

Summary Report for Individual Task
551-88L-2051
Maintain a Pump
Status: Approved

DISTRIBUTION RESTRICTION: Approved for public release; distribution is unlimited.

DESTRUCTION NOTICE: None

Condition: Given an operational pump aboard a vessel, at sea, at anchor or moored alongside a pier, day or night, under all sea and weather conditions, wearing appropriate PPE, (i.e. hearing protection, eye protection, etc.), lock out tag out kit and a marine rail tool box.

Standard: The Soldier correctly maintains a pump aboard an Army vessel, IAW the appropriate Technical Manual and local SOPs, without injury to self or others and without damage to equipment. The pump was fully mission capable at task completion.

Special Condition: None

Special Standards: None

Special Equipment:

Safety Level: Medium

MOPP:

Task Statements

Cue: None

DANGER
None

WARNING
None

CAUTION
None

Remarks: None

Notes: None

Performance Steps

1. Maintain a rotary pump onboard an Army Vessel.

a. Bearings: If the pump bearings are worn excessively, they must be replaced IAW Technical Manual and local SOPs.

b. Timing Gears: Pumps fitted with timing gears must have correct clearance between the two pumping rotors during operation.

(1) The gears must be securely locked to the rotor shafts in their exact designed position.

(2) Be sure that there is no lost motion caused by the looseness of keys or pins holding the rotors in the shafts.

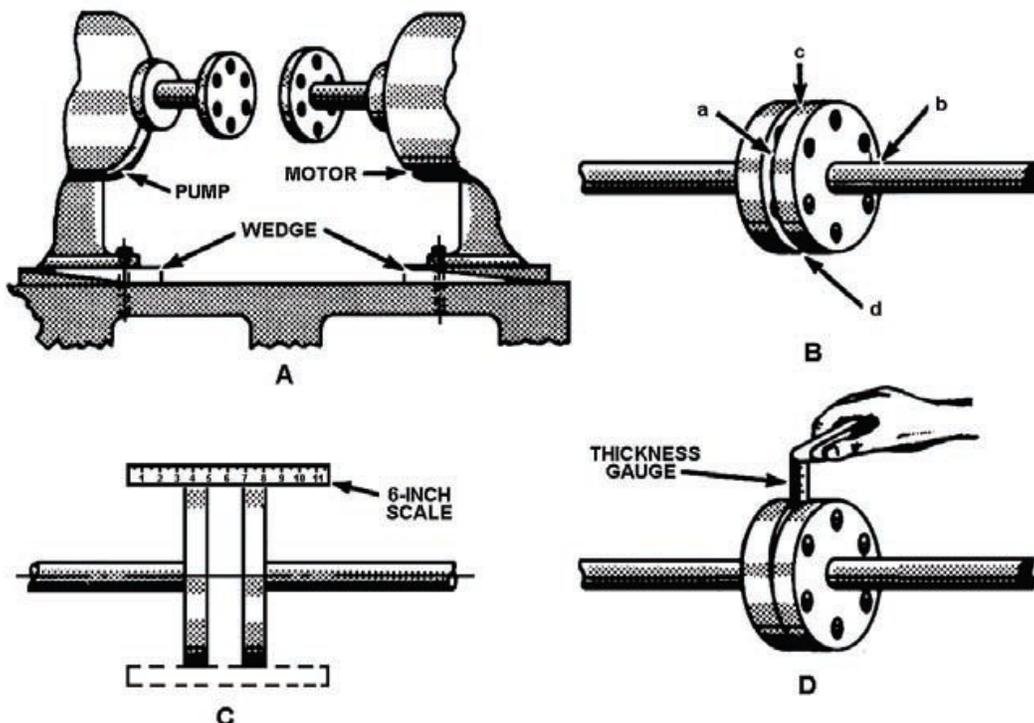
c. Thrust Bearings: Examine thrust bearings quarterly and check the position of the rotors; When checking the rotor position, be sure to make enough allowance for expansion of the shaft from the cold condition to the hot running condition.

d. Couplings: When misalignment of the coupling is minor, the coupling should operate satisfactorily without frequent renewal of coupling parts.

(1) If misalignment is excessive, the coupling parts take severe punishment and the pins, bushings, and bearings must be replaced frequently.

(2) Whenever a coupling is dismantled, inspect the teeth to see that they are in good condition.

(3) When the coupling is reassembled, check the alignment of the driving unit and pump to prevent excessive coupling wear.



Coupling Alignment
Figure 551-88L-2051_01

e. Pump Lubrication: Lack of proper lubrication is a primary cause of pump failure.

(1) Reciprocating engine-driven pumps are usually lubricated by either sight-feed drip cups or wick lubrication.

(2) See that oil cups are filled with oil (10W-30 Weight motor oil) and that an adequate supply is being fed to the bearings.

(3) Water pump shafts are usually fitted with water flingers between the pump shaft stuffing-box gland and the bearing housing to prevent the entrance of water from the pump glands to the bearing housing.

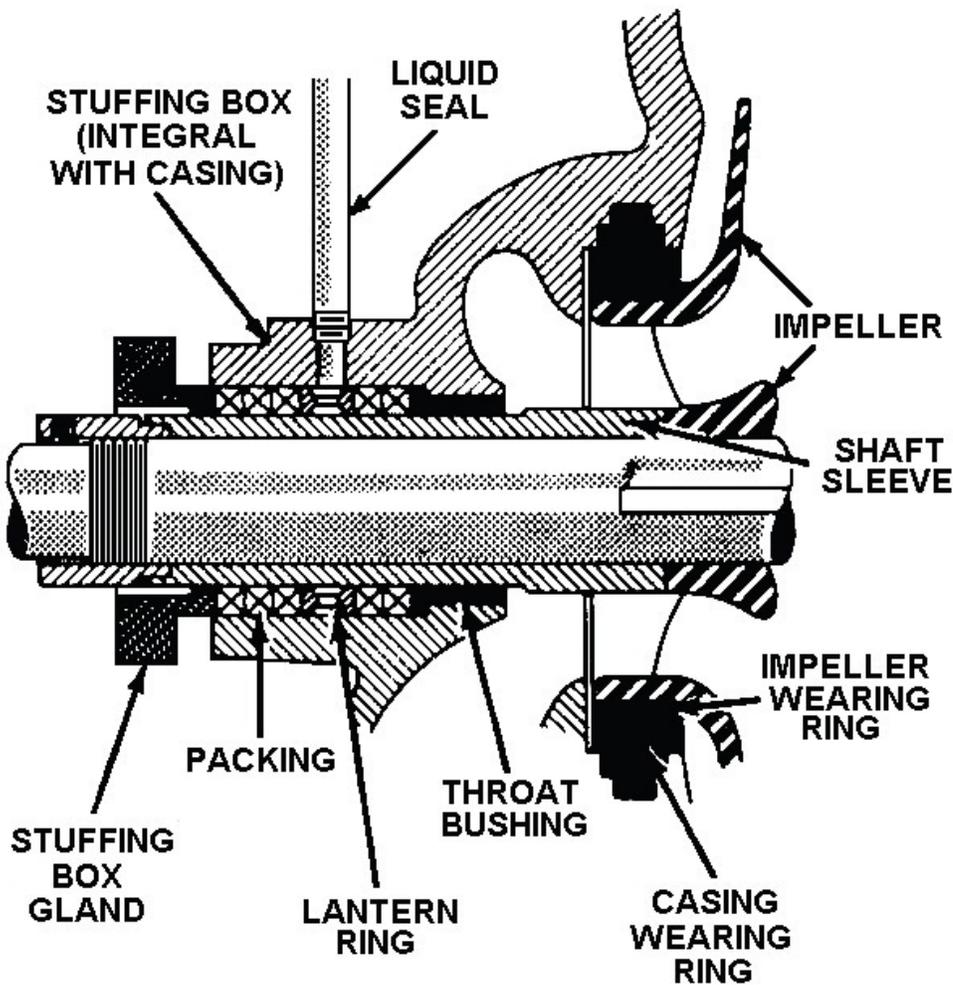
2. Maintain a centrifugal and propeller pump onboard an Army Vessel.

a. Stuffing Box Packing: Packing around the shafts of centrifugal pumps may be the stuffing box type, the labyrinth type, or both.

(1) Stuffing box packing should be replaced IAW Technical Manual and local SOPs with planned maintenance or whenever leakage becomes excessive.

(2) The packing should be installed in a uniform thickness all around the shaft sleeves.

(3) A flow of from 40 to 60 drops per minute out of a normal packed stuffing box is required to provide lubrication and to dissipate generated heat.



Stuffing Box
Figure 551-88L-2051_02

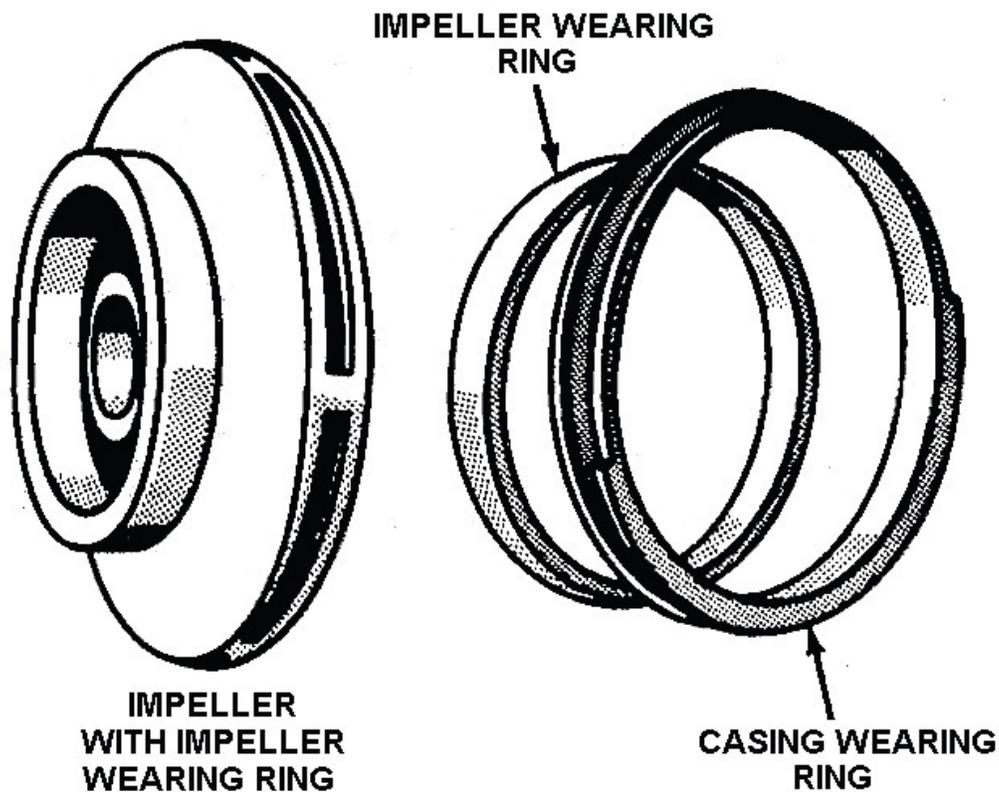
b. Rotary Seals: When the seal requires replacement or when there are signs of abnormal wear or damage to the running surfaces, thoroughly inspect to find the cause.

(1) Seal failure is often caused by dirt on the running surfaces, by worn bearings, or by bent shafts.

(2) Whenever the seal must be replaced, the complete assembly should be replaced in accordance with the manufacturer's instructions and local SOPs.

c. Lantern Rings, Sleeves, and Flingers: When packing a stuffing box fitted with a lantern ring, be sure to replace the packing beyond the lantern ring at the bottom of the stuffing box.

d. Wearing Rings, Impeller, and Casing: Clearances between the impeller and the casing wearing rings should be maintained by the manufacturer's plans or the Maintenance Requirement Card.



Impeller and Wearing Rings
Figure 551-88L-2051_03

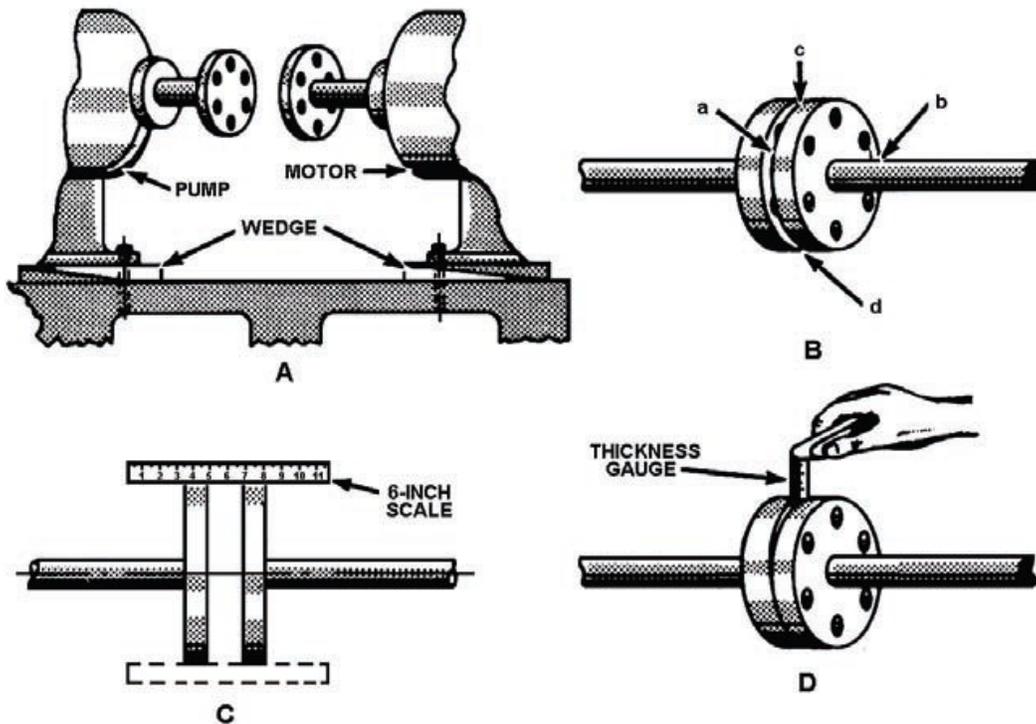
WARNING

This job can be done by the maintenance personnel, but it requires complete disassembly of the pump. If you must undertake this job, follow the manufacturer's instructions carefully. Improper fitting of the rings or incorrect reassembly of the pump can result in serious damage.

e. Shaft Alignment: Check the shaft alignment of a pump frequently or whenever the pump is opened up or whenever there is noticeable vibration.

(1) Whenever practicable, check the alignment with all piping in place and with the adjacent tanks and piping filled.

(2) When the driving unit is connected, or coupled, to the pump by a flange coupling, the shafting must be frequently realigned.



Coupling Alignment
Figure 551-88L-2051_03

(a) These alignments must be checked from time to time and misalignments must be promptly corrected.

(b) In general practice, three methods are used for checking alignments.

1 6-inch scale.

2 Thickness gauge.

3 Dial indicator.

3. Maintain a jet pump onboard an Army Vessel.

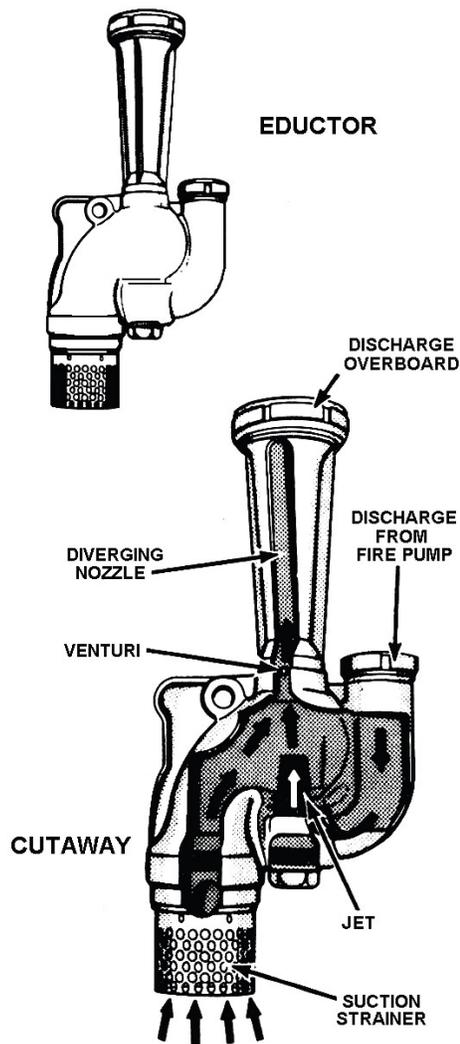
a. Jet pumps have no moving parts (reference Figure 551-88L-2051_05).

b. Because of their simplicity, jet pumps generally require very little maintenance.

(1) By the use of eductors, jet pumps can serve as drainage pumps without the risk of fouling the pump with debris.

(2) Erosion causes the nozzles to become enlarged, in which case they are generally replaced.

(3) The nozzles are occasionally removed; the strainers (if fitted) are cleaned; and a special reamer is inserted in the nozzles to clean out any rust or scale that may have accumulated.



Jet Pump with Eductor
Figure 551-88L-2051_05

(Asterisks indicates a leader performance step.)

Evaluation Preparation: None

PERFORMANCE MEASURES	GO	NO-GO	N/A
1. Maintained a rotary pump onboard an Army Vessel.			
a. Bearings			
b. Timing Gears			
c. Thrust Bearings			
d. Couplings			
e. Pump Lubrication			
2. Maintained a centrifugal and propeller pump onboard an Army Vessel.			
a. Stuffing Box Packing			
b. Rotary Seals			
c. Lantern Rings, Sleeves, and Flingers			
d. Wearing Rings, Impeller, and Casing			
e. Shaft Alignment			
3. Maintain a jet pump onboard an Army Vessel.			
a. Checked nozzles			
b. Checked strainers (if fitted)			

Supporting Reference(s):

Step Number	Reference ID	Reference Name	Required	Primary
	TC 55-509	MARINE ENGINEMAN's HANDBOOK	No	No

Environment: None

Safety: In a training environment, leaders must perform a risk assessment in accordance with FM 5-19, Composite Risk Management. Leaders will complete a DA Form 7566 COMPOSITE RISK MANAGEMENT WORKSHEET 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, NBC Protection, FM 3-11.5, CBRN Decontamination.

Prerequisite Individual Tasks : None

Supporting Individual Tasks : None

Supported Individual Tasks :

Task Number	Title	Proponent	Status
551-88L-1032	Demonstrate Basic Knowledge of a Pump	551 - Transportation (Individual)	Analysis

Supported Collective Tasks :

Task Number	Title	Proponent	Status
N/A	N/A	Not Selected	Obsolete