

Summary Report for Individual Task
551-8ST-3019
CONDUCT THE MAINTENANCE OF DAMAGE CONTROL EQUIPMENT
Status: Approved

Distribution Restriction: Approved for public release; distribution is unlimited.

Destruction Notice: None

Foreign Disclosure: FD1 - The materials contained in this course have been reviewed by the course developers in coordination with the Transportation School, Fort Lee, VA 23801 foreign disclosure authority. This course is releasable to students from all requesting foreign countries without restrictions.

Condition: In an operational environment, aboard a vessel, at sea, at anchor or moored alongside the pier, day or night, under all sea and weather conditions, whether for routine maintenance, emergency drills, or during an actual emergency, while wearing appropriate PPE, (i.e. hearing protection, Nitrile gloves, eye protection, etc.), lock out tag out kit and a marine rail tool box. Standard MOPP 4 conditions do not exist for this task. See the MOPP 4 statement for specific conditions.

Standard: Conduct maintenance procedures of damage control equipment aboard an Army vessel, IAW the appropriate Technical Manual and local SOPs, without injury to self or others and without damage to equipment. The damage control equipment was fully mission capable at task completion.

Special Condition: None

Safety Risk: Low

MOPP 4: N/A

Task Statements

Cue: None

DANGER
None

WARNING
None

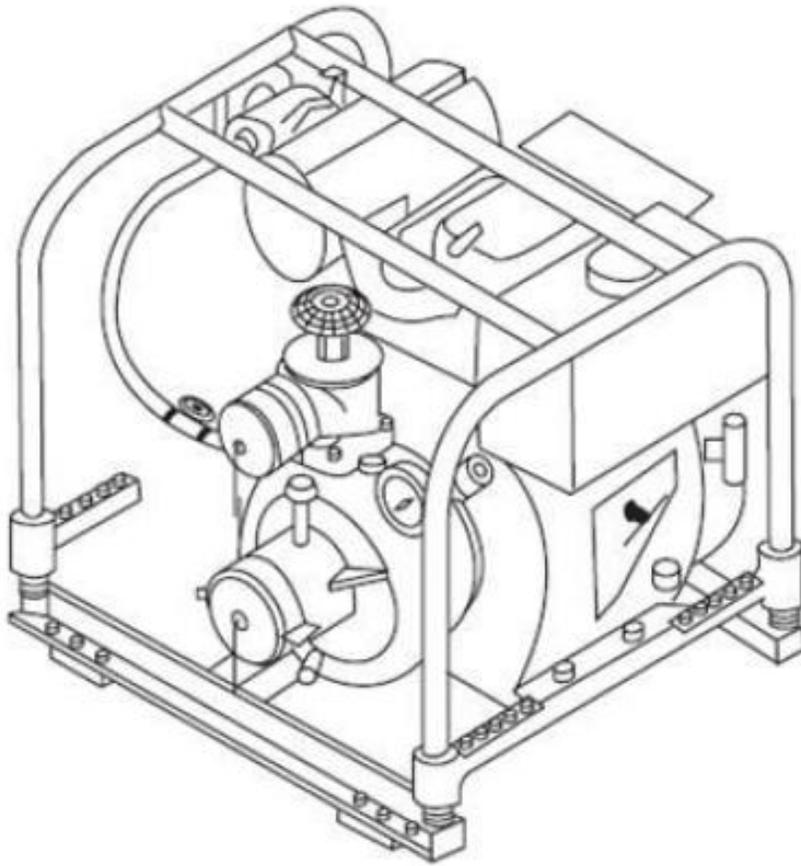
CAUTION
None

Remarks: None

Notes: None

Performance Steps

1. Conduct maintenance on a P-100 Pump.



P-100 Portable Pump
Figure 551-8ST-8109_01

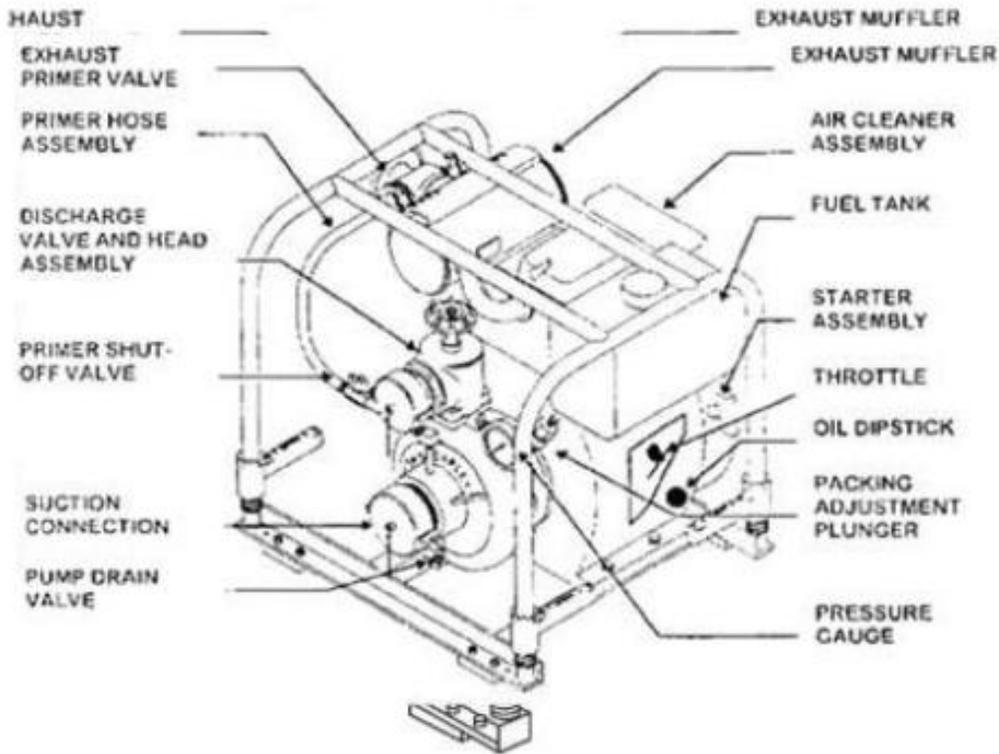
a. Prepare the P-100 pump for priming.

(1) Check the coupling gaskets and connect hose lines couplings. Verify that the couplings are properly tightened.

Note: A strainer with openings not larger than 1/4" mesh must always be used on the end of the suction line when pumping water from draft.



P-100 Suction Hose
Figure 551-8ST-8109_03



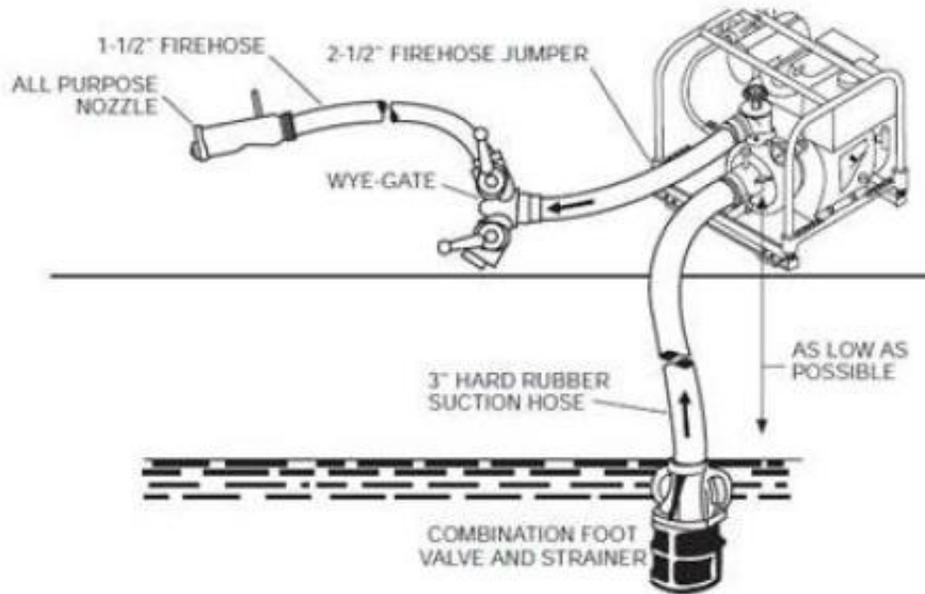
P-100 Portable Pump Description
Figure 551-8ST-8109_02

CAUTION

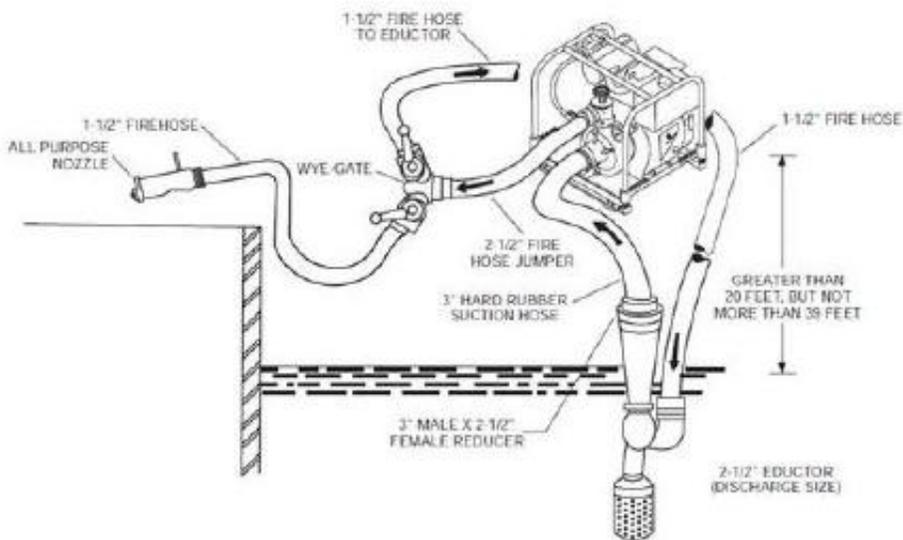
The suction hose may require support to prevent excessive weight from stressing the pump casing, inboard head, or engine. Where practical, the suction hose should be tied to some nearby structure and/or blocks should be placed beneath the suction hose adjacent to the unit to relieve stress on the pump.

(2) Keep the suction intake strainer well above the bottom of the water source to prevent picking up soil and other foreign matter. If the strainer must lie on the bottom, a metal plate or pan should be laid under it.

Note: Water may be drafted from ponds, lakes, streams, cisterns, tanks, sea water, and/or wells. Whatever the source, the static lift must not exceed 22 feet from the center of the pump to the surface of the water. A lift not exceeding 10 feet is recommended. The source of supply should be reasonably clear and free from foreign matter.



P-100 Configured for Firefighting with Suction Head Less than 20 feet/6.1 meters)
Figure 551-8ST-8109_04



P-100 Configured for Firefighting with Suction Head Greater than 20 feet/6.1 meters)
Figure 551-8ST-8109_05

- (3) Submerge the suction intake sufficiently into the water to prevent sucking in air.
- (4) Lay a cover over the top of the strainer to allow the pump to operate with a minimum of submergence.
- (5) Close the drain valve and all other openings into the pump casing.

WARNING

Hearing protection is required in the immediate area of the pump unit while in operation.

- (6) Do NOT start the engine until everything is ready for pumping, with hose couplings properly tightened.

Note: The pump discharge check valve may be partly open during priming at lifts less than 10 feet, and completely closed for lifts of 10 feet and more.

WARNING

The diesel engine exhaust contains poisonous carbon monoxide. Do not operate the pump unit in confined spaces unless the exhaust hose is connected in order to carry the toxic engine exhaust gases outside. Never use the P-100 pump unit in poorly ventilated locations, such as enclosed spaces. If such operation is unavoidable, provide proper ventilation and use an approved exhaust hose routed to the weather decks.

- b. Start and prime the pump.



Exhaust Hose)
Figure 551-8ST-8109_06

- (1) Set the fuel tank isolation valve located under the fuel tank to the open (O) position.
- (2) Set the engine throttle control to the START position.
- (3) Open the primer line shut-off valve between the primer jet and the pump suction.

Note:

The valve is open when the knob is in line with the air passage.

- (4) Slowly pull the recoil starter checking engine and pump for freedom of movement and priming the engine with lubricating oil.
- (5) Depress the compression release lever making sure that it remains depressed. The compression release lever will spring shut when the engine rotates during starting attempts.

(6) Start the engine by pulling the recoil starter rope.

CAUTION

Never run the pump at high speeds, unless it is discharging water. CAUTION: Never run the pump without water any longer than the short time required for priming. NOTE: Start the engine and run at a fast idle to prime with lifts less than 10 feet. Start the engine and run at full throttle to prime with 10 to 22 foot lifts.

(7) Set the engine throttle control to the RUN position, after the engine is running.

(8) Shift the exhaust valve to the prime position blocking the main exhaust opening.

Note: The exhaust valve is in the prime position when the handle is horizontal.

When priming on high lifts, or when pumping dirty water, it may be necessary to seat the discharge stop-check valve by gently tightening down with the handwheel. Unscrew the handwheel when water is discharged through the exhaust jet.

(9) Close the primer line shutoff valve and return the engine exhaust valve to the normal position after a steady stream of water appears at the discharge of the priming jet.

(10) Open the pump discharge valve.

CAUTION

Extended operation without prime may cause serious damage to the packing gland, the pump shaft, and other pump internals.

(11) Repeat the priming operation if the pump fails to hold its prime. If the pump does not deliver water within two minutes, stop the engine and check for air leaks at suction connections and/or the pump packing gland, or failure of the priming jet to produce vacuum.

(12) Prime the pump with water.

(13) Start the pump.

(14) Raise the discharge pressure to 50 pound per square inch (psi).

(15) Tighten the packing screw using a 6" long 9/16" end wrench until drip rate is between 5 and 60 drops per minute. Do NOT over-torque (24 in-lb torque).

(16) Operate the pump at 50 psi for 5 minutes to dissipate packing pressure against the shaft and permit cooling water to flow between the shaft and stuffing box hole.

(17) Make certain that water comes through before operating the pump at a higher pressure. The normal drip rate may vary between 5 and 60 drops per minute.

Note: The packing gland screw should be kept sufficiently tight to prevent excessive leakage only. Slight leakage is always required during operation to cool the packing and prevent damage to the impeller shaft.

(18) Operate the pump for 10 minutes at the highest normal operating pressure flowing sufficient water to prevent overheating.

Note: Do not run the pump blocked tight. Lower the discharge pressure to 50 psi and repeat the packing screw tightening procedure outlined above. The pump may now be operated for any time period required within its rated capacity, however, the drip rate should be monitored more frequently during the first few hours and adjusted, if necessary, to achieve a stable flow rate. Several more adjustments may be required. All diesel engines must be throttled back by the operator in high load situations. This must be done to prevent over-fueling the engine as is evident by black exhaust smoke. Careful readjustment of the throttle will not cause a decrease in pump performance. Throttle back until pump performance begins decreasing.

(19) Monitor the pump discharge gage and the fuel tank level occasionally while the pump unit is running.

Note: For periods of extended operation, refueling may be necessary.

CAUTION

Over-fueling the engine will cause dilution of the engine oil and premature wear on the cylinder walls and bearings.

c. Shut down the pump.

(1) Reduce engine speed to an idle speed.

(2) Allow the engine to cool down for two minutes.

(3) Return the engine throttle control to the STOP position.

Note: If the engine continues to run, shut the fuel tank isolation valve.

(4) Drain seawater from the pump (if the pump has been used to pump seawater) by opening the pump casing drain valve.

(5) Flush the pump with fresh water to prevent corrosion and salt crystals from forming on close tolerance pump internals.

(6) Apply a spray silicone compound to pump internals while slowly pulling the starter rope and replace hose connection caps.

(7) Drain water out of pump casing immediately.

Note: The drain valve is located at the lowest point in the pump casing.

(8) Remember to close all drain cocks after draining all water. If forgotten, trouble in priming will follow on the next run.

(9) Check lubrication after every run.

(10) Inspect and run pumps used for fire service periodically to ensure that they will be ready in an emergency.

d. Maintain high suction lift operation.

(1) Install the Vita Motivator eductor with foot valve and strainer on the submerged end of the suction line.

(2) Verify that the suction line slopes down all the way from the pump to the water.

(3) Fill the hose through a Y-gate valve or Tri-gate valve connected to the 1-1/2" feed line to hand prime the Vita Motivator eductor. By filling through the feed line, the check valve does not have to be held open as the water from the feed line will fill up the suction line and open the check valve.

Note: The first assurance against cold weather trouble is to keep fire apparatus stored in heated quarters. When setting up for pumping, avoid unnecessary delays by thoroughly training pump operators. Be sure that the primer lines are kept closed until ready for use. Have the discharge lines ready so that pumping may be started as soon as it is primed. Do not stop the flow of water through the pump until ready to drain and return to the station. Eliminate all water from the pump casing and the primer line between periods of operation.

CAUTION

In cold weather, it is important to make sure that the tubing leading from the exhaust primer to the pump casing is free from water to prevent freezing. Freezing of this tubing will render the exhaust primer inoperative and may damage tubing and fittings.

e. Remove water from the primer tubing.

(1) Disconnect the suction line.

(2) Restart the engine.

(3) Open the primer line shut-off valve.

(4) Close the engine exhaust valve tightly with lever at the side of exhaust primer.

(5) Wait five seconds.

(6) Open the exhaust valve.

(7) Shut off engine.

f. Test equipment for practice.

(1) Include pumping from low lifts, high lifts with short and long suction lines, with suction line elevated to form an air trap, from hydrants, and at large and small capacities in practice sessions.

CAUTION

Never break or restrict suction or admit air into the suction line while the engine is operating with the throttle open. This will release the load and possibly allow the engine to over-speed.

(2) Document the effects of air leaks in hose, insufficient submergence and restriction of the suction line. Suction lines can be restricted by placing a can or other strong closure around the suction strainer.



P-100 Suction Strainer
Figure 551-8ST-8109_07

2. Conduct the set up of a Electrical Centrifugal Submersible Pump.

Note:

These pumps are small in size and must be configured to perform their function.



Electrical Centrifugal Submersible Pump
Figure 551-8ST-8109_08

- a. Verify that the lifting line is properly attached to the upper pump handle.
- b. Check and make sure that the lifting line is properly secured in order to eliminate strain on the electrical cable.

Note:

The electrical cable must never be allowed to support the weight of the pump.

- c. Verify that the hose fitting on the pump is not bent or cross threaded.
- d. Verify that the electrical plug is properly attached and water-tight.

Note: A lifting line must be attached to the upper pump handle and be sufficiently long enough to have the electrical cable, with slack between each support, woven with half hitches from the lifting line at approximately three feet intervals for the entire length in order to raise and lower the pump. Additionally, the pump discharge piping must have a suitable hose attached to allow the water being pumped to discharge outside the space being pumped.

3. Conduct maintenance on a Water Driven Exhaust Fan.

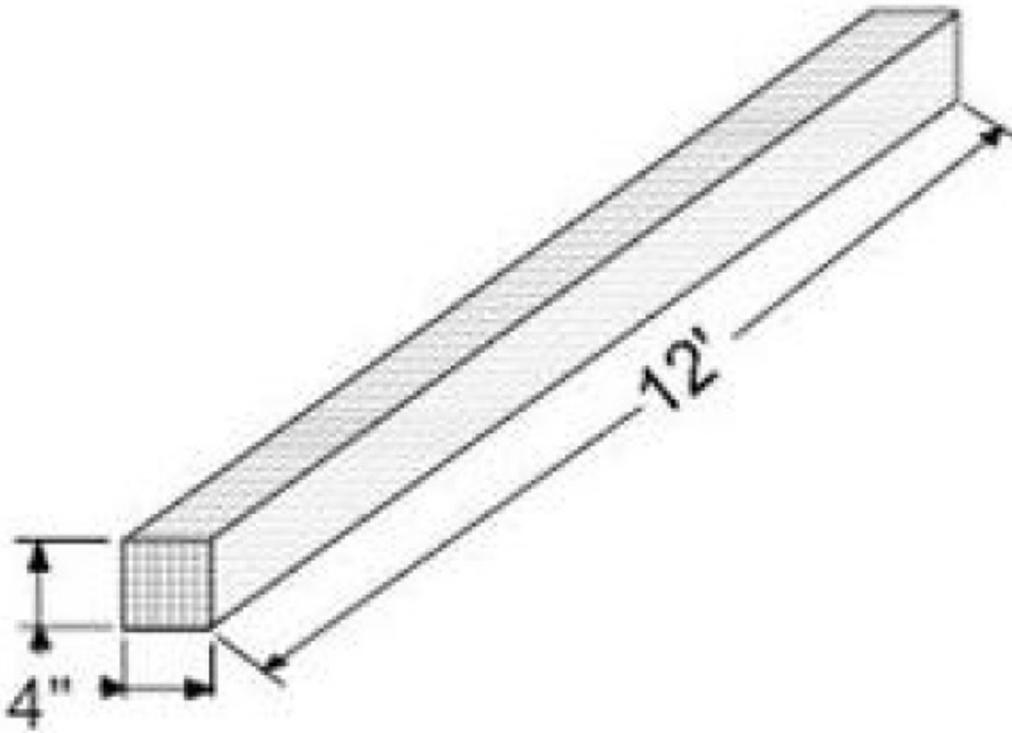
Note:

The strainer must be inspected and cleaned to ensure proper operation.



Water Driven Fan
Figure 551-8ST-8109_09

- a. Verify that the duct adapter connected to the blower and that the duct mounting surfaces are clean and free of corrosion.
 - b. Use only with a properly tested and certified hose for inlet and discharge connections.
 - c. Connect the inlet and discharge water hoses to the fan.
4. Conduct maintenance on Shoring, Wedges, and Plugs.



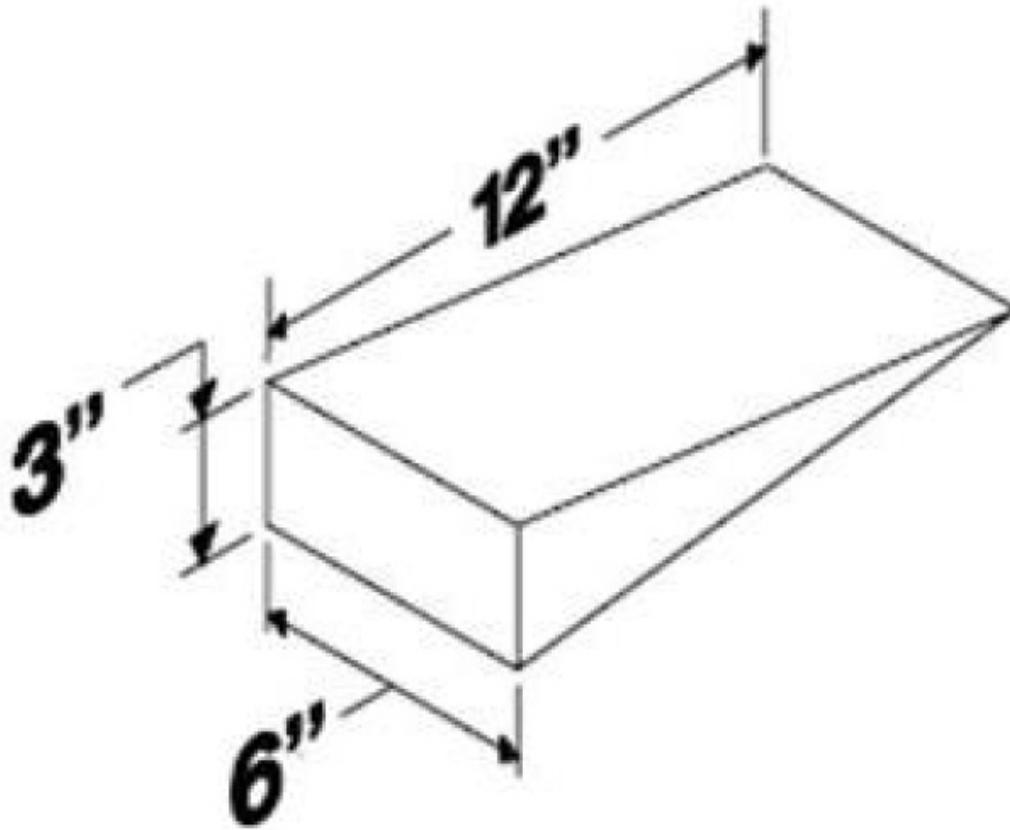
Wood Shoring
Figure 551-8ST-8109_10

a. Verify that the shoring, wedges, and plugs are not

- (1) Cracked
- (2) Split
- (3) Painted
- (4) Oil-stained

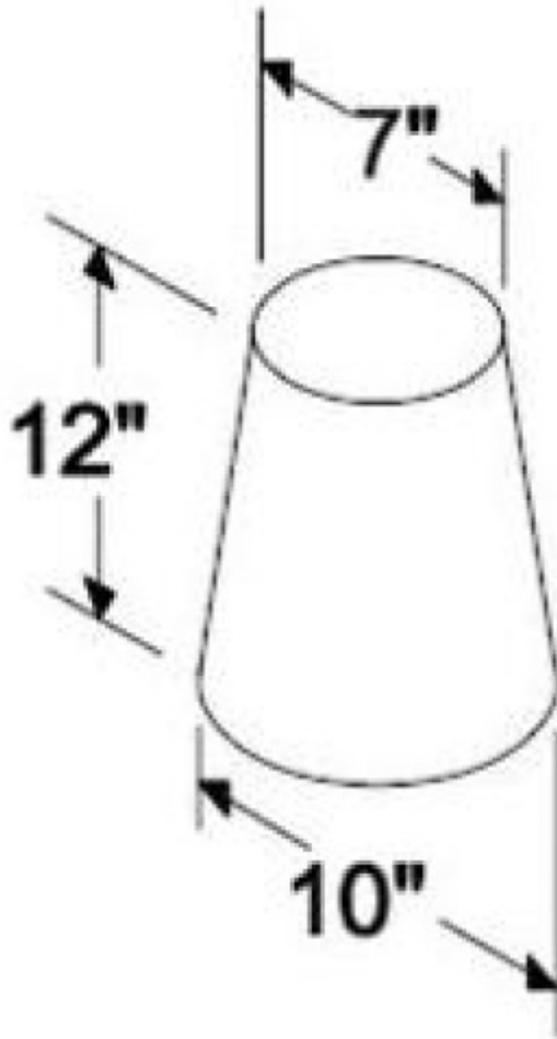
b. Verify that the shoring, wedges, and plugs are stored in a dry place.

c. Maintain wedges in a dry location as specified by the vessels damage control plan.



Wedge
Figure 551-8ST-8109_11

d. Maintain plugs in a dry location as specified by the vessel's damage control plan.



Plug
Figure 551-8ST-8109_12

5. Conduct a serviceability inspection on a Pipe Repair Kit.

a. Verify that the damage control metallic pipe and general repair kit (plastic) Assembly 1: P/N MILR17882 Assy 1; NSN 4730-00-542-3359 contains the following:

- (1) 4 cans of liquid resin, 400 grams each
- (2) 4 cans of liquid hardener, 100 grams each
- (3) 1 piece of woven roving cloth, 24 x 10 inches
- (4) 1 piece of void cover, 8 x 36 inches
- (5) 1 piece of PVC film, 36 x 72 inches
- (6) 1 chalk line, 1/8 pound
- (7) 4 pairs of gloves

- (8) 2 eye shields
- (9) 4 spatulas, wood
- (10) 1 pair of scissors
- (11) 1 instruction manual

b. Verify that the damage control metallic pipe and general repair kit (plastic) Assembly 2: P/N MILR17882 Assy 2; NSN 4730-00-542-3362 contains the following:

- (1) 4 cans of paste resin, 300 grams each
- (2) 4 cans of past hardener, 75 grams each
- (3) 4 depressors, wood, tongue

c. Verify that the kit is complete IAW with the hand receipt. It should contain the following components:

- (1) Belzona Marine Metal (3 x 1 kg)
- (2) Belzona 1221 (Super E-Metal) (6 x 125 g)
- (3) Belzona 1291 (2 x 110 g)
- (4) Belzona 9111
- (5) (Cleaner/Degreaser) (1 x 0.5 liter)
- (6) Belzona 9411
- (7) Release Agent (1 x 100 g)
- (8) Belzona 9341
- (9) Reinf. Tape (1 x 4 m)
- (10) Belzona Tourniquet
- (11) Lockable Tool Box
- (12) 25 disposable working surfaces
- (13) 2 spatulas
- (14) 4 applicators
- (15) Impermeable vinyl gloves
- (16) Material Safety Data Sheets

(17) Instruction CD/leaflet for use

d. Verify that all of the components are not expired.

e. Check that all items are unopened.

6. Conduct serviceability inspection on a Electrical Tool Kit.

a. Verify that the kit is complete IAW hand receipt. The kit should contain the following components:

(1) Chisel

(2) Pliers

(3) Hand wire stripper

(4) Hacksaws

(5) Ball peen hammer

(6) Screwdrivers

(7) Wrenches

(8) Tool belt

(9) Fuses

(10) Electrical tape

(11) Flashlight

(12) Line volt indicator

(13) Electrical workers gloves



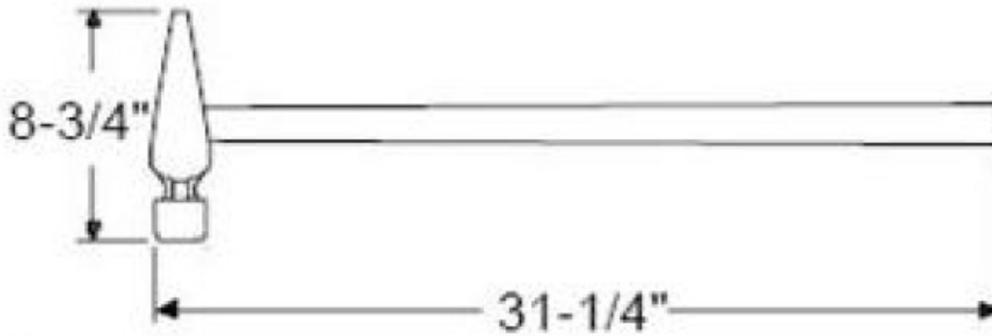
Electrical Tool Kit
Figure 551-8ST-8109_13

- b. Confirm that all of the components are marked for electrical tool kit.
- c. Verify that the micrometer is calibrated IAW test, measurement, and diagnostic equipment (TMDE)
- d. Validate that all of the hand tools are serviceable and free of rust.
- e. Make sure that the flashlight batteries are free from corrosion and that the bulb is working. Replace as necessary.

Note: When making electrical repairs, the following guidelines shall be adhered to by all Army watercraft personnel:

- " No personnel at any time shall work on an electrical circuit or system alone.
- " Know the potential hazard and use equipment properly.
- " Prior to starting work ensure that all circuits of concern are deactivated and tagged out in two separate locations.
- " Use a meter to ensure that circuit is de-energized at the source.
- " Upon completion of work ensure that all tools are cleaned, in operational condition, and returned to proper storage area.

7. Conduct a serviceability inspection of Ship's Maul.



Ship's Maul
Figure 551-8ST-8109_14

- a. Confirm that the handle is not painted or cracked.
 - b. Verify that the head is firmly attached to handle.
8. Conduct maintenance on a Electric Blower.
- a. Disconnect from power before cleaning.
 - b. Use good lifting practices.
 - c. Stop the unit immediately if you hear excessive mechanical noise or vibration.
 - d. Wear proper ear and eye protection must be worn while blower is running.
 - e. Keep fingers and hands clear of blade.
 - f. Keep area clear of rocks and debris.

Note: Never immerse the motor or direct spray at the motor. Blowers are NOT intended for operation in explosive atmospheres, unless specifically certified. See supplementary ATEX technical data if applicable.

WARNING

Do NOT start the blower if there are any signs of damage, particularly to blade, guards, or housing.
Do NOT move the blower while it is running.

CAUTION

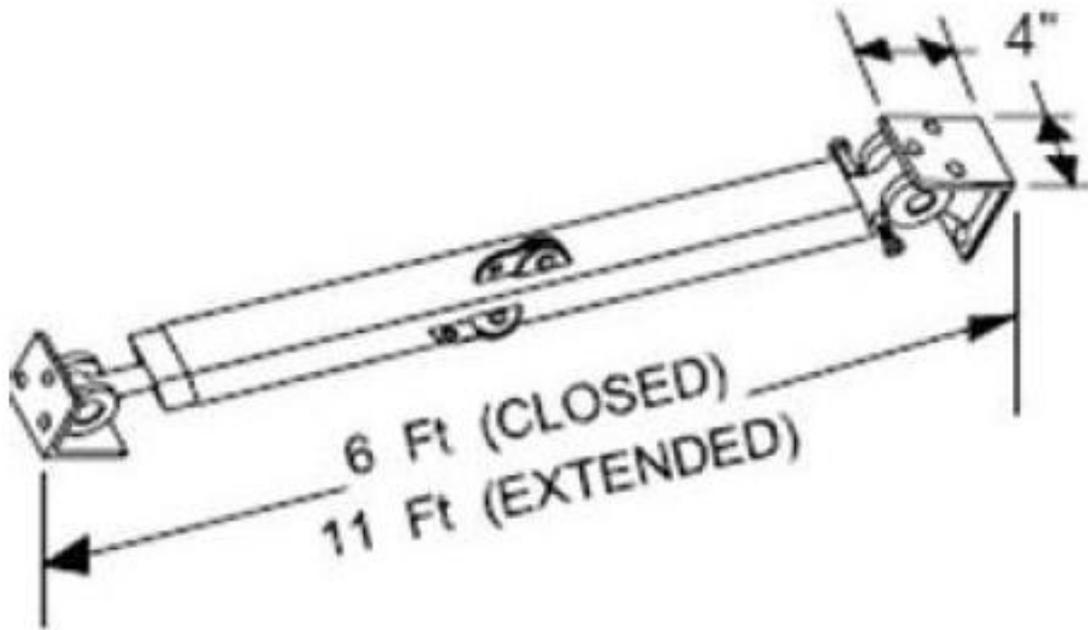
Blowers should be operated and repaired by trained personnel only.

9. Conduct maintenance inspection on a Electric Battle Lantern.



Battle Lantern
Figure 551-8ST-8109_15

- a. Check that the ON/OFF switch is operational.
 - b. Verify that the water-tight gasket is complete and not torn.
 - c. Validate that battle lanterns are numbered according to their station.
 - d. Make sure that the batteries are free from corrosion, and replace them if needed.
 - e. Check the bulbs, and replace them as necessary.
10. Conduct maintenance on the Steel Adjustable Battens.



Ship's Maul
Figure 551-8ST-8109_16

- a. Verify that the spring loaded clips are lubricated and complete.
- b. Corroborate that the pivot balls on the ends are lubricated and free moving.
- c. Confirm that the battens slide open and closed.

11. Conduct maintenance on the ship's chainsaw.

Note: The following maintenance intervals apply for normal operating conditions ONLY. If the daily working time is longer than normal or if the cutting conditions are difficult (For example, you are cutting in a very dusty work area or you are cutting tropical wood), shorten the specified intervals accordingly.

WARNING

Tighten down the cylinder base screws firmly after the first 10 to 20 hours of operation.

- a. Perform the following tasks before starting work:
 - (1) Check the chain lubrication.
 - (2) Examine the guide bar for wear and/or damage.
 - (3) Clean the air filter.
 - (4) Inspect the spark arrestor screen in the muffler.
 - (5) Check the chain catcher.

b. Perform the following tasks before starting work and after each refueling stop:

- (1) Inspect the machine for leaks.
- (2) Check the throttle trigger, trigger interlock, and master.
- (3) Verify that the chain brake is operating.
- (4) Inspect and check the saw chain for its sharpness
- (5) Verify the saw chain's chain tension.
- (6) Confirm the carburetor's idle adjustment. The chain should NOT turn.

c. Perform the following tasks after finishing work or daily:

- (1) Clean the machine.
- (2) Clean the cooling inlets.

d. Perform the following tasks weekly:

- (1) Clean and turn over the guide bar.
- (2) Deburr the guide bar.
- (3) Check the chain sprocket.

(Asterisks indicates a leader performance step.)

Evaluation Guidance: None

Evaluation Preparation: None

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Conduct the required maintenance on a P-100 salvage pump.			
2. Conduct the required maintenance on a electrical centrifugal submersible pump.			
3. Conduct the required maintenance on a water-driven exhaust fan.			
4. Conduct the required maintenance on a shoring, wedges, and plugs.			
5. Conduct the required maintenance on a pipe repair kit.			
6. Conduct the required maintenance on a electrical tool kit.			
7. Conduct the required maintenance on a ship's maul.			
8. Conduct the required maintenance on a electric blower.			
9. Conduct the required maintenance on a electric battle lantern.			
10. Conduct the required maintenance on a steel adjustable battens.			
11. Conduct the required maintenance on a chainsaw.			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	FM 55-502	Army Watercraft Safety (superseded by FM 4-01.502)	No	No
	TM 55-1905-223-SDC	SHIPBOARD DAMAGE CONTROL MANUAL FOR LANDING CRAFT UTILITY (LUC) (NSN 1905-01-154-1191)	No	No
	TM 55-1915-200-SDC	SHIPBOARD DAMAGE CONTROL MANUAL FOR LOGISTIC SUPPORT VESSEL (LSV) (NSN 1915-01-153-8801)	No	No
	TM 55-1925-273-10-1	Operator's Manual For Inland Coastal Large Tug (LT) (NSN 1925-01-509-7013)(EIC XAG) (This item is included on EM 0272)	No	No

Environment: Environmental protection is not just the law but the right thing to do. It is a continual process and starts with deliberate planning. Always be alert to ways to protect our environment during training and missions. In doing so, you will contribute to the sustainment of our training resources while protecting people and the environment from harmful effects. Refer to FM 3-34.5 Environmental Considerations and GTA 05-08-002 ENVIRONMENTAL-RELATED RISK ASSESSMENT.

Safety: In a training environment, leaders must perform a risk assessment in accordance with ATP 5-19, Risk Management. Leaders will complete the current Deliberate Risk Assessment Worksheet in accordance with the TRADOC Safety Officer during the planning and completion of each task and sub-task by assessing mission, enemy, terrain and weather, troops and support available-time available and civil considerations, (METT-TC). Note: During MOPP training, leaders must ensure personnel are monitored for potential heat injury. Local policies and procedures must be followed during times of increased heat category in order to avoid heat related injury. Consider the MOPP work/rest cycles and water replacement guidelines IAW FM 3-11.4, Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical (NBC) Protection, FM 3-11.5, Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological, and Nuclear Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks : None

Supported Collective Tasks : None

ICTL Data :

ICTL Title	Personnel Type	MOS Data
MOS 88K Watercraft Operator SL3	Enlisted	MOS: 88K, Skill Level: SL3, Duty Pos: TAV
MOS 88K Watercraft Operator SL 4	Enlisted	MOS: 88K, Skill Level: SL4, Duty Pos: TFJ
88L30 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL3, Duty Pos: TFR, LIC: EN
88L40 Watercraft Engineer	Enlisted	MOS: 88L, Skill Level: SL4, Duty Pos: TGB, LIC: EN, SQI: O