

Self-Containment Of Motor Caravans



INTRODUCTION

Self Containment is the ability to meet the ablutionary and sanitary needs of the occupants of a motor caravan, for a minimum of three days, without needing any external services or discharging any waste.

All waste and sewage is to be disposed of at a waste dump station, which is connected to a sewerage or septic tank system. You shall not use chemicals in the self-containment system that could affect the operation of the dump station and attached systems.

The following covers the requirements for self containment in motor caravans only. **For full details on Self-Containment purchase a Standard NZS 5465:2001 from Standards NZ, or contact a Self-Containment Testing Officer who has a copy of the Standard.**

WATER SUPPLY

The motor caravan shall be fitted with a fresh water tank. The tank shall hold at least 4 litres per person that the motor caravan is to accommodate for three days. (i.e. a minimum of 24 litres for two persons).

The tank shall be:

1. Made of a material that is inert and opaque, and be capable of storing fresh water indefinitely, while maintaining its potability.
2. Adequately supported and fastened to the motor caravan so that it does not cause any hazard whilst the vehicle is traveling on the road.
3. Fitted with an inlet of not less than 25 mm diameter (or 12mm diameter if pressure fed), and have a cap or seal to prevent foreign matter entering the tank.
4. If of rigid construction have an air vent of not less than 6 mm, fitted with a device to prevent the entry of any contaminant into the tank.

WATER RETICULATION

Water reticulation shall be in opaque non-toxic pipe. Clear plastic pipe shall not be used.

A typical plumbing layout for a motor caravan is shown in Fig. 1.

Explanation

1. Clear plastic pipe admits light, which encourages the growth of algae in the pipe. This discolours the water, and has potentially harmful effects on your digestive system.
2. Where a water-heating device such as a gas califont is installed, the hot water reticulation should be in 10 mm annealed copper or pipe suitable for hot water. This pipe is easily routed around corners and can be installed in one length from the gas califont to the outlet tap. The flow of water through the 10 mm pipe is more than adequate, as the gas califont restricts the water flow so that the gas flame will heat the water in the pipe as it passes through the flame. A large diameter pipe holds a lot of water which is wasted while waiting for the hot water to come through the pipe. Remember the more water you save the less you have to carry in the motor caravan fresh water tank and ultimately hold in the waste tank.

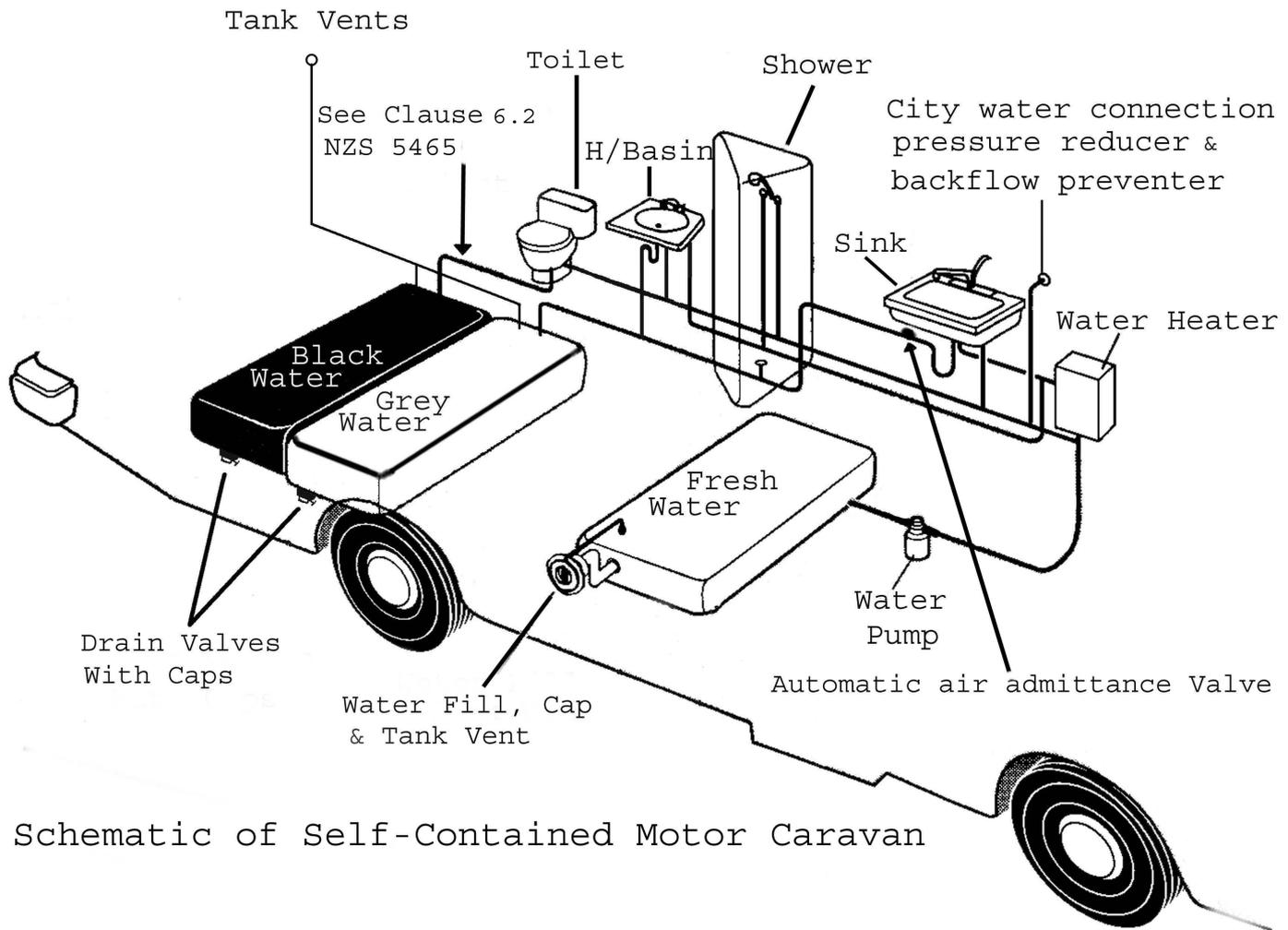


Fig. 1

Typical Plumbing Layout for Motor Caravans - Schematic Only

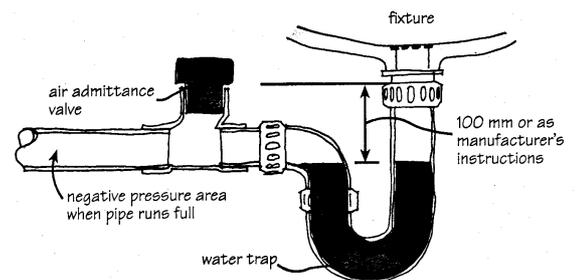
Note - With storage water heaters an inlet pressure regulator and pressure relief valve will be necessary.

SINK

The motor caravan shall be fitted with a sink. Additional sinks, hand basins and shower are optional. Every sink, hand basin or shower fitted shall be supplied with water from the fresh water tank, in such a way to ensure that there is no back siphoning.

All waste pipes from sinks, hand basins and shower trays shall have a water seal of not less than 40 mm, fitted close to the outlet of the fitting and no more than 1 m from the fitting.

The diameter of the waste pipe from a sink, hand basin, shower tray or other fitting shall not be less than 18 mm. Where the length of pipe exceeds 3 metres it shall not be less than 25 mm diameter and be vented with a pipe of not less than 18 mm diameter. Alternatively fit an air admittance valve as shown in fig 2.



Taps or faucets that telescope in a sink so that a cover can be fitted over them whilst travelling shall not be permitted. These installations do not prevent back siphoning of soiled water into the fresh water supply, should there be any water in the sink.

TOILET

The motor caravan shall be equipped with a toilet, and installed in accordance with the manufacturers instructions.

Where the toilet is permanently mounted, it shall be connected to the waste tank by a pipe, preferably of flexible material or with a flexible joint. Where the evacuation is by gravity, the pipe or hose shall not be less than 75 mm diameter, and not deviate from the vertical by more than $\pm 30^\circ$.

Explanation

Toilets shall have sufficient waste holding capacity to provide for the occupants of the motor caravan for a minimum of three days. The waste holding capacity shall be the net capacity after deducting the internal flushing water. The capacity per person per day is 1 litre, e.g. four people for the three day self containment period would require a net total of 12 litres.

Assume the internal flushing water will take up 10% of what the manufacturer states is the waste holding capacity. For example: The manufacturer states the waste holding capacity of a porta potti is 15 litres. Assume 10% of that capacity (1.5 litres) will be used up by flushing water, leaving 13.5 litres for actual waste capacity. The vehicle can therefore accommodate four people, but not five. Another example: The manufacturer states the waste holding capacity of a cassette is 20 litres. Assume 10% (2 litres) will be used up through flushing, leaving 18 litres for actual waste capacity – just enough for six people.

Note: this is the minimum and needs careful management. Persons with medical conditions will need a toilet with a greater capacity.

Marine type toilets shall not draw their flushing water from the drinking water supply.

Explanation

The barrel of a marine toilet pump is used for pumping both the waste to the waste tank, and drawing in the flushing water. It is therefore unavoidable that contamination will travel from the waste to the clean water supply. To use marine toilets in a motor caravan, install a separate tank for flushing water with an air gap between the fresh water supply and the flushing tank water.

WASTE TANK

The motor caravan shall be fitted with a waste tank or tanks to receive the wastewater and sewage from all permanently installed fixtures. The capacity of the waste tank should be 5% greater than the fresh water supply. The waste tank can be less volume than the fresh water, as long as it is greater than the minimum size and has a clearly visible, functioning monitor. The minimum size for the waste tank is the same as the minimum fresh water capacity (i.e. 24 litres for two people).

Removable grey water tanks are allowed as long as they are connected with a water tight seal and the pipe that feeds them has a shut-off valve and cap. Portable tanks should not be more than 20 litres or lifting becomes difficult. 1 litre = 1 kg.

All waste tanks shall be constructed of non-corrodible material. The bottom of the tank shall be shaped so that the contents can be evacuated through a quick acting gate valve. The valve shall not be able to operate from inside the vehicle and the valve shall be fitted with a cap when not in use.

Waste tank valve, pipe and discharge hoses:

Grey wastewater tanks Up to 200 litres 25 mm minimum diameter.

Over 200 litres 32 mm minimum diameter.

Black wastewater tanks Fed from a marine toilet or fed from a standalone macerator pump
32 mm minimum diameter.

Waste macerated on evacuation 18 mm diameter or the size of the macerator pump openings.

All other black water 75 mm minimum diameter.

Explanation

The sizes stated above are the minimum. To get maximum evacuation of your tank and ensure that you dispose of all solids and paper, you should fit the largest valve and pipe work possible to the

lowest point of your tank. This ensures that you evacuate all possible solids. In some cases where maximum flow is not achieved, you will get build up of solids in the tank that will reduce the tank volume. Eventually you will have to remove the tank or cut a hole in it large enough to flush it out.

All waste tanks shall be fitted with a vent of not less than 10 mm, preferably 25 mm, routed above the flood line of the lowest appliance and be vented to the outside of the vehicle. Preferably near the roofline away from windows and doors. Where the evacuation of the tank is by a valve and greater than 50mm an air admittance valve shall be fitted in the system to prevent the water seals being destroyed and/or tanks imploding and to speed up the evacuation of the tank.

The waste and sewage tanks shall be adequately supported and fastened to the motor caravan, so as not to cause a hazard whilst the vehicle is in motion.

EVACUATION HOSE

The motor caravan shall be fitted with an evacuation hose. The hose shall be fitted with a sealable coupling for attaching it to the waste holding tank evacuation valve. The waste hose shall have a minimum length of 3 metres and the diameter shall be no less than the minimum waste tank valve and piping. The hose shall be carried in a separate sealed container if not carried in its own locker.

WASTE WATER TREATMENTS

The chemicals or biological treatments used in a waste or sewage tank should:

1. Deodorise the waste
2. Disintegrate the waste
3. Be biodegradable
4. Eliminate coliform bacteria
5. Prevent foaming at pumping stations
6. Not interfere with the safe operation of a septic tank
7. Not affect component parts of the sanitation system

The manufacturers instructions should be followed when using the treatments.

Explanation

When putting chemicals into your toilet system (portable toilets and waste tanks) it is important to take into account the amount of waste that you will deposit before emptying the tank. No use putting in the full dosage when you are going to empty the tank when it is half full. All you have done is put in twice as much chemical as is needed. Better to put in half the chemical dosage to start with and top it up if you are going to use the full capacity before disposing of the waste at a dump point.

REFUSE CONTAINMENT

The motor caravan shall be fitted with a sealable refuse container, of a permanent or disposable type.

CERTIFICATE OF SELF-CONTAINMENT

A motor caravan equipped and meeting the requirements of this standard, will be issued with a certificate of self-containment. The certificate shall list the equipment fitted and the number of people capable of being accommodated within the terms of the certificate. This is not necessarily the number of beds, e.g. you may own a 6 berth motor caravan but only have it self-contained for two people. The self-containment certificate shall list the information as given in Appendix A.

Each certified self contained motor caravan shall be issued with a warrant of self-containment. The warrant shall be affixed to the inside of the front left window, or the inside of the left windscreen, so as to be visible from the footpath. The warrant shall clearly state:

1. The registration number of the motor caravan
2. The date of issue
3. The issuing authority

4. The maximum number of people, which are to be accommodated by the vehicle.
5. The expiry date.

No certificate shall be valid for more than forty-eight (48) months (four years), and must be renewed immediately if any alterations to the self containment set-up are made.

ISSUING AUTHORITY

Self-containment certificates, and self-containment warrants; shall be issued only by a self-containment issuing authority.

An issuing authority shall be either a registered plumber or a suitably qualified person registered under the Plumbing Registration Board or an organisation appointed by the administering authority. In the case of appointed organisations, they may operate a scheme of testing officers who shall be members of the organisation concerned. Any two testing officers of that organisation shall constitute an issuing authority for the granting of a certificate of self-containment. Any one testing officer shall constitute an issuing authority for a retest.

TESTING OFFICERS

To qualify as a testing officer, a member of an organisation, duly nominated by that organisation, must have attended a course of instruction, and passed a test proving their competence, to ensure the uniform interpretation of the Standard.

ADMINISTERING AUTHORITY

The Ministry for the Environment is the administering authority.

DISPUTES

Any disputes arising should be referred to the New Zealand Motor Caravan Association Inc Executive.

APPENDIX A

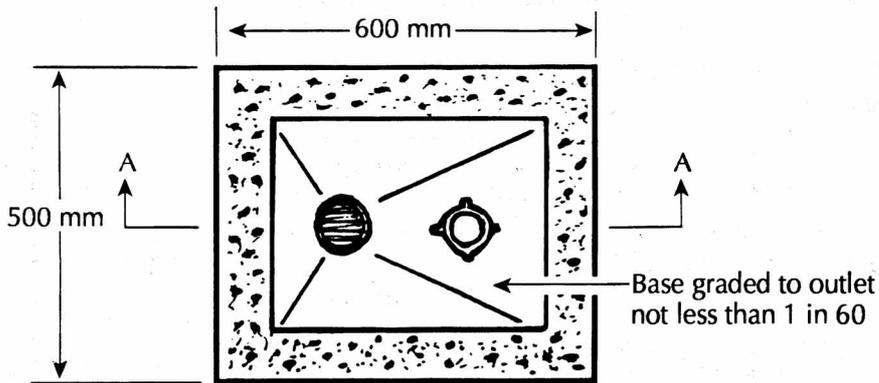
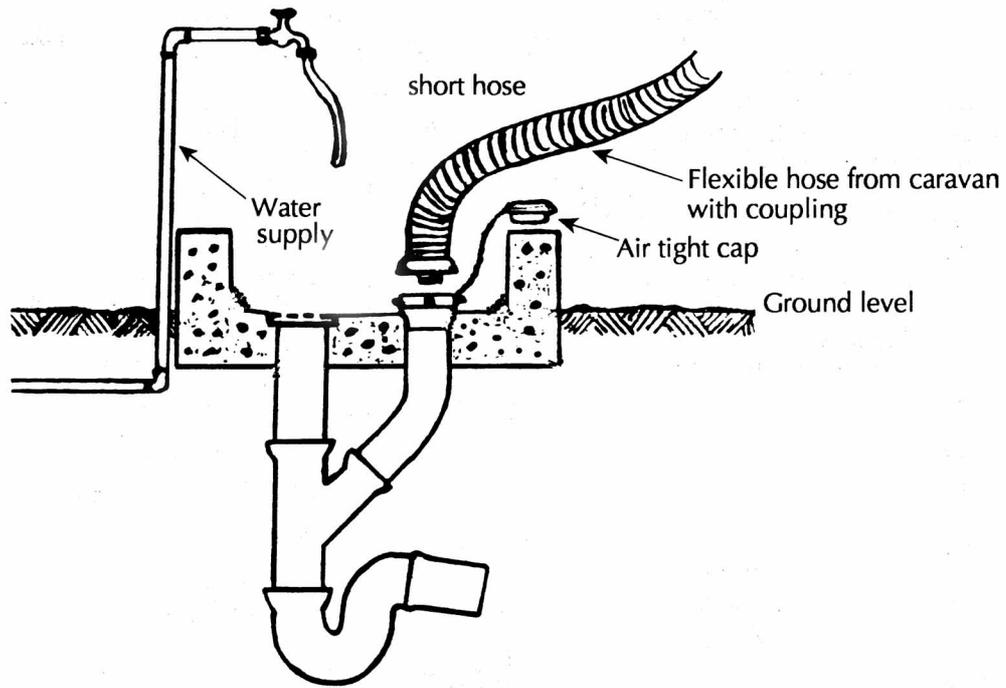
Contains all the information about the self-containment installation on your vehicle, including:

Name of owner & address
Registration Number
Make and year of vehicle
Sink, pipe work, seals and vents
Hand basin, pipe work, seals and vents
Shower, pipe work, seals and vents
Toilet type and capacity
Fresh water tanks, vents, pipes and caps
Grey and black tank capacity, vents, valves and pipes
Waste disposal hose, size and container
Caps on waste valves
Solid waste rubbish container with lid
Number of Occupants for which the vehicle is self-contained

(Note: the above does not constitute a check sheet or layout of certificate for self containment. NZMCA Self Containment Officers hold copies of the real check sheets. Non-member plumbers can obtain blank copies of certificates and warrants from the Ministry for the Environment).

DUMP POINT

Figure 3 shows a schematic of a typical dump point (do not use these drawings as design material). Obtain NZS 5465:2001 *NZ Standard for the Self-Containment of Caravans and Motor Caravans* for full details and specifications.



PLAN

