

# WATER MATTERS!

*This leaflet is prepared by The Caravan Club as part of its service to members. The contents are believed to be correct at the time of publication, but the current position may be checked with The Club's information office. The Club does not endorse the listed products and you should satisfy yourself as to their suitability. As always, check that the installation of an after-market accessory does not invalidate your warranty.*

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## **1. A BEGINNER'S GUIDE TO FRESH WATER – USEFUL TIPS FOR KEEPING YOUR WATER SUPPLY FRESH AND TOPPED UP**

Once you realise that much of the water you struggle to get to the caravan/motor caravan has to be taken back to the waste point again after use, you begin to look forward to the day when each individual pitch has its own tap and drain. Until then, there are a number of ways of carrying water with the minimum of effort.

A reasonable minimum supply for everyday use is about 23 litres, which weighs 23kg.

Perhaps the easiest way of carrying water, and the kindest to your back, is a water carrier, eg Aquaroll and Water Porter, which are of the rolling barrel design. Other carriers, which have small diameter wheels, can tend to clog up and drag on muddy or sandy ground.

You can't always rely on getting the filler right under the site tap, and you will need a filler hose. Those with rubber nozzles that fit over the tap are quite good, but a length of the large-diameter corrugated type sold chiefly as waste hose fits over all taps and will take a very high rate of flow. CAK Tanks, which is a water systems specialist, has available ridged flexible hose with smooth internal bore which is suitable. It is called Superflex hose and is available in ¾", 1", 1½" and 40mm diameter, as well as a 3" discharge hose.

Once you have your fresh water supply back at the caravan or motor caravan, you can wait until it runs out and then wheel the container away for a refill. A useful idea is to have a small (9 litre) container, which can be taken and filled up whenever you are going near the water point. It is not too heavy to carry when full and can be used to top up the water carrier.

Virtually all new caravans use either the Whale Watermaster pump and inlet or the Truma Ultraflow system, which supersedes the Crystal 2. The latter is no longer manufactured but spares are available for this system as well as the older Carver Crystal 3. The problem with the old Crystal 3 is that it requires considerable strength in the fingers to release the inlet, and with the Watermaster you tend to pull the hose to remove the inlet and start a leak. Whichever unit is used you must remember to dunk the pump in the water supply and shake it about under water before plugging the inlet in, or you will create an air lock. Only more recent submersible pumps have an air release hole in their casing. If you are lucky enough to find a pitch with its own water supply, both Whale and Truma market direct hose connectors with built-in pressure-reducing valves which permit a constant supply without a pump. There is a ball valve kit for automatic control of the Water Hog, available from Care-avan. Aquaroll also offers a mains water adaptor for its 40-litre model.

Some caravans, and most motor caravans, have specially fixed tanks instead of portable carrying systems, and these are discussed later.

Do's and Don'ts –

- Do be scrupulous about hygiene at the water point
- Do not let children play round the taps
- Do make a habit of switching the pump off when away from the caravan
- Do not injure your back carrying heavy containers
- Do not waste water!

## **2. CLEANSING OF WATER CONTAINERS, PIPES AND RELATED EQUIPMENT**

Whenever the caravan has been left standing for several weeks or so, before bringing the water system back into use, it should be cleaned using one of the proprietary makes of steriliser on the market – those used for wine/beer making are acceptable. **Follow the instructions carefully, but remember that certain chemicals can react adversely with metal.** This is why if the water passes through a Truma/Carver water heater for example, you should only use the recommended cleaner – Truma suggests either Micropur Forte, Milton 2 or Puriclean. Do not use domestic bleach, Campden tablets or sodium metasilphide. Remember to clean out any connecting hoses and fresh water containers at the same time.

The operator of any organised site has to comply with quite stringent regulations, and you should be able to trust the water when it leaves the standpipe. The same responsibility applies to CL owners. As far as the water in your caravan is concerned, The Environmental Health Department of the Borough Council of King's Lynn and West Norfolk offers the following guidance on the cleansing of drinking water containers and systems in touring caravans and motor caravans, which they recommend should be carried out each time prior to its use:

### **For Containers:**

1. All water remaining in the container should be disposed of so that the container is empty.
2. The outside of the container should be thoroughly cleansed and washed down to remove any dirt, dust or other contaminant. Water at a suitably hot temperature (60°C+), containing an appropriate detergent, eg washing-up liquid, is recommended for this purpose.
3. Water should be put in the container, swilled around then emptied out.
4. The container should then be totally filled with water containing an appropriate disinfectant solution and allowed to stand for the recommended contact time, eg Milton 15 minutes.
5. The above solution should be emptied from the container.
6. The opening to the container should be cleaned thoroughly with an appropriate pre-prepared wipe impregnated with a disinfectant/sterilant.
7. The container should be inverted whilst stored overnight (if possible).
8. The container must be filled with mains water only and mains water must only be used for the above cleaning procedure.
9. On no account should garden hoses be used to fill or flush water tanks.

### **For Systems:**

1. Drain down the system (open all taps to allow air in, enabling the system to drain quickly).
2. Remove any water filters fitted, and replace with a short length of hose or empty filter cartridge (this will ensure the filter is not affected by the disinfectant/sterilant solution).
3. Fill the system by using the pump with a disinfectant/sterilant solution (check that the solution at full strength appears at all taps/showers). Allow to stand for the recommended period of time.
4. Drain the system down completely.
5. Thoroughly clean the outside of all taps/connectors with a cloth soaked in the disinfectant/sterilant.
6. Flush the system through with clean drinking water until no traces of disinfectant/sterilant can be detected at any tap.
7. Replace the filter.

Filters should be replaced at the recommended intervals, irrespective of how often they have been used – the filter ingredients are activated at first use, and will continue to break down whether or not the filter is in regular service. Also, with jug filters for instance, care must be taken not to exceed manufacturers' recommendations before change. ***It is important to remember these filters must be used as a means of filtering fresh drinking water only.***

It should be noted that in new caravans filters are fitted in some models but not in others; they are regarded as a luxury extra! A study carried out several years ago by The Club showed that quality of water coming into the caravan is fine in the UK, being strictly regulated. It is the quality of water coming from the caravan tap that is questionable, having passed first through the caravan pipe work. The hygiene of this is hugely influenced by the user's regime of sterilization and cleansing. Tests showed a filter on the inlet side was largely ineffective because already-clean water is being filtered. The correct place for a filter is immediately before the taps – though this makes it extremely awkward to install and replace. The only advantage of an inlet filter is where the site supply water quality is suspect, as is occasionally the case abroad.

Motor caravans and caravans with fixed tanks have their own particular problems, and are easy to neglect because they are out of sight and, as a result, out of mind. Their positioning may not make inspection or cleaning easy. Worse still, some are difficult, if not impossible, to readily drain. This can lead to stagnant water being left in the tank during periods of disuse. When considering buying a caravan or motor caravan with a fixed tank, it is worth looking at the accessibility and ease of cleaning before purchase

Some inferior plastic water pipes or containers can give the drinking water a 'tcp' type of taste, which is very unpleasant. This is usually triggered by a heavily chlorinated water supply, where the chlorine combines with phenol leached into the water by the plastic, to give trichlorophenol, or TCP. Unfortunately, once the pipes have been so affected the only known complete cure is pipe replacement with a food-quality grade of pipe as used by brewers, etc. At the beginning and end of each season, sterilise the water system with one of the proprietary products on the market, ie Milton, Puriclean, etc. Whenever the caravan is not in use, completely drain down the water system and leave unsealed (cover any exposed ends with fine mesh, eg stocking, to prevent entry of insects). This discourages moisture-loving bacteria, which can thrive in your water system but perish if left high and dry. Waste water pipes and tanks should be disinfected and likewise left open (see also the leaflet entitled 'Storage').

Fenwicks Products has Fendox Waste Water Systems Cleaner that is claimed to unblock drains, clean tanks and convoluted pipework, remove formaldehyde and limescale, and diluted 10:1 will clean work surfaces (food safe and bleach-free), fridges and basins.

Truma advises that you should not use a de-scaler containing chlorine, as the water tank is made of VA stainless steel. Its recommendations for de-scaling are contained in the manual; however, for those who are not in possession of the latter, Truma recommends that five litres of water and five litres of white wine vinegar are put into the fresh water tank and that this mixture is then run into the Ultrastore. The water should then be heated up to the maximum temperature then allowed to cool down again. When this has taken place, rinse the heater out with plenty of fresh water again from the water tank in order to ensure it is given a thorough rinse through.

### **3. WATER PUMPS – OPERATION, CHARACTERISTICS AND POTENTIAL PROBLEMS OF ELECTRICALLY OPERATED WATER PUMPS**

Even though manual pumps used to give satisfactory service, electric pumps are standard equipment in all modern caravans and motor caravans.

Whilst there are exceptions, most caravans are equipped with submersible pumps, whereas motor caravans are usually fitted with diaphragm pumps. The distinction is partly to do with weight differences and price. Submersibles are relatively inexpensive for a manufacturer, which suits the careful costing which characterises touring caravan production, and are most suited to use in separate water containers, rather than in an on-board tank.

#### **Products compared**

##### **Diaphragm pumps are usually:**

- v more expensive
- v considerably heavier
- v serviced by special centres
- v perceptibly noisier, although this depends on product and installation
- v efficient and impressive performers.

These are self-priming products that can run in a dry state for extended periods without sustaining damage.

##### **Submersible pumps are usually:**

- relatively inexpensive
- lightweight
- upset by airlocks in the casing – a feature on models lacking an air relief hole
- cannot be repaired – so it's always worth carrying a spare.

Submersibles are sometimes called centrifugal or 'pusher' pumps because they drive water along the pipes by an impeller. They must not be allowed to run dry for long (eg with an empty water container) since this can cause irreparable damage.

#### **Switching systems**

Both types of pump have to be switched into action. Either microswitches are mounted within the taps, or a pressure-sensitive switch detects a drop in system pressure and the motor is then activated. The sensitivity of the switch can usually be 'fine tuned' by an adjuster screw or thumbwheel.

Opening a tap creates the pressure drop, as can a leak, so pressure-sensitive systems include an over-ride switch to prevent the pump giving unexpected 'blips' of action – irritating at night.

Submersible units are usually triggered by a microswitch, although the Whale Watermaster wall socket used for a Supersub 881 pump contains a pressure-sensitive switch if this arrangement is preferred.

In contrast, diaphragm pumps are usually activated by a pressure-sensitive switch mounted within the casing of the unit itself.

### **Passage of water**

When not in operation, a diaphragm pump cannot permit water to pass through its valve mechanism. On the other hand water *will* pass the impeller and through the casing of in-line and submersible pumps. This has two implications.

When draining down a water system before a winter lay-up using gravity alone, only water 'downstream' of a diaphragm pump will empty out of the system (presuming there is not a non-return valve fitted in the pipe to block the outflow). Water in the section of pipe between the pump and the taps has to be driven out by running the pump, *or* by fitting an additional drain tap.

Similarly, if you want to couple up to a direct water supply eg using a Whale Aquasource coupled permanently to a tap, entry into the caravan's supply pipe must be 'upstream' of a diaphragm pump.

### **Reducing diaphragm pump noise**

This all boils down to proper mounting, which should be a problem only on older vehicles or where the pump has been retro-fitted or replaced with a different one from the original. Essentially, it must be fitted on a solid board – flexible ply can resonate. Check the rubber mounting feet: if perished, or hardened through the mounting screws being over-tightened, replace them. While you are doing this, ensure the fixing screws are a correct snug fit in the rubbers – Shurflo specifies 4mm diameter.

Later vehicles with rigid plastic plumbing can suffer sound transmission along the pipes. Here, a short length of flexible hose for coupling up to the pump's inlet and outlet will absorb any vibration.

*Note: Never cover a pump directly with fibreglass wrap or sound-deadening material to reduce noise; this could lead to overheating.*

### **Causes of poor performance**

Either type of pump can be blamed for a slow flow rate, but inspection often reveals a pipe is kinked. Narrow-bore pipe, especially in a system with numerous bends, elbow couplings and 'T' pieces, can hinder flow. The only solution here is a more powerful or supplementary pump (see below).

Voltage drop at a pump is also common – usually because the connecting cable is too thin. Whale and Shurflo specify at least 2.5mm<sup>2</sup> (21.75amp) cable – though Shurflo recommends 4.0mm<sup>2</sup> (35amp) cable if the run from battery to pump exceeds 20ft.

If a submersible pump seems over-stretched, an in-line pump such as the Whale Superline 99 can be fitted in the pipe supply system, too. This is wired so that both pumps come into action at the same time.

### **Pump failure**

A good quality submersible pump can give unflinching service for 10 years or more. But many develop faults more frequently – so always carry a spare, especially if travelling abroad, to avoid the need to try to find a ‘local’ source of spares.

Diaphragm pumps fail, too, and the first thing to check is the in-line fuse.

Examples of recommended fuse ratings are:

<b>Diaphragm pumps</b>	<b>AMPS</b>
Whale Clearstream 700	6
Whale Universal UP0812	5
Whale Evenflow	10.0
Shurflo Trail King 7	7.5

Equally, a small air leak in the diaphragm chamber can occur – ‘O’ rings can perish or get dislodged. And whereas diaphragm pumps are easy to take apart, they are, with the exception of the Whale Universal, extremely difficult to reassemble – so use the repair service system the distributors operate.

Grit also damages a diaphragm pump and its filter must be periodically cleaned. Regrettably, some manufacturers make this difficult by mounting the pump in most inaccessible places.

### **Pulsating pumping**

Some diaphragm pumps give an irregular pulsating flow, which usually signifies a low battery or constriction in the pipe system. Pump adjustment may be possible, but fitting a surge damper in the system (sometimes called an ‘accumulator’) usually solves the problem.

### **Fault finding**

#### Supply pipe blockage

Despite the benefits of semi-rigid pipework, many caravans are still being fitted with flexible hose. This achieves its purpose but is prone to developing kinks on sharp corners

*Inspect the supply pipe, especially if it takes any tight turns. If there is a point of entry through the floor, check carefully – kinks often develop here. Constrictions may not appear for several years, but once a deformity has occurred the best course of action is usually to replace the run with some new pipe.*

## Pump not working

### ■ Motor not running

Is the battery discharged?

*Try the lights to see if they work.*

Is the pump switched on at the distribution unit?

*Many caravans have a control switch.*

Has a fuse failed?

*Fuses are usually fitted at the distribution unit although on a centrifugal pump (as opposed to a submersible type) there may be an inline fuse holder as well.*

Is current reaching the pump terminals?

*An electrician would use a test meter, but simple 12v testers which look like a screwdriver with a light in the handle are fine. Before checking the pump contacts, remember to turn on the tap to activate the switching system.*

If the current isn't reaching the pump, the problem might be a fault in the switching system that activates the pump (see 'switch system faulty') or a wiring fault.

*Get your dealer to check circuit continuity.*

### ■ Motor running but no water at the tap

First, it is necessary to differentiate between two types of pump. Most trailer caravans have a submersible pump which has to be lowered into a water container. Only a few models are fitted with inboard diaphragm pumps. Motor caravans generally have an on-board tank and a diaphragm pump. Submersibles include Truma/Carver, Comet and Whale products. Diaphragm pumps include Shurflo, Whale Evenflow and Fiamma.

### ■ Submersible problems

When lowered into a water container, air sometimes gets trapped in the casing.

*Disconnect the hose from the input coupling (not possible on early Carver Crystal foldaways) and swing the pipe so the pump gently strikes the side of the water container, under the surface. This usually dislodges air bubbles. Recognising the air lock problem with submersibles, most have an air-relief hole on the casing.*



## ■ Diaphragm pump problems

The construction of a diaphragm pump allows water to be drawn up from a lower level, even if its casing is empty when the motor starts to operate.

If grit gets into the pump, its mechanism is soon damaged.

*Check the filter regularly and clean if necessary. If there is internal damage, the pump can be serviced or repaired by the supplier.*

One of the seals or O-rings inside the assembly sometimes fails and pump chambers cease to be airtight.

*Spares kits are available but repairs would normally be referred to a specialist.*

## Switch system faulty

Irrespective of the pump type, a method is needed to switch it into action. In general, one of two systems is used: either a tiny switch is fitted in the tap itself – called a **microswitch** – or a switch activates the pump when it senses a drop of pressure in the supply system – for instance, when a tap is turned on. This is called a **pressure-sensitive switch**.

## ■ Microswitches

If you look under a sink or washbasin and see two wires coming from the taps, these are almost certainly connected to a microswitch. If you disconnect the wires and join them together, the pump should start working because the switch has merely been bypassed.

Damp can cause the downfall of a microswitch and in some instances the whole tap has to be replaced. In most cases, however, the switch can be changed.

Fitting a microswitch is usually easy; the hardest part is access. Space is tight under a caravan sink. Whale's Elite taps overcome this because the switch is reached from above; you merely prise out the coloured hot/cold plug and remove the operating lever to reveal the microswitch.

## ■ Pressure-sensitive switch

This is usually fitted in one of the following locations: in the body of a diaphragm pump; as a separate component mounted in the supply pipe; or in the coupling socket on the side of a caravan.

An adjuster will alter the level of switch sensitivity. For instance, on a Whale Evenflow pump there is a screw in the pump casing, covered by a plug of white sealant. On separate switches, there is usually a turn-wheel adjuster. And on Whale's Watermaster system there is an adjuster screw on the inside face of the coupling socket.

A correct pressure setting ensures the motor starts as soon as a tap is turned, though sometimes you may need further adjustment when the battery gets low.

An over-sensitive setting causes the motor to start with the tiniest loss of pressure. Even a small air leak in a hose joint can trigger the pump – which is annoying at night. This is why an override switch is usually provided in the circuit to disable the pump completely.

As a result, modern systems work well even though several components might halt the flow of water from time to time.

***Note: There are still some ‘cold water’ caravans in use with foot or hand-operated pumps. Generally, these older products were reliable, only being superseded when water heaters and showers appeared. Service kits are still available for older pumps like the GP51 footpump and the hand-operated ‘Flipper Freshwater’.***

- *Truma (UK) Ltd took over Carver Technology Ltd in August 2000 and, we understand, still have some spares. There may be options where a substitute Truma based product will be offered in place of the Carver-based version. There are also several breakers/spares suppliers that stock Carver/Truma parts and carry out repairs – see ‘Product information’ at the end of this leaflet for details.*

<b><u>Product information:</u></b>	
Arc Systems 0115 921 3175 <a href="http://www.arcsystems.biz">www.arcsystems.biz</a> Carver/Truma parts and repairs	CAK Ltd 0844 414 2324 <a href="http://www.caktanks.co.uk">www.caktanks.co.uk</a> specialist water system supplier
Care-avan 01384 865199 07771 977746 <a href="http://www.care-avan.co.uk">www.care-avan.co.uk</a> Ball Valve Kit	Clean Tabs Ltd 01994 240925 <a href="http://www.cleantabs.co.uk">www.cleantabs.co.uk</a> Puriclean – available from caravan accessory/marine shops; also Aquatabs, Aquasol, Wasteguard
Ellis Brigham 0870 444 5555 <a href="http://www.ellis-brigham.com">www.ellis-brigham.com</a> Micropur Forte	Fenwicks Caravan Products 01270 524111 <a href="http://www.fenwicks.info">www.fenwicks.info</a> Fendox Waste Water Systems Cleaner
Fiamma water pumps and spare parts can be ordered through your caravan dealer	Munster Simms Engineering Ltd (Whale) 028 9127 0531 <a href="http://www.whalepumps.com">www.whalepumps.com</a>
Shurflo Ltd +32 14 283 500 (Belgium) <a href="http://www.shurflo-original.com">www.shurflo-original.com</a>	Truma (UK) Ltd 01283 586050 <a href="http://www.trumauk.com">www.trumauk.com</a>
Tuckers Caravan and Coachwork Services 01543 877023 Carver water heaters	
<b><u>Transport tanks</u></b>	
Aqua roll 01746 712242 <a href="http://www.aquaroll.com">www.aquaroll.com</a>	Water Porter 01623 754567 <a href="http://www.pyramid-products.com">www.pyramid-products.com</a>

This is not an exhaustive list, and there are many manufacturers of water related products, eg sterilising/cleansing agents, components, etc.

*The help of John Wickersham, regular Caravan Club Magazine contributor and author of several books on caravanning and motor caravanning, is gratefully acknowledged in the preparation of this leaflet. John's books, The Caravan Handbook, The Caravan Manual and The Motorcaravan Manual (Haynes Publishing) are available from bookshops.*

