SECTION V

WATER DISTRIBUTION SYSTEMS

INTRODUCTION

Your motorhome is equipped with a completely self-contained water system which includes piping, heating and drainage facilities similar to those used in home installations. The water supply and distribution system includes three networks: (1) a potable water supply system, which includes the water tank, pump, air accumulators, pressure switch, water purifier and input supply lines; (2) water heater and interior hot water heating systems; and (3) waste, winterizing, quick drain and sewage drainage systems. Refer to Section X for potable water system and plumbing drainage system piping diagrams.

WATER SUPPLY AND DISTRIBUTION SYSTEM

As shown in figure 5-1, the dual-purpose tank water fill/COMMERCIAL WATER inlet connection is located in the left rear utility compartment. The TANK FILL ON-OFF switch controls a solenoid-actuated water valve to divert the commercial water input to the pure water storage tank to fill the tank. Located beneath the rear bed, the tank is a non-pressurized type so that system water pressure is developed by pumping action directly into the supply lines, rather than by tank pressurization. A bacteriostatic water purifier system purifies all the drinking-supply water used in the coach.

COMMERCIAL WATER HOOKUP

When facilities are available, the COMMERCIAL WATER hookup can be used to supply all coach water system requirements. In this manner, the coach water tank and pump system is bypassed and the supply line water pressure is developed by the external connection. Water input pressure is regulated by a 45-pound in-line reducer valve. A supply line check valve automatically bypasses the pump and tank.

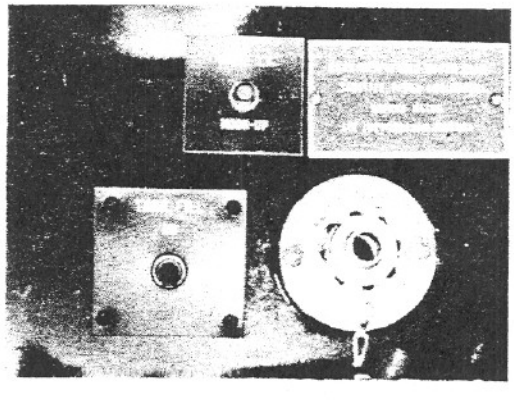

Figure 5-1. Location of Commercial Water Hookup

NOTE

The TANK FILL switch is ON only when the water tank is being filled. This switch must be in OFF position at all other times to prevent the water pump from operating continuously.

WATER SUPPLY FILLING AND SANITIZING

FILLING THE TANK — To fill the water supply tank, connect the water hose to the commercial water inlet, set TANK FILL switch to ON, then turn on the water supply. When the tank is full, as indicated by water overflow beneath the coach, set the TANK FILL switch to OFF position, shut off the water supply and disconnect the hose. At this time, check that The Monitor panel readout on the galley wall indicates a full water tank. To check, press the PURE tank switch and observe that the E and F indicator segments are lit.

SANITIZING THE WATER SYSTEM — Since the only source of potable water in the motorhome is contained in the supply tank, it is extremely important that this water supply be as free as possible of impurities and contamination. Accordingly, water tank sanitizing procedures should be followed before the tank is filled for the first time; after long idle periods, where water may become stagnant; or after any suspected contamination of the water supply. Whenever possible, use a commercially-approved tank sanitizer and follow the procedures on the product package. If it is not possible to use a commercial product, prepare your own mixture and sanitize the tank in accordance with the following procedures:

1. Empty the Water Tank — To drain the entire

water system open the drain valve under the sink, figure 5-2 and open all faucets.

If a complete system drainage is required, such as that normally performed before placing the motorhome in cold-weather storage, refer to the procedures for "Draining the Fresh Water System", at the end of this section. Be sure to close the valves after draining is completed, and turn off the water pump and faucets.

2. Prepare the Sanitizing Solution — Prepare a concentrated sodium hypochlorite solution from a mixture of water and household bleach (Clorox, for example, 5½ to 6% solution). The proportions are ¼ cup bleach to one gallon of water so that a 100-gallon water tank would require 25 cups of bleach.

3. Add Sanitizing Solution to Water Tank — Using the prepared sanitizing solution, pour into the tank one gallon of solution for each 15 gallons of tank capacity. Since the water tank will hold about 96 gallons, 6-½ gallons of the solution will be required for a thorough sanitizing of the tank.

4. Fill Tank to Capacity — Connect the hose to the commercial water inlet, set the TANK FILL switch to ON and fill the water tank completely. Shut off and remove hose, set TANK FILL switch to OFF and allow the system to stand for several hours.

5. Drain System — Open several faucets, open the drain valve beneath the sink and allow the system to drain completely.

6. Refill System — Close the drain valve and faucets, connect the water hose to the commercial water inlet, set TANK FILL switch to ON and fill tank completely. When the tank is full, set TANK FILL switch to OFF, shut off water supply and disconnect hose, replace fill cap and turn on water pump. When water flows from opened faucets, close them and open other faucets until water flows. This flushes the system, removing trapped air from the piping and ensures that the fresh water supply is ready for use.

NOTE

Residual tastes or odors can be removed by again draining and rinsing the system with a vinegar solution mixed to the ratio of one quart of vinegar to five gallons of water.

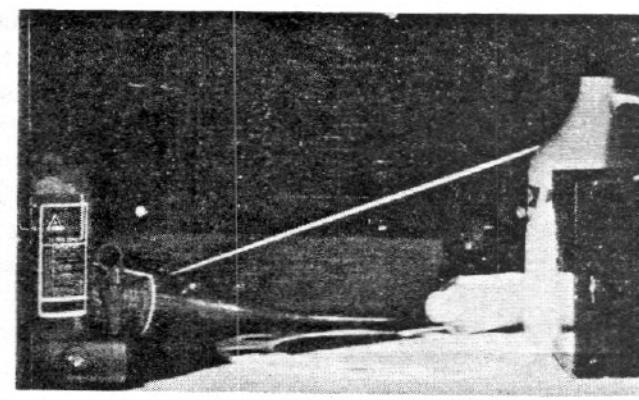

Figure 5-3. Front Right Side Compartment

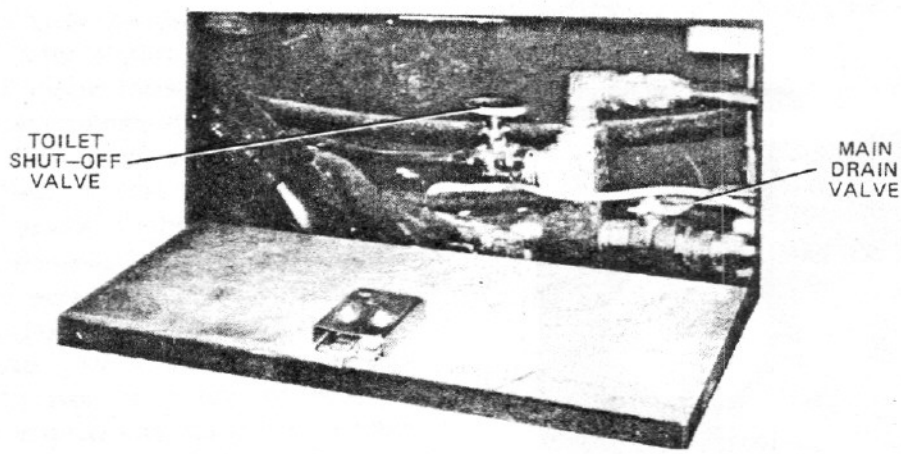

Figure 5-2. Under-Sink Plumbing

POTABLE WATER DISTRIBUTION SYSTEM

The major components of the potable water distribution system, shown in Section X, are the water tank, water pump, air accumulators, hot water heater, piping and fixtures. In addition, a bacteriostatic water purifier is connected in the cold water supply line to the galley sink, lavatory, constant hot tap (option) and ice-maker (option). Note that heating coils in the hot water heater are also a part of the heat exchanger loop for the engine coolant system, shown in the heater piping diagram in Section X.

For side-bath models, the hot and cold water piping is routed first to the galley sink, then to the shower, bathroom sink and the toilet. (For rear-bath models, the hot and cold water piping is routed first to the toilet water supply shut-off valve located beneath the sink.) Note that the drain valves are also located beneath the sink, as shown in figure 5-2. These valves are used only when it is necessary to drain out the lines prior to winterizing the unit; or for draining the system completely for sanitizing. Keep valves closed at all other times.

The water pump is equipped with a factory-calibrated pressure control switch which is preset to turn the pump on when the system pressure falls below 25 psi; and turn the pump off when the pressure reaches 35 psi. If the pump has been out of service for a period of time, it is advisable to open a faucet before turning the pump on. This will allow for easier starting by reducing the pump starting load. When water flows steadily from the opened faucet, close faucet and observe that pump shuts off when system becomes pressurized. (It may also be necessary to bleed the air from the other faucets as well.) When the potable water supply tank level is low, or empty, shut the pump off to prevent possible damage to the pump motor. In addition to integral motor overload protection, the pump mechanism is also protected from jamming by the presence of an inline filter (pump guard)-between the pump and the supply tank.

WATER PURIFIER

The bacteriostatic water purifier filters and purifies the potable water supply to eliminate tastes, odors and coloration produced by chlorine, rust, insecticides, detergents, sediment and other foreign objects. All water-borne disease-carrying bacteria are neutralized and removed from the water supply through bacteriostatic action. This is accomplished by a hygienic filter bed which consists of silver ions absorbed on sponge silver metal which is deposited in a finely divided form on activated carbon of high surface area.

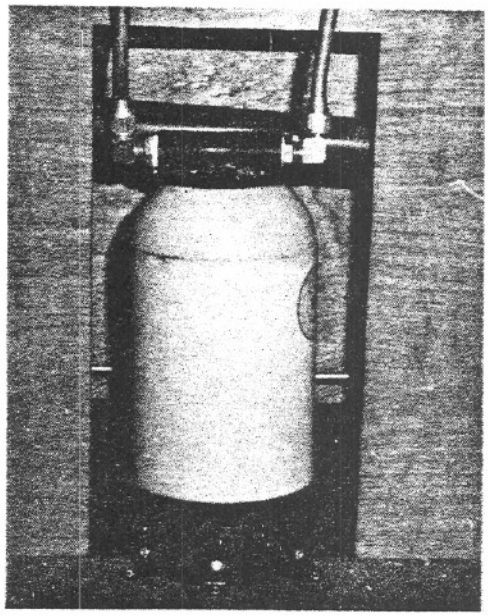

Figure 5-4. Water Purifier

The water purifier, located beneath the galley sink, figure 5-4, is a self-contained unit, requiring no routine or periodic maintenance.

Each time you use the filtered water supply for drinking or cooking purposes, it is recommended that you run the tap for a few seconds to clean out the line prior to using the water. This is particularly important if the water tap is not used on a daily basis. If the water supply has not been in use for extended periods, allow the water to flow for five to ten minutes before use.

FILTER CARTRIDGE REPLACEMENT — Refer to the manufacturer's service manual for filter cartridge maintenance and replacement procedures.

HOT WATER HEATER

The hot-water heater is a fibreglas-jacketed coil-type heat exchanger which ensures a continuous supply of hot water through heat exchanger action with the automotive coolant system and auxiliary pump. When the engine is off, the hot water heater can still supply hot water through the use of an electrical heater. The electrical heater is on all the time that the ac supply is available. The electric heater circuit breaker, located in the circuit breaker panel in the rear closet, should be switched OFF when heated water is not needed; or, use the ON-OFF pilot light/switch located in the side of the rear left bed base. For electrical operation, a source of 120 volts ac must be available, either from the shore line, or from the internal generator plant.

PLUMBING AND DRAINAGE SYSTEM

A diagram of the plumbing and drainage system is provided in Section X. Separate holding tanks for gray water (32 gallons) and waste (52 gallons) are located beneath the coach mid-section. In side-bath units, the gray water holding tank is closer to the front of the coach and is the receiver for the gray water from the kitchen sink and the shower. The waste holding tank, located toward the rear of the unit, stores toilet wastes and waste water from the bathroom sink. In rear-bath models, the 32 gallon holding tank is located in the right rear; and the 52 gallon holding tank is located in the left rear. Each holding tank has a separate drain valve, dumping gray water and wastes through a common single discharge connection. A common wet vent system connects both holding tanks to the vent stack located on the coach roof.

DRAINING THE HOLDING TANKS

The holding tanks drain valves are located under the left side of the coach, as shown in figure 5-5. The waste drain valve is on the right side, near the drain cap; and the gray water drain valve is on the left side, near the wheel. Each drain valve operates in the same manner. Drain the holding tanks as follows:

1. Check that both drain valves are in closed position before proceeding any further. Note that the valve handles will be turned clockwise to close the valve.
2. Drain the waste holding tank first.
3. Remove the safety cap from the single discharge connection by turning the locking ring in a counter-clockwise direction and connect the 3-inch sewer hose coupling to the end of the valve. Tighten locking ring securely, in a clockwise direction. The sewer hose is stored within a pipe located to the right of the drain cap, on side-bath units; and under the bottom skirt panel, left rear, on rear-bath models. Place the discharge end of the hose into the sewer connection and check that all connections are secure to prevent accidental spillage.

4. Open the drain valve by turning the handle to the left (counter-clockwise), then pull the valve stem straight outward. This will discharge the holding tank contents into the sewer connection.

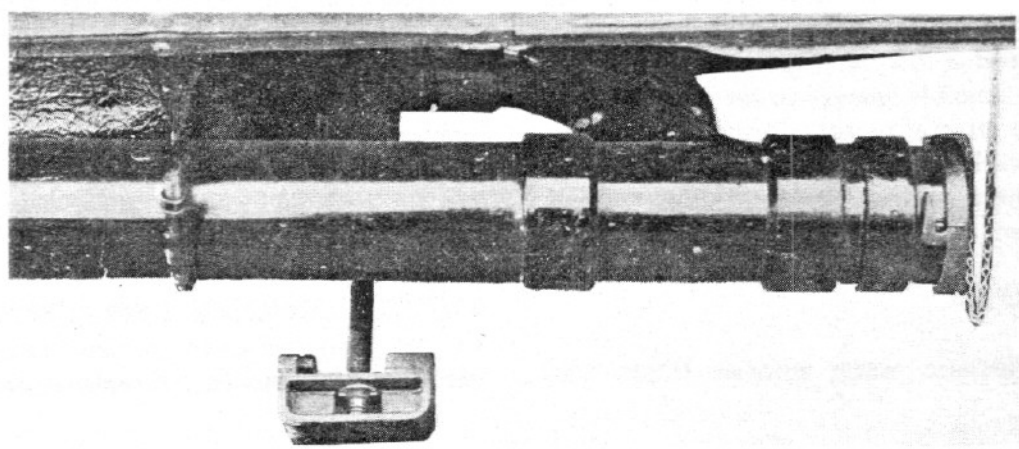

Figure 5-5. Location of Holding Tanks Drain Valves

5. Periodically, after contents are emptied, flush out holding tank to dislodge remaining solids. [Connect a water hose to the "swisher" connection (water saver hose connection adjoining the toilet) and turn on the water supply. A check valve keeps contents from running back into water hose.]

NOTE

To clean the holding tank, add a cup of detergent into the tank after it is emptied. The agitating action from vehicle movement will clean the tank.

6. Close drain valve by pushing valve inward and turning handle to the right (clockwise) into the locked position.

7. Drain gray water holding tank in the same manner, following steps 4, 5, and 6, as applicable.

8. Disconnect and wash out drain hose and replace safety cap securely.

TANK LEVEL DETECTORS

Each of the holding tanks and the potable water supply tank has a level detector which provides an electrical input to The Monitor panel on the side galley wall. Activate the display to read the level of liquid remaining in each tank by pressing the appropriate pushbutton switch inward.

WINTERIZING

To prevent freezing of water pipe supply lines, pipes are wrapped with heat tapes that operate automatically when the temperature drops below 38 degrees F. The holding tanks are also wrapped with heat tapes that activate at the same temperature point. Note that the heat-tapes operate from the ac supply; the water pipe tapes are connected to the ac outlet in the rear of the refrigerator compartment; the tank heater tapes are connected to the ac outlet beneath the bath sink.

If your motorhome is to be stored outside during cold weather, it will be necessary to winterize the water system to prevent damage from subfreezing conditions. Winterizing procedures are covered in the following paragraphs.

DRAINING THE FRESH WATER SYSTEM

The potable water system is designed so that it can be completely drained within 30 minutes, with a full water tank and heater, by using the water pump, one drain valve and the air blowout system. Use the following procedure for draining and winterizing the system:

1. Turn water heater element OFF.

2. Open hot water heater drain valve (under left-hand bed) by turning the control knob to the OPEN position, connecting the hot and cold water lines together. (This knob is located behind a small door in the vertical wall of the bed, in the aisle.)

3. Open the drain valve beneath the bathroom vanity. (This ¼-turn valve is accessible by lifting a door in the floor of the vanity cabinet.)

4. Open all faucets (kitchen sink, shower and lavatory) to center position, opening both the hot and cold water lines.

5. Turn water pump ON and allow to pump until only air is being pumped through faucets. Leave all faucets open. Note that the amount of time this step requires will depend on the amount of water remaining in the water tank.

6. When only air is being pumped through the faucets, close the water heater drain valve under the bed by setting the knob to CLOSE position.

7. Flush the toilet and prop open the toilet water valve.

8. Turn the air blow-out switch to ON (located behind the same door as the water heater drain valve knob). This opens the solenoid valve that allows chassis air supply to enter the water lines and blow out any water that may remain after the water pump would no longer pump water through the faucets. Note that it may be necessary to idle the chassis engine to maintain the air supply until the water lines are blown out. Inject the air only until the air again comes through the faucets then turn the air switch to OFF. The water lines are now drained.

9. Because the air volume is insufficient to blow all the water from the water filter under the kitchen sink, remove filter element and pour out any remaining water. Replace element.

10. Close all faucets, including the valve on the toilet. Flush any water that may have blown into toilet bowl.

11. Close drain valve under vanity.

12. Drain both holding tanks. This completes the winterizing procedure.

PREPARING DRAINAGE SYSTEM FOR STORAGE

The entire drainage system should be thoroughly drained and flushed with fresh water. The following procedures are recommended:

1. Completely drain holding tanks of waste material.
2. Flush sinks, shower and lavatory with a solution of hot water, water softener and soap. Rinse well and allow solution to drain into tanks. Flush with clean water.
3. Agitate water in tank by rocking vehicle or, for a more through cleaning, drive vehicle for a few miles. Drain tanks again.
4. Alternatively, use a chemical deodorant, let mixture stand a few days, and then drain.
5. Flush with fresh water and again drain.
6. Fill traps and partially fill tanks with an anti-freeze approved for use in plastic pipes. Normally, a cupful of anti-freeze poured into each drain will fill the trap. Do not use anti-freeze solution with an alcohol base!

BATTERY STORAGE IN FREEZING WEATHER

Batteries that are not kept fully-charged must be given protection against freezing. Partially-charged batteries will freeze at low temperatures, so batteries must either be left connected to a trickle charger or removed from the vehicle and stored in a warm location. Alternatively, the motorhome can be left connected to the shoreline ac supply and the thermostatically-controlled battery heater pads will protect the batteries from freezing. At the same time, the coach converter will keep the batteries charged. Note that even in a warm location it is advisable to keep the batteries charged so that they are ready for use. Add water as required.

NOTE

Remove all items from the coach which may freeze, including canned foods, miscellaneous liquids, etc. Remove all contents of the refrigerator/freezer, clean unit and leave doors ajar.

GENERAL STORAGE NOTES

Drawing draperies will reduce fading of rugs and upholstery. Leaving an air freshener agent will minimize odors from plastics and other materials. Slight opening of windows and vents will allow air circulation without worry of water entering. Covering wheels to eliminate direct rays of the sun on tires will reduce sidewall cracking.