

Kayak Pump Construction

These are the materials I use. You might have other or more suitable things to use.

- 1- Body – 460 mm x 64 mm ID, plastic water pipe
- 2- Spout – 40 mm ID x 60 – 100 mm, water pipe
- 3- Disks ~ 260 mm x 65 mm x 3 mm, PVC sheet
- 4- Flapper valves, inner tube
- 5- Pump shaft ~500 mm x 10 mm, fibreglass rod
- 6- Handle – 70 – 80 mm x 25 water-pipe
- 7- Plastic or SS nuts & bolts
- 8- Close cell foam block ~65 mm cube, floatation and flow deflector
- 9- Bungy ~40 mm x 4 mm, for stowing the pump closed
- 10- Garden hose ~40 mm – stops the handle hitting the top disk

The pump body is a piece of plastic water/drain pipe cut off square. I make mine 460 mm long as they fit in the box we transport our gear in.

There are 4 disks, bottom with flapper valve, piston with flapper valve, top inner, top outer. There are two at the top, one to centre things so that is fitted inside the body and one over the top to stop you pushing the inner one in any further. The disks are made by either using a holesaw to cut the disks to a size bigger than needed or hacking out a rough shape. I use a 76 mm (3") holesaw. A hole is drilled in the centre and a 5 or 6 mm bolt (use imperial if you insist) is fitted. This goes into your power drill and, mounting the drill firmly somehow, turn the disks down to the required size using a chisel, paint scraper or large knife as the turning tool. I use a triangular paint scraper.

You need two disks that are a neat fit and one that fits freely (piston). The fourth one is equal to the outside diameter for the top.

Cut two disks from a car inner tube, just a little smaller than the inside diameter of the pump body. Cut 4 slots in the disks, around the centre but leaving enough plastic for fastening the rubber flapper and, on the piston disk, the pump shaft.



The parts of a pump

Note here that the piston does NOT seal. There is a little loss but so little it will not impinge on the performance of the pump. It will still out perform a commercial pump because of its volume.



Disk, flapper and source of flapper



Disk drilled and two holes cut

I use PVC plastic rod for nuts to hold the disks and flapper valves together because I have access to a lathe and taps & dies. The “nuts” could be made out of small blocks of plastic or for the bottom disk and flapper, a SS nut and bolt ~6 mm or bigger.



Shaft assembled with piston, flapper, bottom spacer, float, top spacer, handle



Piston and flapper on shaft

Even threading the pump shaft and using PVC nuts, I still lock things together with thin SS welding wire, through the nuts and shaft. These items could be glued but I like to be able to totally dismantle my pumps. If you are not worried about that, glue everything solidly.

Using a ~40 mm holesaw, cut a hole in the side of the body of the pump about 20 – 40 mm from the top for the spout. This distance from the top of the pump allows for a block of closed cell foam to be put inside the pump, shaped to aid the flow of water from the pump body to the spout and most importantly, act as a float. The pump should float upright with the handle ready for you to retrieve it if it falls overboard. The spout is glued to the body with PVC cement, **after** the pump plunger with piston is fitted to the pump body.

Using a piece of 100 mm x 25 mm water pipe, drill a hole through it in the centre, suitable for the pump shaft. Fasten it to the pump shaft by gluing, or top and bottom plastic blocks. Below it, fit about 40 mm of garden hose over the shaft. This stops you banging your fingers on the top of the pump and stops the bottom of the shaft hitting the lower flapper valve disk.

Fit on to the pump shaft the two top disks, the larger above the one that fits inside the body. Next fit the floatation foam then fit the lower disk with flapper valve and a short length of hose to stop the piston hitting the spout at the top of the stroke.

Glue on the spout.

Glue the lower disk with flapper valve into the bottom of the pump. Mine are about 10 – 12 mm up the pump body. This stops the bottom fastening resting on what you are pumping from and damaging the glue of the disk. You could also cut a slot or two in the side of the pump ~5 mm high so that the pump doesn't suck itself to the bottom of your kayak.

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