

How to service a...

Brydon sea toilet

The manual toilet aboard his 27ft Jeanneau *Magicienne* had been a bit 'iffy' for some time, so **Geoff Westgarth** decided it was time for a complete service and took the plunge...



SAILING TODAY
Project time: 2 hours
Project level: Basic
Project cost: £25



People might think that this is not a job for the faint-hearted, but with some fairly simple tools and liberal

amounts of disinfectant it's not too bad a job and can save you a lot of money. You can make life simpler still by setting up an area outside

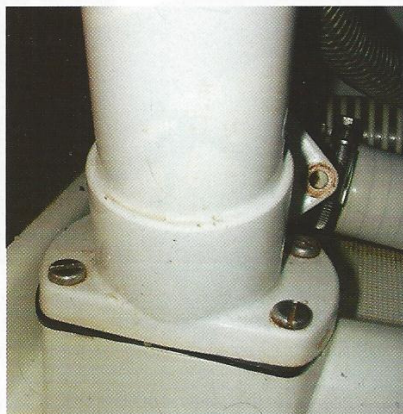
the heads covered in plastic sheet. If you have them, wear thin operating theatre gloves to protect your hands – some bits are a bit fiddly, so thick gloves are out. If you're squeamish, wear a breathing mask as some splashing can occur. Have plenty of old plastic shopping bags (for rubbish removal) and kitchen roll to hand to keep things as dry and clean as possible. The service kit required is available from any decent chandler – make sure you take the 'type number' of the toilet with you to get the correct kit; it is on the label at the front of the valve cover.

How to service the sea toilet step-by-step

1 A typical head assembly prior to dismantling. If, like on *Magicienne*, the heads on your boat is fairly small, before starting on the job you can make life a lot more comfortable by thoroughly disinfecting the whole area, thus allowing you to get a bit more up close and personal. The picture shows the whole assembly to the side of the toilet. At the top is the handle, below that the valve assembly, cylinder and at the bottom the base, behind which can just be seen the screws to the discharge flange. The pipe coming from the rear is the inlet water and just out of sight behind and underneath the black flush control switch is the water outlet to the toilet bowl.

Pour some disinfected water into the bowl. Set the flush control switch to pump. Thoroughly pump as much as possible from the system.

Shut off the inlet and discharge sea cocks. Loosen the jubilee clips on the inlet/outlet water pipes and disconnect the pipes from the valve assembly.



2 The base and discharge flange. Before starting to disassemble, it is worth noting that the six screws involved are large, with aggressive self tapping threads, and the assembly is made of plastic. So when re-assembling, put the screws in by hand for the first few turns to avoid cross threading them and badly damaging the toilet.

Remove the two screws that hold the discharge flange to the base of the cylinder. (Note, in the picture, one of the screws is already removed). Remove the four screws holding the pump cylinder to the base. Lift off the pump assembly, disinfect it and place it on a plastic sheet.



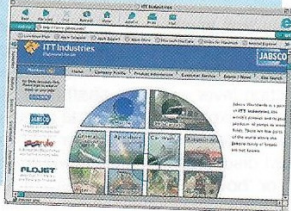
3 The bottom valve gasket (in front) and joker valve (seated in the discharge pipe). Once the pump assembly has been removed, the rubber bottom valve gasket (in the front) and rubber joker valve (the black ring seated in the discharge pipe) are exposed. Remove both, along with any debris and scale that has built up. Replace the gasket and valve. The purpose of the joker valve is to prevent sea water and discharge contents coming back into the toilet, so make sure you put it in the same way round as the old one. The bottom valve gasket is 'keyed' with three plastic pegs in the base, so you can't get it on the wrong way round. Worst bit over!

Tools & equipment

- Long, large screwdriver
- Standard screwdriver
- Thin screwdriver
- Large pliers
- Adjustable spanner
- Insulating tape
- Service kit
- Disinfectant
- Surgical gloves
- Face mask
- Kitchen roll
- Plastic sheets

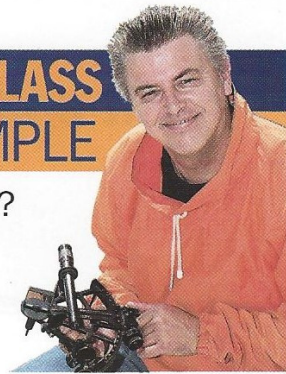
Useful contacts

■ Jabscos UK Tel: 01992 450145
 www.jabscos.com
 www.jabscosshop.co.uk



4 Dismantling the pump assembly. Open the flush control valve – push it to the left hand position. Remove the six screws that hold the valve cover in place and slide the piston out of the cylinder and put to one side. This will expose the rubber top valve gasket (the flat black component seen here and beneath it the black plastic valve seat – see picture 7). Remove both these items – after noting how they are seated in the assembly. Clean, disinfect and carefully remove scale from the bore of the cylinder – do not scratch the inner surface. Run some vaseline or washing up liquid around the bore of the cylinder. ▶▶

JOHN GOODE'S MASTERCLASS NAVIGATION MADE SIMPLE



Studying for your RYA qualifications? If so, you'll find this plotter, *Lights and Shapes* booklet and these instruction videos welcome additions to your study notes...



John Goode's Cockpit Plotter

Specially designed by John Goode, this plotter makes piloting and navigation easier than ever before. A must for your chart table, with easy learning instructions.

Price **£7.95** plus £1 P&P (UK only)

Handling Under Sail Part 1

This booklet is intended as a tutorial on the core skills required to handle a short-handed cruising yacht under sail – before engaging in tidal water manoeuvring at close quarters. The selected articles in this booklet also look at the pros and cons of different types of rig. It is not only invaluable for newcomers to sailing, but is also a handy source of reference for those experienced old hands who have been at it for years.

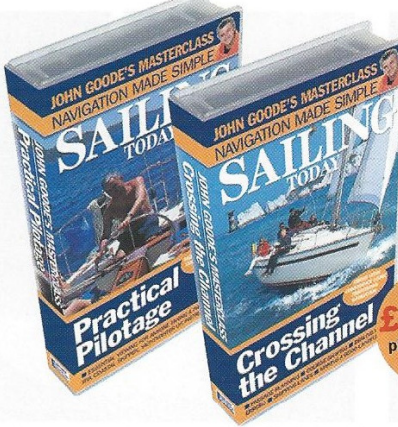
Lights and Shapes Made Simple Instruction Booklet

Packed with essential information on lights and shapes, this easy-to-read reprint of John Goode's articles in *Sailing Today* magazine makes essential reading for all those taking RYA exams, or those needing to brush up on the subject. It includes extracts from the lights and shapes regulations.



Price **£6.95** plus £1 P&P (UK only)

Price **£6.95** plus £1 P&P (UK only)



NAVIGATION MADE SIMPLE: Crossing the Channel

By following the progress of a typical family cruiser across the English Channel for the first time, this re-released 45-minute video shows basic navigation, good skipping techniques and how to navigate without electronic aids, or how to cope if they fail.

NAVIGATION MADE SIMPLE: Practical Piloting

Piloting is the skill of skipping a boat in confined waters where it is more important to be on deck in complete control of the boat rather than down below at the chart table.

Price **£14.95** plus £1 P&P (UK only)

Please make cheques payable to: Marine Training Trust Publications and send to 305 Swanwick Lane, Lower Swanwick, Southampton SO31 7GT. To order by credit card call: 24-hour Order Line number ☎ 01633 411090 Fax 01633 411090 Website www.marinepublications.co.uk

SAILING TODAY JOHN GOODE'S MASTERCLASS

Initials _____ Surname _____

Address _____

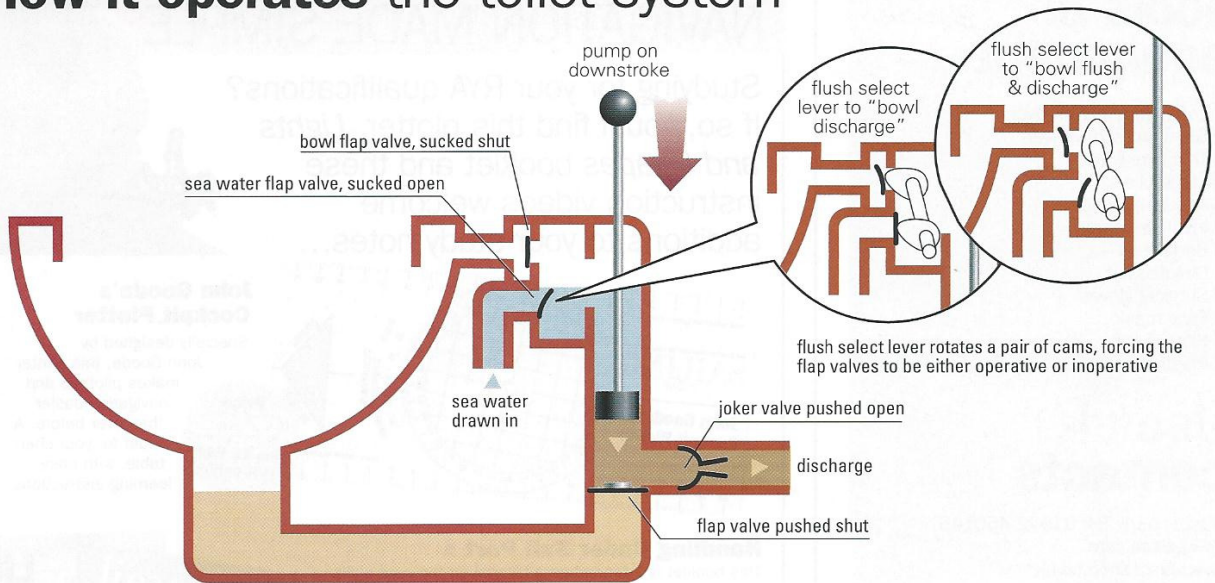
Postcode _____

Please send me (enter quantity in box)

- John Goode Cockpit Plotter(s)
- John Goode Lights and Shapes booklet
- John Goode Handling Under Sail
- NAVIGATION MADE SIMPLE: Practical Piloting
- NAVIGATION MADE SIMPLE: Crossing the Channel

P&P prices apply to UK only. Please call for details of overseas postage rates

How it operates the toilet system



On the pump downstroke, the pump piston pulls or sucks clean flushing water (sea water) into the top of the pump cylinder while driving sewage out of the bottom end. On the pump upstroke, the

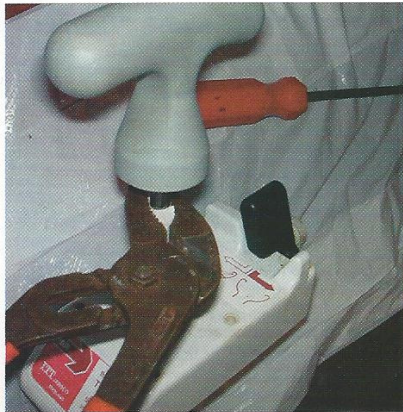
piston forces the clean flushing water into the toilet bowl, while sucking effluent into the base of the cylinder. Due to the volume of space taken up by the piston rod in the upper chamber,

it follows that the volume of flushing water will be less than the volume of the effluent in the lower chamber. Therefore, the pump will always pump out more than it sucks in.

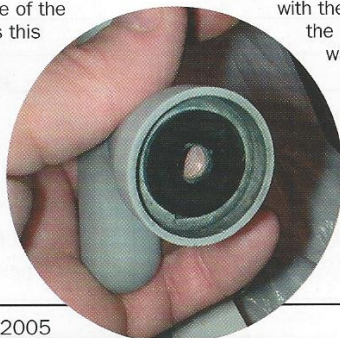
For those that know this toilet well, they'll be aware that there is a flush selection lever (see pic 5 and exploded diagram overpage) – either, 'bowl discharge and flush' or 'bowl

discharge' only. This lever simply rotates a pair of cams on a common shaft (see diagram detail above), which will either rest 'off' or 'on' the sea water and bowl flap valves – in effect, forcing

How to service the sea toilet step-by-step



5 Removing the handle and underside of the handle. The stainless-steel piston rod passes through a seal in the valve cover. The surface of the rod must not be damaged (as this will eventually damage the seal). Wrap a turn of insulating tape around the rod and grip it on the tape with a pair of pliers – the handle can now be unscrewed and the rod will slide out of the seal in the valve cover.



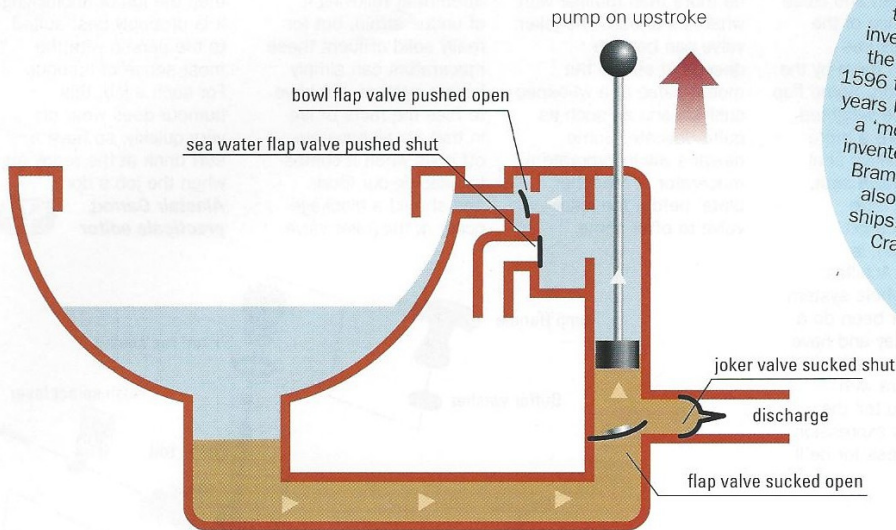
6 Removing and replacing the seal. Unscrew the seal from the valve cover; this may need a bit of help with the pliers and slide it off the rod. Replace the bumper washer on the rod, on the piston side of the seal. Pass the rod back through the hole in the valve cover. Before sliding on the new seal, wrap a single turn of insulating tape around the thread, to protect the rubber surface of the new seal



as you slide it on. Make sure the tape is only on the thread otherwise you won't be able to get the seal on. Screw the new seal into the valve cover using a strong finger pressure. Replace the black rubber bumper washer on the handle side of the rod. Screw the handle back on using the tape to grip the rod with the pliers.

A SHORT HISTORY OF TOILETS

The origins of sewage management date back 4,000 years to the Minoan Empire, and the Roman Empire, but it wasn't until the 16th century that engineers in England started showing some invention. Sir John Harington's 'Ajax' water closet was the first 'necessary' (toilet) built in English history, in 1596 for his godmother, Queen Elizabeth. It would be 200 years before the idea took hold again. The first patent for a 'modern' toilet belongs to Alexander Cumming, who invented the 'S' trap in 1775. Three years later, Joseph Bramah patented an improved version. The 'Bramah' also became a prototype for closets on boats and ships. Many illustrious names followed, but Thomas Crapper, who many believe invented the toilet, could be nothing more than a wrong turn in the 'S' bend as numerous historians doubt that the man ever even existed...*



them to be operative or inoperative in turn.

When selected to 'bowl discharge', the upward stroke of the pump will feel a shade lighter since the lower cam has shut off the sea

water from the pump, while the upper cam is venting the upper pump chamber, thus leaving the upward stroke of the pump with nothing to do. You may have observed that the

movement of this selection lever has now changed the pump from a double-action into a single-action pump. The downward stroke will always feel on load, until, that is, all effluent in the

bowl is pumped out. Then the pump handle will feel light on both strokes.

When selected to 'bowl flush and discharge', the pump will feel loaded again since both the cams have moved 'off' the flap

valves, thus restoring their function of flushing the bowl and charging both

sides of the pump cylinder with sea water and effluent – giving both actions of the pump something to do.



7 Removing the piston 'O' ring. Remove the piston 'O' ring using a small screwdriver. If you look carefully, you'll see there is a flat bit on the bottom of the piston to facilitate this; otherwise, it's very fiddly and you may damage the plastic piston. Replace with a new 'O' ring.



8 The valve seat (top) and top valve gasket (bottom). Replace the plastic valve seat as shown and then the top valve gasket. Slide the piston down into the cylinder. Reassemble the top valve cover with the six screws – make sure that the flush control valve is open (switched left) and that you do not cross thread the screws – do the first few turns by hand.



9 Reassembled. Re-connect the discharge flange first and then re-connect the assembly to the base. Do the first few turns of the screws using fingers to avoid a cross thread.

Further advice

These Jabsco toilets are widely used and are no doubt familiar to most readers. The exploded diagram should help you to assemble the toilet again after it has received its overhaul. However, it also helps to have some knowledge as to how these toilets work. This particular toilet would be defined as a 'manual double-acting pump action'. The main features of the pumping action are the flap valves and the joker valve. The flap valves are nothing more than pre-formed slits within a gasket joint, and


can freely open and close by the influence of the differing pressures induced upon them by the pumping action. Some flap valves may be weighted down to create a more rapid and positive seal against the valve seat.

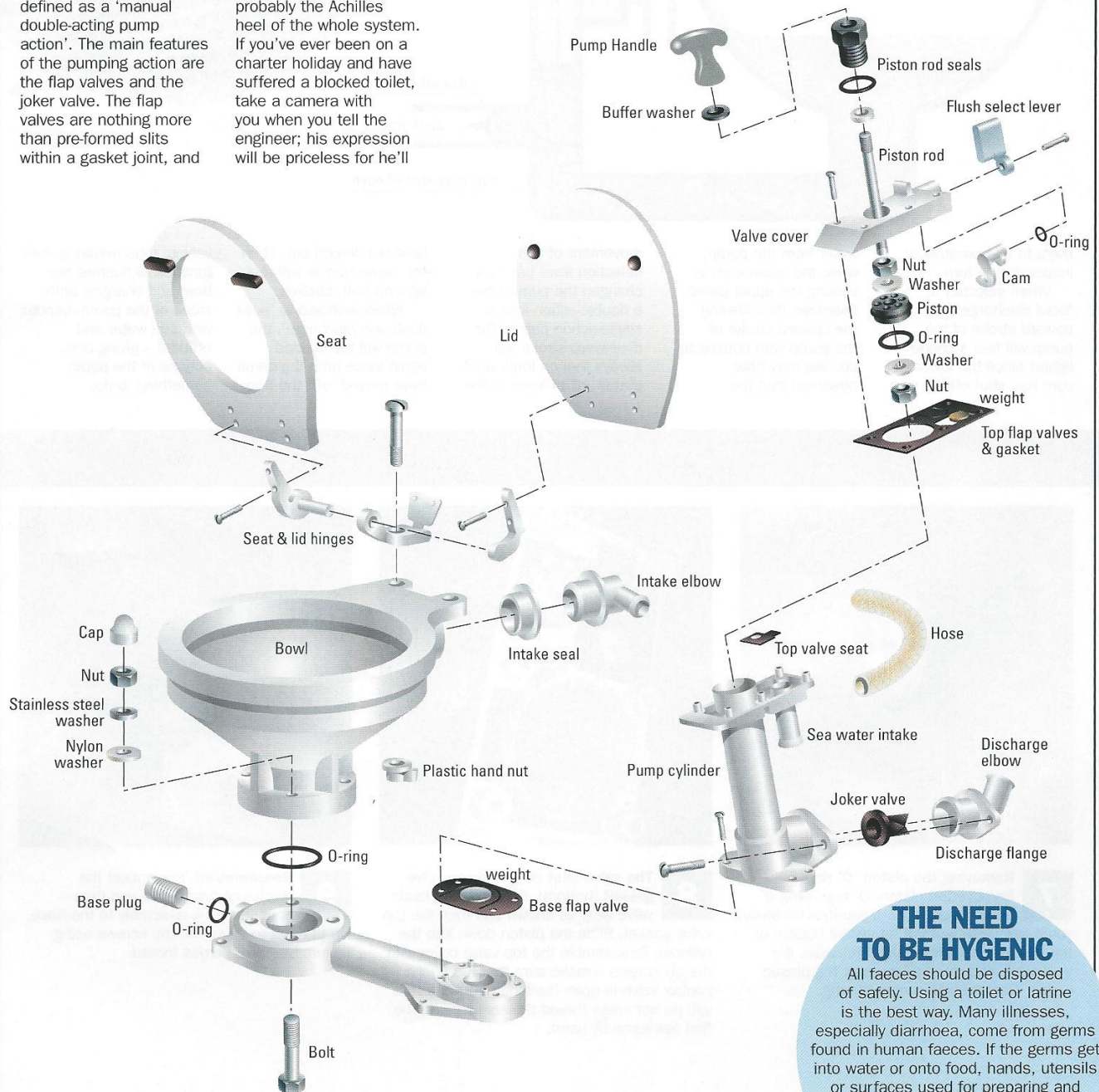
The joker valve (sometimes called the duck's bill), is probably the Achilles heel of the whole system. If you've ever been on a charter holiday and have suffered a blocked toilet, take a camera with you when you tell the engineer; his expression will be priceless for he'll

be more than familiar with what lies ahead. The joker valve can best be described as like the mouth piece of a whoopee cushion and as such its quite delicate. Some designs will incorporate a macerator or 'chopper plate' before the joker valve to offer some

attempt at relieving it of undue strain, but for really solid effluent these macerators can simply hinder matters. We have to face the facts of life in that we all have our off days when it comes to passing our food, and should a blockage occur at the joker valve,

then the job of unblocking it is probably best suited to the person with the most sense of humour. For such a job, this humour does wear off very quickly, so have a stiff drink at the ready for when the job's done.

Alastair Garrod, *practicals editor* 



NOTE Different models will vary a little but these steps give you a good guide to achieving your goal. Speak to your supplier if you have any problems dismantling your system.

THE NEED TO BE HYGENIC

All faeces should be disposed of safely. Using a toilet or latrine is the best way. Many illnesses, especially diarrhoea, come from germs found in human faeces. If the germs get into water or onto food, hands, utensils or surfaces used for preparing and serving food, they can be swallowed and cause illness. Toilets need to be cleaned frequently, should be kept covered and flushed regularly.**

Sources: *www.theplumber.com **www.unicef.org