

Pump Assembly and Testing Tips

You are to assemble and evaluate the performance of your pump. Assembly steps include:

1. Make sure you don't have any burrs (stray pieces of the gray PVC material) projecting into the impeller cavity that could interfere with your spinning pump impeller. If you see something that could interfere with impeller rotation, you must trim this off before going to the next step.
2. Grease your pump shaft near the o-ring. Wipe off any grease that gets on the portion of the pump shaft that will interface with the impeller; this grease will reduce the friction between the impeller and shaft, causing the impeller to slip on the shaft.
3. Press your impeller onto the shaft. You WILL break your impeller if you are not extra careful, and you may break it anyway. Apply a uniform pressure to the top of the impeller with your thumb. If you apply even a small force to an impeller blade that is not straight down (in the direction of the pump axis), the blade will snap off.
4. After pressing the impeller into the cavity, the top of the impeller must be below the top of the pump body or else it will contact the face plate and be jammed. If the impeller protrudes beyond the pump body, you must remove it and carefully reduce the height of the impeller by sanding with fine sandpaper (no less than 220 grit sandpaper). When sanding, apply only a very small amount of force to the impeller or it WILL definitely break. You can only remove the impeller by pulling the motor out from the rear of the pump (ask the help desk for more zip ties if this happens).
5. Insert the faceplate o-ring seal, and tighten four screws.
6. If you break your impeller, check with your instructor or the help desk to see if you can get a spare. The pump may still pump even if it only has one or two blades left.
7. You will have the next class to wrap up loose ends on the pump project, in case you need didn't finish last time.

Reasons Some Pumps Don't Work:

1. The motor doesn't spin. *If the motor has power and still doesn't turn, the impeller is probably stuck either by contact with the face plate, the bottom of the pump cavity, the sides of the pump cavity, or with one of the barbed fitting (which could be screwed in too far).*
2. The motor spins but the impeller does not turn. *The impeller is probably hung up. However, your pump may still not work when the impeller is freed since a loose connection may be present between the motor shaft and the impeller.*
3. Poor pump performance:
 - a. *Try swapping the + and – leads to the pump since the impeller may be spinning backwards.*
 - b. *Air may be sucked into the pump housing due to poor sealing of one of the o-rings.*
 - c. *The o-ring may be squeezing too tightly on the DC motor shaft or there may be super glue in the bronze bushing that is restricting motion. If this occurs, you need to remove your motor (cut the zip ties and pull the motor out) and ream out the bushing hole and o-ring with a #42 drill bit.*