An easy to use, install and maintain 12volt electric pump for kayak as fitted to 3 boats by Peter Baker.

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This installation was a result of having studied multiple different pump installation and most importantly methods of pump switching. The three main ones being:-

1. Single pole switch operated by a through deck toggle with a plastic waterproof cover
2. Single pole rocker switch operated by flexible water proof cover, fitted over a hole in the deck.
3. A magnet operated reed switch that via a relay that operates the pump.

All of these systems operate in conjunction with a in line fuse/holder.

**The main disadvantages I have found are:-**

1. The vulnerability of the waterproof toggle cover and the potential of the salt water/vapour rendering the switch non operable and need to drill hole into day hatch.
2. The vulnerability of the waterproof rocker switch cover and the potential of the salt water/vapour rendering the switch non operable and need to drill hole into day hatch.
3. A magnet mounted to operate the reed switch which must be positioned in a waterproof under deck position. This in turn requires a diode to prevent a surge on operation that would damage the relay fitted to operate the pump. All of which require space and have the potential for failure.

I settled for a system that minimises the electrical components and is reliable under all conditions. This is enhanced by the elimination of switching methods which are exposed to the corrosive effects of salt water. The use of the Rule float switch has two main benefits; first it is safe and reliable way without further modification of operating the pump. This is either by the action of water activation or manually by pulling on rope. Which means unlike the automatic float switch and pump which spins up all the time the battery supply is connected. This system only operates when water is present in the cockpit or manually.

**I used the following components:-**

* Rule 12v Model 25D 500 gallons per hour (pic 1 & 3)
* 19mm clear hose ,SS Jubilee clips and through deck fitting (pic 2)
* Rule 35A Rule-a matic float switch (pic 1 & 3)
* 12volt minimum 3 amp sealed lead acid battery , Maplin have a good selection (pic 10)
* In line fuse holder (pic 10)
* 2 pole battery connector (pic 10)
* PELI rubber lined waterproof box to fit battery and space for battery connector and Fuse holder (pic 10)
* Shopping trolley child strap to secure battery box (pic 7 & 10)
* 12mm plastic cable gland for entry into box and through behind seat bulkhead ( pic 3)
* Nylon sheathed 3mm rope (pic 1)
* Cable organising wrap (pic 8 & 9)
* Guide for rope (pic 5 & 9)

 **Guide for fitting this pump set up**

1. Procure fittings and fixtures including effective waterproof glue. I used Bostic wet grab and west epoxy.
2. Drill out hole for plastic cable gland in PELI battery box and glue in place; remember to allow room for battery, connector and inline fuse.
3. Determine position for battery box, mark where you intend to fibre glass (1 inch tape) of shopping trolley plastic securing eyes. Use bent electrical wire to hold in position whilst tapping and drying in place.
4. Glue 18 inches of 3mm rope to Rule float end
5. Drill hole for plastic cable gland in bulkhead behind seat and clue gland in place.
6. Determine where pump discharge is going to be, remember if through side you will require a in line non return valve. Drill glue and fit hose discharge fitting. I prefer deck behind cockpit rim behind seat.
7. Glue in place pump basket, then glue in place float fitting. I reinforced the resin with 1 inch fibre glass tape.
8. Glue in place float base fitting ensuring that the operating line route is suitable
9. When fully dried (24hrs) clean up and fit pump first and measure and fit hose with stainless steel jubilee clips.
10. Drill out sheath securing guide, (top half of cord pull) glue in place length of skeg sheath and glue into pre drilled hole in deck ,having ensured operating line is suitable.
11. Run pump and float cable through bulkhead gland, fill with Wet Grab and tighten.
12. Connect the black lead from the pump directly via box gland to negative terminal.
* Connect in line fuse holder to positive connection and connect one lead from float to other end
* Join red lead from pump directly to other lead from float external from battery box. I prefer to solder connection having placed insulating shrink on cable I can pull over connection and heat in place.
* Remember to trim cables and double check line up before cutting and fitting.
1. Check rope sheath is trimmed to allow operation of float in boat and 2 mm above toggle gland on deck.
2. Pull through rope glued to float and trim to fit tow cleat
3. Fit cable organising wrap 50mm approximately

Should you have any trouble don’t hesitate to contact me