



## WATER SYSTEMS

**WATER STORAGE & DISTRIBUTION SYSTEMS** — In the demand system, a non-pressurized supply tank is used and the water is pumped by a motor-driven pump from the tank directly to the outlet faucets. A pressure-sensing device is placed between the pump and the faucets. After the faucets are turned off, the pump continues pumping for a fraction of a second until the sensing device is triggered to turn off the pump. Each time a faucet is turned on, the pressure is momentarily reduced and the sensing device turns the pump on until the faucet again is turned off.

In the system there is a switch connected in series with the pump so the user can deactivate the pump so it will not operate when the motorhome is being stored. It also is good policy to turn this switch off when the motorhome is traveling on the highway. During such periods there is very little demand for water, and any malfunction of the water system might not be detected.

**City Water Hook-Up** — In addition to the water system described above, your motorhome has a city water hook-up system. This simply is a fitting connected to the high-pressure system of the motorhome which will accept the end of a high-pressure hose which can, in turn, be connected to a city water supply. A pressure regulator is connected to prevent possible damage to the system due to extremely high outside water pressure. When the city water supply is connected to the motorhome, this valve is activated to stop the demand from the fresh water storage tank.

**CAUTION:** Never run the water pump when hooked up to a city water source or when the tank is empty. Damage to the pump will result.

**Water Purification** — Water which is questionable can be purified by allowing it to boil at least five (5) minutes or by proper treatment with chlorine, iodine, or Halazone or Globaline tablets. Of these methods, chlorination is used by most motorhome owners. Chlorine bleach in the amount of two (2) drops of 5.2% solution for each gallon of water will purify against most bacteria and viruses. Super chlorination does introduce the unpleasant taste of chlorine in the water, but water purifiers are now available which will eliminate this problem. The following treatment is recommended for super chlorination to protect against all organisms.

Before refilling the water tank, pour sufficient household bleach into it to produce an ultimate solution which will amount to 20 drops of 5.2% chlorine for each gallon of water. Then fill the tank with water and run the motorhome several miles to be sure that the chlorine solution has been thoroughly mixed with the water. Then draw all drinking water through the purifier which is basically a filter charged with activated charcoal or other substances.

Some additional facts relative to water treatment might be informative. Bacterial activity increases in 100° water. Freezing does not destroy bacteria; they merely remain dormant.

**Water Filter** — The water filter installed in your coach is located in the under-counter cabinet below the sink. The filter is installed with a cartridge.

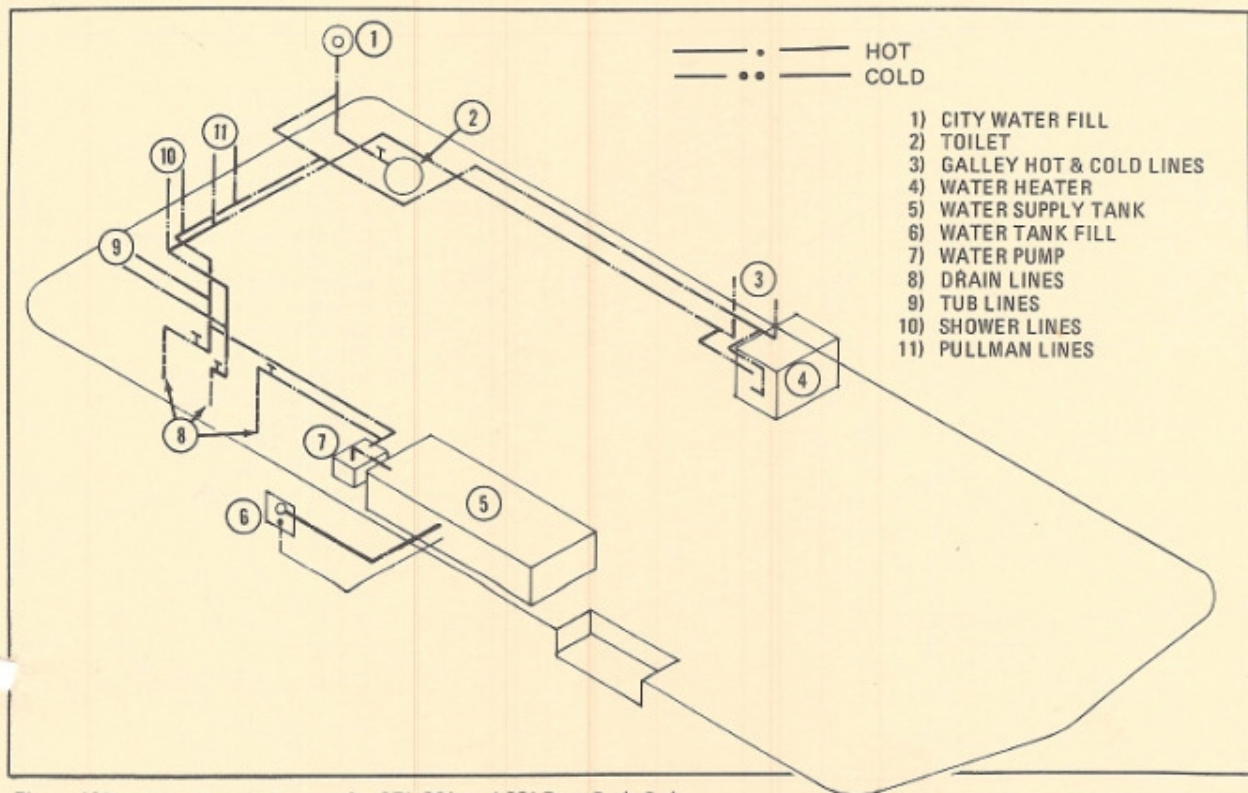


Figure 160— Water Supply System for 27', 30', and 33' Rear Bath Only.



**WATER SYSTEMS (Continued)**

Each time water passes through the filter, dirt particles are trapped and held in the tiny pores of the coating on the filtering element inside the cartridge. As the filter actively removes the impurities from the water, its microscopically small pores slowly fill and the amount of water from the filter gradually lessens. When the flow of the water from the unit becomes too slow for convenience, it should be serviced. If the cartridge is not changed, eventually the flow will stop entirely. It would be wise to carry a spare cartridge with you when you are traveling, just in case you fill the water tank from an exceptionally dirty source.

Even when decreasing flow does not demand it, at least one cartridge change per year is recommended for reliable performance from your water purifier system.

**Filling the Tank** — Using the method of super-chlorination followed by treatment with a water purifier, water can be taken on board from almost any source.

Experienced motorhome users usually carry their own water hose. Special hoses which will withstand continuous high pressure, and which will transfer drinking water without adding unpleasant tastes and odors, can be purchased from RV dealers. One or two 50' lengths of such hose should be made a part of the standard motorhome equipment.

For each system, after the tank is full, the pump switch should be turned on. After using the hose, it should be sealed by screwing the male and female ends together prior to storage.

**Water Heater** — Your water heater has a capacity of up to approximately 10 gallons, more than sufficient for a normal supply of hot water.

When operating the water heater with LP gas, use the controls located on the heater itself. Temperature may be set from warm to very hot. The water may be heated through the automotive heat exchanger system (see page 138).

For proper operation and maintenance, study the instructions on the heater, in addition to those provided in your Owner kit. Access to the water heater is gained through the exterior compartment.

**Draining and Sanitizing Water Tank** — It is a good policy to drain the water from the system at the end of each trip. After draining the tank, it is wise to close all valves so that air-borne contamination or small insects cannot enter the system.

After purchasing a new motorhome, or after a unit has been out of use for any extended period of time, the water system should be sanitized by the following procedure. Use 2/3 cup of 5% bleach solution for each 10 gallons of water, in the tank. To insure a thorough mixing of the bleach, figure out beforehand the amount of bleach required. Place a portion of it in the tank intermittently between the adding of each five or six gallons of water. When the tank is full, open the faucets and

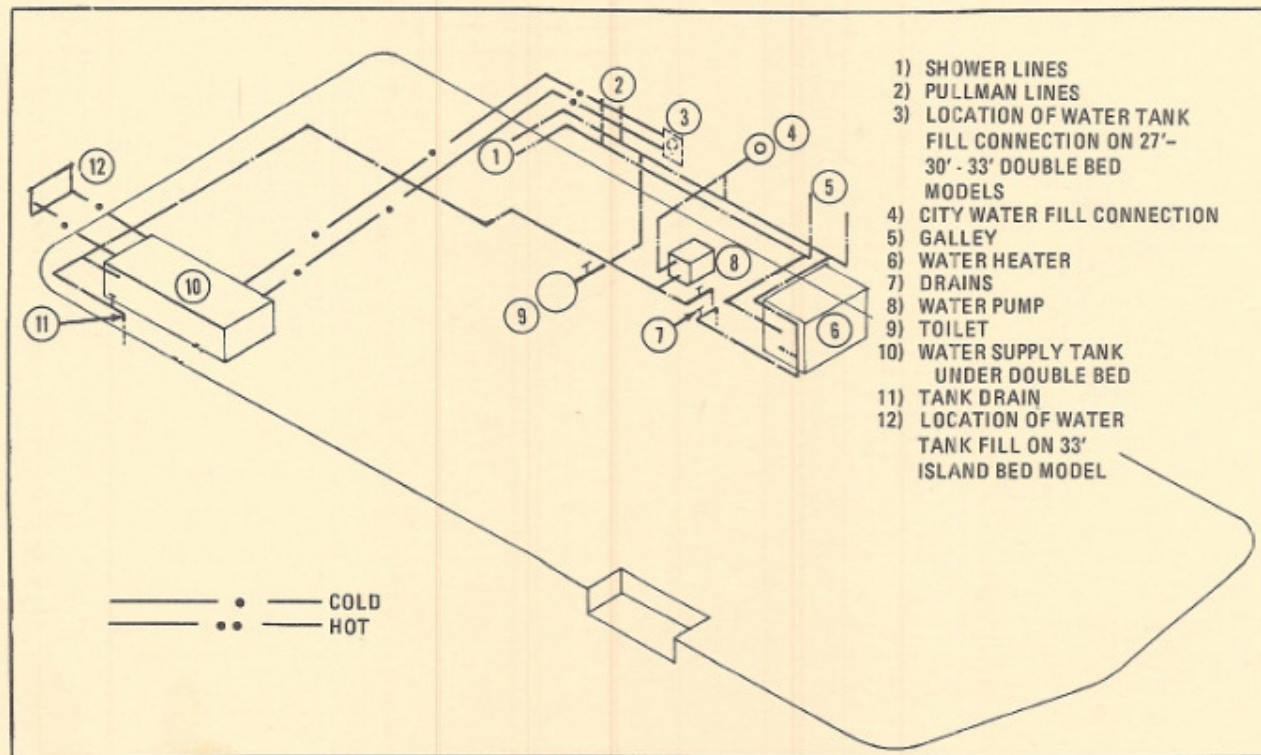


Figure 161 — Water Supply System for 27', 30', 33' Double Bed Only.



**WATER SYSTEMS (Continued)**

fill all waterlines. Allow the solution to stand in the system for approximately one hour. Then drain and flush the system thoroughly with fresh water.

**Freeze-Proofing Water System** – The use of the water system in freezing weather is a matter that must be given careful attention. Freezing can cause extensive damage to a water system.

To make sure the system is totally purged, the following procedure may be followed. Turn off the water pump and water heater. Then open all drain valves, including the valves at the bottom of each tank, at the bottom of the water heater, and at low points in the water lines. Permit water to drain out.

After all water appears to have drained out, depress the foot pedal of the toilet.

Also remove the hose connection cover on the city water hook-up fixture, and depress the button on the check valve to permit that line to drain. Turn on water pump to insure that water is expelled.

A new procedure has recently been developed using non-toxic, non-flammable anti-freeze, which can be purchased from RV dealers. The procedure is as follows: Add an adequate amount of anti-freeze to the tank to enable the pump to run it through all the lines. The motorhome is equipped with a hot-water heater that has a storage tank, enough anti-freeze will have to be used to fill the tank and allow the solution to come through all of the hot-water lines. Each faucet or water-using device

should be opened one at a time until the solution begins to flow through it.

The anti-freeze can be saved and used year after year. Some users eliminate the need to fill the water-heater by disconnecting the water-heater lines and then connecting them together with a by-pass connection.

**Water Disposal Systems** – Wash basins, showers, bathtubs and the kitchen sink all produce waste water which must be disposed of. Since the volume of liquid that passes through these sinks and basins is relatively high, these wastes are collected in the sewage holding tank.

**Holding Tank Systems** – The primary principle of operation of the holding-tank systems used in your motorhome is simply that of collecting waste water and sewage into tanks and then emptying these tanks from time to time at suitable disposal stations. At the outlet of this tank there is a 3" diameter plastic tubing; then a slide valve, which can be opened or closed; then another piece of tubing and a tightly fitting cap.

All primary drain outlets of holding tanks are located on the left side of the coach and are equipped with the watertight cap. This cap must be in place while the vehicle is in motion.

Each sink, wash basin, shower, or bathtub in the motorhome empties through a water-type gas trap, called a P-trap.

The wash-water drainage system is designed with plumbing lines having a drop of 1/4" per running foot. These lines all converge at a common outlet.

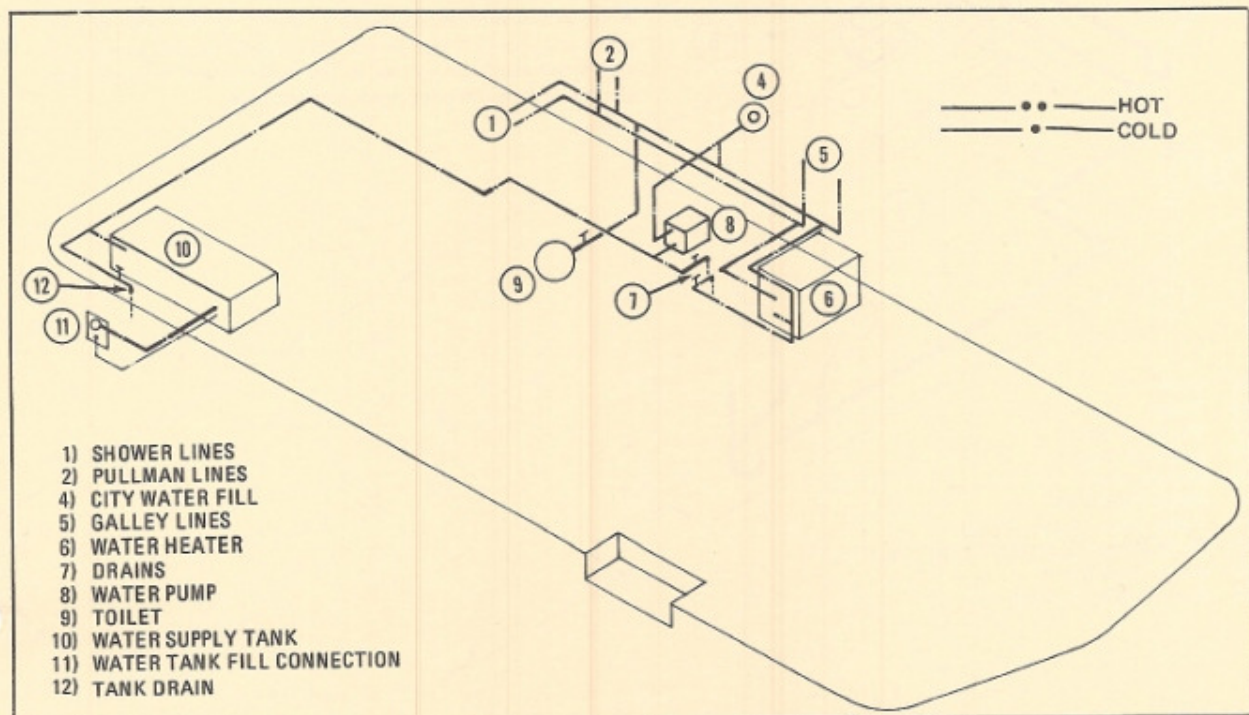


Figure 162 – Water Supply System for 27', 30', 33' Twin & Family Room Only.



## WATER SYSTEMS (Continued)

The shower basin or bathtub is the lowest disposal plumbing facility in the motorhome. If the holding tanks are not emptied when they are full, flooding could occur which would involve wash water and/or sewage backing up into the shower or tub.

Approved dumping stations may be found at private campgrounds, gasoline stations, state parks, national parks, roadside rest parks, etc. A book listing the locations of many approved dumping stations may be obtained from most RV dealers.

Your REVCON motorhome has been equipped with the latest sanitation system available, including:

1. A suds, or gray tank into which the tub/shower and sinks drain.
2. A sewage, or solids, tank, into which the toilet drains.

The solids tank is mounted directly to the base of the toilet. Holding tank plumbing is designed to allow each tank to be drained separately, by using the Push-Pull valve.

It is recommended that the solids tank be drained first. Leaving the suds tank full until all solids are drained will cause the

suds tank water to act as a wash, thereby cleaning the drain hose and helping to dislodge any waste that may build up.

To empty the holding tank of sewage:

1. Be sure the Push-Pull valves are closed.
2. Remove the drain tube plug.
3. Attach drain hose to drain tube.
4. Insert open end of drain hose at least two feet into the sanitary station connection.
5. Remove the metal wire retainers from the handle of the Push-Pull valve. When opening the valve, use a quick jerk to create the necessary flushing action.
6. When the tanks are drained, shut the valves and replace the retainers.
7. Remove the sewer drain hose, and rinse it thoroughly. Place it into storage.

When connecting your drain hose to an in-park sewer system, keep holding tank valves closed. Empty the tanks when necessary, as stated above. This will prevent liquid run-off which causes tank clogging of solids.

If an obstruction should occur in the drain system, **do not use lye or commercial drain products. A toilet flush-through or a wire drain cleaner should clear the drain.**

To clean and sanitize your holding tanks, flush with a hose through toilet valve, then pour in a 1/4 cup of household bleach, diluted in two gallons of water, let the solution stand, and rinse thoroughly. Be sure to use plenty of water for rinsing to thoroughly clear tank and valves.

The sewage holding tank should be deodorized each time it is emptied, using a chemical deodorant recommended by your dealer. Add a gallon of water and pour the solution into the bowl of the toilet. Follow directions on the deodorant container. Misuse of chemicals may cause damage to your sanitation system.

A REVCON motorhome with a "ZAP" system does not require any chemical deodorant. The "ZAP" system produces a very small electrical voltage in the holding tank material. This electricity kills the odor-producing bacteria.

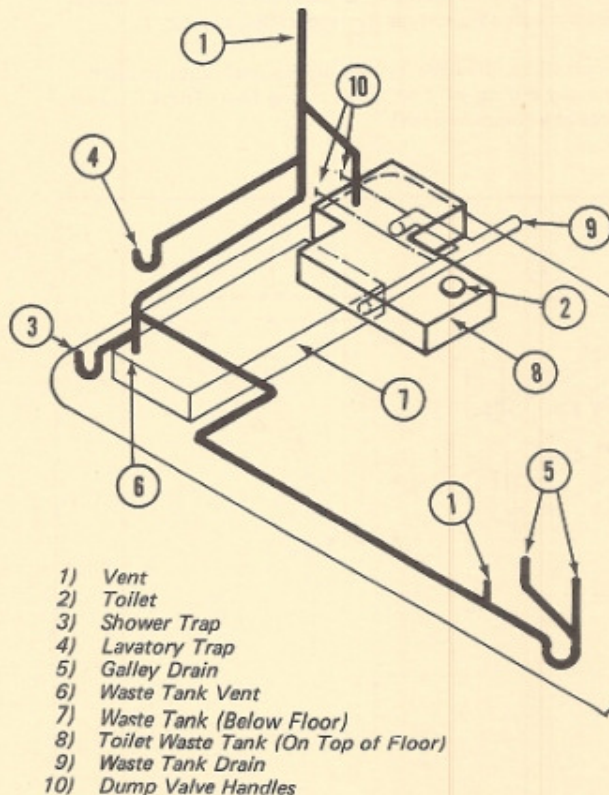


Figure 163 – Water Drainage System for 27' Rear Bath Models Only



**WATER SYSTEMS (Continued)**

**Wintertime Use of Holding-Tank Systems** — Obviously, in cold weather the contents of the holding tank might freeze and damage the plumbing. The holding tank can be used at below-freezing temperatures if an appropriate anti-freeze is placed in the tank. The owner should consult with the dealer service department from where he purchased the motorhome, to determine whether or not automotive-type anti-freezes can be used. Inquiry should also be made into the use of sodium chloride or calcium chloride as an anti-freeze agent.

**TOILET —**

Your REVCON motorhome uses the "Aqua-Magic," toilet unit by Thetford. It features the unique "Micro Rinse" flush, and dual pedal fill. It comes in ivory and white decorator colors, and there is a padded seat model available.

**Toilet Operating Instructions —**

1. To add water to bowl, step on small pedal until water reaches desired level, then release pedal slowly.
2. To flush, step on large pedal until rinse clears bowl, release pedal slowly.

**Toilet Maintenance** — No routine maintenance is required. To clean toilet, use Thetford Aqua Bowl or any other high grade, non-abrasive cleaner. **Do not use highly concentrated or high**

acid content household cleaners or scouring powders, as they damage seals and finish.

**Winterizing —**

1. **Draining Method** — Completely drain the toilet water supply line leaving the water supply valve open. This valve may be kept open by inserting a round object, like a soft drink bottle into the flush hole in the bowl.

**CAUTION:** When using air pressure to drain water line, toilet valve should be held in open position.)

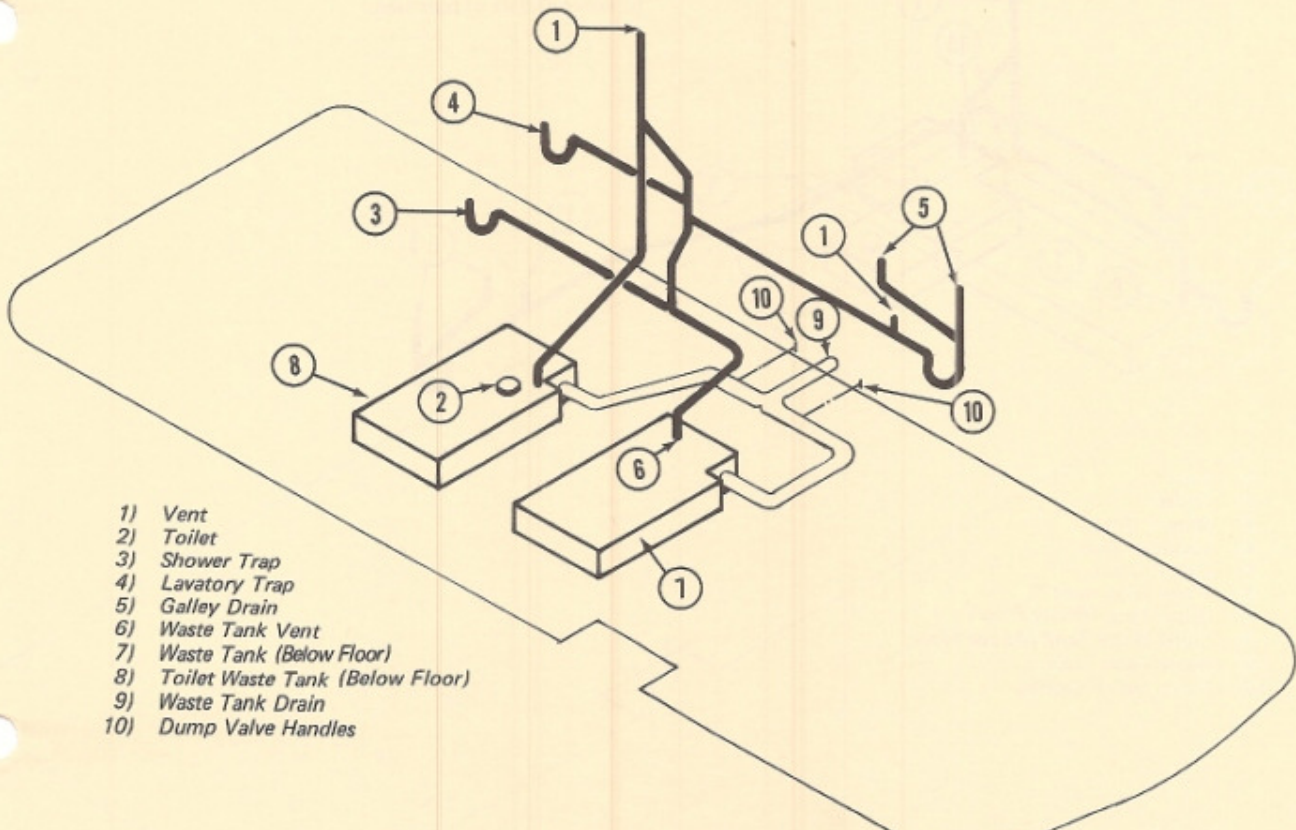
2. **Anti-freeze Method** — Use potable water system type anti-freeze to winterize the fresh water plumbing system. (See page 133.)

**CAUTION:** Never use automotive type anti-freeze in fresh water system. These are highly toxic.)

**CAUTION:** Do not use household detergents or cleaning compounds. They may contain chemicals that would damage the plastic drain system or termination valve seals.

**NOTE:** If water is inadvertently frozen in the toilet, do not attempt to flush until the ice is thawed. Otherwise damage to toilet could occur.

**Holding Tank Hints** — After hook-up to sewer line at campgrounds, leave the vehicle termination valve on the blackwater (toilet waste) holding tank **closed until the tank is at least 3/4 full**. This provides sufficient water in the tank to insure com-



- 1) Vent
- 2) Toilet
- 3) Shower Trap
- 4) Lavatory Trap
- 5) Galley Drain
- 6) Waste Tank Vent
- 7) Waste Tank (Below Floor)
- 8) Toilet Waste Tank (Below Floor)
- 9) Waste Tank Drain
- 10) Dump Valve Handles

Figure 164 — Water Drainage System for 27', 30', and 33' Mid-Bath, and '33 Island Bath Models Only.



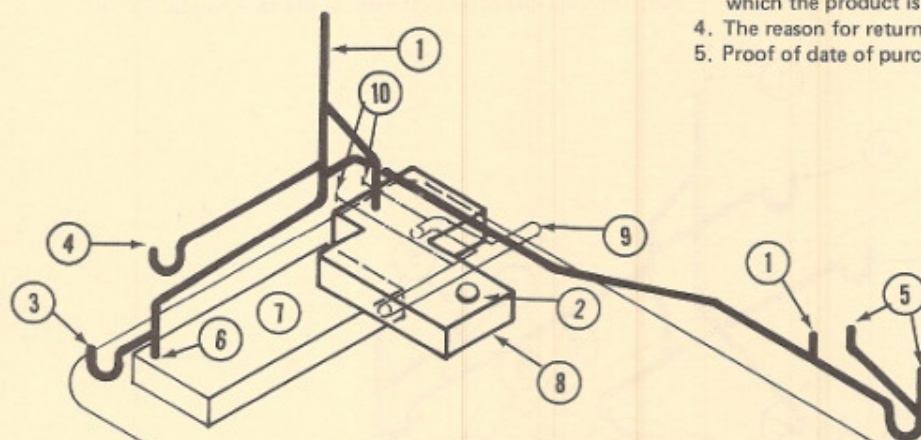
## WATER SYSTEMS (Continued)

plete flushing of waste material into the outside sewer line.

Unlike the toilet at home which uses between 4 - 7 gallons of water per flush, the average RV uses from 1 cup ( 8 oz. ) to several quarts of water per flush, which is enough water to flush the waste from the toilet into the holding tank. If there is not sufficient water in the holding tank, waste materials may not evacuate properly when the termination valve is opened and clogging could eventually result.

To empty the blackwater holding tank, **open** the termination valve. When holding tank is empty, rinse it thoroughly using Aqua-Bowl Cleaner, (or a comparable cleaner recommended by your RV dealer). Use the cleaner with several gallons of fresh water. Be sure to **close** termination valve after emptying and thoroughly rinsing out the holding tank.

**NOTE:** With two holding tanks, one for blackwater (toilet waste) and one for graywater (sink and shower waste), there are two vehicle termination valves, one for each holding tank. You may leave the graywater termination valve open during hookup to an outside sewer line. Graywater contains few solid particles and will not clog the holding tank. But it is a good practice to rinse the graywater tank with clear water and the Aqua-Bowl Cleaner before closing the termination valve.



- 1) Vent
- 2) Toilet
- 3) Shower Trap
- 4) Lavatory Trap
- 5) Galley Drain
- 6) Waste Tank Vent
- 7) Waste Tank (Below Floor)
- 8) Toilet Waste Tank (Above Floor)
- 9) Waste Tank Drain
- 10) Dump Valve Handles

## Toilet Trouble-Shooting —

1. **Symptom:** Water keeps running into bowl.  
**Correction:** Clean out foreign material in groove where water valve blade seats in bottom of bowl. If blade cannot close completely, neither will water valve.
2. **Symptom:** Toilet leaks, water on floor.  
**Correction:** If vacuum breaker leaks while flushing, replace vacuum breaker. If vacuum breaker leaks when not flushing, replace water valve. If leak is at bowl to mechanism seal, replace mechanism. If leak is at closet flange to floor seal, check flange nuts for tightness. If leak continues, remove toilet, check closet flange height. (1/4" to 7/16" above floor). Adjust accordingly. Replace flange seal if it is damaged.
3. **Symptom:** Foot pedal operates harder than normal or blade sticks.  
**Correction:** Apply light film of silicone spray on blade.

**Toilet Service and Parts —** See warranty in owner's packet for service information. Refer to your local Thetford dealer for parts and service. If it becomes necessary to send parts to a Thetford Certified Service Center for warranty consideration or to contact the factory, please include the following information:

1. Your name and address.
2. The product name, model, serial number and color.
3. The type of recreational vehicle (brand name and year) on which the product is used.
4. The reason for return.
5. Proof of date of purchase.

Figure 165 — Water Drainage System for 30' and 33' Rear Bath Models Only.



## WATER SYSTEMS (Continued)

### For Best Results Use Thetford Convenience Products —

Wherever your travels take you, Thetford offers three holding tank products:

1. Aqua-Kem, a liquid concentrate deodorant.
2. Dri-Kem, a granular holding tank deodorant.
3. Aqua Zyme, an enzymatic waste treatment liquid.

All three products are highly effective and are quick and easy to use when the label instructions are followed.

When adding Aqua-Kem, Dri-Kem, or Aqua Zyme to holding tank, be sure the vehicle termination valve is closed. Then add 8 oz. of Aqua-Kem or two, 2 oz. packets of Dri-Kem, with enough fresh water to cover the bottom of your empty holding tank. When using Aqua Zyme, add 2 oz. to toilet and flush, using two gallons of water. Variations in time periods, temperatures or usage may require changes in amount of product used. For more complete information, see label instructions on the Aqua-Kem, Dri-Kem and Aqua Zyme containers.

To prevent holding tank clogging by toilet tissue, use Aqua Soft toilet tissue. Specially formulated by Thetford, Aqua Soft fights clogs because it disintegrates and dissolves rapidly in holding tanks.

**CAUTION:** Aqua-Kem contains methyl alcohol and formaldehyde. It cannot be made non-poisonous. Avoid contact with skin, eyes, and mucous membranes. Avoid prolonged or repeated breathing of vapor. Prolonged or repeated contact may cause allergic irritation.

**FIRST AID:** In case of skin or eye contact, immediately flush affected area with plenty of water for at least 15 minutes. For eyes, get prompt medical attention. If swallowed, give one or two glasses of water or milk. Induce vomiting and call your physician or Poison Control Center immediately.

**WATER PUMP —** The water supply system for the REVCON incorporates an ITT Jabsco water pump which operates on 12-volt DC electrical power. The pump is capable of delivering three (3) gallons per minute under 16 psi pressure. A pressure-sensing device, in the line between the pump and the faucets or water outlets, turns the pump on when a faucet is turned on. The pump continues to operate for a fraction of a second after the faucet is turned off until the sensing device triggers to turn off the pump.

**AUTO WATER HEATER EXCHANGE SYSTEM —** The REVCON motorhome is equipped with a unique system which provides heated water directly from the automotive engine. The advantage of this system is that it provides hot water whenever the vehicle engine is operating to the coach outlets, thus eliminating the use of the regular water heater except when the vehicle is parked. For a schematic of this system, see figure 166.

**HOT WATER HEATER —** The REVCON is equipped with a 10-gallon hot water heater. The heater is equipped with a fail-safe pilot which will automatically shut off the gas supply if the pilot flame is extinguished. When the water reaches the pre-determined temperature, the water heater will automatical-

### WATER PUMP DIAGNOSIS

CONDITION	POSSIBLE CAUSE
Pump operates but no water flows through faucet.	Low water level in tank. Suction line clogged or kinked. Air leak in suction line. Loose hose clamps or fittings in suction line.
Pump cycles on and off when faucets are closed.	Defective valves or check valve. Water leak in plumbing. Defective toilet flush valve. Internal leak in pump. Outlet valve not sealing.
Pump operates roughly and has excessive noise and vibration.	Intake line is restricted, kink in suction hose or fittings too small. Pump mounting insecure. Deformed or ruptured pulsation dampener in pump.
Pump fails to start when faucet is opened.	No voltage to pump. Blown fuse. Clogged or kinked outlet line.
Pump fails to stop when faucets are closed.	Empty water tank. Outlet valve not sealing. Very low voltage to pump. Air in system. Defective pressure switch.

ly shut off. When the water heater switch is turned "ON" the spark should begin and the burner will light. If the spark stops before the burner lights, then turn the switch to "OFF." Wait five (5) seconds and then switch to the "ON" position. This will re-start the ignition cycle. The first start-up of the heater may require several ignition cycles before all air is purged from the gas lines.

If the burner will not come on, check the following:

1. Switch turned off.
2. Gas supply to heater empty or turned off.
3. Reset button tripped.
4. Fuse blown.

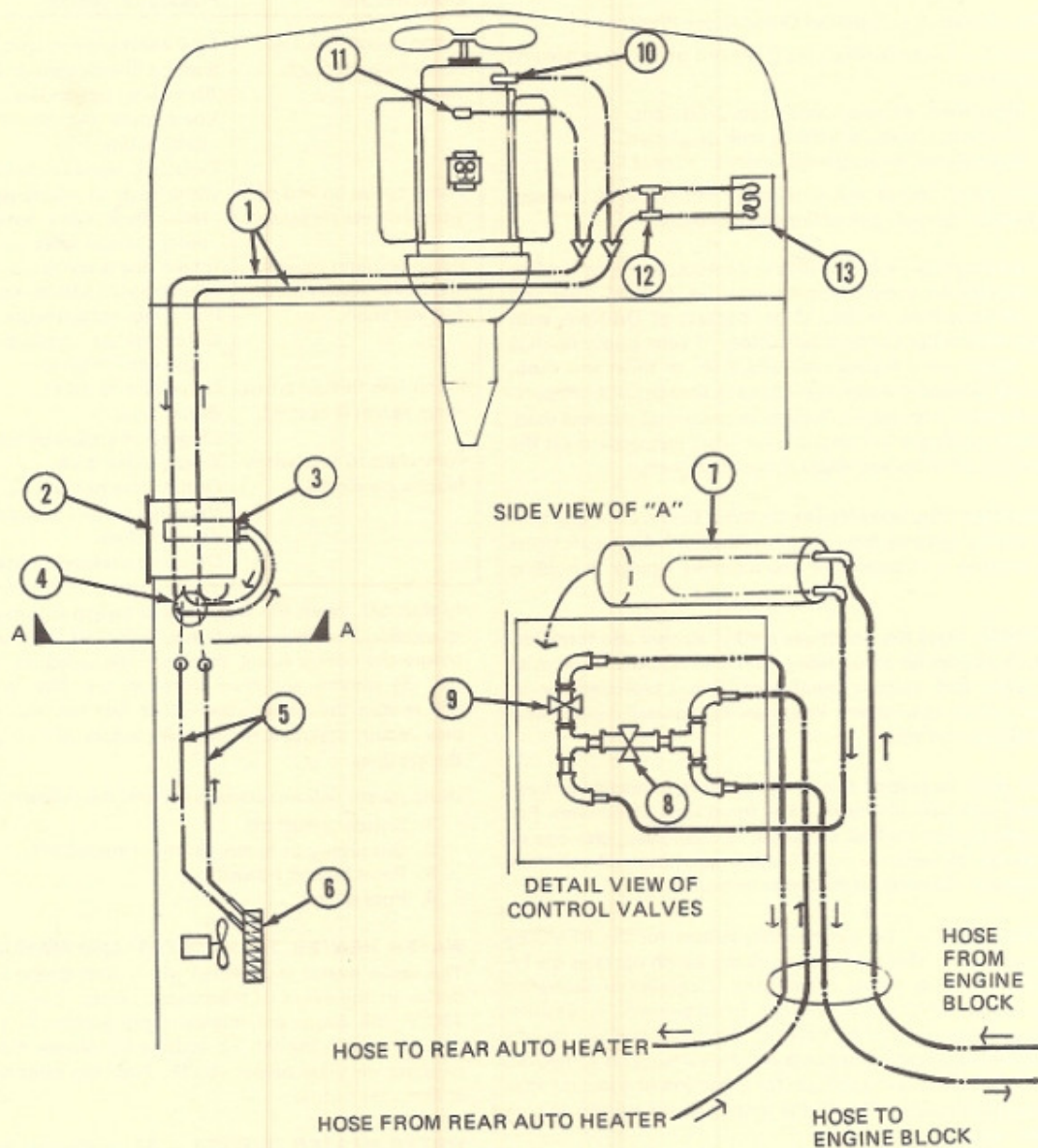
**WATER HEATER THERMOSTAT AND MANUAL TEST —** The water heater is provided with a high-temperature cut-off device in the event of thermostat failure. Temperature above 190°F will cause the manual reset button to trip shutting down the main burner. To activate the burner, the water temperature must be below 100°F. Push the reset button to reactivate the burner.

**WATER HEATER BURNER —** All air shutters are pre-set to obtain a blue or orange-blue flame. If it is necessary to adjust the air shutter, be sure to maintain the blue or orange-blue flame color. Do not allow the burner plate to burn with a yellow flame, because sooting will occur.

In cases where sooting has occurred, there is a possibility that this condition may be corrected by making the correct air shutter adjustment. If the burner flame continues to burn yellow after adjusting the air shutter, check for an obstruction in the burner or the flue box. A stiff brush is recommended for the removal of soot deposits. If there is soot in the burner, check to make sure the gas valve is shutting off clean. This can be checked by turning the OFF-ON switch to the OFF position. There should be no flame at the burner orifice at the burner.



## WATER SYSTEMS (Continued)



- 1) 5/8" HEATER HOSE TO AND FROM WATER HEATER AND REAR AUTO HEATER
- 2) WATER HEATER
- 3) WATER HEATER HEAT ELEMENT
- 4) CONTROL VALVES
- 5) 5/8" HEATER HOSE TO AND FROM AUTO HEATER
- 6) REAR AUTO HEATER
- 7) DETAIL OF WATER HEATER ELEMENT

- 8) GATE VALVE: NO. 8 OPEN NO. 9 CLOSE – HEATS ONLY WATER HEATER.
- 9) GATE VALVE: NO. 9 OPEN NO. 8 OPEN – HEATS WATER HEATER AND REAR AUTO HEATER.
- 10) ENGINE WATER PUMP
- 11) ENGINE BLOCK
- 12) "H" VALVE
- 13) DASHBOARD HEATER CORE

Figure 166 – Automotive Heat Exchanger Water System Schematic