

# Spotlight on... WATER SYSTEMS

 The water system is one of the most complex parts of your motorhome. **Phil Curry** takes it apart and gives advice on how to look after it

**I**n your home's system, water is controlled by the pressure in the mains. This pushes it through your pipes and up to your taps, waiting for you to open the valve and let it flow.

The problem with motorhomes is that they're not built with a mains source in mind. Instead, they rely on a tank, pump, switches and an intricate system of pipes to get water where it is needed.

## The water pump

At the heart of this system is the pump, which supplies the pressure to get water moving along the pipes.

Pumps can be fitted either in the tank (submersible pumps)

or elsewhere (in-line pumps), which pull water from the tank.

Submersible pumps are often unable to start pushing water along until it is introduced into the mechanism. This usually incorporates a paddle or wheel, which by its nature cannot create a vacuum to suck water up. This is why it has to be used under water, but when located in the tank, priming does not take long.

On the other hand, the popular diaphragm pump, fitted in the water line, is always primed: it uses electrically operated pistons to suck water from the tank and push

**Diaphragm pumps are electrically operated and always ready to go**



it to the open tap. Usually these have a filter attached, to stop any debris from getting in and harming the pistons. This filter should be replaced annually.

## Switches

There are two common types of switch: a pressure switch (located between the pump and a tap) and a micro switch (found within a tap).

The pressure switch is more common. This allows the pump to run until a pressure of around 1bar is detected. The pump is then shut off, and the water lines primed and ready.

When a tap is opened, the water flowing out depressurises the lines, so the switch turns the pump back on until the taps are closed and the pressure is built up



Well-winterised 'vans will often have their water tanks on board

## Phil's TIPS

As a water system is constantly under pressure once the pump is activated, any split or hole could turn into a flood. With most piping running behind the walls, a leak might not be noticed until it's too late.



If the pump continues to run on, even when the tap is off, you may have a problem.

With a pressure switch, a leak in the system, which causes a drop in pressure, will most likely be the fault. Turn each tap on full to see which has the worst flow, then track the piping back. Alternatively, the switch could have failed, in which case water will run from the overflow pipe.

If a micro switch has failed, water will run from the overflow

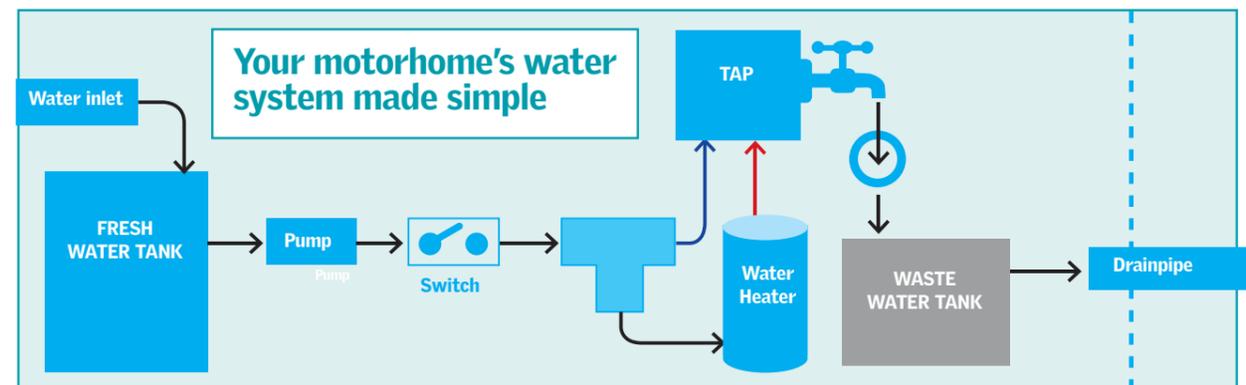
due to excessive build-up. To see if a micro switch is faulty, disconnect the terminals from each tap until the pump stops.

If you turn a tap and nothing comes out, this could also mean a micro switch failure. Leave the tap open and turn on another. If water flows from both, it's a faulty switch.

### TOP TIP

If you need to dismantle a lever-operated mixer tap, the screw to take the head off is usually hidden beneath the hot/cold indicator on the top.

Finally, should you have the misfortune to even partially fill your water tank with fuel, do not, under any circumstances, activate the system. Once the contaminated water flows through your pipes, pumps and taps, the whole lot must be replaced, at great expense. Replacing the water tank alone is much cheaper and easier!





The size of your fresh tank depends on the class of your motorhome

again. This is why a pump will run on for a short time after you close a tap.

Micro switches are becoming less popular among 'van manufacturers, but can often be found on second-hand vehicles, and are by no means obsolete. They are installed in the taps; they turn on when you open the tap, and off when you close it. They are susceptible to failure, however, as water on the electrical contacts can cause them to break down.

There is an easy way to tell which kind of switches you have. Look in the cupboard under the sink: if you see positive and negative wires running from the tap, you have a micro switch system. Otherwise, it's a pressure switch.

## Water tanks

A water tank can be stored either internally, under a seat or between a double floor, or externally, beneath the chassis. Its location will depend on your 'van's level of winterisation. Internal tanks are not as susceptible to the cold, while underslung tanks will need some insulation to survive a cold snap.

The tank size depends on the vehicle size and specification. You won't see a 100-litre tank in a campervan, for example, whereas one of that size is common in an A-class.

The fresh and waste water tanks are not always the same size: the latter is often smaller, meaning that you have to empty it slightly more often than you fill up the fresh tank. Fresh water is used for drinking and often for flushing the toilet system, so a bigger tank is needed.



The boiler supplies hot water, and so is a vital part of the system

## The water boiler

It's often forgotten that the boiler is part of the water system, and should be included in any maintenance of it.

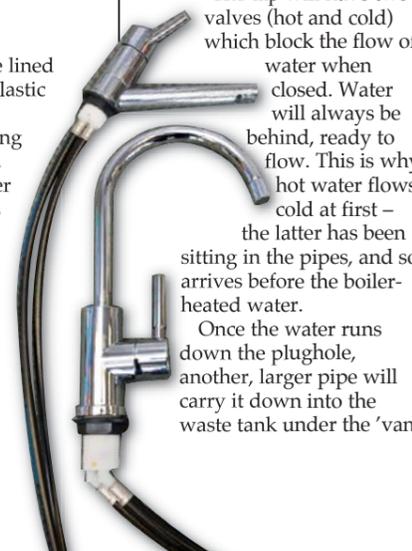
The boiler ensures that there is hot water for washing or showering, and can be combined with a space heater to provide warm air, too. It is usually controlled by a separate control panel, and depending on your system, can be heated by gas, mains electric or both. When turned on, its thermostat detects when the water drops below a certain temperature and cuts in to heat it.

The heater also acts as a water storage facility, and should be drained off if the 'van is left for long periods.

## Taps

Motorhome taps are lined with a food-grade plastic to keep the water untainted for drinking or food preparation. Most are of the mixer variety, which saves both space and weight. While they look like domestic taps, they don't

**Washroom and kitchen mixer taps use twin pipes for hot and cold water**



deliver water at the same rate as a mains system, as the pump cannot replicate the high pressure. Taps can be expensive to replace should anything go wrong.

## Pipes

Most motorhomes make use of semi-rigid pipes, which are strong but bendable, to deliver water to all areas of the 'van. This is better than using flexible pipes, which can kink, split and are more susceptible to decay.

Pipe work must be placed so that it doesn't interact with other systems, especially heating ducts, which could melt the plastic. To join pipes together, push-fit hose connectors are used, as they're more watertight than other solutions, such as hose clips. The pipe work is held down by brackets, to stop it coming apart when the vehicle is in motion.

Waste piping is wider than fresh water piping, to allow for debris to flow to the waste tank without causing a blockage. It is usually a corrugated pipe with a smooth interior lining. If this lining is omitted, waste can become trapped in the grooves.

## How it works

If you have activated the 12V feed to the pump, the system will switch on as soon as you open a tap. You will either trip a switch in the tap (micro switch), or a pressure switch will sense water is flowing and pressure is being lost, and water will be pushed along the pipes.

The tap will have two valves (hot and cold) which block the flow of water when closed. Water will always be behind, ready to flow. This is why hot water flows cold at first – the latter has been sitting in the pipes, and so arrives before the boiler-heated water.

Once the water runs down the plughole, another, larger pipe will carry it down into the waste tank under the 'van.

## Maintenance

### Sterilising

To ensure that your water system remains fresh at all times, it should be regularly sterilised. You can do this by adding Puriclean tablets to the water when you flush through the tank: these are tasteless and will ensure the system stays fresh. You should also clean out the waste tank as and when you can.



Thetford produces a tank purification chemical, Tank Freshener, which can be added to the drainage system daily, reducing the build-up of grease and rubbish in the pipes and helping to prevent smells.

### Draining

Whenever you leave your motorhome standing for long periods of time, you should make sure you drain both the fresh and waste water tanks. This will prevent the build up of algae and, in winter, stop water from freezing in the tank and pipes. This is crucial, as when water turns to ice it expands and can cause

pipes to leak, split or burst. When parking on site in cold weather, leave the waste tap open (pictured above), and put a suitably sized container beneath it.



### Filter

A diaphragm pump needs a filter between it and the water tank. Should any dirt or grit get into the pump mechanism, it could cause a failure, requiring either a repair or a new pump. These filters should be replaced, at least annually. This will ensure that they keep harmful agents from the pump.

