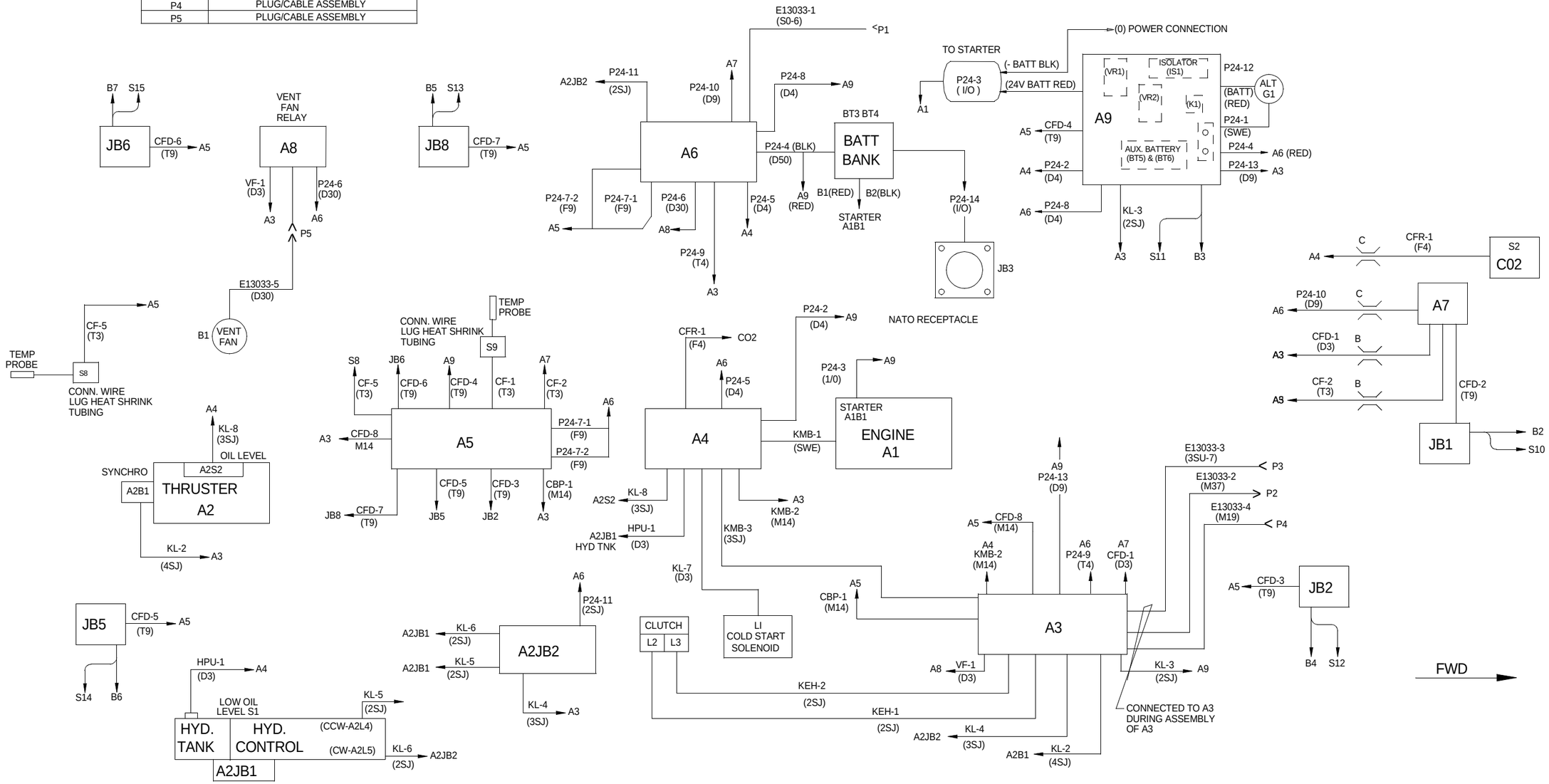


Figure 1. MCS Propulsion Module Electrical Assembly Wiring Diagram (Sheet 2).

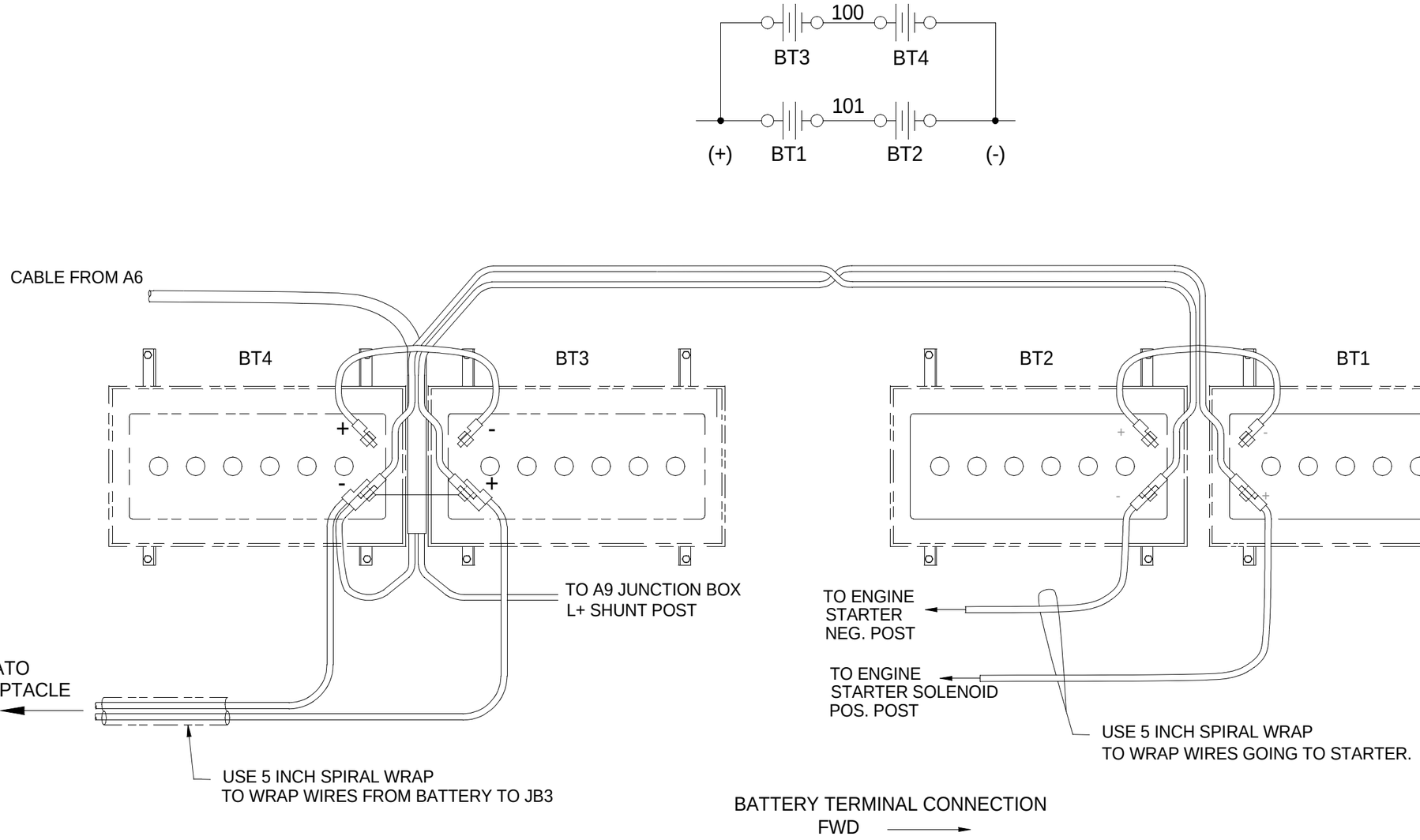


Figure 1. MCS Propulsion Module Electrical Assembly Wiring Diagram (Sheet 3).

PROPULSION MODULE
UNIT 1 IF LOCATED STBD
UNIT 2 IF LOCATED PORT

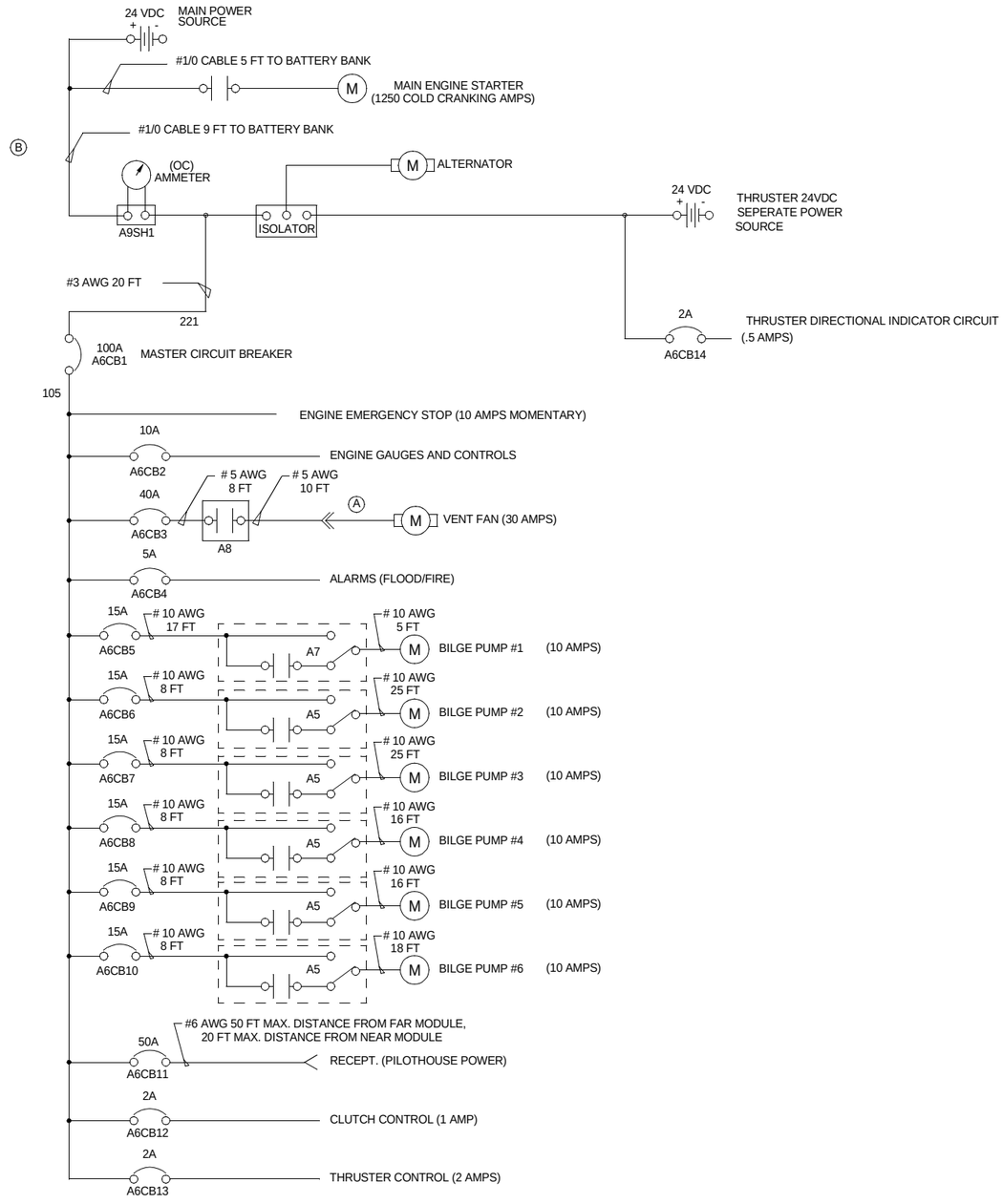


Figure 2. MCS Propulsion Module One Line Diagram.

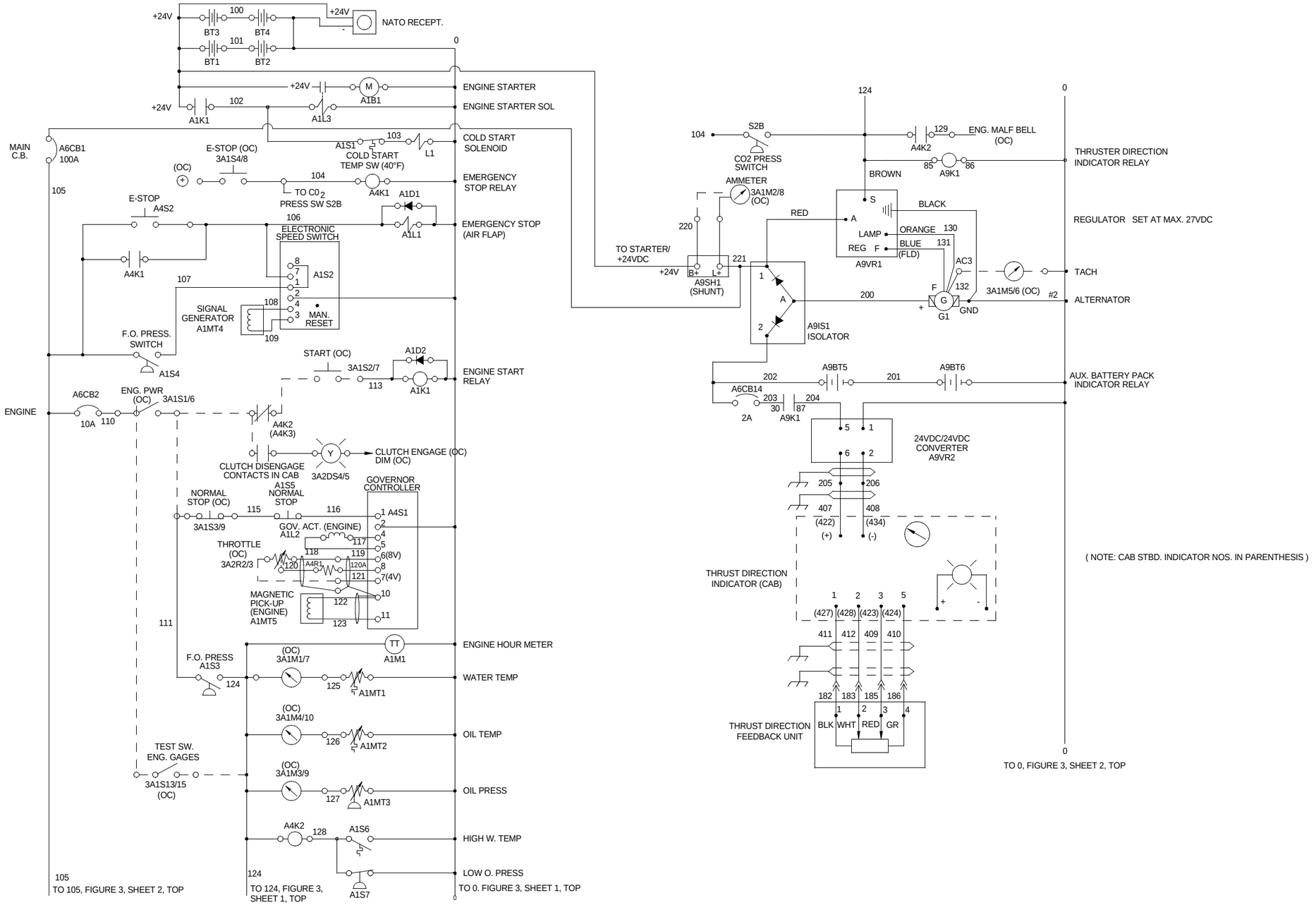


Figure 3. MCS Propulsion Module Schematic (Sheet 1).

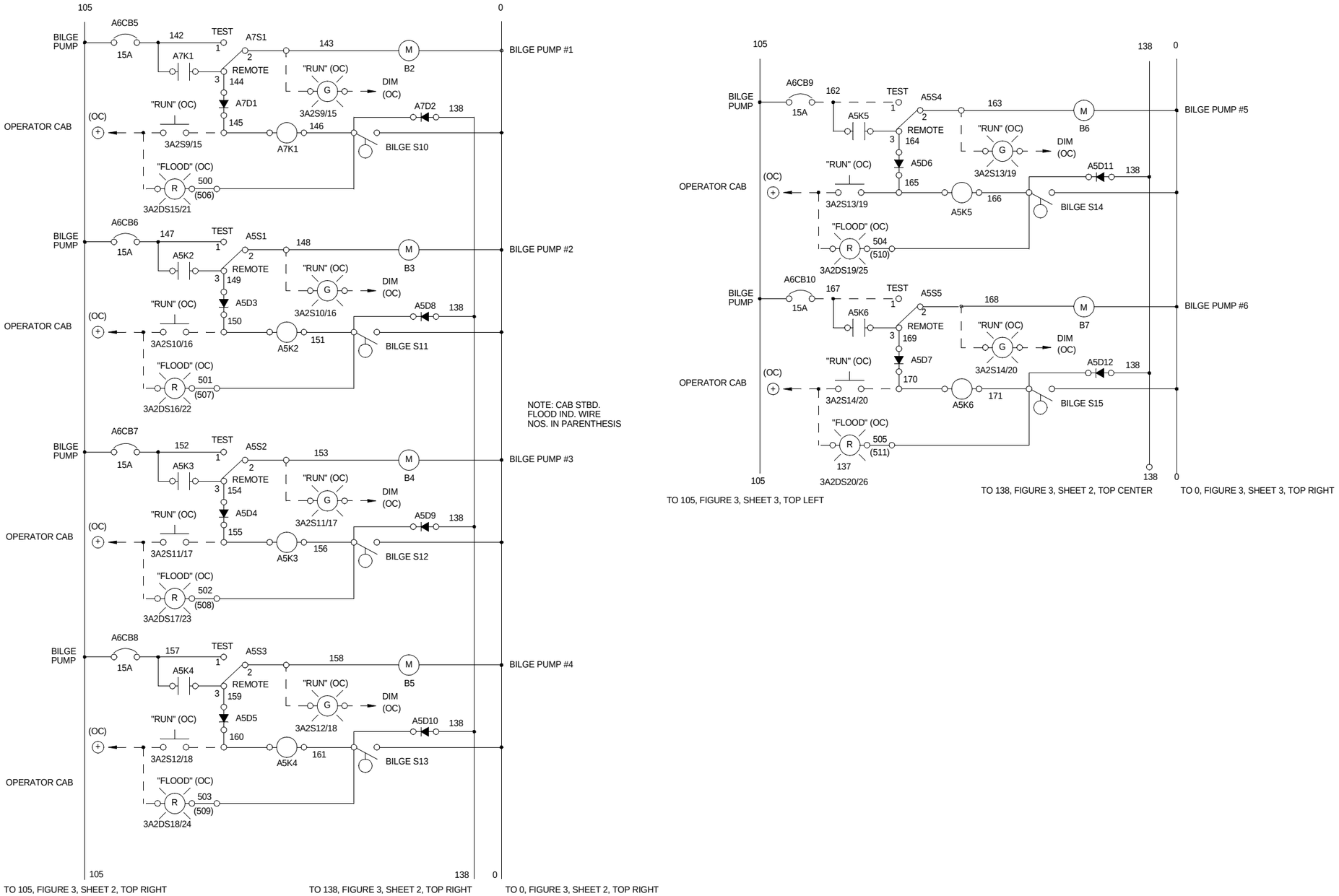


Figure 3. MCS Propulsion Module Schematic (Sheet 2).

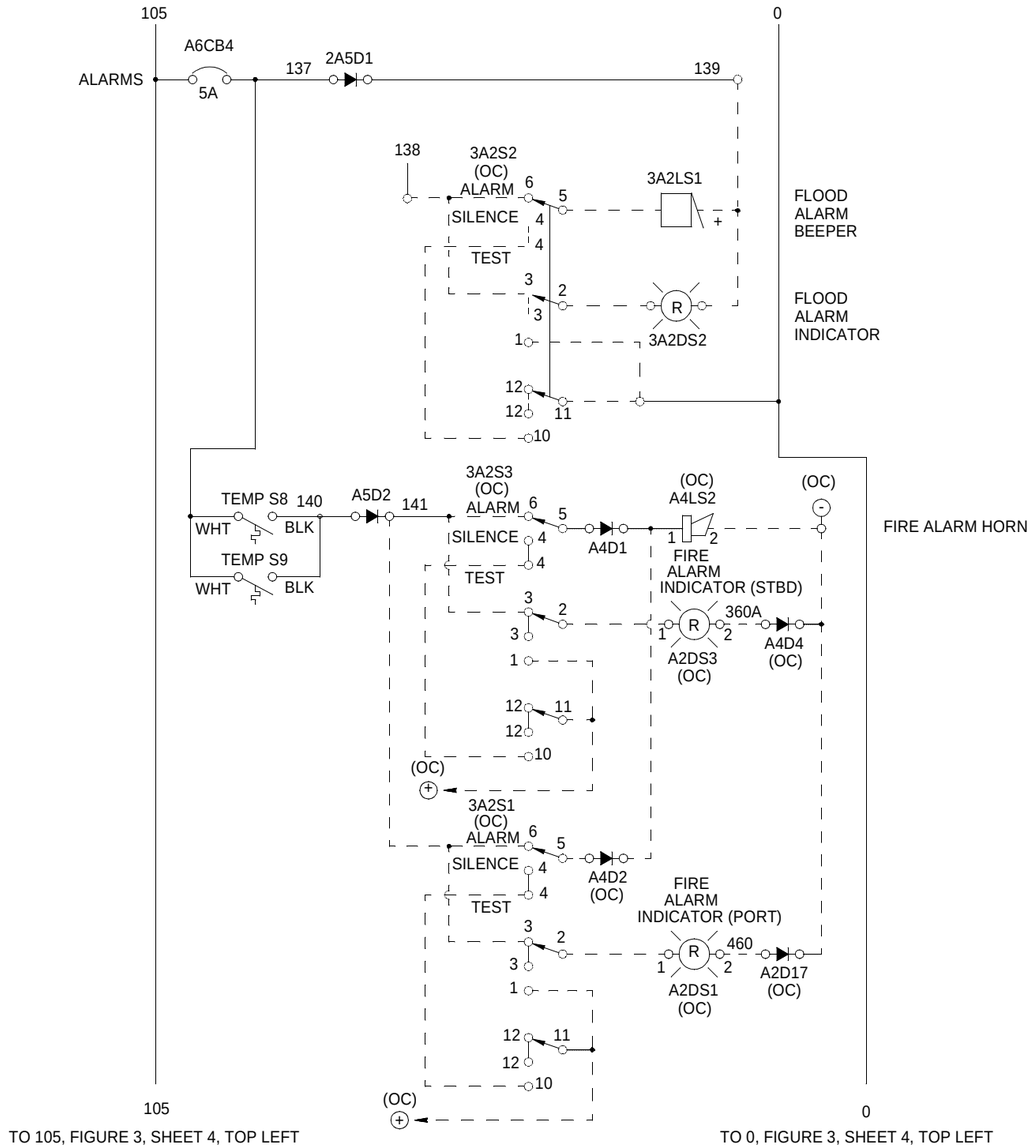
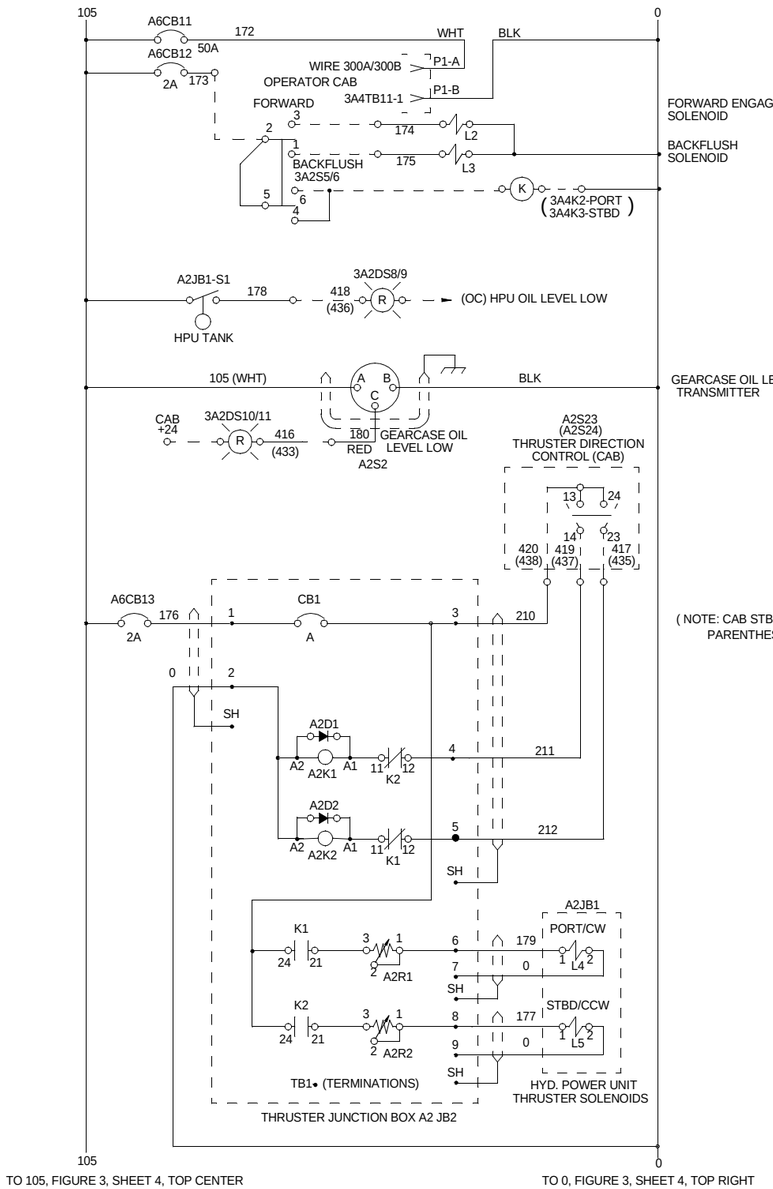
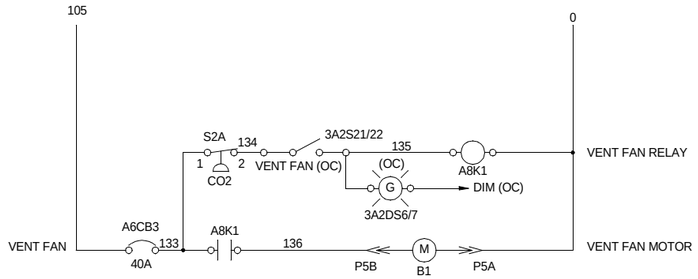


Figure 3. MCS Propulsion Module Schematic (Sheet 3).



(NOTE: CAB STBD. WIRE NOS. IN PARENTHESIS)



LEGEND

ABBREVIATION	EXPLANATION
AC3	CONNECTION FOR ALTERNATOR STATOR WINDING USED FOR TACHOMETER
CO2	CARBON DIOXIDE/FIRE EXTINQUISHING SYSTEM
E-STOP	ENGINE EMERGENCY STOP/AIR SHUT-OFF
ENG PWR	ENGINE POWER
ENG MALF	ENGINE MALFUNCTION, INDICATES LOW OIL PRESSURE OR HIGH WATER (COOLANT) TEMPERATURE
FLD	ALTERNATOR FIELD
FO PRESS	FUEL OIL PRESSURE
HIGH W TEMP	HIGH ENGINE WATER (COOLANT) TEMPERATURE
LOW O PRESS	LOW ENGINE OIL PRESSURE
OC	OPERATOR CAB/ALSO DESIGNATED AS UNIT 3
TACH	TACHOMETER FOR ENGINE SPEED IN RPM

DESIGNATORS

NOTE: ALL DESIGNATORS ARE PREFIXED WITH UNIT OR ASSEMBLY NUMBERS AND FOLLOWED BY AN ASSIGNED NUMBER FOR IDENTIFICATION. SEE NOTE 4 FOR A DESCRIPTION OF UNIT DESIGNATORS.

DESIGNATOR	DEVICE
A1	DIESEL ENGINE & ELECTRICAL COMPONENTS INSTALLED ON ENGINE
A2	THRUSTER & ASSOCIATED ELECTRICAL COMPONENTS, E26929
A3	POWER MODULE JUNCTION BOX, E09683
A4	ENGINE JUNCTION BOX, E08913
A5	BILGE PUMP CONTROL PANEL, E08893
A6	POWER MODULE CIRCUIT BREAKER PANEL, E06783
A7	SINGLE BILGE PUMP CONTROL PANEL, E08903
A8	VENT FAN RELAY ENCLOSURE, E23703
A9	THRUSTER DIRECTION / AUX. BATT. JUNCTION BOX ASS'Y
B	MOTOR, STARTER or SYNCHRO
BT	BATTERY
CB	CIRCUIT BREAKER
D	DIODE, SEMICONDUCTOR
DS	INDICATING LAMP
K	RELAY
L	SOLENOID
LS	AUDIBLE DEVICE, BEEPER etc.
M	METER, GAGE or PICK-UP
MT	TRANSDUCER FOR METER/GAGE
S	SWITCH or GOVERNOR
VR	REGULATOR
SH	SHUNT
IS	ISOLATOR

EXAMPLES: 1) A1M1, THIS IS METER NUMBER 1 (ENGINE HOUR METER) INSTALLED ON DIESEL ENGINE (A1)
2) S3, THIS IS SWITCH NUMBER 3 (NEUTRAL LIMIT SWITCH) IN POWER MODULE. THIS SWITCH IS THE ONLY ELECTRICAL COMPONENT INSTALLED ON THE POWER TAKE OFF CLUTCH ENGAGEMENT CYLINDER.
3) 3A2DS13/19,THIS IS INDICATING LAMP (DS) NUMBER 13 FOR PORT AND NUMBER 19 FOR STBD LOCATED IN ASSEMBLY A2 IN THE OPERATOR CAB (UNIT 3). SEE OPERATOR CAB SCHEMATIC E26546 AND ASSEMBLY E02873 FOR DESCRIPTION OF THE A2 ASSEMBLY WHICH IS THE LOWER CONTROL PANEL ASSEMBLY "A2" DRAWING E06773.

NOTES:

1. CONDUCTORS GOING TO OPERATOR CAB ARE SHOWN AS DASHED. DEVICES IN OPERATOR CAB HAVE DESIGNATIONS THAT START WITH "3". LAST DIGIT OF OPERATOR CAB DEVICES IF SEPARATED FOR PORT/STBD ARE SHOWN WITH A SLASH BETWEEN THE PORT AND STBD DEVICE NUMBERS.

2. THIS SCHEMATIC DOES NOT SHOW ALL TERMINAL OR CONNECTOR PIN NUMBERS.

3. SYSTEM DESIGNATORS (ALL DESIGNATORS NOT USED ON THIS SCHEMATIC)
UNIT 1 : STBD PROPULSION MODULE. THIS IS MODULE INSTALLED IN STBD LOCATION.
UNIT 2 : PORT PROPULSION MODULE. THIS IS MODULE INSTALLED IN PORT LOCATION.
UNIT 3 : OPERATOR CAB
UNIT 4 : MAIN MAST
UNIT 5 : STUB MAST

4. GOVERNOR A4S1 SETTINGS AS FOLLOWS:
SWITCH S1=OFF
SWITCH S2=ON
GAIN = 40% OR 50% POSITION
DROOP = FULL CCW
I = 30% POSITION
IDLE SPEED 800 RPM MINIMUM

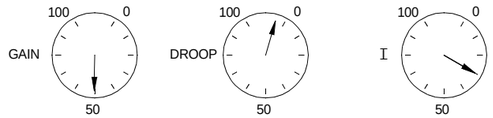
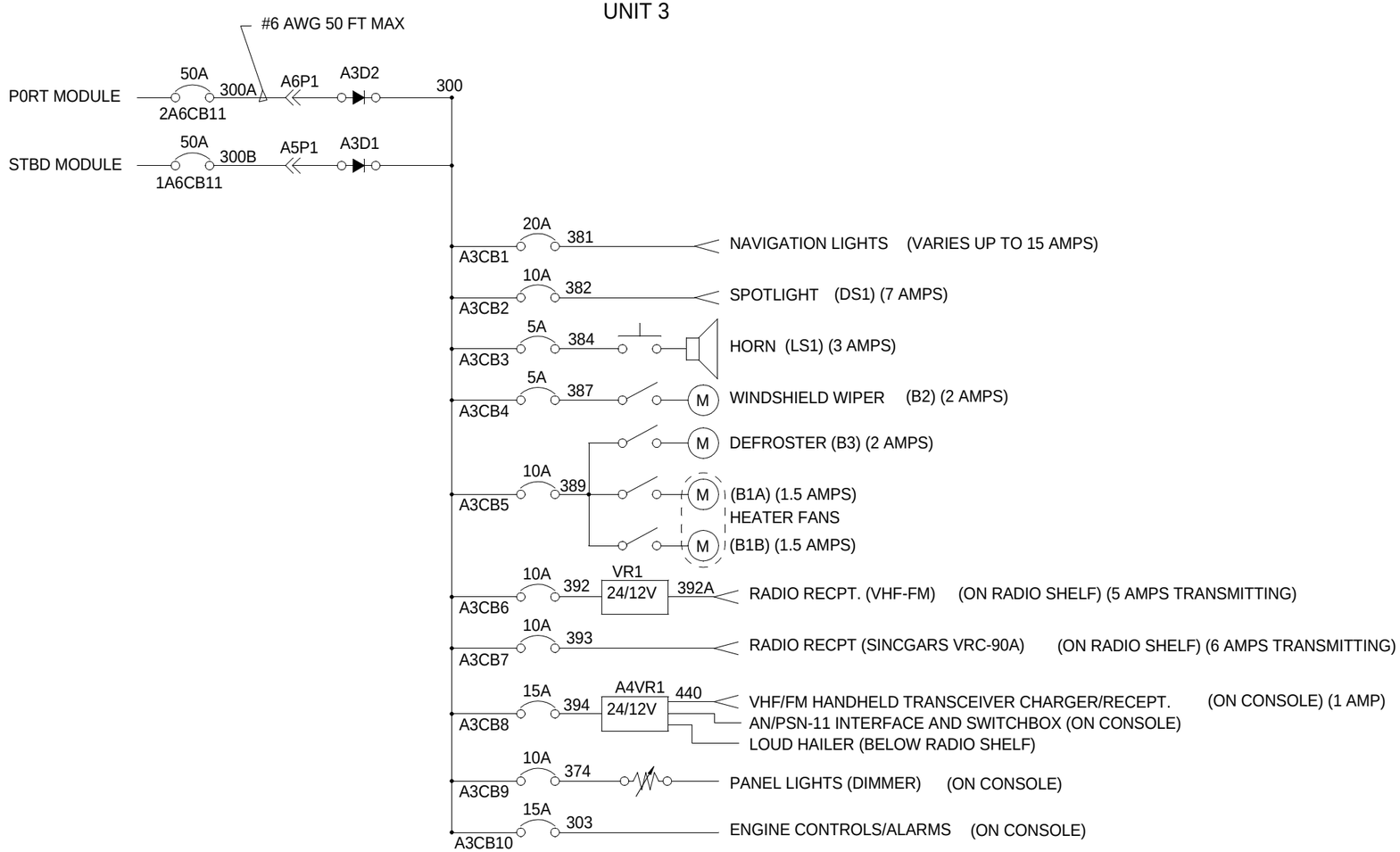


Figure 3. MCS Propulsion Module Schematic (Sheet 4).



NOTE: ALL INTERNAL HOOK-UP WIRE IS 14 OR 16 AWG
SOME DEVICES ARE PROVIDED WITH PRE-WIRED
PIGTAILS FOR CONNECTIONS.

Figure 4. MCS Operator Cab One Line Diagram.

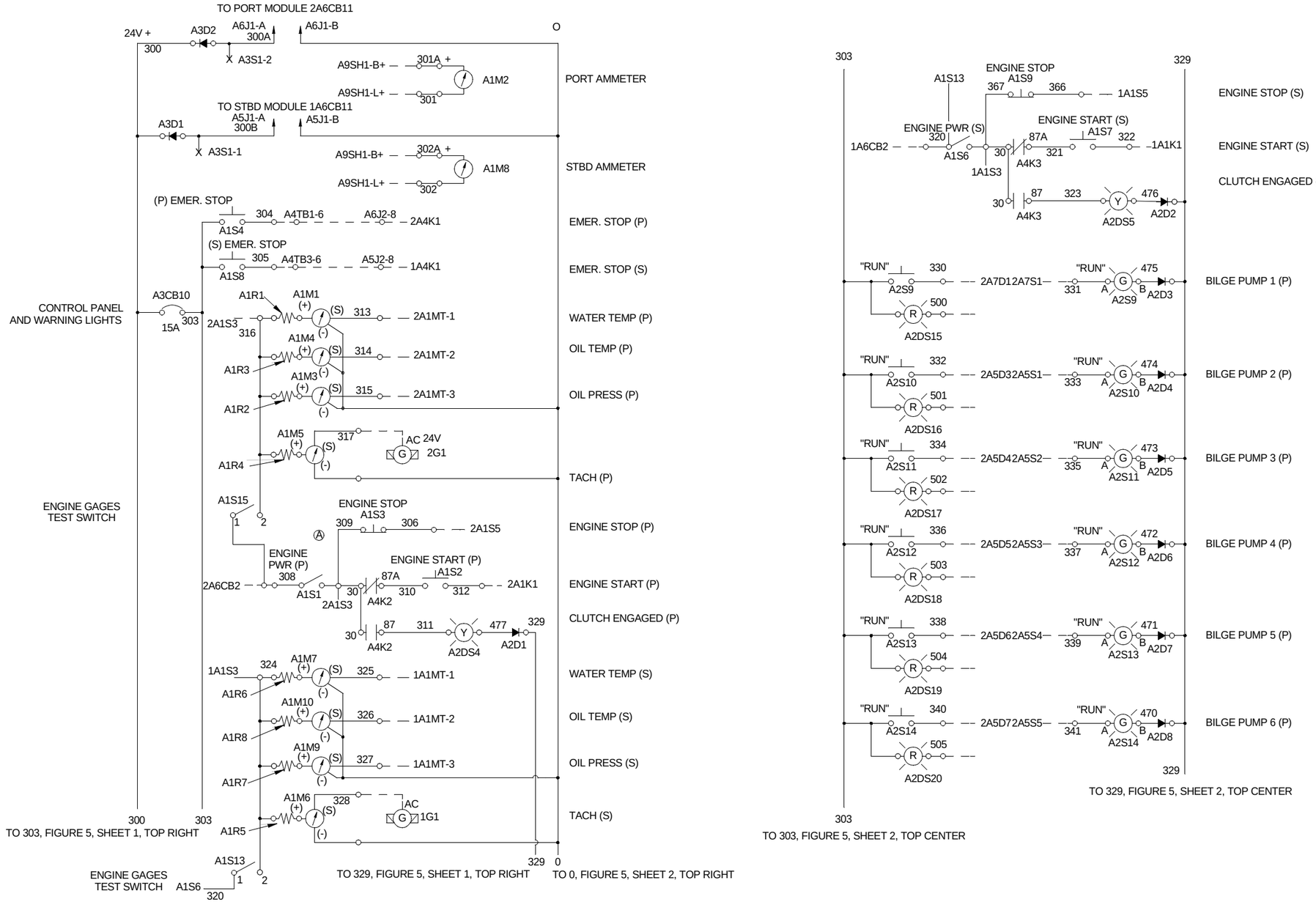


Figure 5. MCS Operator Cab Schematic (Sheet 1).

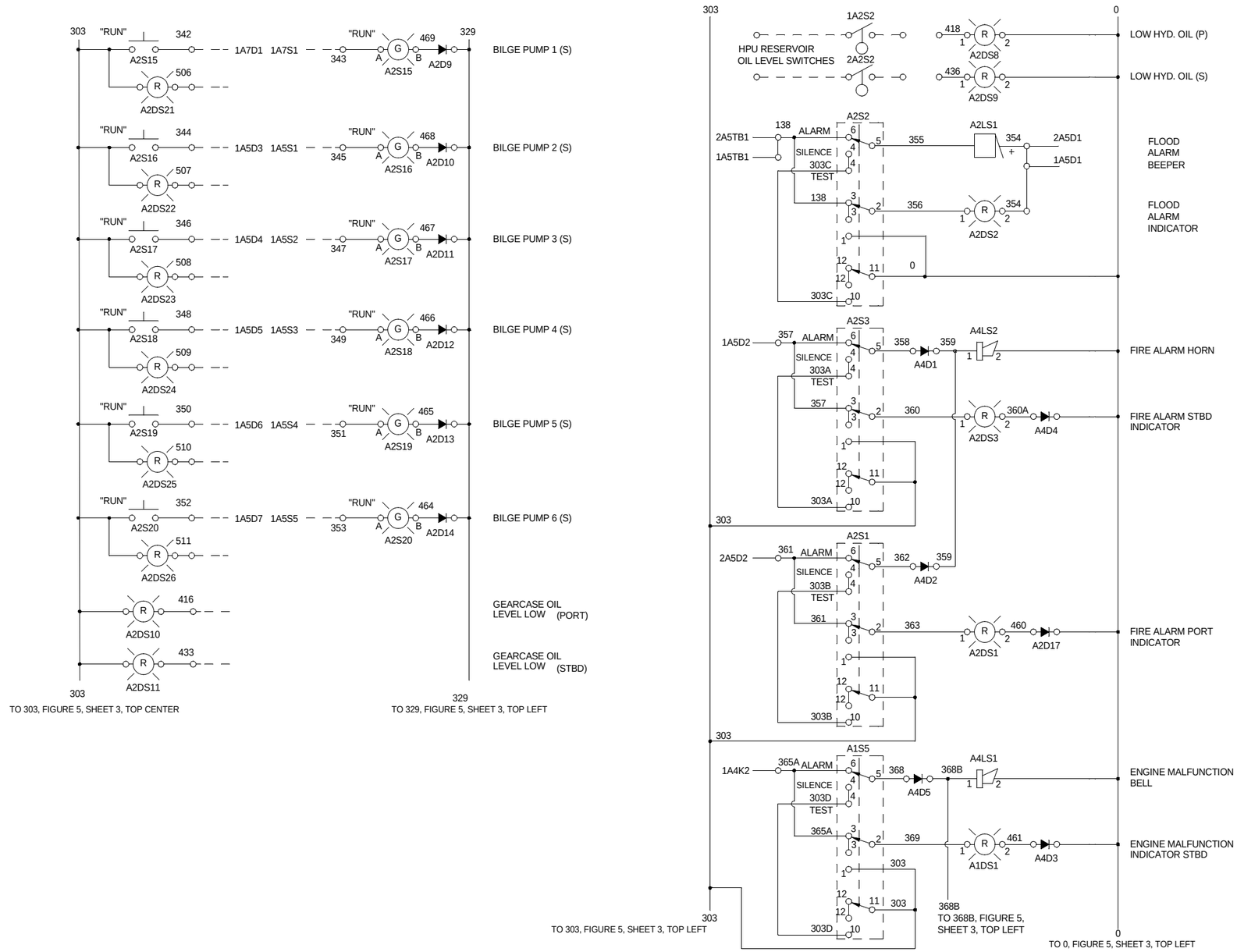


Figure 5. MCS Operator Cab Schematic (Sheet 2).

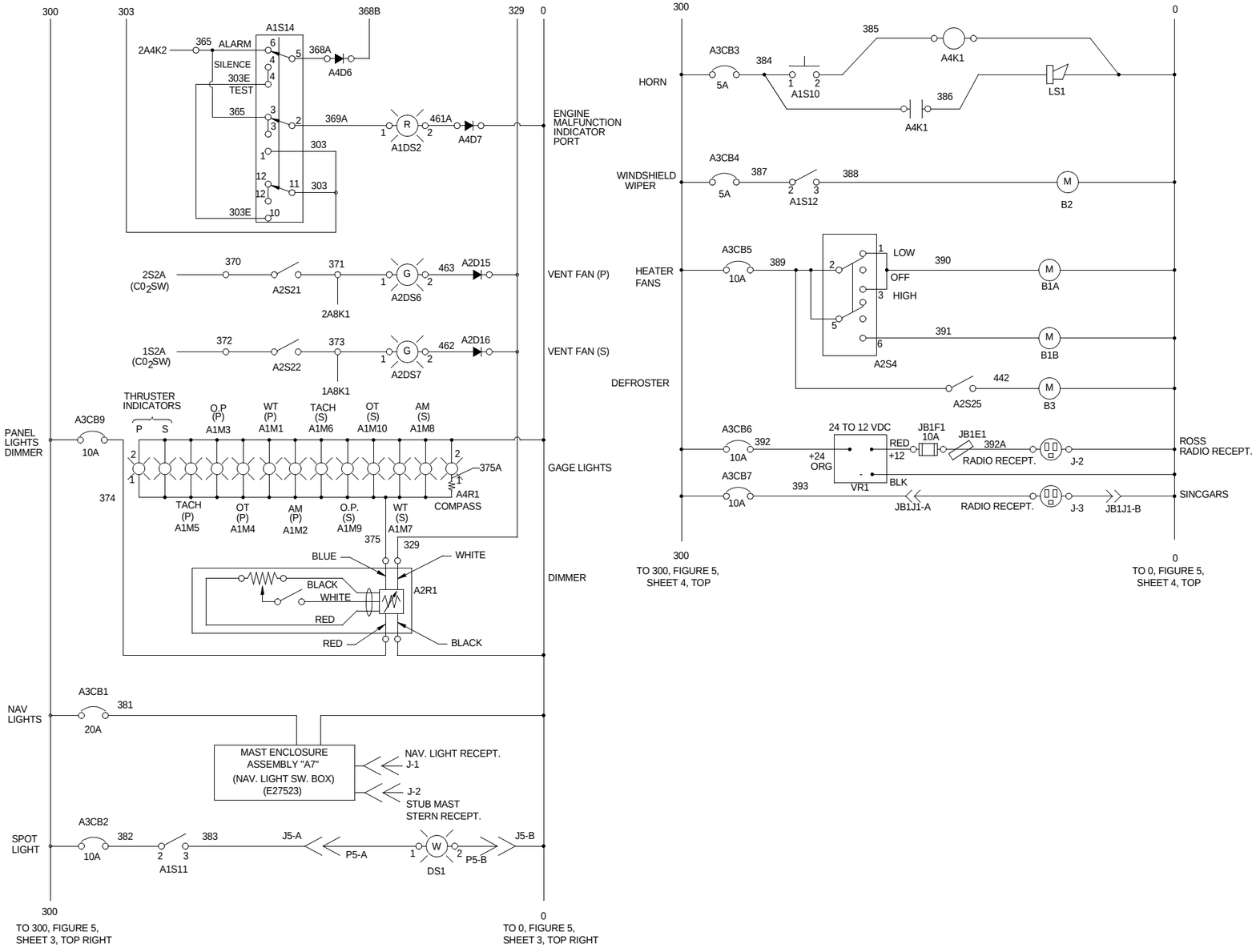


Figure 5. MCS Operator Cab Schematic (Sheet 3).

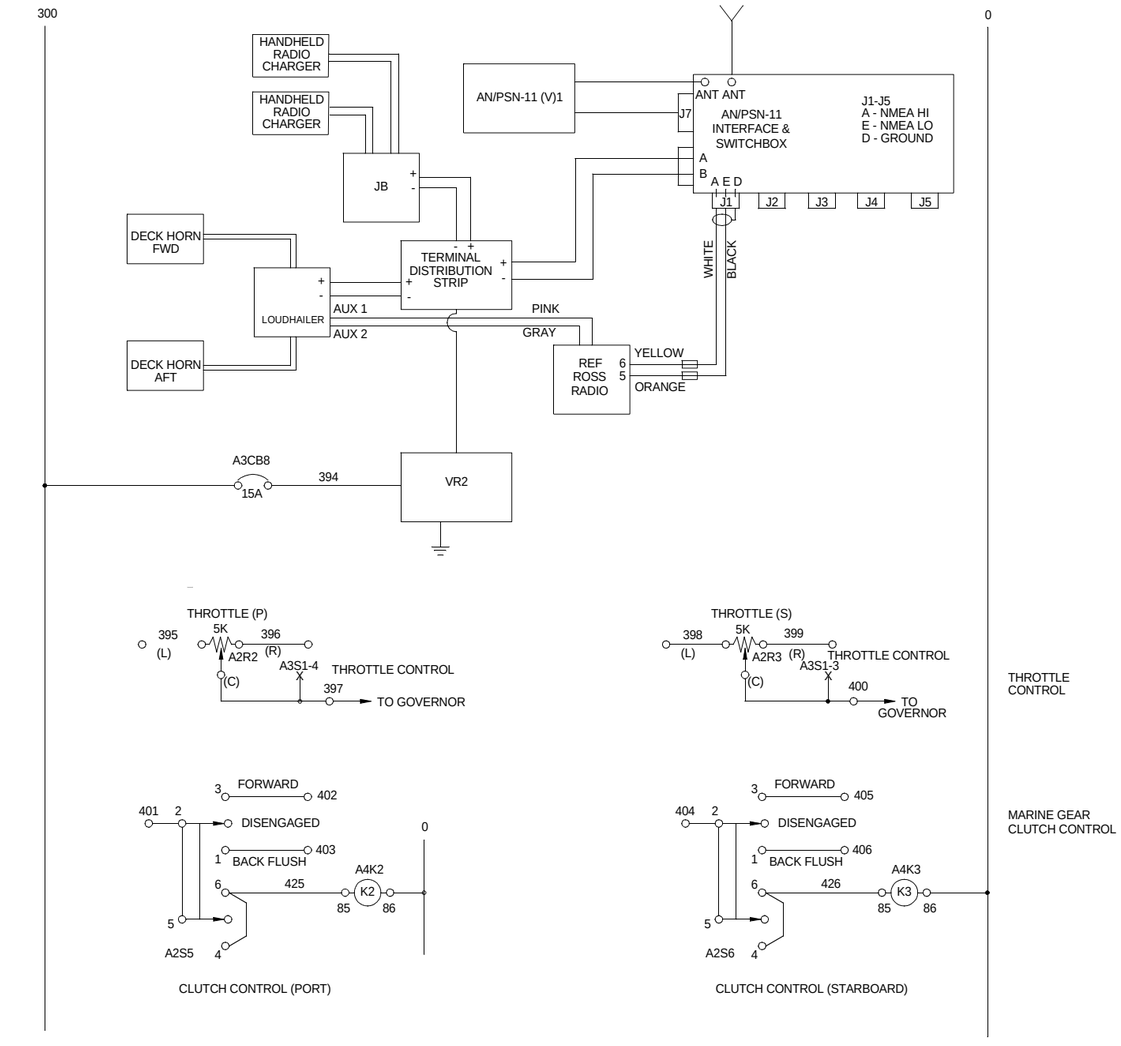
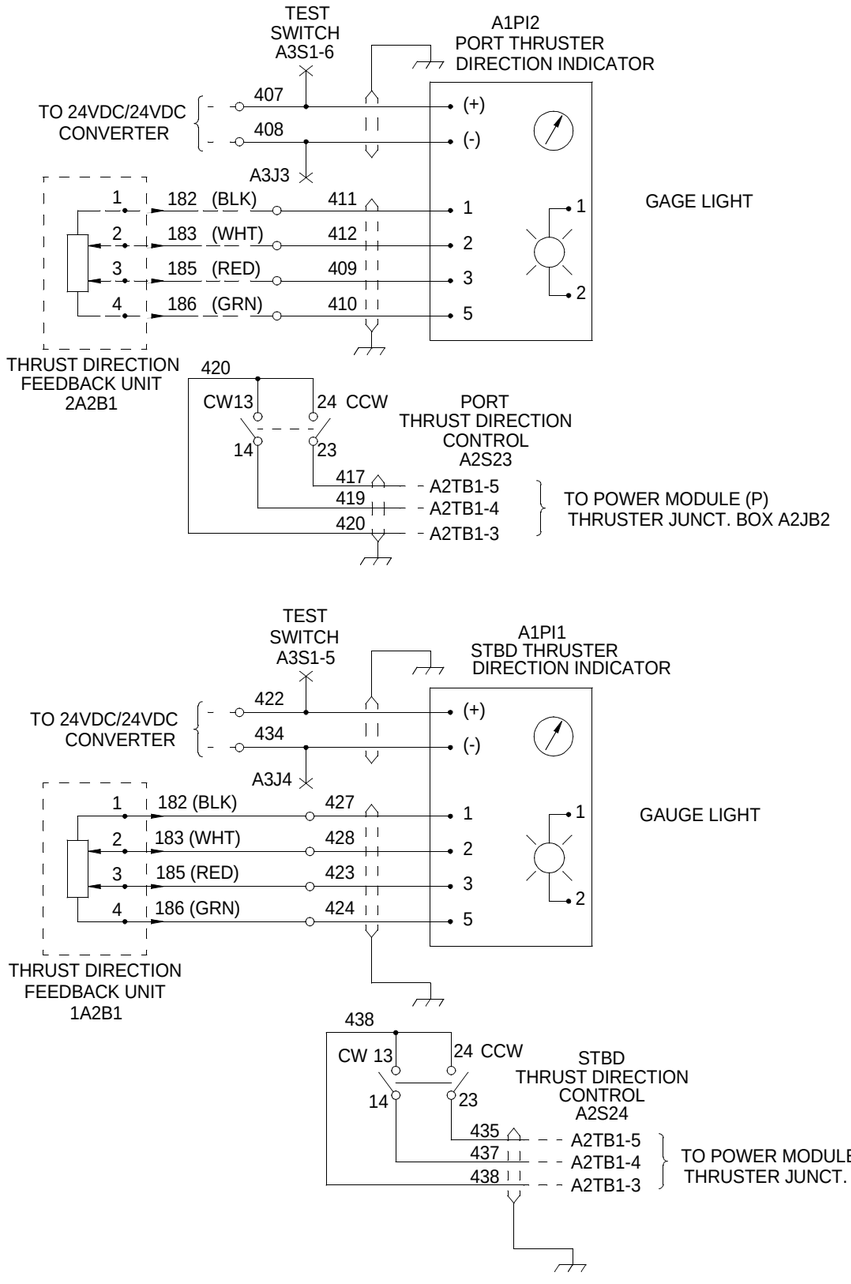


Figure 5. MCS Operator Cab Schematic (Sheet 4).



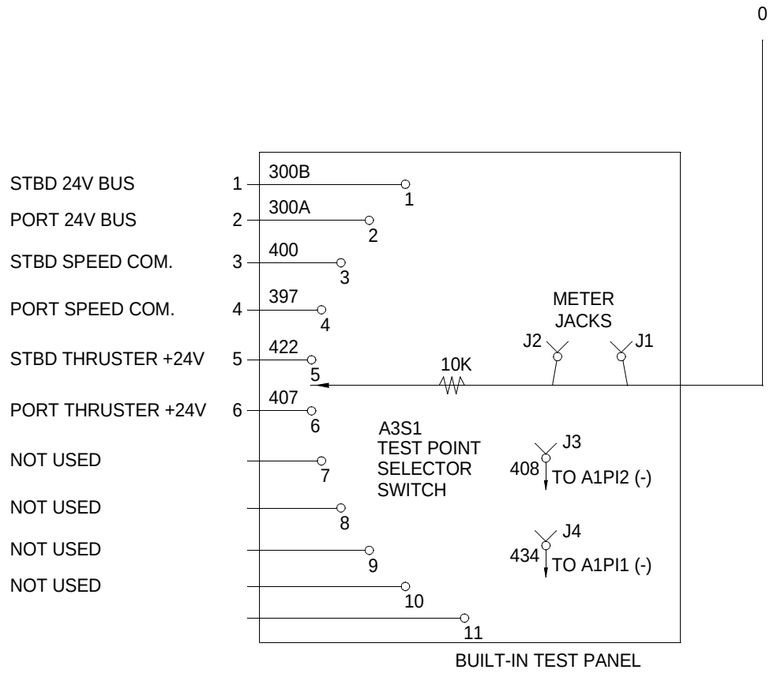


Figure 5. MCS Operator Cab Schematic (Sheet 5).

DESIGNATORS

NOTE: ALL DESIGNATORS ARE PREFIXED WITH UNIT OR ASSEMBLY NUMBERS AND FOLLOWED BY AN ASSIGNED NUMBER FOR IDENTIFICATION.

DESIGNATOR	DEVICE
A1	MIDDLE CONTROL PANEL ASSEMBLY, E06763
A2	LOWER CONTROL PANEL ASSEMBLY, E06773
A3	OPERATOR CAB CIRCUIT BREAKER PANEL, E06793
A4	TERMINAL STRIP ASSEMBLY, E08683
A5	STBD RECEPTACLE ASSEMBLY, E08873
A6	PORT RECEPTACLE ASSEMBLY, E08883
A7	MAST ENCLOSURE ASSEMBLY, E27523
B	MOTOR, STARTER or SYNCHRO
BT	BATTERY
CB	CIRCUIT BREAKER
D	DIODE, SEMICONDUCTOR
DS	INDICATING LAMP
E	EMI/RFI SUPPRESSOR
G	ALTERNATOR
JB	JUNCTION BOX
K	RELAY
LS	AUDIBLE DEVICE, BEEPER etc.
M	METER, GAGE or PICK-UP
MT	TRANSDUCER FOR METER/GAGE
PI	PANEL INDICATOR
R	RESISTOR OR POTENTIOMETER
S	SWITCH INCLUDING ILLUMINATED PUSHBUTTON SWITCHES
VR	VOLTAGE CONVERTER, 24VDC TO 12 VDC

EXAMPLES: 1) A1M1, THIS IS METER NUMBER 1 (PORT ENGINE WATER TEMP METER) INSTALLED ON MIDDLE CONTROL PANEL ASSEMBLY "A1"
2) A1S6, THIS IS SWITCH NUMBER 6 (STBD ENGINE POWER SWITCH) INSTALLED ON MIDDLE CONTROL PANEL ASSEMBLY "A1"
3) A2S13, THIS IS SWITCH NUMBER 13 (ILLUMINATED PUSHBUTTON SWITCH FOR PORT BILGE PUMP NUMBER 5 INSTALLED ON LOWER CONTROL PANEL ASSEMBLY "A2"

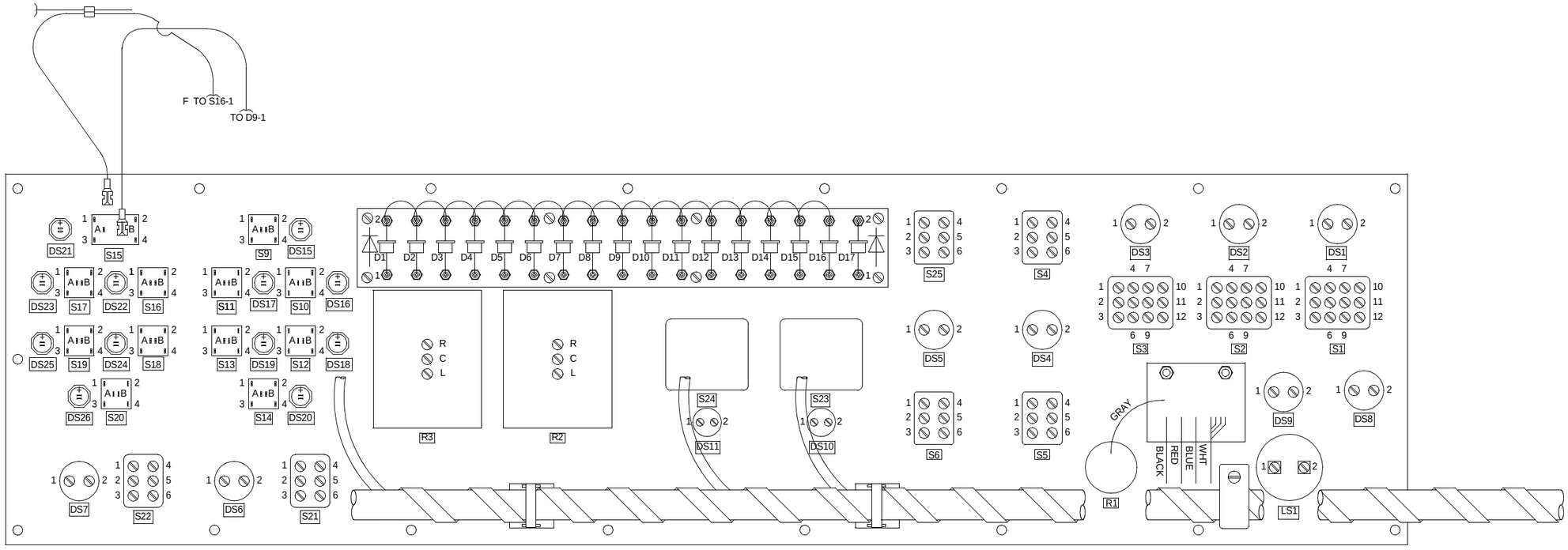
NOTES:

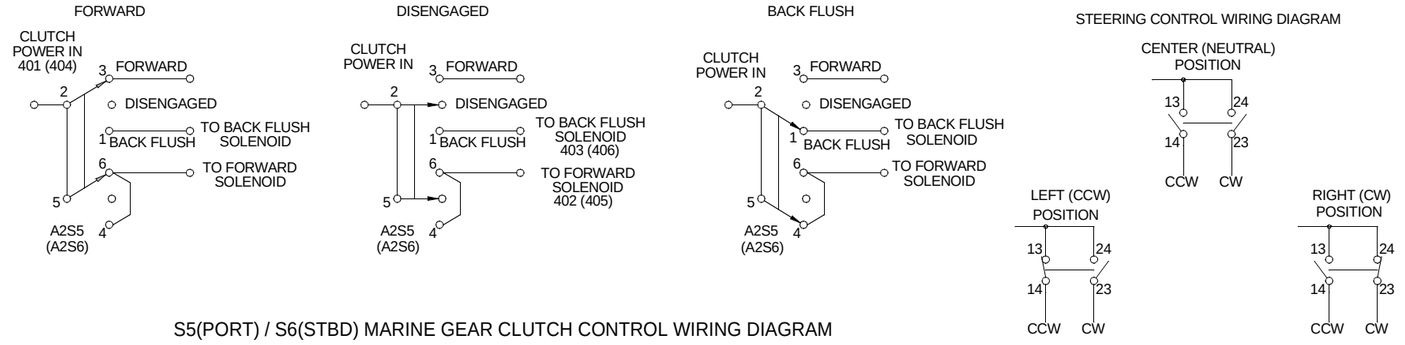
1. CONDUCTORS SHOWN AS DASHED CONTINUE TO PROPULSION MODULES THROUGH CONNECTORS. DEVICES IN PROPULSION MODULES ARE DESIGNATED BY NUMERICAL PREFIX, TYPE DESIGNATION, AND PART NUMBER. PORT (2) OR STBD (1) MODULE DESIGNATIONS PREFIX PART DESIGNATOR.
2. THIS SCHEMATIC DOES NOT SHOW ALL TERMINALS OR CONNECTOR PIN NUMBERS.
3. TERMINAL MARKINGS ON GAGES OR OTHER DEVICES MAY DIFFER DUE TO ALTERNATE SOURCES.
4. "RUN" LIGHTS A2S9 THROUGH A2S20 (SHEET 1) ARE PART OF ILLUMINATED PUSHBUTTON SWITCHES A2S9 THROUGH A2S20. FOR SCHEMATIC PURPOSES THESE LIGHTS HAVE "S" DESIGNATIONS INSTEAD OF "DS" DESIGNATION FOR OTHER LIGHTS IN THE SYSTEM.

LEGEND

ABBREVIATION	EXPLANATION
AC	CONNECTION FOR ALTERNATOR STATOR WINDING USED FOR TACHOMETER
E-STOP	ENGINE EMERGENCY STOP/AIR SHUT-OFF
ENG PWR	ENGINE POWER
ENG MALF	ENGINE MALFUNCTION, INDICATES LOW OIL PRESSURE OR HIGH COOLANT TEMPERATURE
DISENGAGED	CLUTCH IN NEUTRAL POSITION
(P)	PORT
RECEPT	RECEPTACLE, CONNECTOR
(S)	STBD
SINCGARS	GOVERNMENT FURNISHED RADIO, SINGLE CHANNEL GROUND & AIRBORNE RADIO SYSTEM
SW	SWITCH
TACH	TACHOMETER FOR ENGINE SPEED IN RPM
TEMP	TEMPERATURE
AM	AMMETER

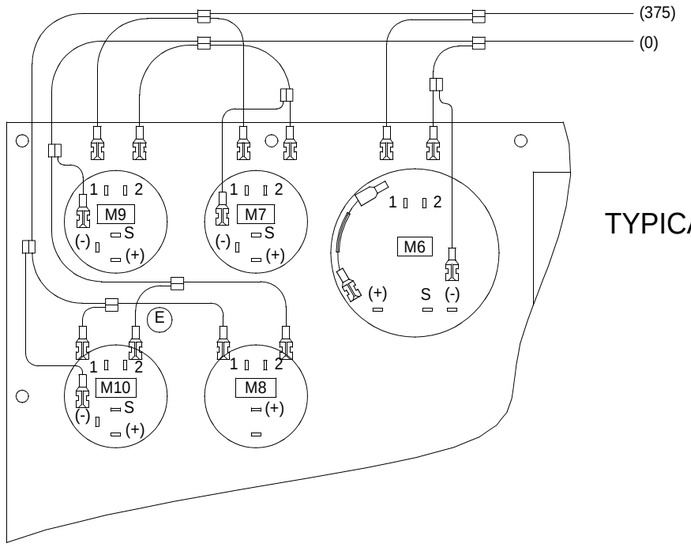
Figure 5. MCS Operator Cab Schematic (Sheet 6).





S5(PORT) / S6(STBD) MARINE GEAR CLUTCH CONTROL WIRING DIAGRAM

Figure 6. MCS Operator Cab Lower Control Panel Wiring.



TYPICAL WIRE RUNS

BACK SIDE OF PANEL

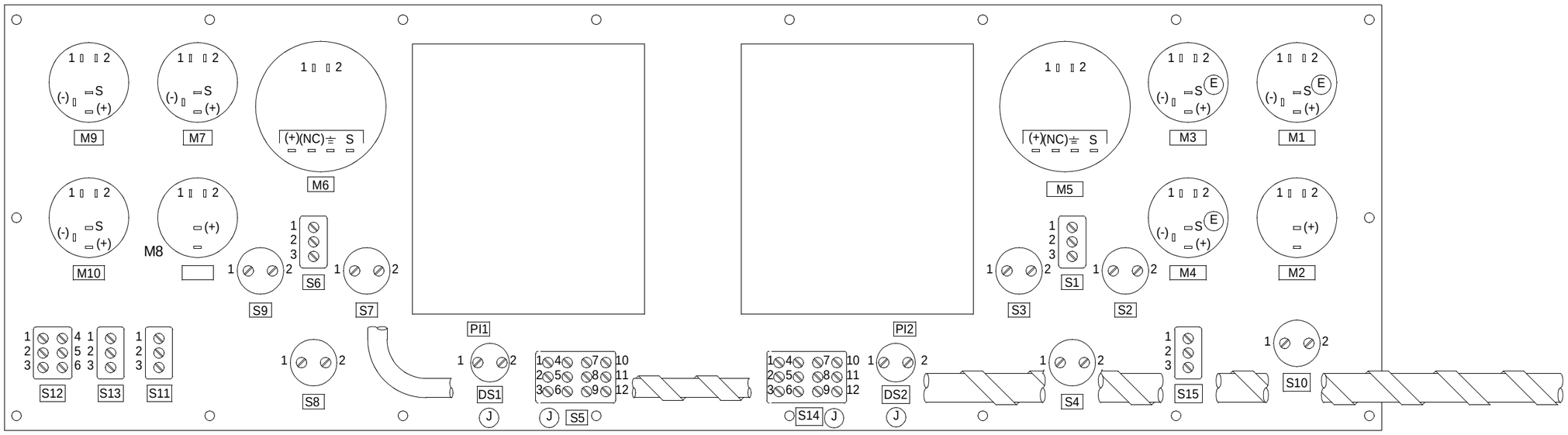
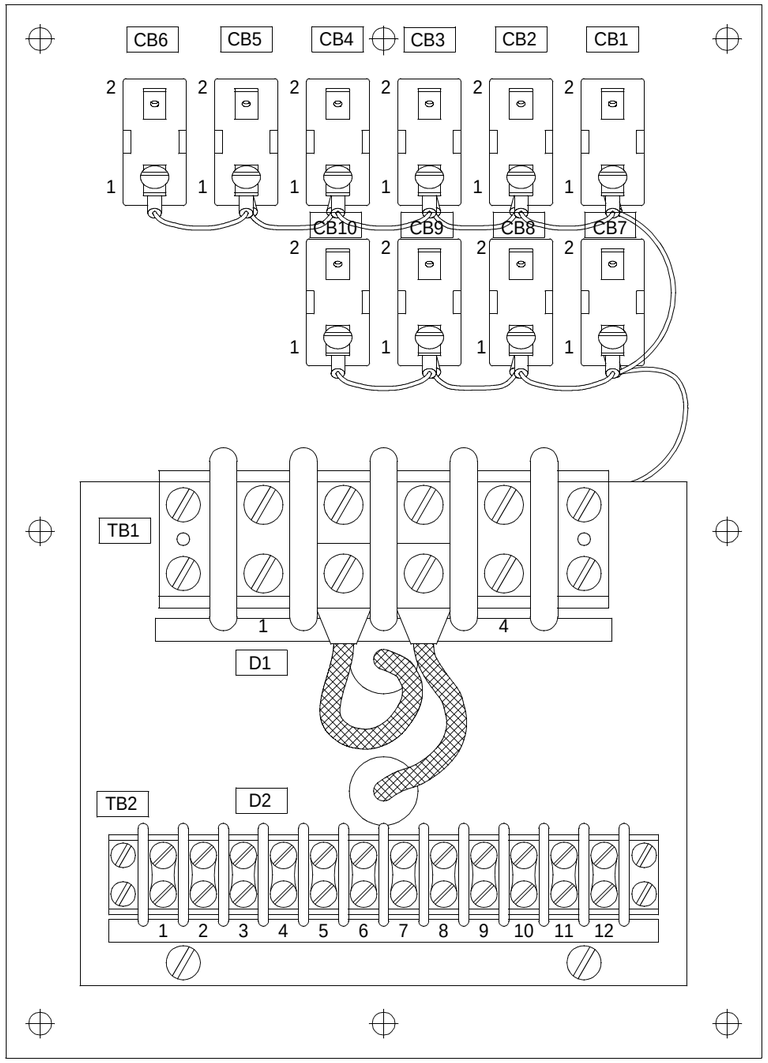
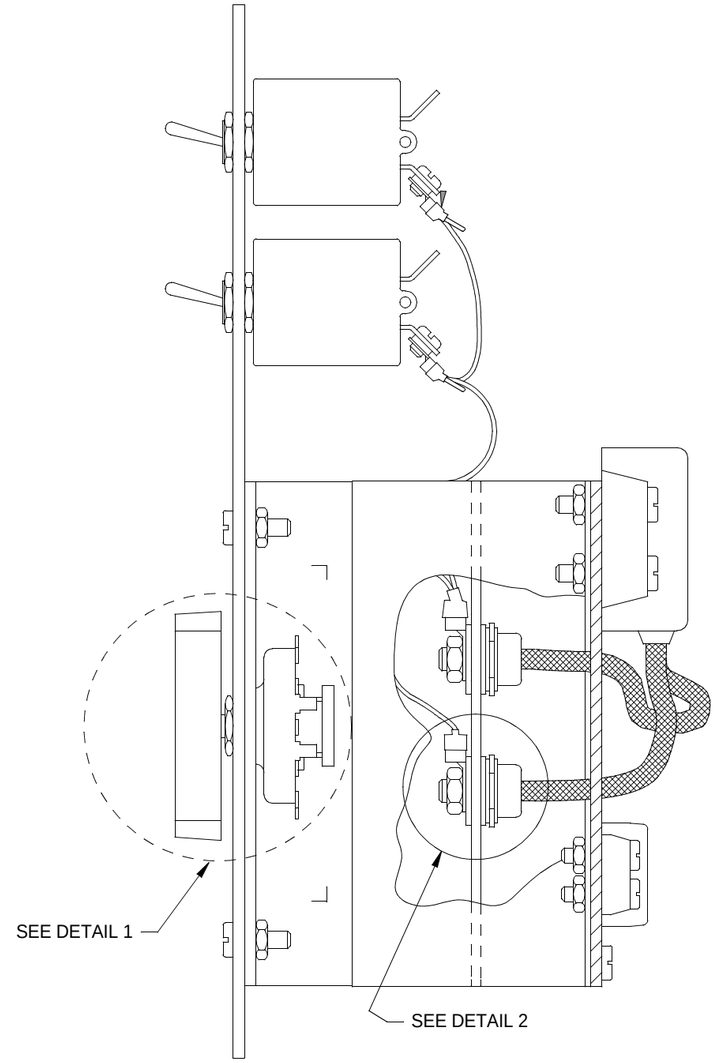
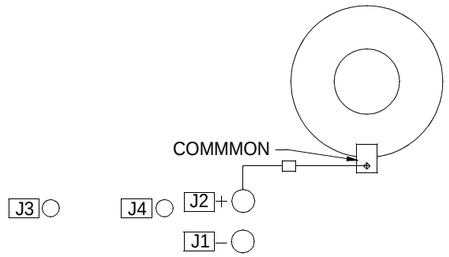


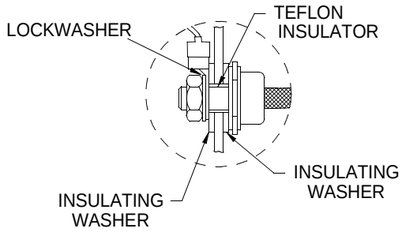
Figure 7. MCS Operator Cab Middle Control Panel Wiring.







DETAIL 1
RESISTOR LEAD CONNECTIONS



DETAIL 2

Figure 8. MCS Operator Cab Circuit Breaker Panel A3 Diagram.

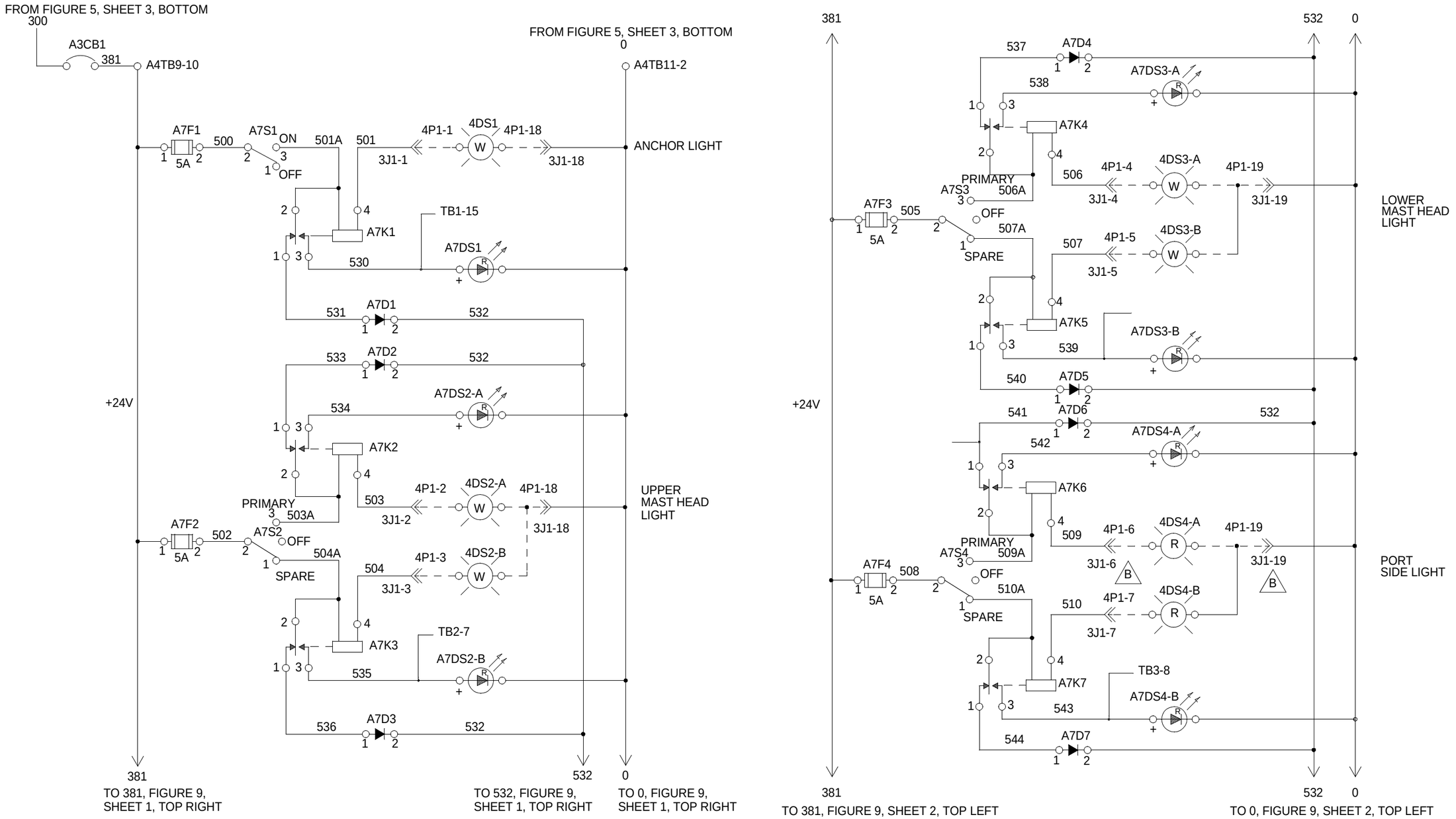


Figure 9. MCS Navigation Lights Schematic (Sheet 1).

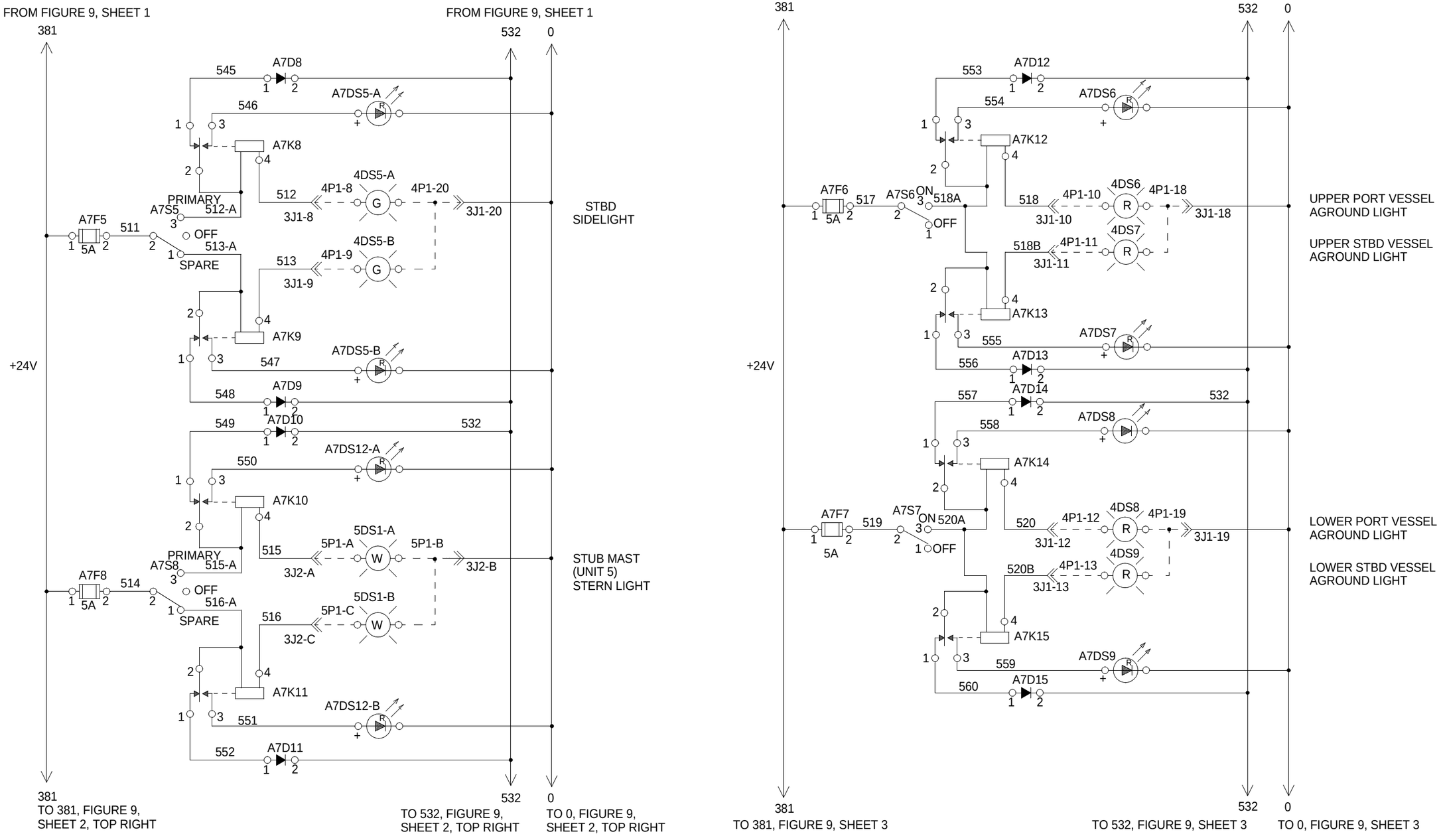


Figure 9. MCS Navigation Lights Schematic (Sheet 2).

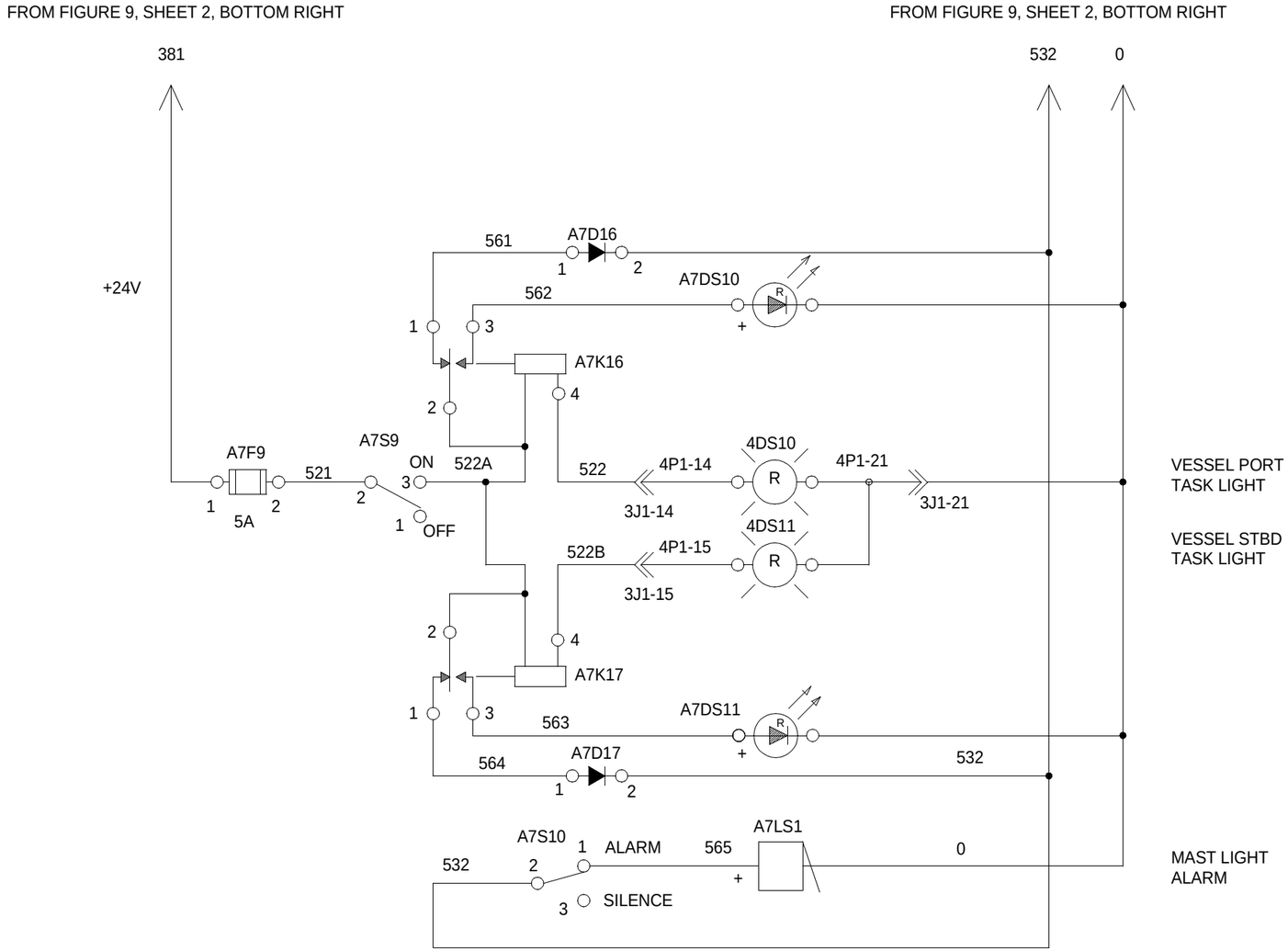
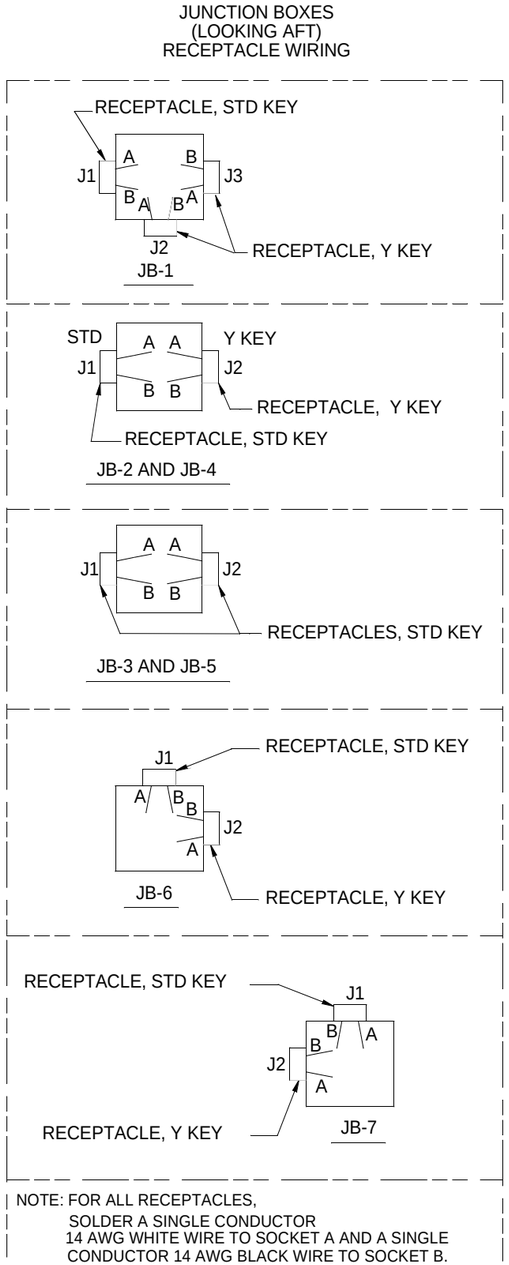


Figure 9. MCS Navigation Lights Schematic (Sheet 3).

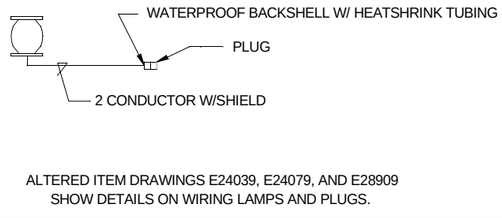


NOTES:

2.1) ALL INTERNAL CABLES ARE SJOW-A TYPE.

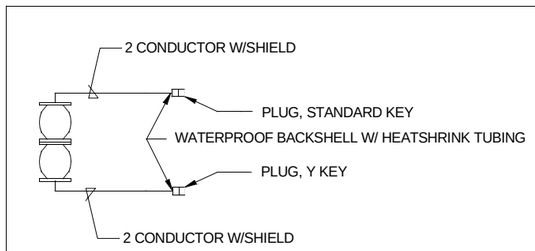
2.2) CONDUCTOR LABELS:
ALL WIRES ARE TO BE LABELED ON BOTH ENDS WITH CONDUCTOR NUMBER ON HEAT SHRINK TUBING.

SINGLE LAMP - TYPICAL WIRING FOR PLUG



ALTERED ITEM DRAWINGS E24039, E24079, AND E28909
SHOW DETAILS ON WIRING LAMPS AND PLUGS.

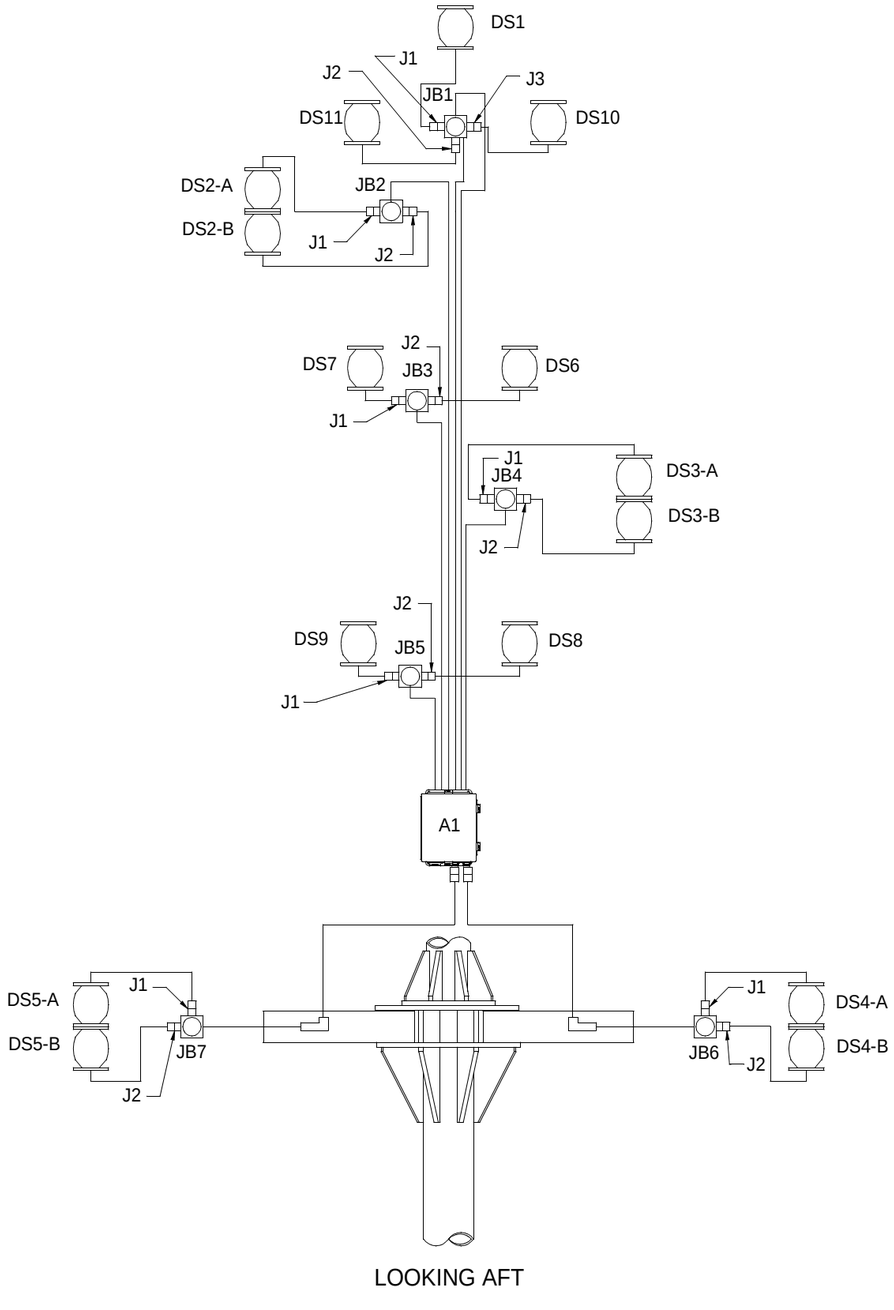
DOUBLE LAMP - TYPICAL WIRING FOR PLUGS



UPPER LAMP IS PRIMARY, LOWER LAMP IS SPARE

ALTERED ITEM DRAWINGS E24049, E24059 AND E24069
SHOW DETAILS ON WIRING LAMPS AND PLUGS.

Figure 10. MCS Navigation Lights Junction Boxes Schematic.



LEGEND

ANCHOR WHITE, ALL AROUND SINGLE	DS1
UPPER PORT VESSEL TASK RED, ALL AROUND SINGLE	DS10
UPPER STBD VESSEL TASK RED, ALL AROUND SINGLE	DS11
UPPER MASTHEAD WHITE, SCREENED DOUBLE	DS2-A DS2-B
UPPER PORT VESSEL AGROUND RED, ALL AROUND SINGLE	DS6
UPPER STBD VESSEL AGROUND RED, ALL AROUND SINGLE	DS7
LOWER MASTHEAD WHITE, SCREENED DOUBLE	DS3-A DS3-B
LOWER PORT VESSEL AGROUND RED, ALL AROUND SINGLE	DS8
LOWER STBD VESSEL AGROUND RED, ALL AROUND SINGLE	DS9
PORT SIDELIGHT RED, SCREENED DOUBLE	DS4-A DS4-B
STBD SIDELIGHT GREEN, SCREENED DOUBLE	DS5-A DS5-B
NAVIGATION LIGHT TERM BOX	A1

Figure 11. MCS Navigation Lights Diagram.

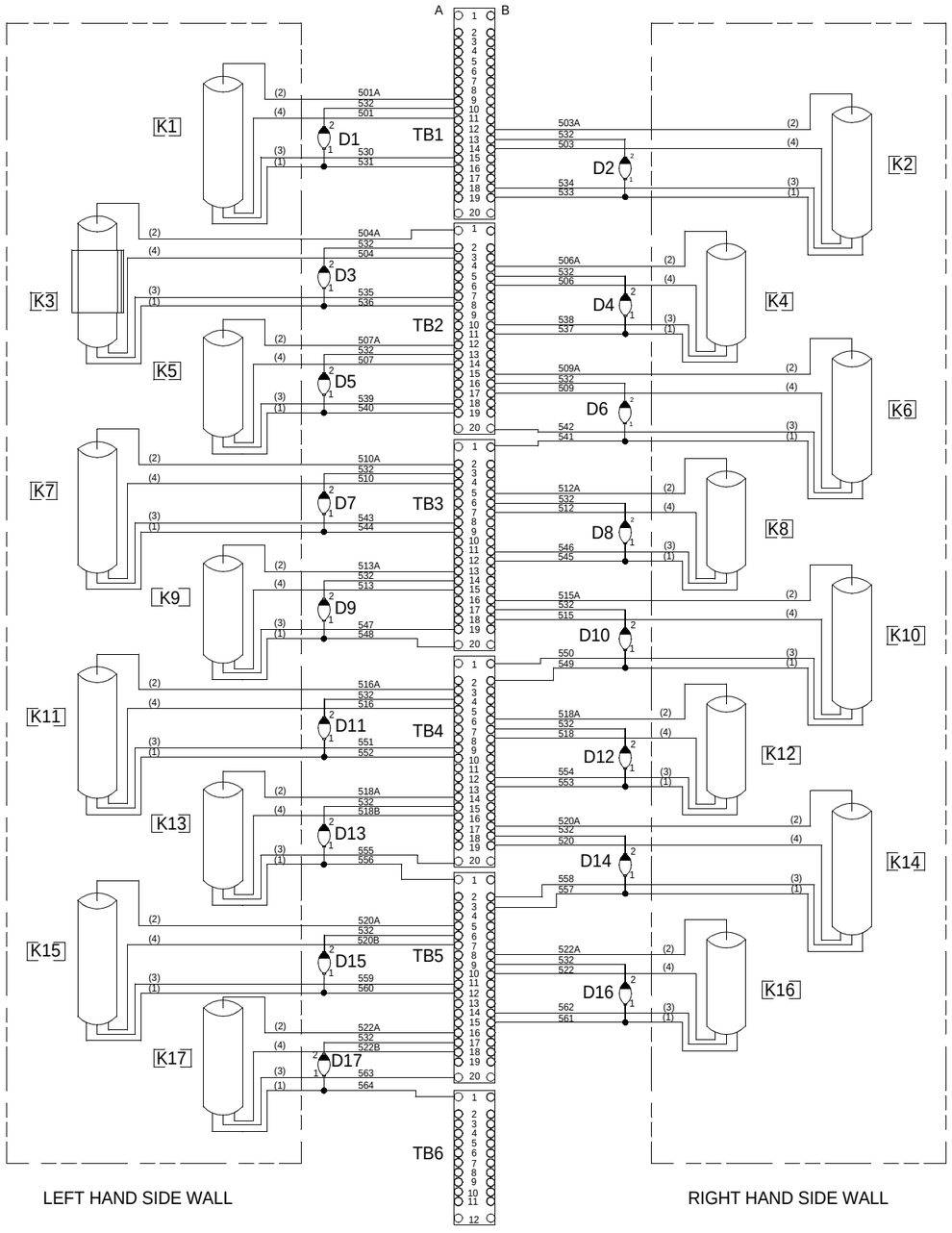


Figure 12. MCS Mast Enclosure A7 Schematic.

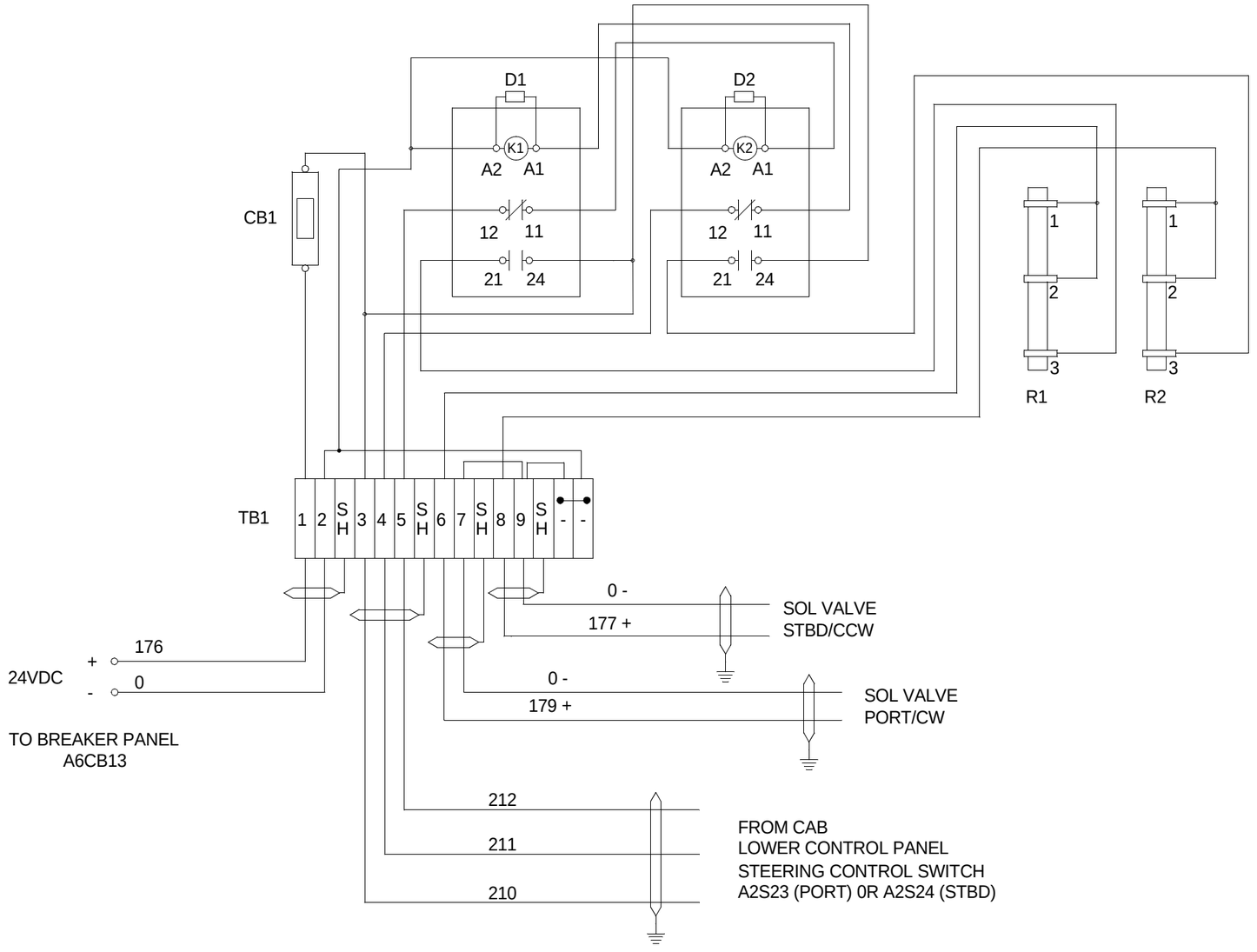


Figure 13. MCS Thruster Junction Box A2JB2 Schematic.

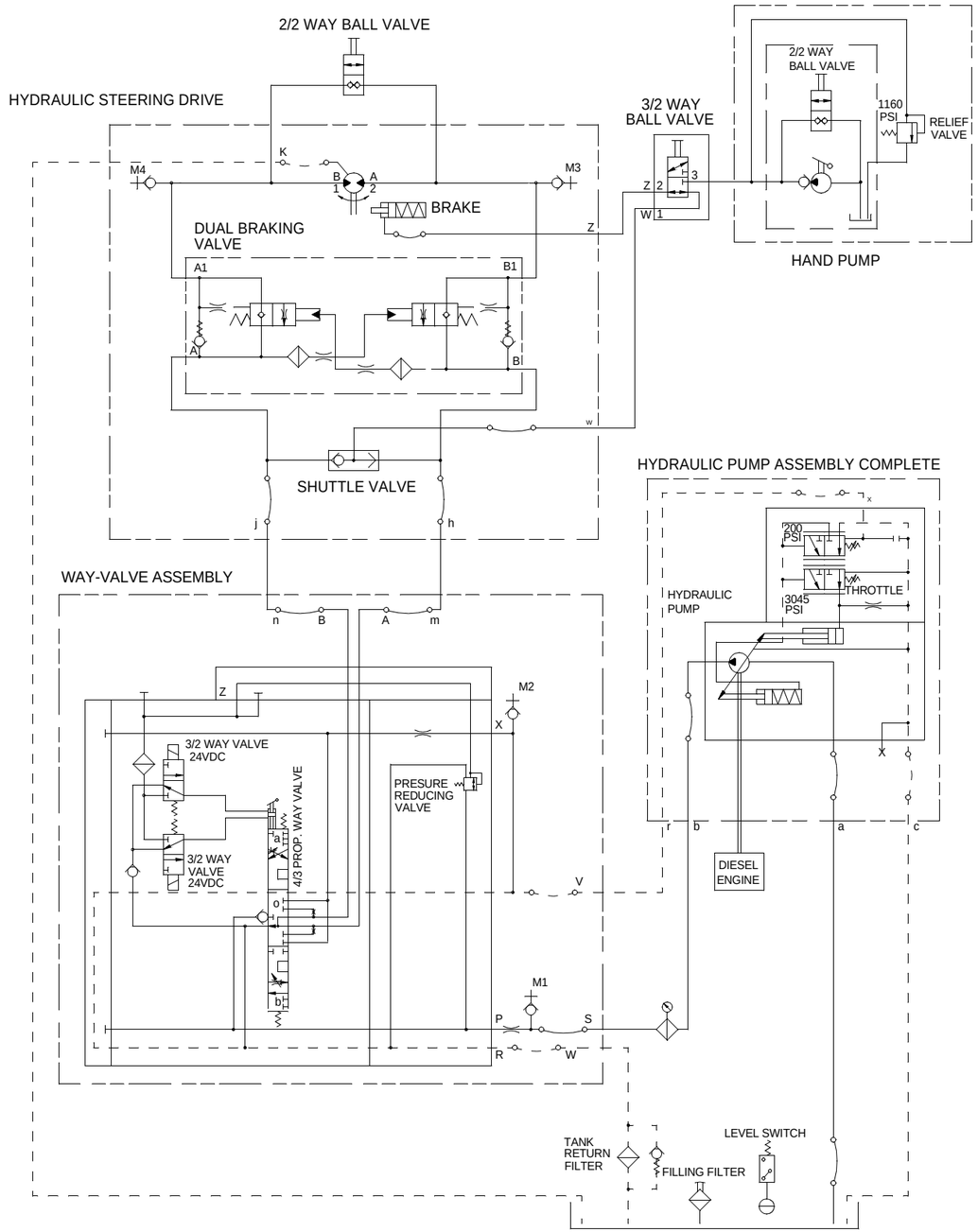


Figure 14. MCS Hydraulic System Schematic.

These are the instructions for sending an electronic 2028.

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

From: "Whomever" whomever@avma27.army.mil
To: 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 Fname:*** Joe
14. ***Submitter Mname:*** T
15. ***Submitter Lname:*** Smith
16. ***Submitter Phone:*** 123-123-1234
17. ***Problem:*** 1
18. ***Page:*** 1
19. ***Paragraph:*** 3
20. ***Line:*** 4
21. ***NSN:*** 5
22. ***Reference:*** 6
23. ***Figure:*** 7
24. ***Table:*** 8
25. ***Item:*** 9
26. ***Total:*** 123
27. ***Text:***

This is the text for the problem below line 27.

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

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

PUBLICATION/FORM NUMBER	DATE	TITLE

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

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

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

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

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

PUBLICATION NUMBER	DATE	TITLE

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

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

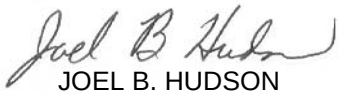
TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

USAPA V3.01

By Order of the Secretary of the Army:

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

Official:



JOEL B. HUDSON
Administrative Assistant to the
Secretary of the Army
0231305

To be distributed in accordance with the initial distribution number (IDN) 256760 requirements for TM 55-1945-205-24-1-1.

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 decigram = .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 milliters = .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

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

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C