



The ubiquitous Jabsco loo pump

# Jabsco pumps and their maintenance

Stu Davies on how to service and maintain a Jabsco heads pump

**M**ost modern mass produced boats are fitted with Jabsco hand pumped toilets. They are cheap, simple and robust and can put up with a lot of abuse. On the flip side, they do need a bit of looking after, and there are a lot of misconceptions about them, as the many threads on the PBO forum show.

My Beneteau 381 is 18 years old now, and it came fitted with two Jabsco heads. I have recently removed one and replaced it with a Porta Potti so that I can comply with the requirement for a holding tank when she is in Southern Europe.

That leaves the one remaining Jabsco. I have overhauled it once in the time I have had the boat, but the old problem of the bowl filling up with the sea cocks open comes back on a regular basis. As a general rule we try to keep the water on the outside of our boats, but a toilet brings a certain amount of seawater inside. The

Stu Davies has an 18-year-old Beneteau 381 fitted with a Jabsco loo



toilet is often mounted on or below the waterline, and this brings with it the risk that the sea can syphon in. There are a few ways to deal with this problem...

## How a toilet pump works

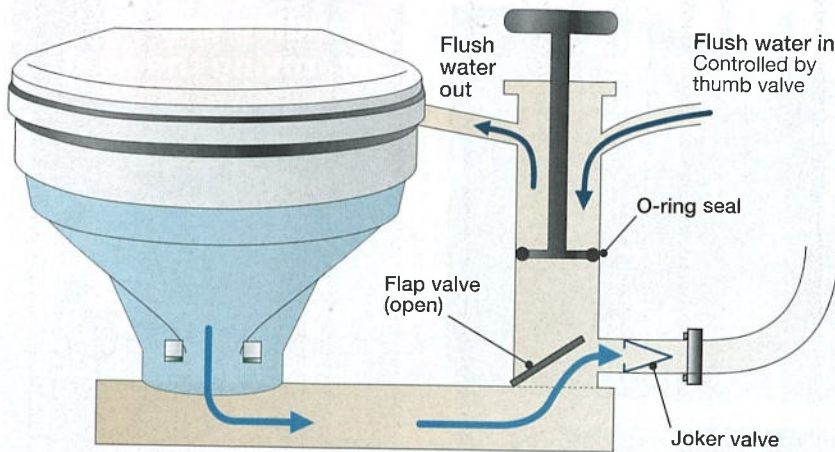
There is a large dual action hand pump at the side of the bowl which pumps fresh raw water in and raw sewage out at the same time.

A thumb valve on the top allows you to select whether to fill or empty the bowl. The usual procedure is to fill the bowl most of the way, then switch over to stop the raw water coming in and start to drain the bowl. The waste is sucked out of the bottom of the bowl and into the sea (where legal) or into a holding tank where appropriate.

The familiar T-handle that we push up

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**ABOVE** A standard dual-action Jabsco toilet pump and its location on the loo

and down is connected to a simple piston that has a fat O-ring on it to act as a seal or 'piston ring'. This both draws water in and expels the waste, by way of a simple one way flap valve at the bottom of the hand pump.

When the T-handle is pulled up, negative pressure at the base of the cylinder means sewage is sucked out of the bowl, past the flap valve at the base of the pump and into the pump cylinder. Meanwhile the positive pressure at the top end of the pump is pushing the raw water through the little change over valve thumb lever in to the rim of the bowl.

When it is pushed down, the flap valve at the bottom closes and the bottom side of the pump piston pushes the raw sewage out of the pump cylinder, through the joker valve and out of the boat or to a holding tank. At the same time the top side of the piston is sucking fresh raw water from the outside of the boat through one of the smaller pipes and thumb valve system to fill the top side of the pump cylinder ready for the up stroke again.

### The Joker valve

The Joker valve was originally intended to stop back flow and back-siphoning to the bowl. It is a piece of conical shaped rubber with three flaps that are supposed to compress together, much like our human heart valves, to make a one way valve, so that sewage can't flow back.

At this point a little lesson on hydraulics: 27in height of water gives 1psi of pressure. So if the outlet pipe loop was 27in above the joker valve then a pressure of 1psi would be acting on the flaps of the joker valve to keep them closed and stop back siphoning. The slightest bit of contamination or scale on the flaps will prevent them sealing.

### How to maintain a Jabsco

The problem with toilets is that urine reacts with the seawater to form calcified deposits, which slowly reduce the internal diameter of your piping over time – leading to the risk of blockages. Worse still, as the internal valves become covered in salts, they stop sealing properly: the rubber O-ring in the piston starts squeaking and binding, and water starts back flowing in to the bowl. All this means your toilet pump will become less and less effective over time.

The squeaking and stiffness is easily cured: a bit of sunflower oil dropped into the bowl on a regular basis and pumped through lubricates it. Long term it is better to undo the plastic nut underneath the T-handle, withdraw the piston assembly and apply liberal quantities of Silicone grease – just don't forget to close the seacocks first!

As a preventative measure, pumping at least six strokes every time on both the empty cycle and the flush cycle means that all urine is emptied out so that it

## Siphons and siphon breaks

Siphoning occurs when the water pressure outside the boat is higher than that inside – ie when the toilet is mounted on or below the waterline. All boats are different when it comes to loo plumbing, and the measures you need to take to prevent siphoning depend entirely on where the toilet is placed in relation to the waterline. If it's above the water line, then the risk of siphoning is reduced.

Best practice is always to take a large loop in the pipes above the waterline – at least 200mm above both static and heeled waterlines is recommended – and to fit a siphon break to both the inlet and outlet pipes, rather than just relying on the pump's valves to keep the sea out. Vented loops contain a simple valve that prevent water flowing back into the boat.

In an ideal world, you'd close the seacocks every time you'd finished with the toilet – but on modern boats these are often hidden behind the joinery and are left open all the time.

In the most simple installations such as mine the toilet bowl is placed high enough that even if the outlet water syphons back in, it still won't overflow the bowl and so there isn't a syphon break fitted.


## Twist and lock

Jabsco brought out a modification some years ago that is designed to guard against flooding and waste backflow by locking the waste outlet valve shut – the handle is grey rather than the previous black, and secures with a twist. Several years ago I bought the twist and lock conversion kit, and this puts an extension on the plunger piston that should push on the flap valve at the base of the pump to seal the bowl from the pump. It worked for a while – but problems can still occur if foreign matter, such as scale, clogs the valves.

doesn't react with the seawater to produce hard salts to block the pipes and valves.

### What's wrong with my loo?

Water was gradually seeping into the bowl when the toilet was not in use – and while this only reached a certain level and stopped, it was worrying and a chore to keep pumping away.

I took the plunge and stripped the pump down: this was quite easy to do – a simple matter of four screws in the 



**ABOVE** Ensure stop cocks are off before taking your loo apart

**RIGHT & BELOW** Cleaning scale from the pump assembly



**ABOVE** Complete Jabsco service kit

**LEFT** Take care when reinstalling 'quick thread' screws so as not to strip the holes

base and two in the joker valve housing, slacken the hose clips and off it comes to reveal the valves.

I found a small amount of scaling, but more important was the fact that the joker valve's lips did not shut properly – and there is a depression in the flap valve that corresponds with the lip on the base of the pump that is supposed to be the seal. The flap was distorted – and that's why water was syphoning back into the pump.

So from my experiences with my pumps I have learned the cure is to change the flap valves and clean up the interiors of the pumps. A kit can be bought for just over £20 from Jabsco Direct, or the flap valve can be bought alone for about £6. My advice? Buy the kit and change as much as you can while it is stripped down.

With the pump apart, I cleaned up all the scale with vinegar and elbow grease and used scotch pads to clean up the plastic housings. Once all traces of scale were gone, the pump could be reassembled and the new valves could be put on. It's obvious how to install them as both the flap valve and the joker valve can only be installed one way.

When screwing everything back together, be aware that the stainless screws are twin threaded self-tappers and have 'quick' threads. Put them in their place and hand twist them backwards until you feel a slight click. This makes sure they are engaged in the original threads in the soft plastic housings. If you get it wrong they cut another thread which will then strip as you tighten it!

## Mending and improving the seat



**Seat hinges were worse for wear**

My toilet is nearly 19 years old and the lid and seat were getting tatty. They are only held on by two 8mm plastic screws and a wing nut, so I removed them, rubbed them down with 80 grit abrasive paper and used a rattle can of matt white enamel paint to refurbish them.

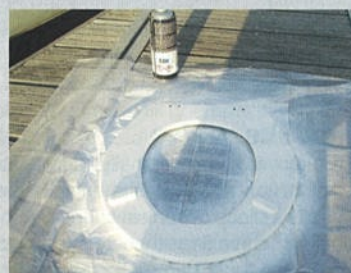
The hinges are attached with plain steel screws – which had rusted. I had to drill them out and replace with stainless steel, which took far more time than it should have done.

By the time I'd managed to remove the old screws, the holes were pretty shot, so I used Araldite to fill the holes as I was putting the stainless screws in. I just nipped them up until the Araldite had gone off then tightened them a touch more.

After putting everything back together, the seat looks like new, and best of all, the new set of seals has cured the syphoning problem.



**Rusted hinge screws had to be drilled out.. leaving oversize holes which Stu filled with epoxy before replacing with new stainless steel screws**



**Respray tidles up toilet seat**

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