

MC-9 MAINTENANCE MANUAL

SECTION 17

LAVATORY

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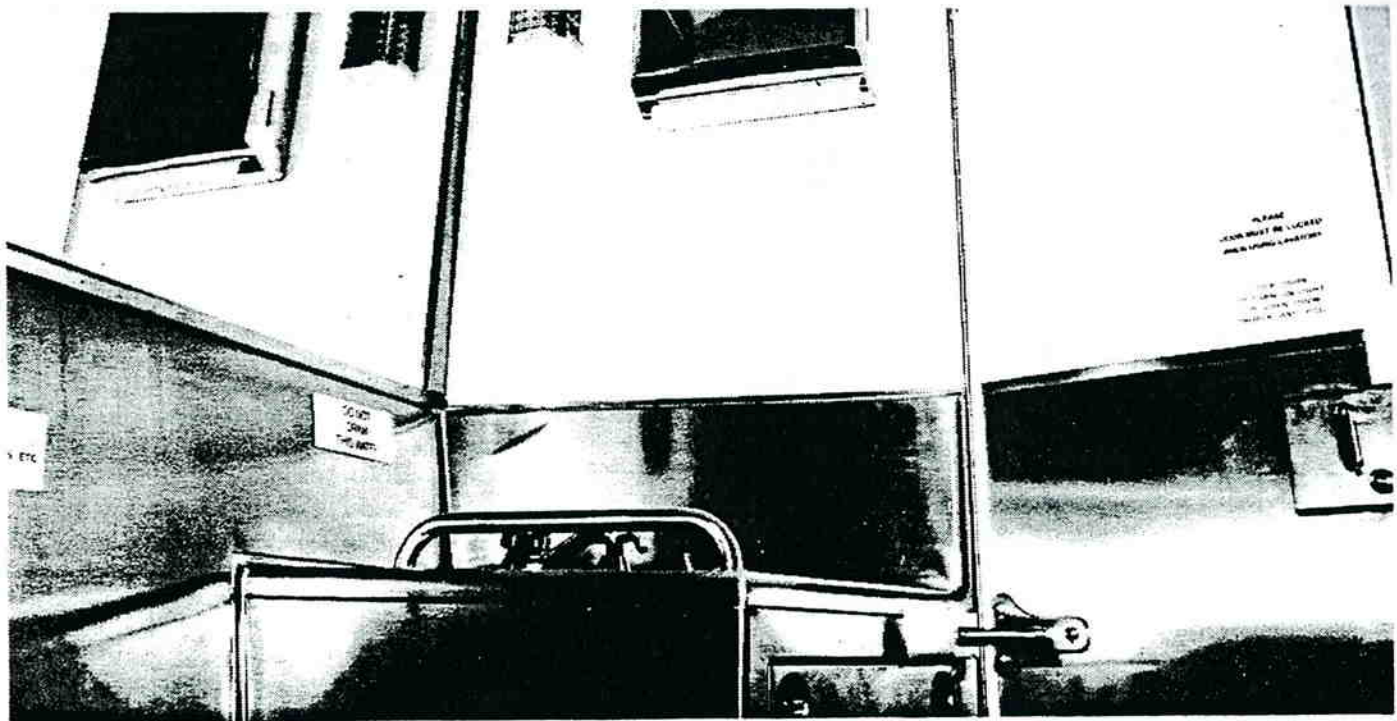


Figure 17-1. Lavatory.

LAVATORY

DESCRIPTION

Washroom facilities are installed at the right rear corner of the coach. Installation of the washroom eliminates seating for two passengers, leaving three seats on the rear cross seat.

The washroom (figure 17-1) has a special, embossed stainless steel floor with stainless steel bright finish paneling on the lower half of the walls, door and sink partition. Permanent finish melamine panels are utilized on the upper half of the washroom partitions for ease of cleaning and resistance to damage. A large mirror is mounted on the back wall above the wash basin. Extreme care has been taken in the design of the washroom to avoid corners where dirt may collect. The use of stainless steel enables the washroom to be easily maintained in a pleasing condition at all times.

A single waste water and chemical tank with bottle stop in drop tube is used. A stainless steel fresh water tank for the wash basin is located in the interior of the coach behind the wall mirror. A large overflow line is provided on the fresh water tank to eliminate the possibility of damage by excessive water pressure. A manually operated slide dump valve is provided to drain the chemical tank.

A coupling which provides water to the fresh water tank is easily accessible through a small door on the right rear side of the vehicle. A coupling for flushing and filling the chemical tank is accessible through the right hand rear side engine service door.

VENTILATING BLOWER AND MOTOR

A ventilator blower mounted on the chemical tank exhausts odors and also provides constant air circulation to the lavatory compartment. Air enters the lavatory compartment through a duct on the outer wall which discharges behind the window release bar.

The exhaust blower operates whenever the master control switch on the driver's instrument panel is put in the ON position. The blower motor is rubber mounted and can easily be removed from the engine compartment by removing the mounting screws and separating the electrical wires at the connectors.

NOTE: Later production coaches have a ventilation system without the blower and motor (unless the blower and motor have been retained by special request). Information on this newer system will be found later in this section.

MAINTENANCE

The frequency of preventative maintenance should be determined by coach mileage and the operating conditions. However, these items should be checked approximately every 50,000 miles (80,000 km) or 1,700 coach operating hours.

Remove the blower and motor assembly (see figure 17-2). Free operation of blower wheel and motor is important. Check blower housing wheel and ducts. If dirty, they should be cleaned.

Check motor brush seating and amount of wear. If not seating properly or worn, the brushes should be replaced. They can be replaced without removing the unit from its mounting.

REMOVAL AND INSTALLATION

1. Open right hand rear side service door.
2. Disconnect wiring.

NOTE: Tape ends for safety purposes.

3. Loosen clamp attaching flexible air hose to blower shroud and remove hose.
4. Remove the screws which attach blower assembly, then remove motor with fan and housing assembly.

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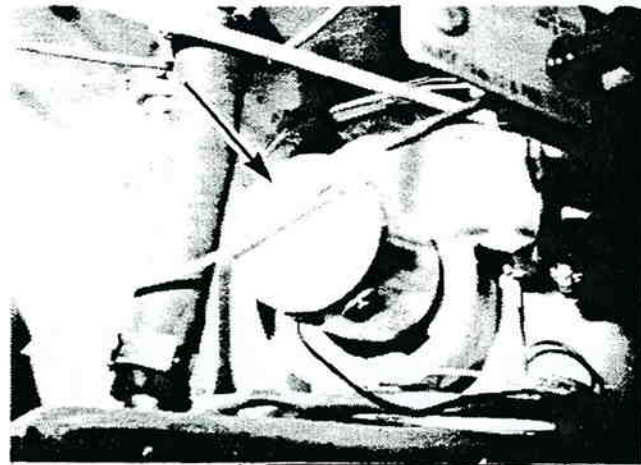


Figure 17-2. Lavatory Ventilating Blower and Motor (On Earlier Coaches).

5. To install, place blower motor with fan and housing in position, then attach with four cap screws.

6. Install flexible air hose to blower shroud and attach with clamp.

7. Connect electrical wiring and tape the wiring connections securely.

8. Check motor operation.

ENGINE VACUUM POWERED VENTILATION SYSTEM

The lavatory ventilation system installed on later production coaches operates off the engine vacuum. A large air hose connects the lavatory drop tube to the engine air intake box. The constant vacuum thus applied to the drop tube causes a continuous flow of fresh air from the duct on the outer wall of the lavatory to pass through the lavatory compartment (figure 17-3).

A drain line from the air exhaust elbow on the drop tube keeps moisture from accumulating in the exhaust hose and from entering the air intake box. See figure 17-4.

LAVATORY COMPONENTS

Various items associated with the lavatory are described below. Refer to figures 17-1 and 17-5 for their locations.

TOWEL AND TISSUE DISPENSERS

A towel dispenser is mounted on the inside of the lavatory above the sink. See figure 17-1. Also a "Towelette" wet towel

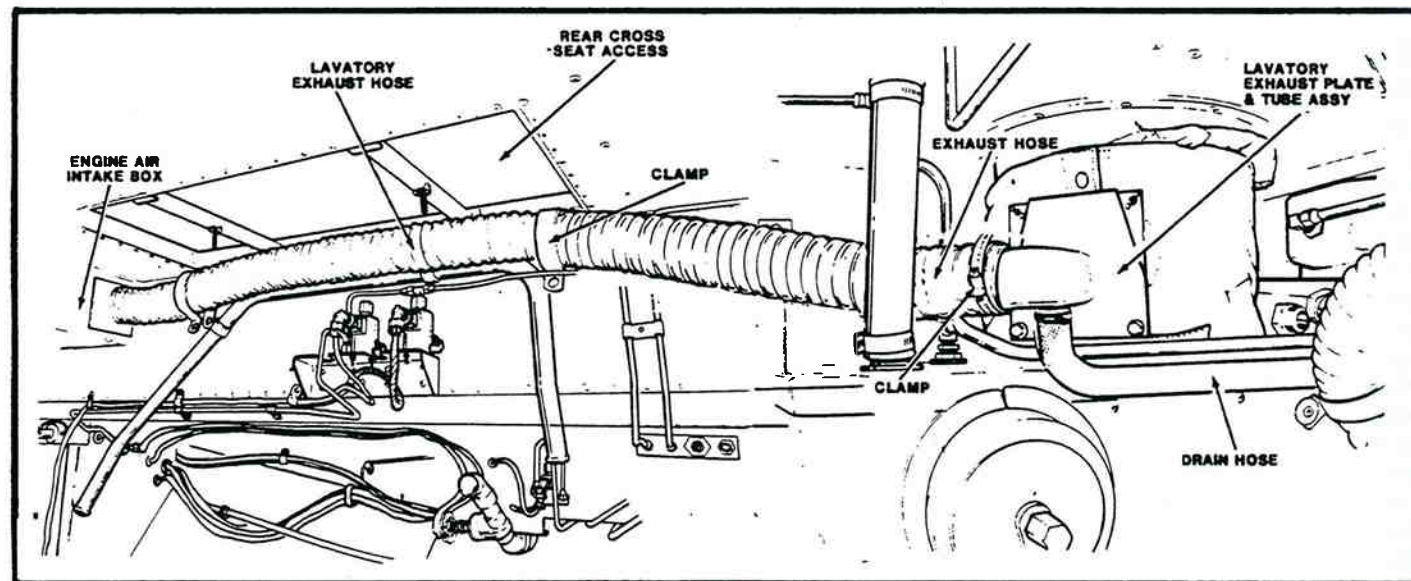


Figure 17-3. Vacuum Operated Lavatory Ventilation System.

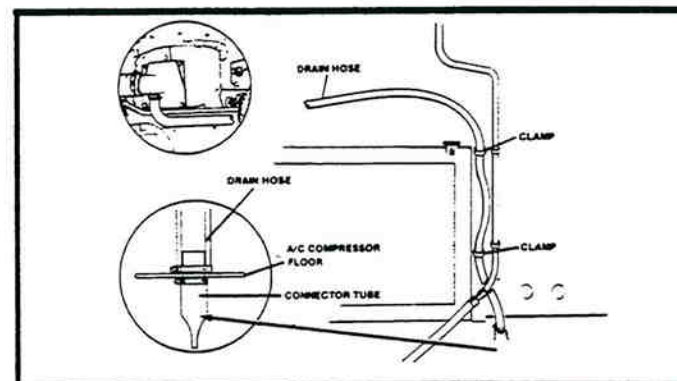


Figure 17-4. Drain Hose Installation.

dispenser is mounted on the inside of the lavatory wall above the sink. These towels can be used for washing and drying when temperature is below 32°F (0°C).

A tissue dispenser is mounted at the lavatory front wall. A key is furnished for refilling dispenser.

EMERGENCY BUZZER

The lavatory emergency buzzer is mounted in the front junction box and sounds when the emergency switch button in the lavatory compartment is pushed. Refer to wiring diagram for circuit continuity.

The emergency buzzer switch marked "To Signal Driver - Emergency Only" is located on upper right corner of the front

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partition of the lavatory compartment. A light on the instrument panel marked "Lavatory Alarm" illuminates and a buzzer sounds when the switch is depressed

DEODORIZER

A block refill-type deodorizer is mounted on the side compartment partition. To install a new block, open the grille-cover and place the block on the platform.

OCCUPIED SIGN

A lavatory occupied sign light is located on the exterior of the forward lavatory compartment partition. This sign which reads "Wash Room Occupied" is illuminated when the lavatory door is closed and locked.

DOOR LOCK

The lavatory door lock has both inside and outside handles and an inside latch to lock door from within the compartment. When this latch bolt is locked it automatically turns on the compartment ceiling light and the exterior occupied sign light. If the lock fails to release, the door can be opened from the outside with a special key which is furnished to the driver.

The lock assembly can be removed from the door, then readily disassembled and the parts replaced, if necessary. A light application of lubricant to all moving parts will assure free operation.

DOOR LIGHT

A microswitch is installed in the door post at the edge of the front partition. This switch is activated by the door lock mechanism upon locking to energize the dome light and the "Washroom Occupied" sign on the outside wall. The switch is readily serviced by removing the two screws securing the striker plate to the post.

The lavatory dome light contains a 6-candlepower bulb that lights with the marker lights and a 32-candlepower bulb that lights when the door is closed and locked.

SOAP DISPENSER

To refill the liquid soap dispenser, unscrew the plunger cap which is threaded into the dispenser body. Remove cap and pour liquid soap into dispenser tank until full. Replace plunger cap into dispenser body.

Periodic cleaning of soap dispensing equipment should be made a regular part of your washroom cleaning routine and general maintenance program.

Sometimes a dispenser is considered in need of repair when it may only be clogged and in need of a good cleaning. As a general rule, all soap dispensing equipment should be flushed out once a month to remove soap residue and dirt.

The exterior of the soap dispenser should be washed with warm soap and water, then dried with a clean cloth.

Never use abrasive cleaners on parts of the soap dispenser as this will mar the surface.

If it becomes necessary to remove the soap dispenser for cleaning, this procedure should be followed:

1. Remove the soap container from the cover.
2. Place a small chain, 24" (610 mm) long, inside the soap container.
3. Add a small quantity of soap and warm water.
4. Shake the container until the chain has dislodged all film from the interior.
5. After removing the chain, thoroughly rinse the container and let it dry before refilling with soap solution.

As part of your regular routine, make it a practice to check the operating condition of the soap dispensing piston mechanism at regular intervals to make sure it works freely. If it is not working, disassemble and wash all metal parts in soap and water and let dry. Assemble and replace in service.

DOOR LOCK AIR CYLINDER

An air-operated air cylinder (1) is installed to provide positive closing of the lavatory door. The cylinder also reduces rattles and strain on lock, striker plates and hinge.

The cylinder is fed from the coach accessory air supply (4). A pressure regulating valve (2) and a flow control valve (3) assure a controlled closing action (figure 17-6). Refer to Section 4, Brakes and Air System, for detailed maintenance of regulating valve.

The lavatory door air cylinder should be lubricated at regular intervals — approximately every 30,000 miles (48,000 km). The recommended procedure is as follows:

1. Remove air feed hose and put a few drops of SAE 30 oil into the cylinder through the air hose connector.
2. Reconnect the feed hose.
3. Check air cylinder for leaks.
4. When overhauling air cylinder, it is important to replace all seals, felts, cups and O-rings with new parts for proper operation. Also when overhauling cylinder, the new parts should be coated with oil before assembly.

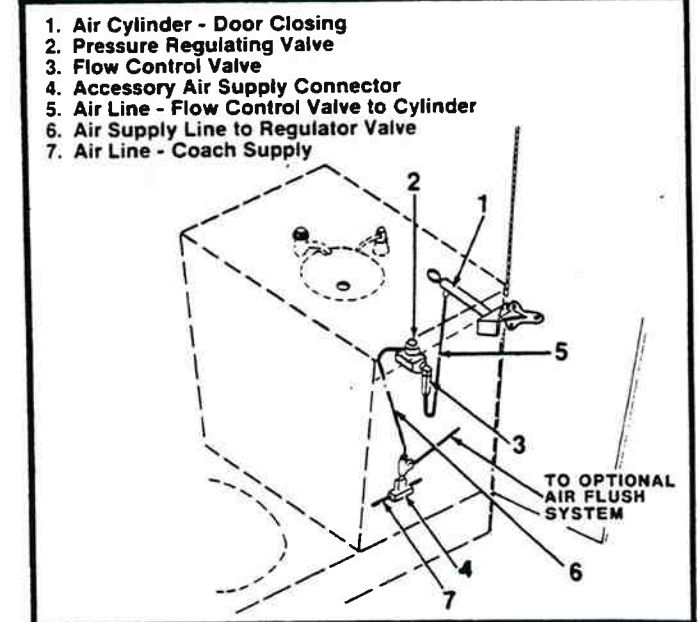


Figure 17-6. Lavatory Door Air Cylinder Installation.

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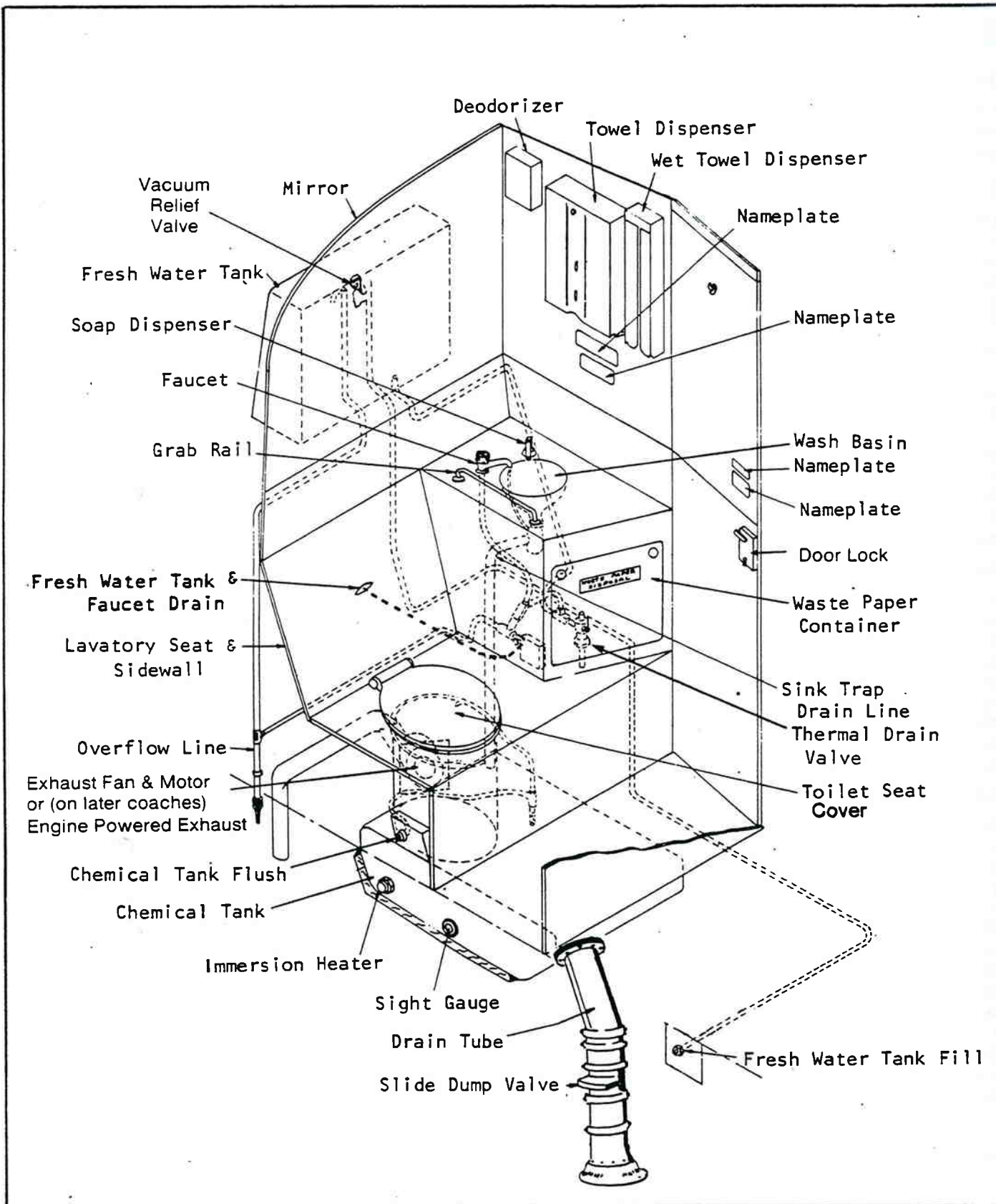


Figure 17-5. Lavatory Components.

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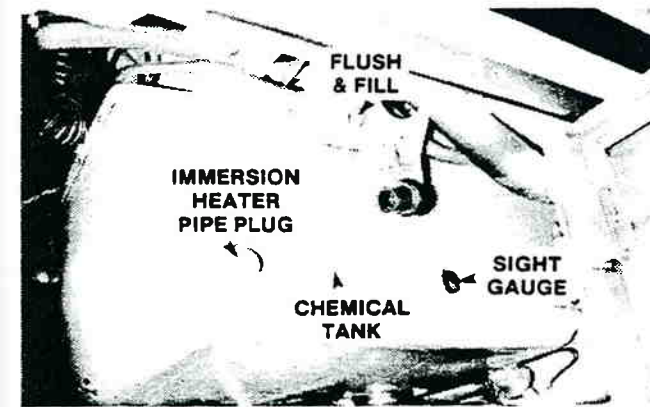


Figure 17-7. Lavatory Service Panel.

LAVATORY SERVICE PANEL

The fresh water fill service panel is located on the exterior right hand rear side. See figure 17-7. Chemical tank flushing and filling service points are located in the engine compartment above the right hand rear side engine service door. A Hansen 6000 series quick connector is used for flushing and filling the chemical waste tank. A Hansen 5000 series quick connector is used for filling fresh water tank (figure 17-8). The flushing and filling inlet cap is made of molded vibrin plastic and a steel link chain is used to attach the cap to the coach body to prevent loss of cap. A lavatory service door assembly incorporates a cup-shaped spring loaded seal to close off the fresh water fill opening.

A manually operated dump valve is located under the chemical tank in the dump tube. To drain the chemical waste tank, pull the handle of the slide dump valve. After draining and flushing, push the handle all the way in. A special hopper in the floor of the service area (or equivalent to local health regulations) with proper flush down facilities should be used to convey waste contents to the sewer system.

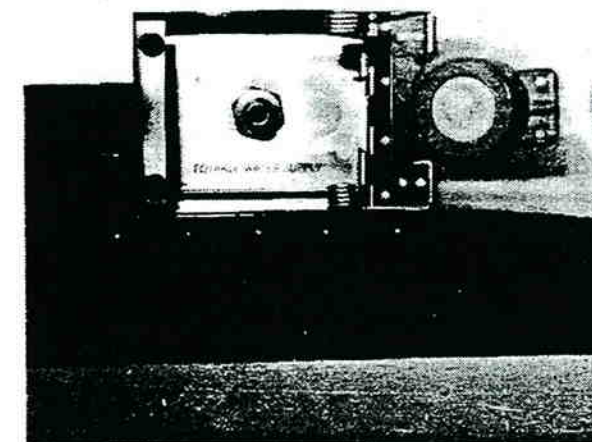


Figure 17-8. Fresh Water Supply Fill Inlet.

WINTERIZING

Although DG-19 will freeze below +30°F (-1°C), upon thawing, the performance of the chemical will not be affected.

The most economical way to protect the assembly should it be exposed to extreme cold temperatures, is to use an anti-freeze solution such as ethylene glycol in the waste chemical tank.

Based on the expected average low temperature and the quantity of waste in the waste chemical tank, charge the tank as follows:

Protects To:	Percentage of Antifreeze Required in Tank			
	25%	33%	40%	50%
+10°F	0°F	-12°F	-34°F	
(-12°C)	(-17°C)	(-24°C)	(-36°C)	

CAUTION: Ethylene glycol can be fatal if a sufficient quantity is swallowed. Do not use automotive "stop-leak" formula which frequently causes coagulation of the flushing fluid when mixed with high quality deodorizing additives.

For better odor control the amount of chemical (DG-19) should be doubled when used in conjunction with antifreeze.

SERVICE AND CLEANING

Servicing of the flush unit and tank (figure 17-9) should be performed at regular intervals or when it becomes necessary.

1. After rinsing the tank, close the drain valve and fill toilet with clean water until the water level reaches sight gauge level.
2. Flush the toilet three more times or until the liquid in bowl becomes clear. This should remove any sediment which may have collected in the pump.
3. Open the drain valve and drain the tank while flushing toilet.
4. Close the drain valve.
5. Recharge unit as per instructions under Charging System.

A thorough cleaning is essential prior to inspection for determining the existence, exact location, and extent of any defects. The assembly may be cleaned by scrubbing the inside and outside surfaces with a solution of soap and water or five tablespoons of liquid disinfectant to each gallon of water. Do not use abrasive cleaners on any part of the assembly. Rinse thoroughly with hot water and dry, using compressed air.

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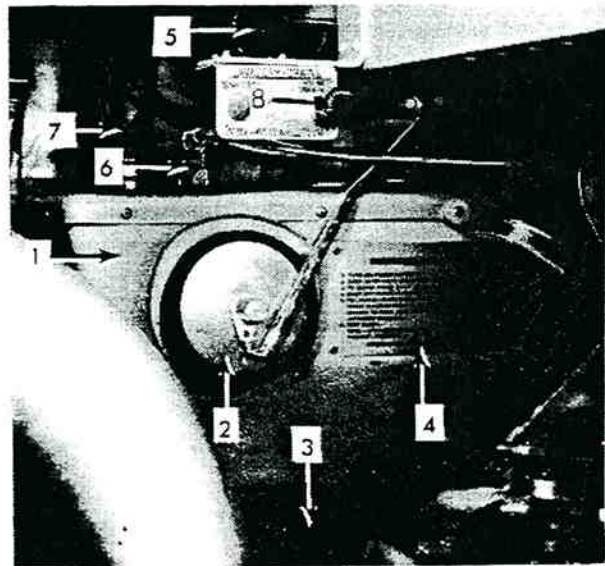


Figure 17-9. Air Flush Chemical Tank.

- 1. Chemical Tank
- 2. Clean-Out Plug
- 3. Air Flush Pump
- 4. Nameplate - Servicing Procedure
- 5. Lavatory Exhaust Blower & Motor
- 6. Rinse Tube
- 7. Hose - Sink Drain
- 8. Drain Valve Handle

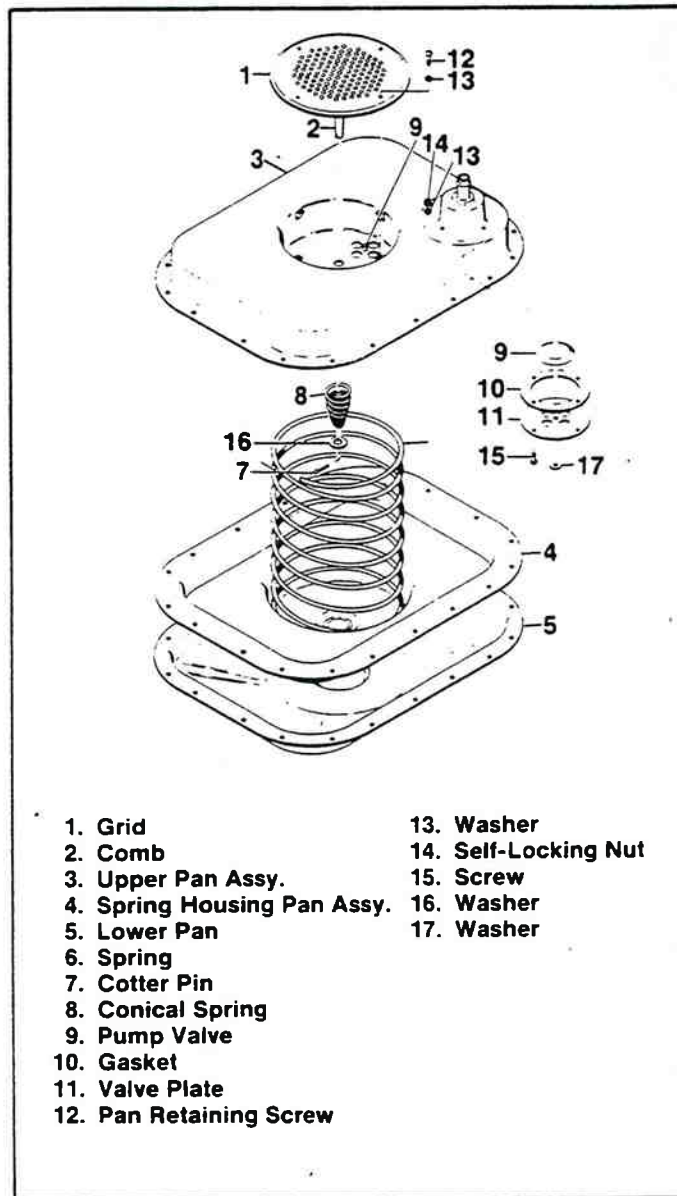
REMOVAL AND DISASSEMBLY

1. Discharge and clean the waste chemical tank as described under Service and Cleaning.
2. Remove air line from lower pan assembly.
3. Refer to figure 17-10. Remove only the 3/16" (4.7 mm) brass hex nuts that mount the air pump assembly to chemical tank.

NOTE: The 6 small hex nuts should not be removed at this time. Disassembling these will separate both pump halves after the pump is removed.

4. Carefully remove air pump assembly and invert or place it on its side.
5. Remove flexible tubing from the flush outlet port on the air pump assembly.

WARNING: Pump assembly spring is compressed to 25 lbs. (11.3 kg) pre-load. Exercise care during disassembly.



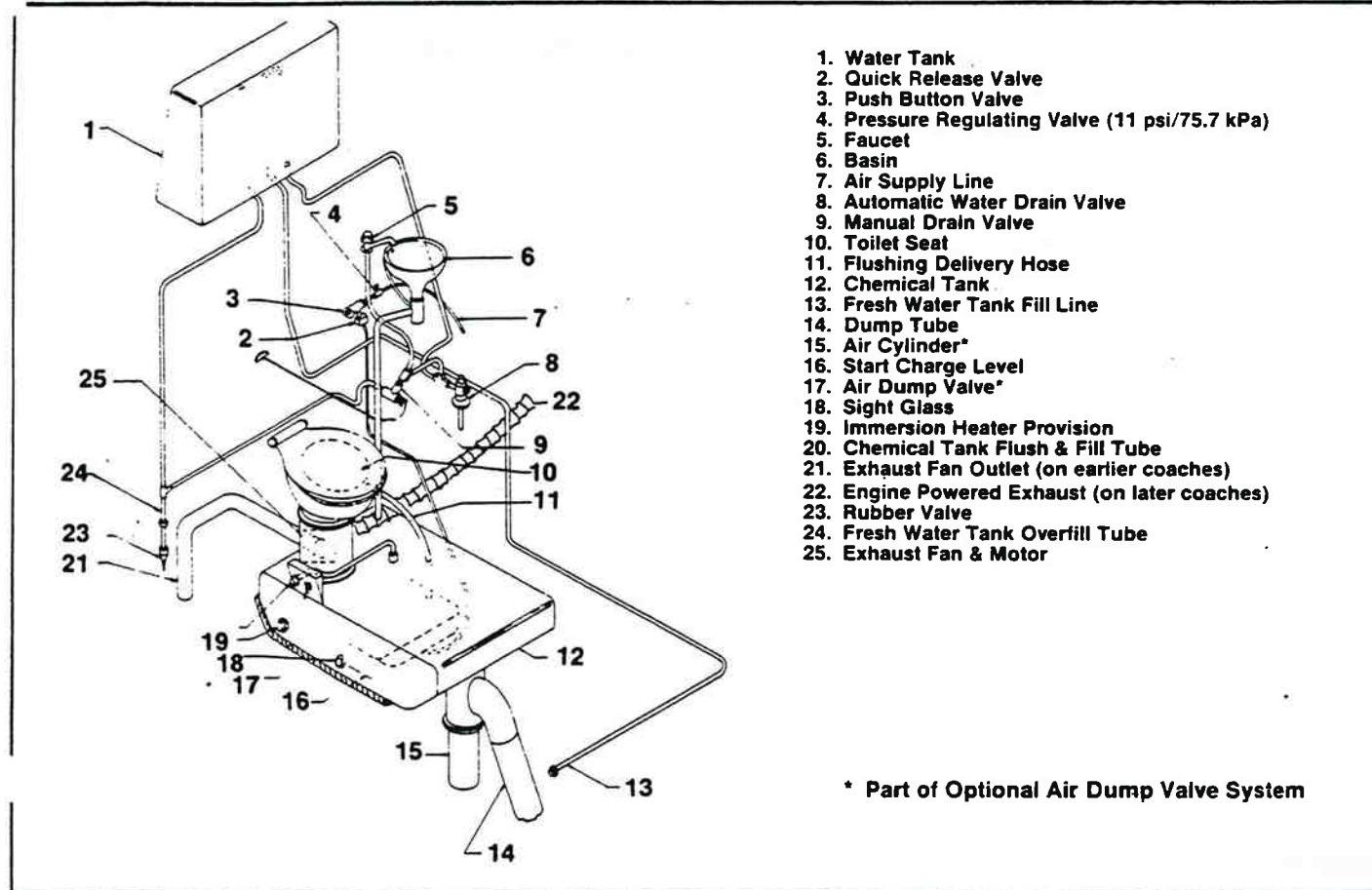
- 1. Grid
- 2. Comb
- 3. Upper Pan Assy.
- 4. Spring Housing Pan Assy.
- 5. Lower Pan
- 6. Spring
- 7. Cotter Pin
- 8. Conical Spring
- 9. Pump Valve
- 10. Gasket
- 11. Valve Plate
- 12. Pan Retaining Screw
- 13. Washer
- 14. Self-Locking Nut
- 15. Screw
- 16. Washer
- 17. Washer

Figure 17-10. Air Flush Pump Disassembled.

6. Remove lower pan assembly from air pump assembly.
7. Remove retaining ring securing comb and grid.
8. Remove cotter pin securing conical spring. Remove spring and comb stem.
9. Remove screws securing pump valve to flush outlet port.
10. Remove plate and gasket from pump valve.
11. Remove pump valve from flush outlet port.
12. Remove spring from spring housing assembly. Reassemble in reverse order of disassembly.

Figure 17-11 shows the air-operated flush system interconnection. Also see figure 17-12.

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- 1. Water Tank
- 2. Quick Release Valve
- 3. Push Button Valve
- 4. Pressure Regulating Valve (11 psi/75.7 kPa)
- 5. Faucet
- 6. Basin
- 7. Air Supply Line
- 8. Automatic Water Drain Valve
- 9. Manual Drain Valve
- 10. Toilet Seat
- 11. Flushing Delivery Hose
- 12. Chemical Tank
- 13. Fresh Water Tank Fill Line
- 14. Dump Tube
- 15. Air Cylinder*
- 16. Start Charge Level
- 17. Air Dump Valve*
- 18. Sight Glass
- 19. Immersion Heater Provision
- 20. Chemical Tank Flush & Fill Tube
- 21. Exhaust Fan Outlet (on earlier coaches)
- 22. Engine Powered Exhaust (on later coaches)
- 23. Rubber Valve
- 24. Fresh Water Tank Overfill Tube
- 25. Exhaust Fan & Motor

* Part of Optional Air Dump Valve System

Figure 17-11. Air Flush Lavatory Components.

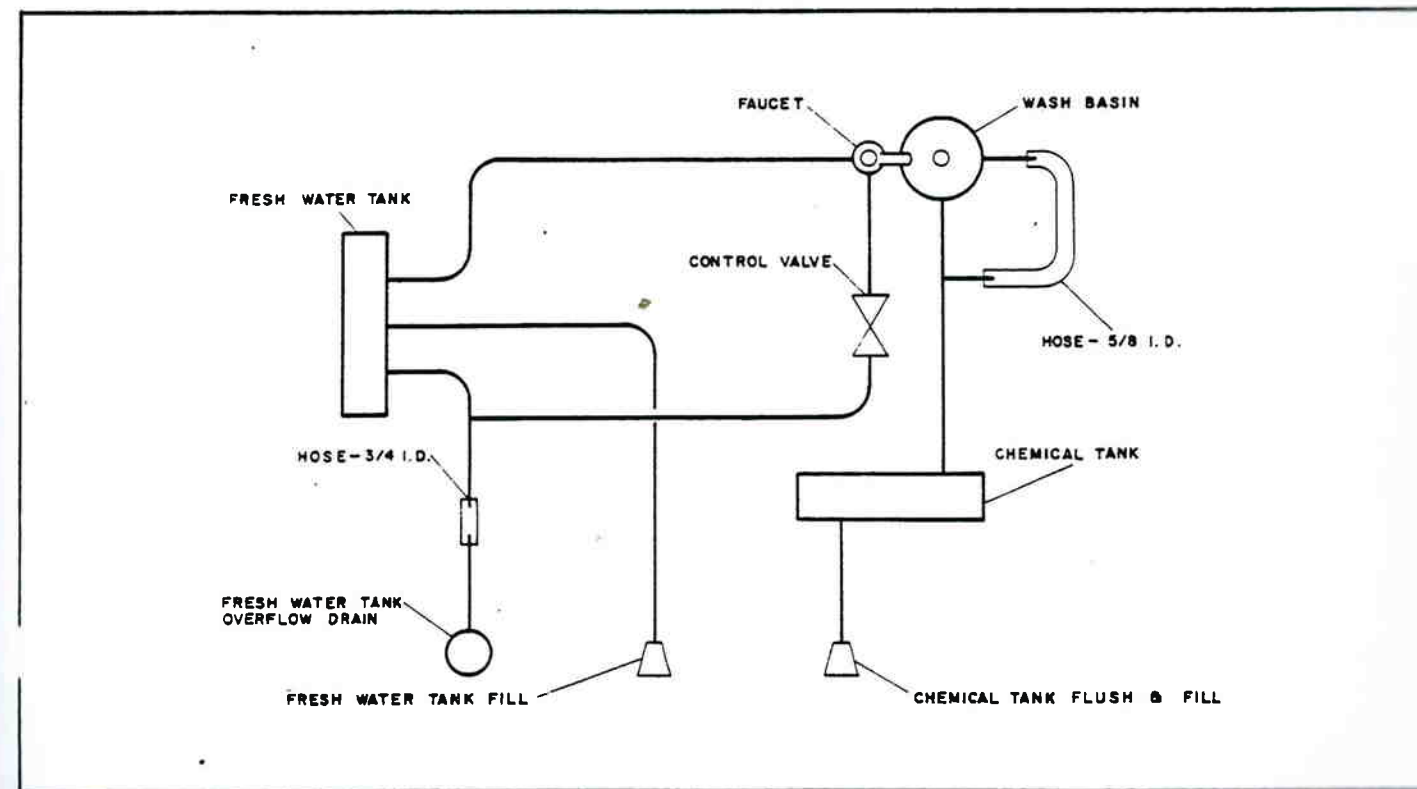


Figure 17-12. Plumbing Schematic.

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CHEMICAL TANK

DRAINING CHEMICAL TANK:

1. Place coach over floor flush hopper.
2. Pull handle of slide dump valve. This completely exposes the dump tube opening and drains the contents of the tank.

NOTE: The valve should be left open until the flushing operation is performed; the chemical tank incorporates a large clean-out hole in one end for removal of wastes.

FLUSHING CHEMICAL TANK — Connect water service hose to Hansen connector to introduce continuous flushing action through chemical tank. Flush chemical tank until clean.

FILLING AND TREATING CHEMICAL TANK — Before filling chemical tank make certain that dump valve is closed.

The water supply hose is left connected to inlet until the water level can be seen in the sight gauge on the side of the chemical tank.

Pour 1/3 pint (.15 liters) of Kilgerm or equivalent disinfectant into chemical tank. This chemical mixed with water will properly treat the chemical tank. It can be obtained from:

Government Chemical Products Corporation
5511 Bellford Avenue
Cleveland, Ohio

WINTERIZING — The most economical way to protect the chemical tank, should it be exposed to extreme cold temperatures, is to use an antifreeze solution such as ethylene glycol (unless the tank is equipped with an immersion heater).

AIR OPERATED FLUSH SYSTEM

The air-operated pump is a self-contained flushing unit having one movable part, an air-operated diaphragm which is within the unit. The pump unit is mounted to the bottom of the chemical tank.

The system operates from the main air supply and pressure is reduced to 11 psi (76 kPa) by a regulator. A push button control valve is installed and when pressed will permit the regulated air pressure to operate the pump diaphragm. The diaphragm will expel sufficient water to flush the toilet bowl. The flushing cycle takes approximately 14 seconds and the recovery time approximately 10 seconds.

Flushing is accomplished by delivering water into the toilet bowl in a vigorous swirling action.

When the push button is released the quick release valve will release air from the diaphragm pump.

CHARGING SYSTEM (WARM OR COLD WEATHER)

To charge the system fill the tank with 5 gallons (19 liters) of water through the chemical tank rinse and fill fitting located above the inside right side engine compartment door. Press the control button in lavatory to flush and add the recommended 6 oz. (177 ml) of DG-19 chemical or the alternate and quantities as shown later. Flush again and the system is ready for use.

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The following chemicals are approved for operation in this flush system.

Supplier	Trade Name	Mixture
West Chemical Products 2110 E. 37th St. Los Angeles, Calif.	Teramine	1 U.S. pint (.47 liters) liquid chemical to 1 U.S. gallon (.37 liters) water
4216 West Street Long Island, N.Y.	Sanitor	1 oz. (29.5 ml) liquid chemical to 1 gallon (3.7 liters) water
Vapor Corp. 6420 West Howard St. Chicago, Ill. 60648	DG-19C	3 parts dry chemical to 11 parts water by volume
Leeder Chemical Co. 16220 Illinois Ave. Paramount, Calif. 90723	Commode Magic	1 oz. (28.3 grams) dry chemical to 1 gallon (3.7 liters) water

TROUBLESHOOTING

TROUBLE	CAUSE
TOILET WILL NOT FLUSH Pushbutton will not reset, air leaking can be heard.	Air line from pump assembly to control valve broken or disconnected or cracked or broken lower pan housing.
Air regulator hissing.	Defective air regulator.
Water in the air line from pump to pushbutton.	Pump diaphragm broken.
Comb stuck in up position.	Replace comb and grid, or replace conical spring if broken.
Pump is functioning but no water in the bowl.	Broken water line from pump assembly to bowl.
SHORT FLUSHING CYCLE (10 SECONDS OPTIMUM)	Bubbles in the flush pattern. Hole in the water hose from pump assembly to bowl.
Comb will not reach full height during flush cycle.	Excessive build-up of debris between pins of comb.
Water bubbling in grid area.	Defective valve in the comb housing area.
AIR BUBBLES IN THE FLUSH Water level below comb pins.	1. Recharge with water and chemical DG-19C. 2. Insufficient amount of water pre-charge. 3. Water in the air line from pump to pushbutton. 4. Small hole in the pump diaphragm.

NOTE: Periodic visual inspection should be made of the tank interior for foreign objects and/or excessive buildup in the tank corners due to lack of proper rinsing.

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FILLING FRESH WATER TANK

To fill the fresh water tank the following procedure should be followed.

1. Open lavatory service door situated at the rear right hand side of the coach marked "Potable Water Supply." The fitting is accessible once the service door is opened.
2. Attach a Hansen 5000 series connector to the fitting.
3. Open the water supply and fill the tank until water flows out of the overflow line.
4. Remove fill hose and close service door.

REMOVAL

To remove the fresh water tank, the lavatory mirror will have to be removed first.

1. Remove the snap-on molding and track which holds the mirror in place around the top and sides of the mirror.
2. Pull the mirror up from behind the bottom retaining channel and carefully swing out. The fresh water tank, mountings and line fittings are now exposed.
3. Disconnect the lines and fittings, and remove the mounting hardware.

THERMAL DRAIN VALVE

Available as optional equipment is a thermal drain (Ozontz) valve which automatically drains the washroom fresh water tank when the temperature in the vehicle drops to approximately 34°F (1°C). The valve is located in the washroom below wash basin. Refer to figure 17-13.

TESTING

The following method is recommended for testing thermal drain valves:

1. After the thermal drain valve has been at room temperature for at least one half hour, pour 45°F (7°C) or warmer water into the inlet of the valve. The valve should be closed and no water should flow.
2. Place the thermal drain valve in a container of ice and

cover it with a minimum of water. The water should be about 33°F (1°C).

3. After at least one half hour, remove water, remove valve and pour water from container into inlet of valve. Water should flow through discharge of valve.

MAINTENANCE

It is recommended that the thermal drain valve be inspected for leakage at outlet port located in the engine compartment once a year, preferably in the fall. The following procedure should be followed. If there is no leak, temperature above 40°F (4°C), the valve is satisfactory and needs no servicing. If a leak is evident, the following procedure should be followed:

1. Remove cap, thermal unit, cage, operating spring and bearing plate.
 2. Clean seat at bottom of valve body.
 3. Reassemble bearing plate, operating bearing spring, cage, thermal valve unit and cap making certain that the cage is properly aligned with the valve port and that the cage assembly is not cocked.
- If the valve still leaks, the following procedure should be followed:
4. Remove cap, thermal unit and cage.
 5. Remove valve guide and poppet from cage.
 6. Install new Buna S poppet and re-install guide.
 7. Re-install cage and a new thermal unit.
 8. Re-install cap making certain that cage is properly aligned with valve port and that the cage assembly is not cocked.

NOTE: In case of a complete replacement of drain valve, make sure to seal around outlet port in engine compartment with mortite tape to prevent fumes from engine compartment entering the lavatory compartment.

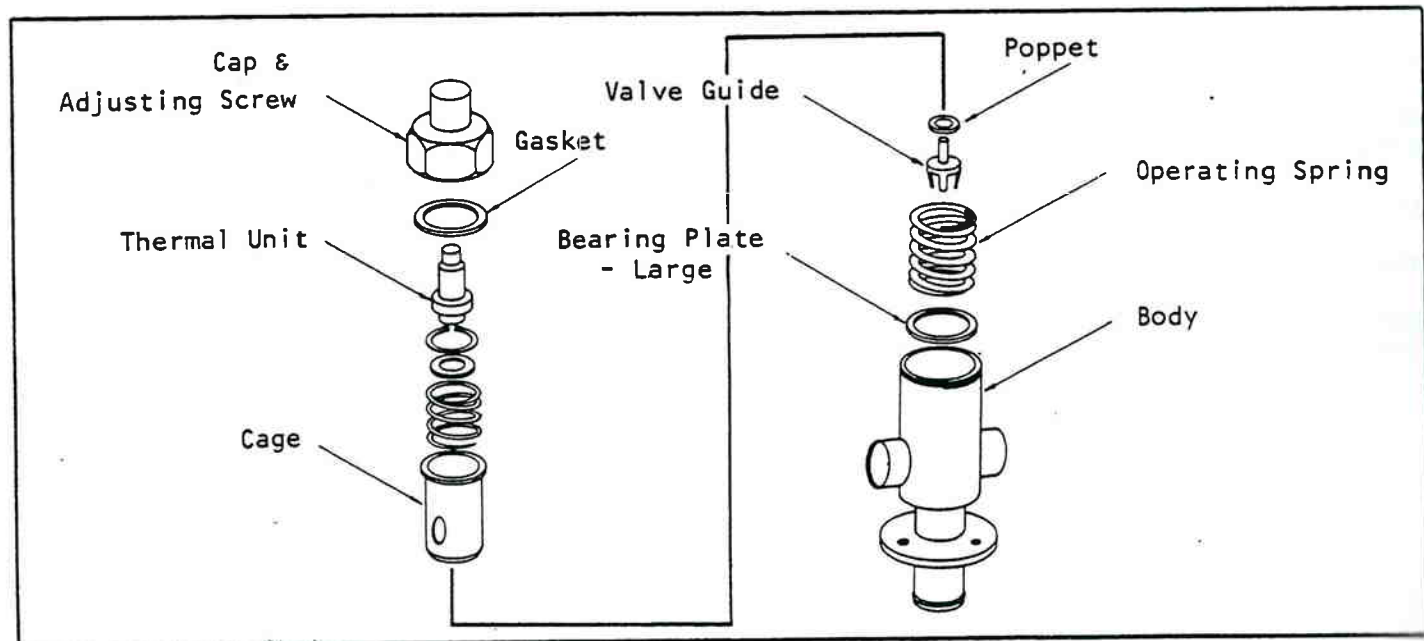


Figure 17-13. Thermal Drain Valve.

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SPECIFICATIONS

Chemical Tank Capacity	20 gals. (76 liters)
Chemical Tank Fill and Rinse Hansen Valve No.	6000 Series
Fresh Water Supply Fill Hansen Valve No.	5000 Series
Fresh Water Tank Capacity	10 gals. (38 liters)
Thermal Drain Valve Opening Temperature	Approx. 34°F (1°C)