

Prime-Air Blowers, Inc.

Worldwide Ventilation Specialists

Prime-Air Typhoon 12 and *Super* Typhoon 15

Water Driven Marine Blower/Exhauster



Instructions for Operation and Maintenance

TYPHOON MARINE BLOWERS / EXHAUSTERS

OPERATING AND MAINTENANCE INSTRUCTIONS

The TYPHOON 12W / Super 15W is a reaction water motor driven tube axial blower specifically designed for vertical mounting on oil tankers and similar type ships. It has been designed to deliver the maximum possible airflow from the smallest possible size unit. Its weight has been minimized with the intent of producing a conveniently portable blower of rugged and durable construction. The water motor drive is intended to take advantage of the water supply commonly available on deck.

This unit has been designed to comply with title 46 codes of the U.S. Federal Regulation, Section 110, 15-175, Sub Section 1 requirements, dealing with non sparking fans. Meeting this regulation would be necessary before a unit of this type could be granted U.S. Coast Guard approval. Please note, however, that where tanker-ventilating equipment is concerned, Coast Guard approval is only granted on case by case, application by application basis.

The high-pressure fan is capable of driving or removing (with exhaust version) a sizable quantity of air into (from) cargo tanks for rapid and effective degassing, cleaning, drying or ventilating.

MAXIMUM SAFE OPERATING SPEEDS

The water motor drive is equipped with nozzles specifically designed to provide maximum speed with a differential pressure of 150 psig. Operation with a differential pressure greater than 150 psig may result in damage to the water motor housing with possible failure and danger to nearby personnel and equipment.

OPERATING INSTRUCTIONS

A complete inspection is performed on each blower before shipment. The unit is then shipped ready for use without further adjustment or lubrication.

The blower should be installed securely on the deck opening and several deck covers opened to allow an adequate escape path for the ventilating air prior to start-up of the unit. Failure to open a sufficient number of ventilating air exhaust covers before startup may limit ventilating effectiveness.

Water connections can be made directly to the 2" 'Camlock' inlet and outlet on the unit itself. During operation of the unit, the operator should check to ensure that the exhaust water pressure (normally "zero") is not exceeded.

At start-up, the water inlet valve should be opened slowly and the unit brought up to speed gradually. When ready to shut down, stop the blower by closing the water inlet valve.

If the unit is to be exposed to sub-freezing temperatures, it must be completely drained of water when not in operation. This can be accomplished by tipping the unit on its side and allowing the water to drain out of the inlet. **NEVER** operate unit without safety screen in place.

MAINTENANCE

The TYPHOON 12W/15W is designed to run for long periods with minimal service. The stainless steel bearings are grease-sealed and require no further maintenance unless they become worn or damaged (see Section VI)

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A build-up of solids around the mechanical seal will lead to reduced seal life due to reduced cooling and increased abrasive action. The duration between seal maintenance will depend upon the amount of sand and other contaminants in the water used to operate the water motor. Failure of the seal will be evident from excessive water escaping through the 1/8" pilot hole in the turbine mounting housing.

DISASSEMBLY AND PARTS REPLACEMENT

1.1 General

Qualified personnel and facilities should be utilized for servicing of this unit. When properly operated, the water motor should only require servicing if one or more of the following is evident:

- a) Excessive water leaking is evident from the slots above the upper bearing. This indicates a worn or damaged seal.
- b) The performance has dropped off.
- c) The bearings are worn or damaged.

The remedy for a) is to check the mechanical seal for build-up of foreign material and/or wear due to abrasive to heat action and to install a new mechanical seal if necessary.

The remedy for b) is to check that the impeller has not been damaged or that the vanes on the cover have not become clogged with foreign matter.

The remedy for c) is to install new bearings. Use stainless steel bearings only - See Parts List herein.

2.1 Disassembly of Water Motor

Remove the five (5) bolts, which hold the turbine top cover. Once the cover has been removed the impeller is in clear view. The impeller is screwed on the stainless shaft the same rotation as the water inlet. This arrangement allows the impeller to tighten at all times when in operation as the water is pushing the impeller tighter on the shaft. To disassemble, start by removing the impeller from the shaft. To do this, unscrew the impeller by holding the fan blade in one hand and unscrew the impeller with the other. The water motor can now be removed from the rest of the unit. Remove the four (4) bolts that hold the water motor to the base bearing housing.

The mechanical seal can now be removed and replaced. The stationary (lower) part of the seal is removed by turning the motor base over and pressing the seal out from the bottom. The opening should be cleaned of all foreign materials before a new seal is installed. Turn the motor base over to replace the seal.

2.2 Reassembly of the water motor

The new seal should be installed in the counterbore with a light coat of sealant such as Permatex. Press the new seal into the counterbore until fully seated. An assembly tool such as an arbor press is recommended to insure a square installation.

The rotating (upper) part of the mechanical seal is slid fully onto the shaft to mate with the lower seal. First, lubricate the shaft and the inner rubber inner diameter of the seal with a light machine oil or a 5% detergent solution. The seal **MUST** be installed with the **POLISHED CARBON SURFACE** facing **DOWN**. The impeller can now be installed on the shaft to force the seal mating surfaces together. Tighten the impeller until it is seated fully on the shaft. The cover is replaced using a sealant such as Loctite 510 Gasket Eliminator at the mating surfaces and secured with the five (5) bolts.

The completed water motor should not be put into service for 24 hours to permit adhesives and sealants adequate cure time.

3.1 Disassembly of Unit

It should be noted that to remedy items (a) and/or (c) of Section 1.1 above, it will first be necessary to disassemble the water motor from the rest of the unit. To accomplish this, remove the fan by first removing the hex head cap screws holding the safety screen to the housing.

Then remove the four 1/2"-13x3" hex head cap screws and their corresponding nuts and washers and lift the water motor assembly with propeller out of the main housing.

The bearings may now be accessed for replacement. To replace the bearings, loosen the two (2) set screws on the propeller hub and slid the prop off the shaft. With the water motor base assembly upside down the retaining ring can be removed.

Care should be taken to protect the threads on the other end of the shaft from damage. The shaft and bearings can now be pressed out of the housing from the top end. Using an arbor press, press the shaft out from the threaded end of the shaft using care not to damage the threads. After the shaft is removed the bearing can be pressed off the shaft. New bearings are pressed on the shaft then the shaft assembly is pressed into housing that it was removed from, the retaining ring is replaced and the Propeller blade is reattached to the shaft. Make sure to place the safety screen loosely between the bearing housing and the propeller blade before attaching the blade onto the shaft. The whole assembly can now be placed back in the main housing and secured as before. Once the bearing assembly has been completely reassembled in the main housing, the water motor can be reassembled on top of the bearing housing as per section 2.1.

NOTE: BE SURE TO CHECK THAT THE FAN TURNS FREELY BEFORE OPERATING.

NOTE: EXCESSIVE VIBRATION IS ANOTHER PROBLEM THAT SHOULD BE CORRECTED IMMEDIATELY.

IT CAN BE CAUSED BY ANY ONE OR MORE OF THE FOLLOWING:

- WORN BEARINGS
- BENT SHAFT
- DAMAGED FAN
- DAMAGED IMPELLER
- BUILD-UP OF FOREIGN MATERIAL ON IMPELLER OR FAN

REPAIR AND SPARE PARTS

Refer to drawings and recommended spare parts list for reference number, part number, and description.

When ordering, please supply the following information:

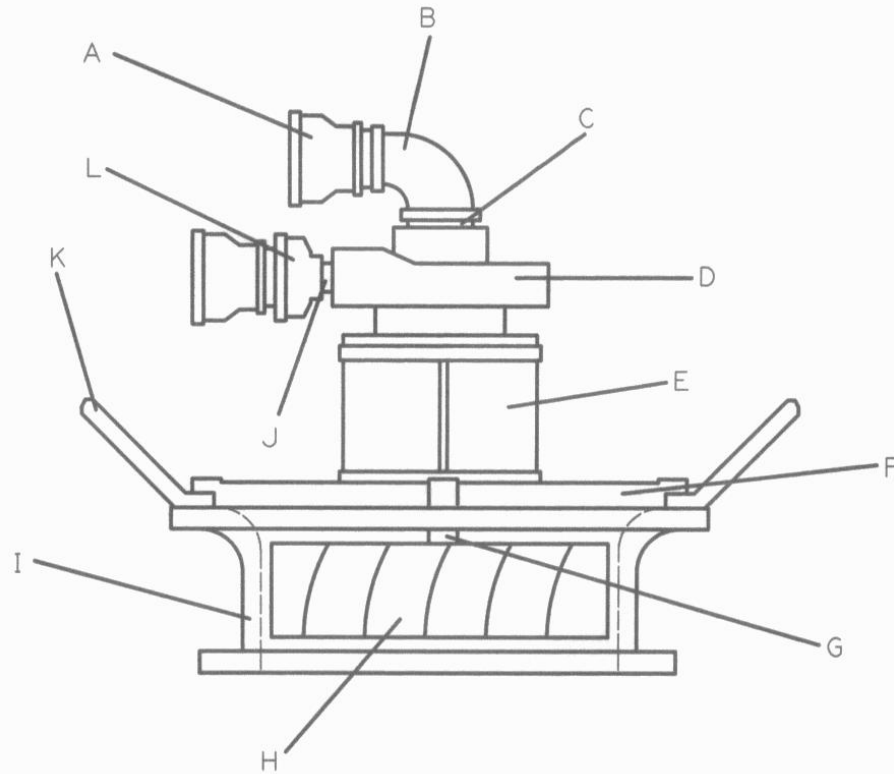
- Model Number
- Quantity
- Description
- Prime-Air Part Number
- Purchase Order Number
- Billing, Shipping, Marking, & Routing Instructions

Hardware items that do not have a reference number can usually be purchased locally. Order spare parts from your local representative or:

Prime-Air Blowers, Inc.
118 Cambridge Street & Cambridge Crossing
Worcester, MA. 01603 USA
Telephone: (508) 755-5577 / Fax: 508-755-5548

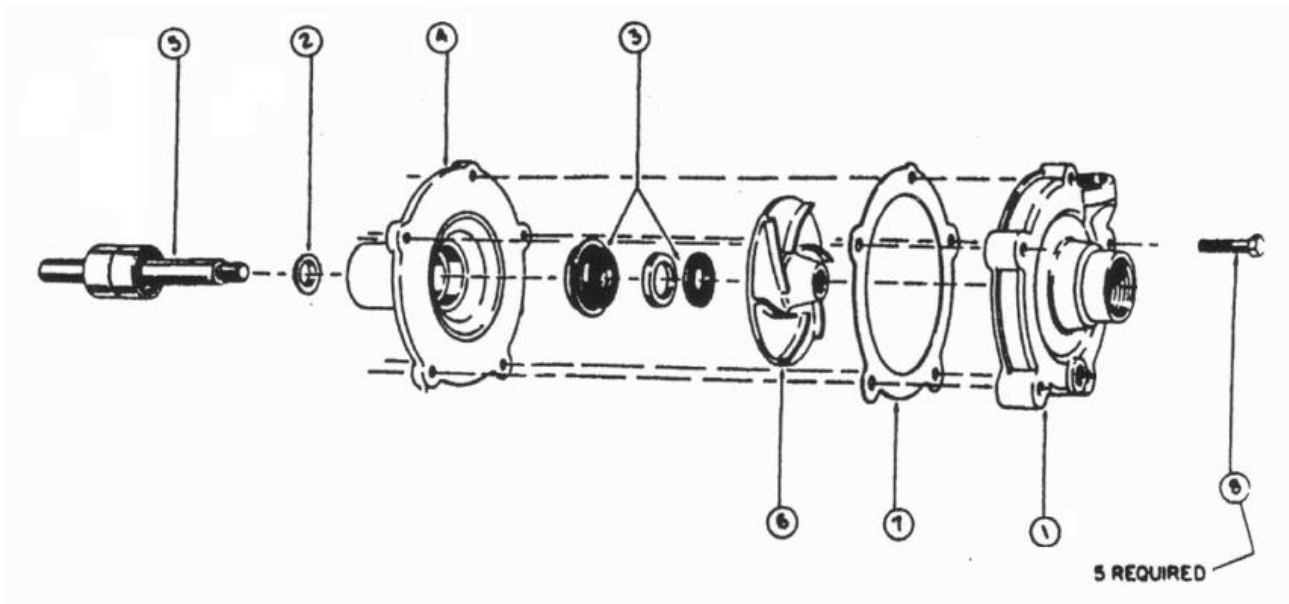
This manual is for the assistance of personnel operating and maintaining the equipment. It does not vary or substitute for the express warranty of PRIME-AIR BLOWERS, INC. This manual is general in nature and may not apply to special units. Please consult the factory if in doubt as to applicability.

Typhoon 12W and 15W Parts List



Part	Description
A	2" Camlock coupling
B	2" to 1 1/2" 90 Degree bronze elbow
C	1 1/2" Bronze NPT nipple
D	Water motor assembly
E	Water motor mount
F	Motor mount "spider"
G	Stainless steel shaft
H	Spark resistant fan blade
I	Cast aluminum fan housing
J	1" Bronze NPT nipple
K	Carry handle
L	1" to 2" Bronze adapter
	Safety screen
	Safety screen bolts
	Carry handle bolts
	Motor mount "spider" bolts

Typhoon 12W and 15W Water Motor Assembly Parts List



Part	Description
1	Centrifugal housing
2	Slinger
3	Mechanical seal and seat assembly
4	Centrifugal body
5	Shaft assembly
6	Impeller
7	Gasket (made with RTV sealant)
8	Hex bolt