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## BILGE PUMP CHECKLIST

### **Step #1 - Test Existing Pump Capacity**

- a) Pour a known quantity of water into your bilge (at least 20-30 gallons).
- b) Turn on your **Electric Bilge Pump** and use a stopwatch to time how long it takes to empty your bilge. Record the time in your vessel records.
- c) Pour another 20-30 gallons and empty your bilge using your **Manual Bilge Pump**. Time the test and count the strokes of the pump needed to empty your bilge. **You will need to calculate the volume per stroke of your manual bilge pump.** (This is the most important number when determining manual pumping capacity).
- d) Fill a 2 ½ or 5 gallon bucket with water (not to the top but close to full) and stand in the cabin. Pick up the bucket and empty it out into the cockpit. This will help you understand the sheer weight of the bucket and the awkwardness of lifting it up to or above your shoulders. While doing this test imagine doing it many times in a seaway. Also, take note of your Nav Station location, (typically next to your companionway) with all its electronics and communication equipment. Imagine that getting doused with a bucket of water. NOTE: consider the water level required in your vessel that allows for the use of a bucket (it is often not until the water has risen above the floor boards).
- e) Record your capacities in electric, manual, and scared man buckets after performing the above tests. Calculate your combined current pump capacity.
- f) The above suggestions are intended to establish your current baseline bilge pumping capacity. You need to put yourself into the worst case situation to make a reasonable assessment of (1) your electrical pump capacity (2) your manual pump capacity, and (3) estimate how many

buckets of water you can throw out of the companionway. NOTE: Your physical capabilities need your honest assessment.

### **Step #2 - Understanding How and What to Add for Pump Capacity**

- a) When looking at the capacity of Electric Bilge Pumps it is important to know the approximate distance from the bottom of the bilge to the underside of the deck where the “loop vent” is located for the discharge hose. This height is known as the discharge head. Based on the discharge head and the rated capacity of the pump, you will now be able to calculate the actual capacity of the electric pump.

NOTE: A typical 2000 gallon per hour pump with 6’ of discharge head will actually pump approximately 1,300 gallons per hour, or 22 gallons per minute. The capacity gets reduced further by right angle turns, ribbed hoses, etc.

- b) Boat manufacturers are required to install an Electric Bilge Pump and a cockpit mounted Manual Pump. However, there is no capacity requirement for either.

### **#3 - Important factors to consider**

1. How far offshore do you plan to venture?
2. Will you be boating in a remote area or one populated with other boats who could help in an emergency?
3. How comfortable/confident are you with your current pumping capacity?
4. Survey available space for hose runs for additional manual and/or electric pump installations.
5. If you are considering adding a **Manual** pump, think about the ergonomic activity of pumping. Can you brace yourself in a seaway? Can you put your body behind each stroke? These are important considerations, as “sustainability” is the main ingredient in maintaining manual pump output volume. Remember **volume per stroke** when shopping for a manual pump!

6. Is your boat of sufficient size to have compartmentalized pump requirements? If so, how do you best address that? Most would suggest each compartment have its own bilge pump with its own discharge hose and thru hull.
7. Know your physical limitations, and that of your crew.
8. Know how fast water can come in to a boat. See chart below.

**CHART SHOWING FLOW OF WATER IN “GALLONS PER MINUTE”**

		Feet Below Waterline		
		2'	4'	6'
Hole Diameter In Inches	1”	28	40	49
	2”	111	157	192
	3”	250	354	433

\*Multiply by 60 for “gallons per hour”

**Step #4 Planning & Prevention**

- a. Check all hoses above and below the waterline.
- b. Check engine exhaust risers and hoses.
- c. Check seacocks and all thru-hull fittings for cracks and/or corrosion.
- d. Check prop shaft and rudderpost stuffing boxes.
- e. Clean the bilge and paint it white. This will help you see debris that could clog a pump, hopefully in advance.
- f. Keep a waterproof LED flashlight handy. If your bilge is deep, tape the flashlight to a dowel long enough to reach the bottom of the bilge. This will help you see debris and any issues happening below the water level.
- g. Draw a map of the thru hull hole locations in your boat. Laminate three (3)

or more copies, one for each cabin, and keep them in logical places. Place one on the back of the head door so family and friends have something important to read. It is also good to note the location of fire extinguishers on the same sheet of paper and any other safety tips that you think would be helpful in case of emergencies (which could include incapacitation/injury to the captain and/or vessel owner).

In summary, we have seen 45' LOA vessels launched, tied to a marina, and used as a summer home. We have also seen 25' boats designed for "coastal cruising" circumnavigating the globe. These guidelines are designed to help boat owners make informed decisions as to the pumping capacity needed for the intended use of their vessels

Respectfully,

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Manual Pump Manufacturers:

- 1) Whale
- 2) Bosworth
- 3) Patay
- 4) Plastimo
- 5) Edson