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CHAPTER 38 - WATER AND WASTE

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WATER AND WASTE – DESCRIPTION AND OPERATION

1. General

   A. The water and waste system is composed of four independent but related systems. (See figure 1.) The passenger water system stores, delivers, monitors and controls drinkable (potable) water for the galley unit and lavatory components. This system contains electric water heaters that heat the water supplied to the hot water taps in the lavatory sinks. The toilet system provides sanitary toilets in the lavatory compartments and a means to dispose of toilet waste. The waste water system disposes of all waste water from the lavatory compartments by draining it into the toilet tanks. The water tank pressurization system causes the passenger water system to be evenly pressurized at all times.

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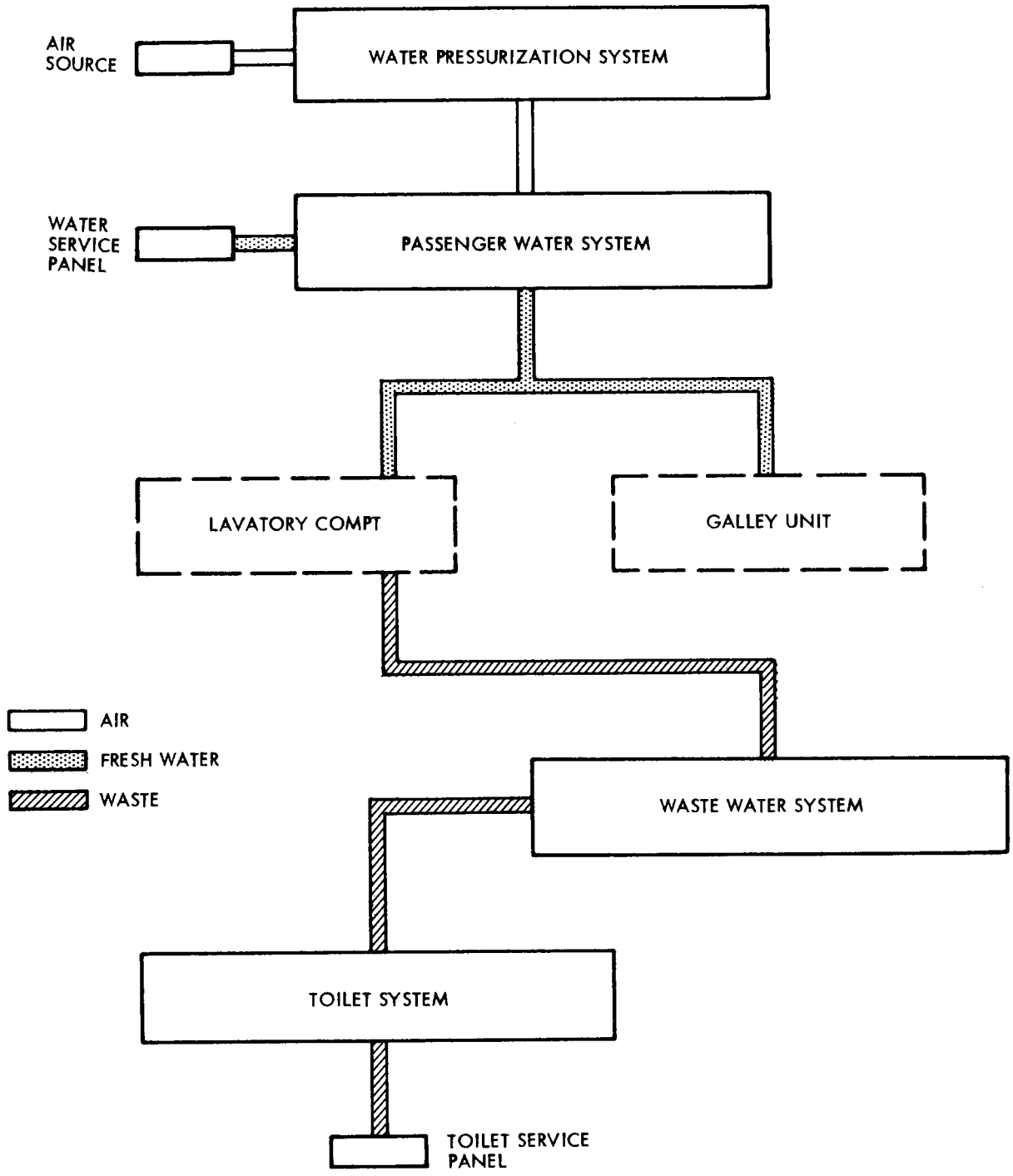

Water and Waste Block Diagram
Figure 1

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PASSENGER WATER SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The passenger water system supplies drinkable (potable) water to the galley units and lavatory compartments. The water system includes the equipment necessary to store, pressurize, monitor, deliver, control and heat the water supplied to the various components. Water for the system is stored in a pressurized tank. The water tank is normally pressurized by engine bleed air from the No. 1 engine. For other pressure sources refer to 38-41-0, Water Tank Pressurization System. The quantity of water in the tank is monitored by a quantity transmitter on the tank and one or more quantity indicators as shown on figure 1. The passenger water system is controlled by the following valves: a fill and overflow valve, drain valves, and vent valves. Water supplied to the hot water tap in the lavatory compartments is heated by an electric heater. (See figures 1 and 2.)
2. Passenger Water Tank
   A. The passenger water tank has fittings attached to the top for system filling, overflow, galley and lavatory supply, system pressurization, and a float-type quantity transmitter. A drain fitting is located on the bottom of the tank. The volume of the tank is 34 gallons with a standpipe on the overflow line to limit capacity to 30 gallons. The welded titanium water tank is mounted on the right side of the airplane aft of the aft cargo compartment. (See figure 1.)

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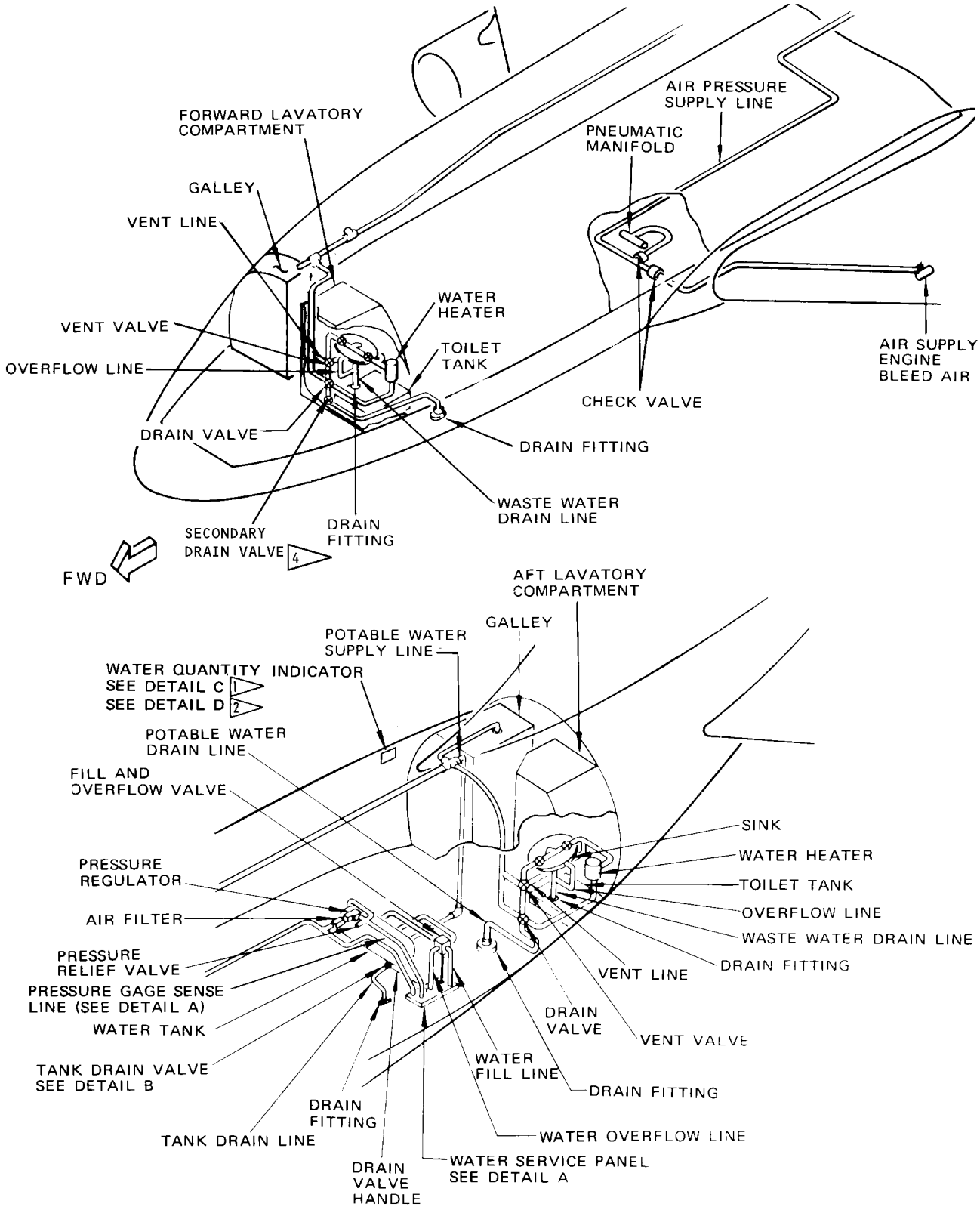

Passenger Water System Components Location
Figure 1 (Sheet 1)

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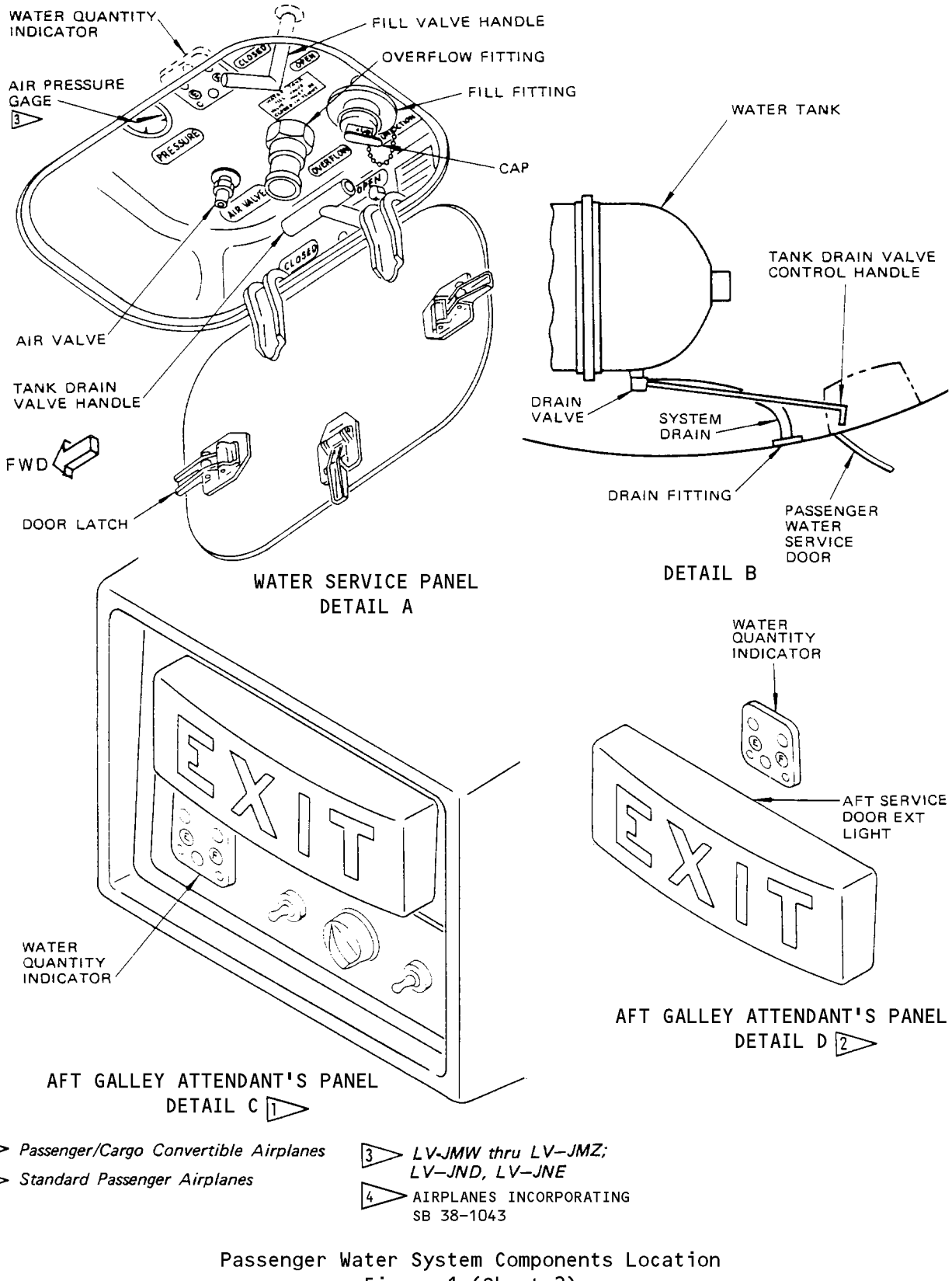

1 *Passenger/Cargo Convertible Airplanes*
2 *Standard Passenger Airplanes*
3 *LV-JMW thru LV-JMZ; LV-JND, LV-JNE*
4 AIRPLANES INCORPORATING SB 38-1043

Passenger Water System Components Location
Figure 1 (Sheet 2)

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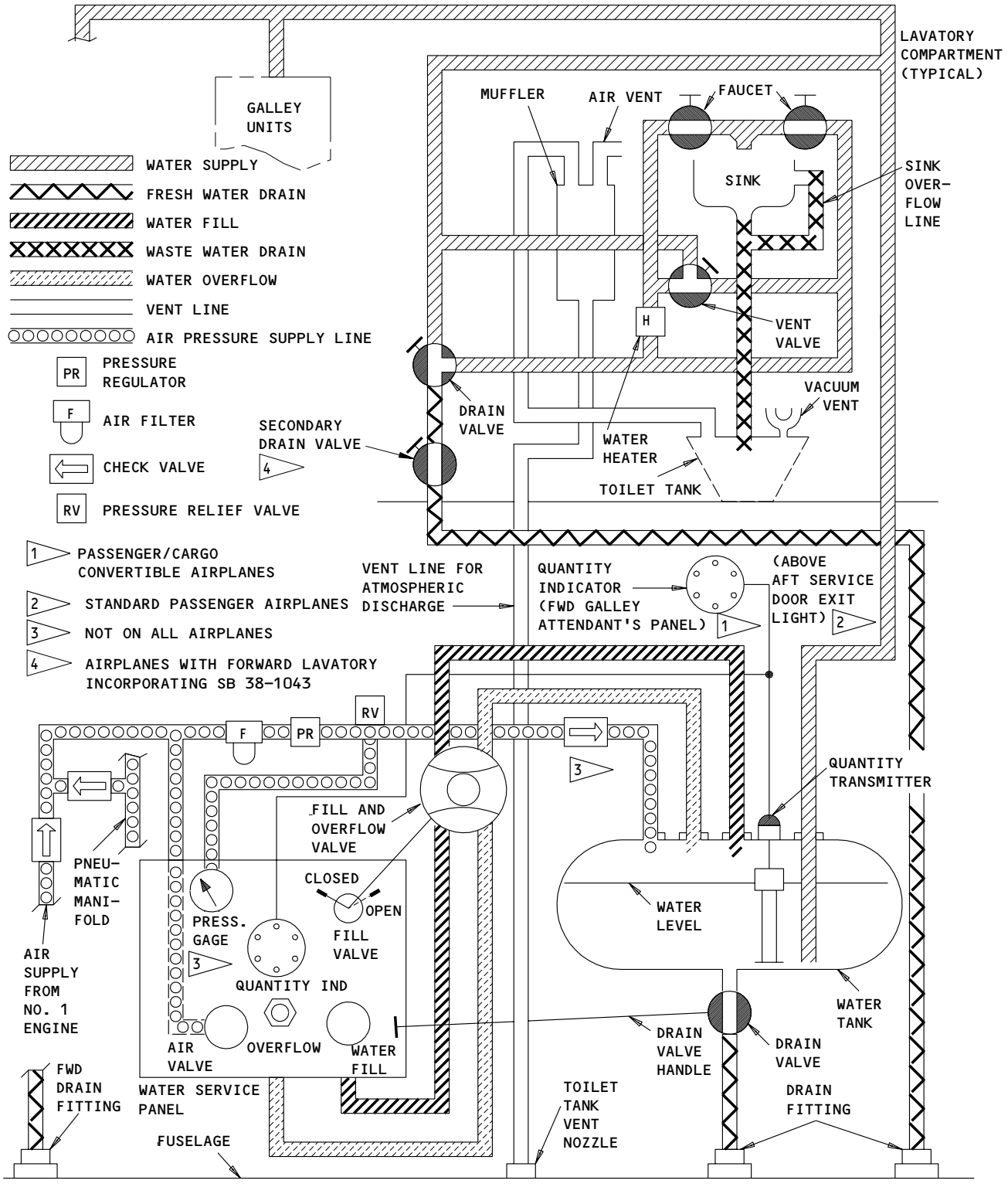

Passenger Water System Schematic
Figure 2

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3. Quantity Indicating System
   A. The passenger water system quantity indicating system is provided to indicate water quantity in the passenger water tank. The system consists of a float-type transmitter on the top of the tank and one or more indicators as shown on Fig. 2. Changes in the tank water level cause different switches in the transmitter tube to be energized to control illumination of the water quantity indicator bulbs. When the pushbutton switch on the indicator is pushed, the applicable bulb or bulbs illuminate to show water quantity.
4. Water System Plumbing
   A. The passenger water system plumbing consists of reinforced plastic hose. Supply plumbing hose is enclosed in aluminum conduit.
   B. For the material of any specific hose assembly refer to Boeing Illustrated Parts Catalog.

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5. Water System Valves

A. Fill and Overflow Valve (Fig. 1)

(1) The fill and overflow valve controls filling of the passenger water system. The valve is a four-port machined body with a rotary core. The rotary core is spring-loaded to ensure positive seating and prevent leakage. The valve is operated by a handle attached to the rotary core by a short stem. It is a 2-way valve with an OPEN and a CLOSED position. During flight the valve must be in the CLOSED position. The OPEN position permits filling of the water tank. The fill and overflow valve is located just above the water service panel. Plumbing from the fill and overflow valve is connected to the water service panel located on the airplane fuselage below the aft entry door. The panel contains a fill connection and an overflow outlet.

B. Drain Valves

(1) Lavatory Drain Valves (Fig. 3)

(a) Each lavatory is provided with a drain valve which controls potable water drainage of lavatory compartment plumbing. The valve has 3 positions: OFF, DRAIN and ON. In the OFF position all lines are completely closed. In the DRAIN position all lines are completely open. In the ON (normal) position, the water inlet and outlet lines are open and the drain line is closed. The valve is accessible in the lower part of the lavatory sink cabinet below the water heater.

(b) On airplanes with forward lavatory, a secondary drain valve may be installed to prevent in flight accidental drainage. The existing 3-way drain valve is designated the primary drain valve. The secondary drain valve is a 2-way valve with an OPEN and a CLOSED position. The secondary valve is accessible in the lower part of the lavatory sink cabinet.

(2) Water Tank Drain Valve (Fig. 1)

(a) The passenger water tank drain valve is a two-port valve located aft of the aft cargo compartment and below the passenger water tank. The valve controls draining of the passenger water tank. A drain valve control handle is accessible on the water service panel below the aft entry door.

C. Vent Valves

(1) A vent valve is provided in each lavatory to vent the passenger water system plumbing while water is draining. It is a 2-way valve with an open and a closed position and it is located below the sink in the sink cabinet. (See figure 3.)

(a) In the forward lavatory the two vent valve positions are determined by a placard reading ON and DRAIN.

(b) In the aft lavatory the vent valve is closed when the handle points directly into the cabinet, and open when the handle is parallel to the airplane centerline.

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6. Water Heaters

A. A one and one half-quart water heater is installed under each lavatory washbasin in the supply plumbing to the hot water faucet. (See figure. 3.) Water is heated by one 400-watt heater consisting of three probes inserted in the bottom of the heater tank. A heater control switch and a light which is illuminated during normal operation are mounted on the side of the heater tank. A cycling thermal switch inserted in the bottom of the heater tank regulates the water temperature to approximately 125°F. (See figure 4.) A manually reset overheat switch attached to the top of the water heater tank limits the case temperature to approximately 190°F. If overheat occurs, the switch interrupts power to the heater and the light. The light will be out only if the control switch is OFF or the overheat switch is open. The overheat switch may be located by removing the cover at the top of the water heater. The overheat switch is reset by pressing the bubble in the center of the rubber covering on the overheat switch after a sufficient cooling period. A pressure relief valve installed in the side of the water heater is designed to relieve at approximately 140 psig. The primary purpose of the relief valve is to relieve excessive pressure when the heater overheats due to a malfunction of the cycling and overheat switch and the water heater is isolated from the water system by the lavatory drain valve. When the heater is connected to the water system, any excessive pressure will be forced back through the water line into the water tank and relieved overboard. A cap is bolted to the top of the heater tank to protect the electrical connection.

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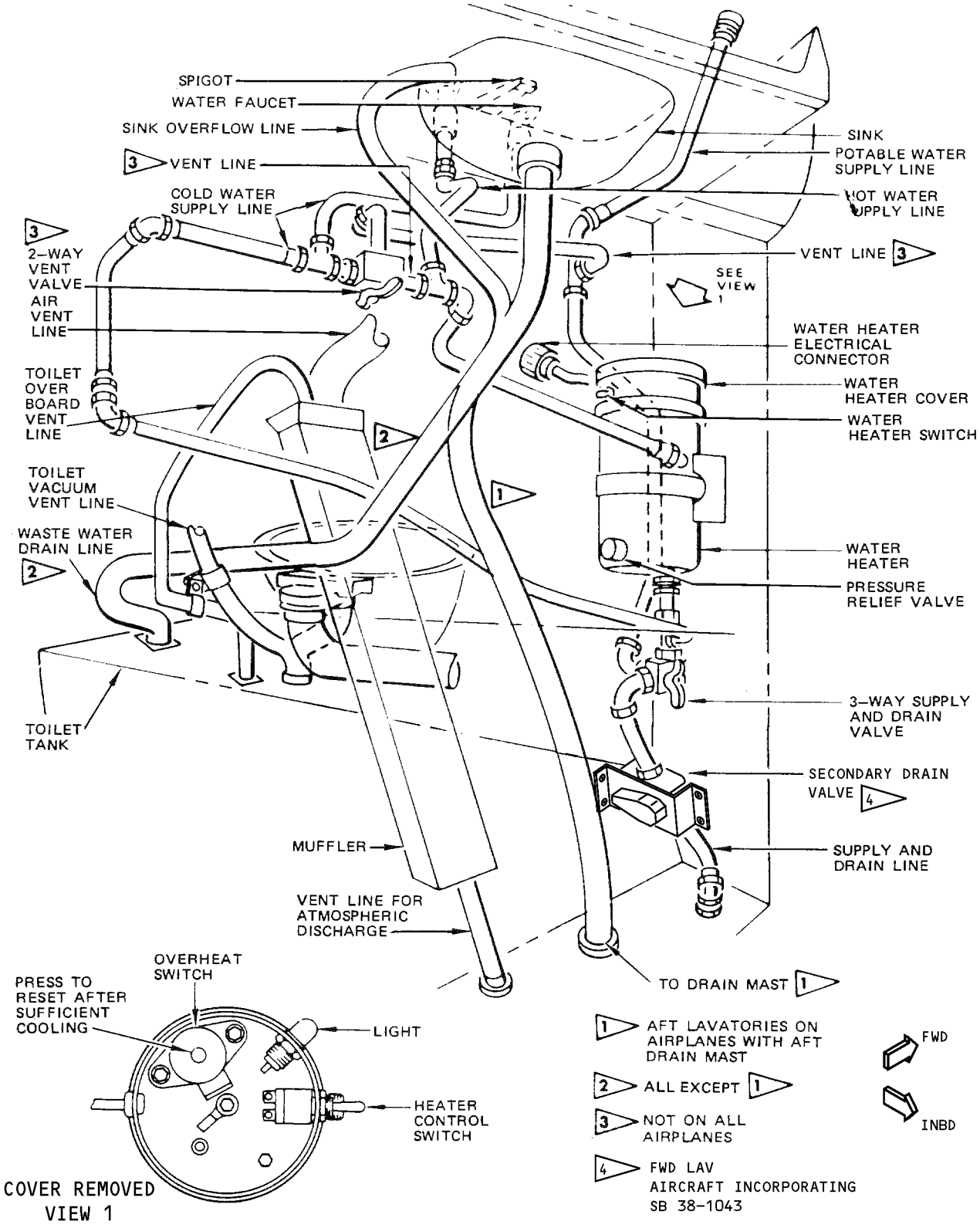

Sink Cabinet Passenger Water System Components
Figure 3

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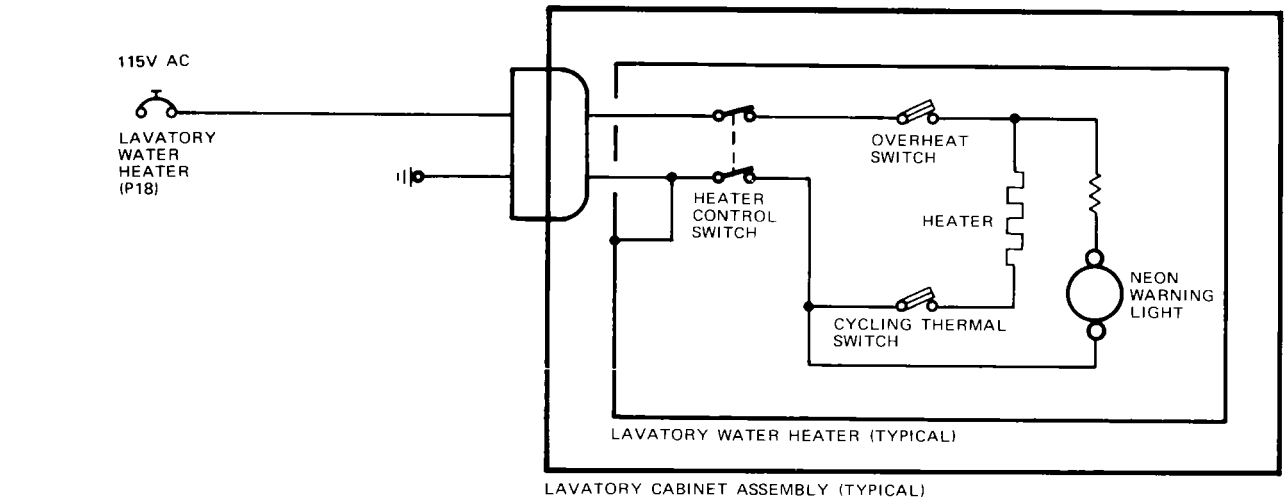

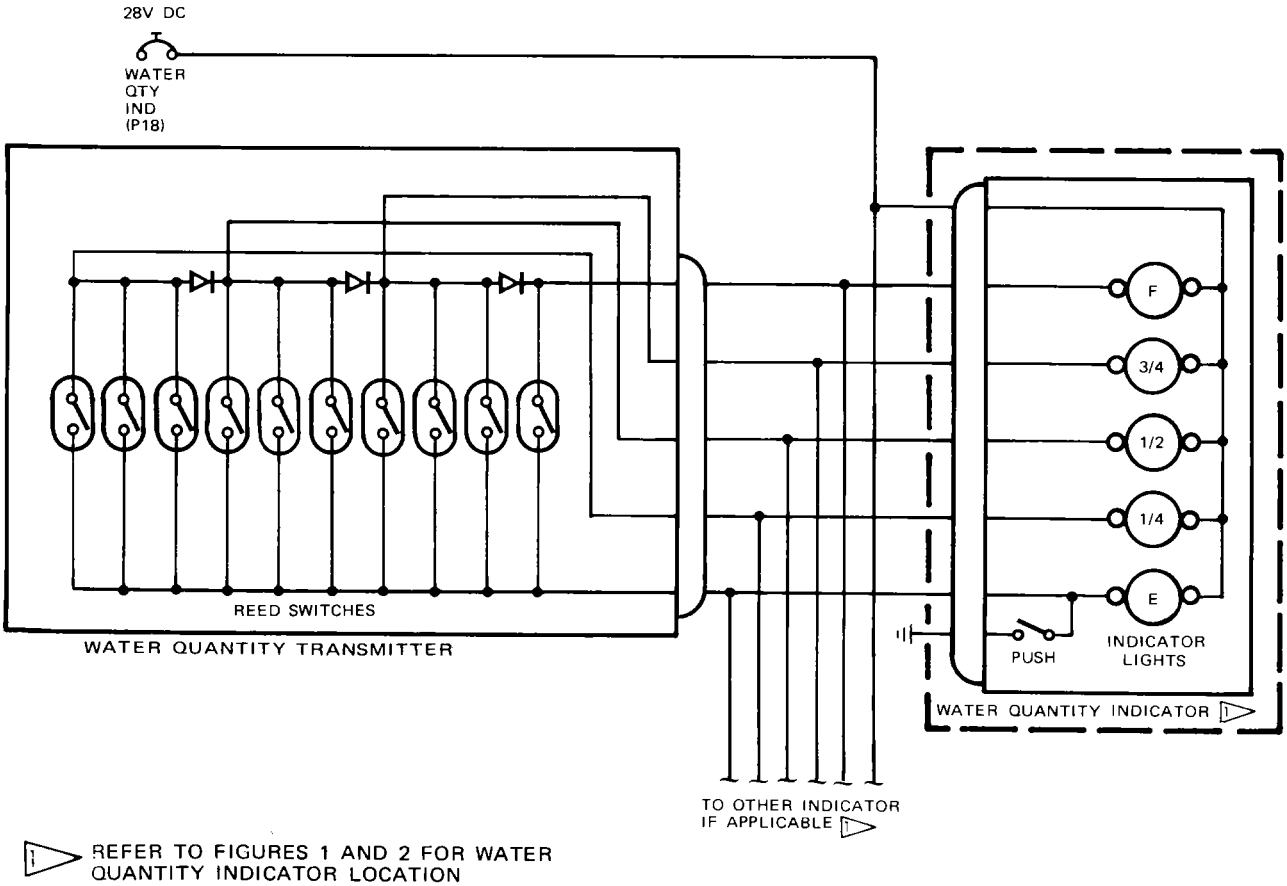

Water Heater and Water Quantity Indicating System Circuit
Figure 4

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PASSENGER WATER SYSTEM - TROUBLESHOOTING

1. Passenger Water System Troubleshooting Chart

TROUBLE	PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
Water pressure low	Filter clogged	Check air filter element	Replace filter element (AMM 38-41-11/301) as required
	Defective check valve	If pressurized air is provided by a single source from APU or engine bleed air, check condition of applicable check valve downstream of source and replace if defective	Replace applicable check valve

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PASSENGER WATER SYSTEM - SERVICING

1. General
   A. It is necessary to completely drain the water system before disinfecting it or when parking the airplane in freezing weather.

      WARNING: YOU MUST DRAIN THE POTABLE WATER SYSTEM AT LEAST ONE TIME EVERY 3 DAYS TO PREVENT THE GROWTH OF BACTERIA IN THE SYSTEM. IF YOU DO NOT DRAIN THE SYSTEM AT LEAST ONE TIME EVERY 3 DAYS, AND YOU DRINK THE WATER, ILLNESS CAN OCCUR.

   B. The water should be drained at least every 3 days and fresh water added to the system to prevent the growth of bacteria.
   C. Use a disinfectant regularly in the potable water system. Use a disinfectant after you complete a maintenance procedure on the water system or if the water system is contaminated.
2. Pressure Draining Passenger Water System
   A. Open all lavatory water heater circuit breakers on P18.
   B. Pressurize water system (AMM 38-41-0/201).
   C. Obtain access to supply/drain or vent valve:
      (1) Open sink cabinet door.
      (2) For supply/drain valve, if necessary, proceed as follows:
         (a) Open towel disposal container access door.
         (b) Remove container and open access door inside container enclosure.
   D. Open tank drain valve. In each lavatory, position three-way supply/drain valve handle to DRAIN. In each forward lavatory, position vent valve handle to DRAIN. In each aft lavatory, position vent valve handle parallel to airplane centerline.
   E. On airplanes with forward lavatory, with secondary drain valve installed, position the drain valve to OPEN.
   F. When water stops flowing from drain outlets close tank drain valve. Position three-way lavatory supply/drain valve handles to ON.
   G. Allow 2 minutes for pressure to stabilize.
   H. In each lavatory, position three-way supply/drain valve handle to DRAIN to exhaust residual water, then to ON.
   I. In each lavatory repeat step G and open each water faucet for 1/2 minute, then close.
   J. Repeat step G, open each galley water outlet, and drain water into gallon container. Close galley water outlet.
   K. Where applicable disconnect coffeemaker and repeat step J.
   L. Restore airplane to normal.
      (1) Depressurize water tank (AMM 38-41-0/201).
      (2) On airplanes with forward lavatory, with secondary drain valve installed, position the drain valve to CLOSED.
      (3) In each forward lavatory, position vent valve handle to ON.

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(4) In each aft lavatory, position vent valve handle pointing into sink cabinet.
(5) Where applicable connect coffeemaker to water supply in galley.

3. Gravity Draining Passenger Water System
   A. Open all lavatory water heater circuit breakers on P18.
   B. Open fill and overflow valve and tank drain valve. In each lavatory, position 3-way supply/drain valve handle to DRAIN. In each forward lavatory, position vent valve handle to DRAIN. In each aft lavatory, position vent valve handle parallel to airplane centerline.
   C. On airplanes with forward lavatory, with secondary drain valve installed, position the drain valve to OPEN.
   D. When water stops flowing from drain outlets close fill and overflow valve and tank drain valve. Position 3-way supply/drain valve handles to ON. In each forward lavatory, position vent valve handle to ON. In each aft lavatory, position vent valve handle pointing into sink cabinet.
   E. Open each galley water outlet and drain water into gallon container. Close outlet.
   F. Where applicable disconnect coffeemaker and repeat step E.
   G. On airplanes with forward lavatory, with secondary drain valve installed, position the drain valve to CLOSED.
   H. Install towel disposal container as necessary and close doors.

4. Disinfect Passenger Water System
   A. General
      (1) The passenger water system may be disinfected with an application of the following:
         (a) 50 parts per million of chlorine acidified with vinegar
         (b) 100 parts per million of chlorine - not acidified
         (c) 50 parts per million of chlorine - not acidified

         NOTE: Disinfecting time for (a) and (b) is 1 hour.
               Disinfecting time for (c) is 4 hours.

      (2) Recommended chlorine solution (concentrated). The following concentrated solution will result in a 50 parts per million of acidified chlorine solution when added to a 30-gallon water tank. This solution minimizes the objectionable taste normally attributed to disinfectants and requires the shorter disinfecting time.
         (a) 9 fluid ounces (266 ml) chlorine dioxide stabilized 2%
         (b) 9 fluid ounces (266 ml) acetic acid (vinegar)
         (c) Approximately 1 gallon (4 liters) clean water

         NOTE: Let mixture stand 5 minutes to complete activation.

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B. Remove all filter cartridges from water system, where applicable, including coffeemakers. Reinstall filter caps.

NOTE: An excessive amount of disinfectant in the passenger water system may contaminate filter and give an objectionable taste of chlorinated water. Use of the recommended chlorine solution (Ref par. A.(2)) will minimize the objectionable taste.

C. Drain system (Ref par. 2 or 3).
D. Fill system with chlorinated water which contains 50 or 100 parts per million of chlorine (Chapter 12, Water System - Servicing).
   (1) Water may be chlorinated in three different ways.
      (a) A concentrated chlorine solution may be introduced first and then the system filled with drinkable water.
      (b) Concentrated chlorine solution may be mixed with drinkable water first and then pumped into system.
      (c) Concentrated solution may be added while system is being filled.
E. After system is filled with chlorinated water and chlorinated water has appeared at overflow fitting on service panel, close fill and overflow valve.
F. Pressurize system (AMM 38-41-0/201).
G. Open each lavatory faucet until chlorinated water appears at each. At each galley open water outlet(s) until chlorinated water appears at each.
H. At each lavatory proceed as follows:
   (1) Position 3-way supply/drain valve to OFF.
   (2) On airplanes with forward lavatory, with secondary drain valve installed, position the drain valve to CLOSED.
   (3) At each forward lavatory, position vent valve handle to DRAIN.
   (4) At each aft lavatory, position vent valve handle parallel to airplane centerline.
   (5) Open both faucets to allow water to flow through vent line. Close faucets.
I. Connect hose from chlorinated water source to fill connection.
J. Connect a length of hose to overflow fitting to avoid contact with chlorinated water under pressure.
K. Slowly open fill and overflow valve.
L. Top off tank with chlorinated water (Ref step D).
M. Let chlorinated water stand in system for 1 hour if filled with 50 parts per million of acidified chlorine or 100 parts per million of chlorine (not acidified) solution. Let chlorinated water stand for 4 hours if filled with 50 parts per million of chlorine (not acidified).
N. Drain system (Ref par. 2 or 3).
O. Fill system with drinkable water (Ref Chapter 12, Water System - Servicing).

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P. Repeat steps E thru O, substituting drinkable water for chlorinated water, as many times as necessary until chlorine contents in water is not objectionable.

Q. Return system to normal as follows:
   (1) At each lavatory position three-way supply/drain valve handle to ON. At each forward lavatory position vent valve handle to ON. At each aft lavatory position vent valve handle pointing into sink cabinet.
   (2) Install clean filter cartridges and coffeemaker as applicable.
   (3) Remove hose from overflow fitting.

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PASSENGER WATER TANK - REMOVAL/INSTALLATION

1. Prepare for Removal
   A. Drain water tank by opening fill and overflow valve and drain valve.
   B. Depressurize water tank (AMM 38-41-0/201).
   C. Close drain, fill, and overflow valve.
   D. Open WATER QTY IND circuit breaker on panel P18.
   E. Remove aft cargo compartment rear bulkhead access panels. (See figure 401.)
2. Remove Passenger Water Tank
   A. Disconnect electrical connector from water quantity transmitter.
   B. Disconnect air pressure, fill, overflow, supply and drain lines from water tank.

      NOTE: Obtain access through insulation blanket. Blanket is attached by Velcro tape.

   C. Remove drain valve adapter connecting pin and two washers, and pull valve handle on water service panel, to disconnect valve actuator shaft coupling from adapter.
   D. Loosen upper and lower attachment bolts on struts on forward side of tank.
   E. Remove attachment bolt assembly from aft side of tank. (See view 1.) Bolt attaches to a nutplate on outboard end.
   F. Remove upper attachment bolts and washers from struts on forward side of tank. Swing struts forward.
   G. Carefully lift and remove tank, with drain valve and quantity transmitter attached, through access panel opening.

      CAUTION: ENSURE THAT DRAIN VALVE AND QUANTITY TRANSMITTER ARE NOT DAMAGED.

   H. Remove insulation blanket from tank.
   I. Remove adapter mounting screw and washer and remove adapter from drain valve. (See detail B.)
   J. Loosen jamnut and remove drain valve and O-ring from tank boss.
   K. Remove quantity transmitter from tank. Refer to 38-11-21, Water Quantity Transmitter - Removal/Installation.
3. Prepare for Installation
   A. Install quantity transmitter on tank. Refer to 38-11-21, Water Quantity Transmitter - Removal/Installation.
   B. Install drain valve and O-ring on tank boss. Do not tighten jamnut.
   C. Install valve adapter with screw and washer.
   D. Install insulation blanket on tank. Blanket is attached by velcro tape.

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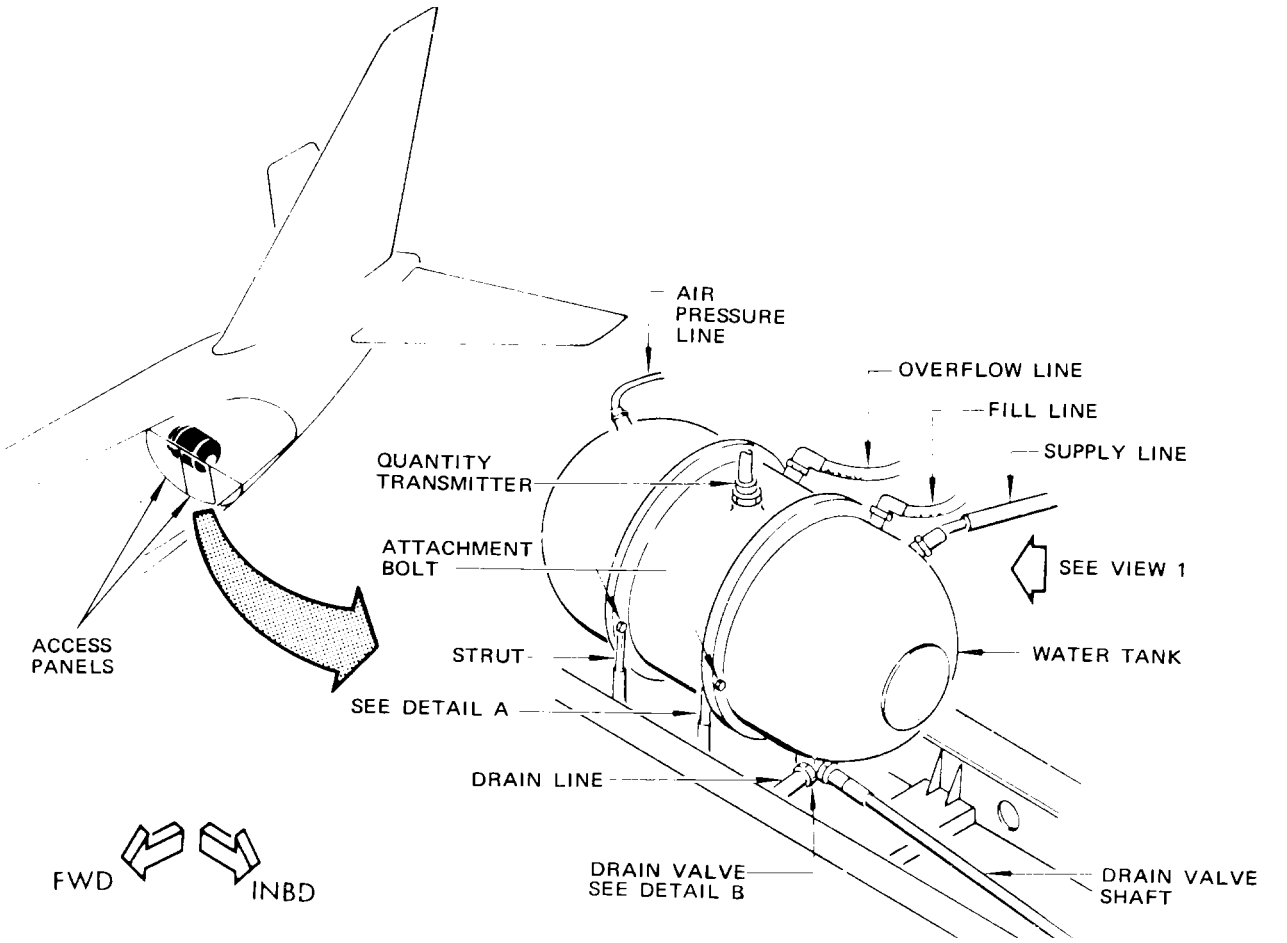
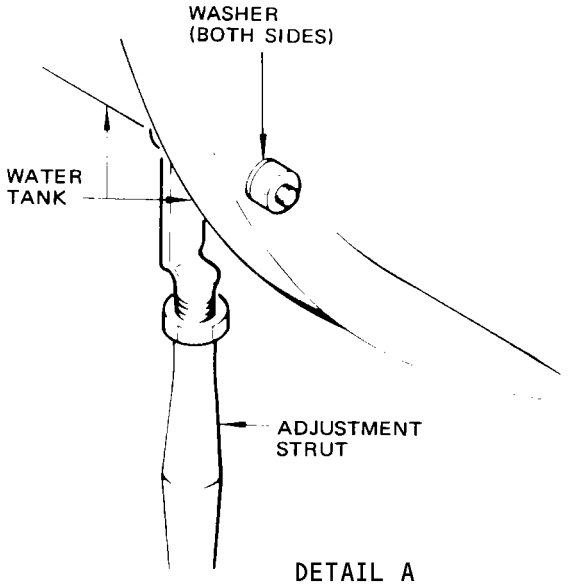
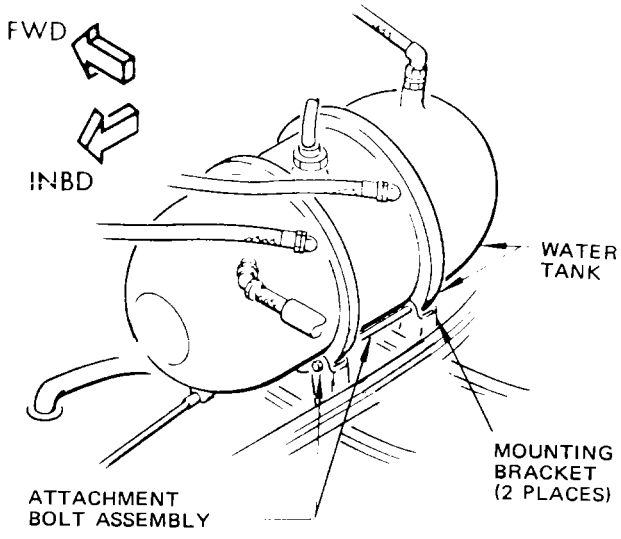




DETAIL A



VIEW 1

Passenger Water Tank Installation
Figure 401 (Sheet 1)

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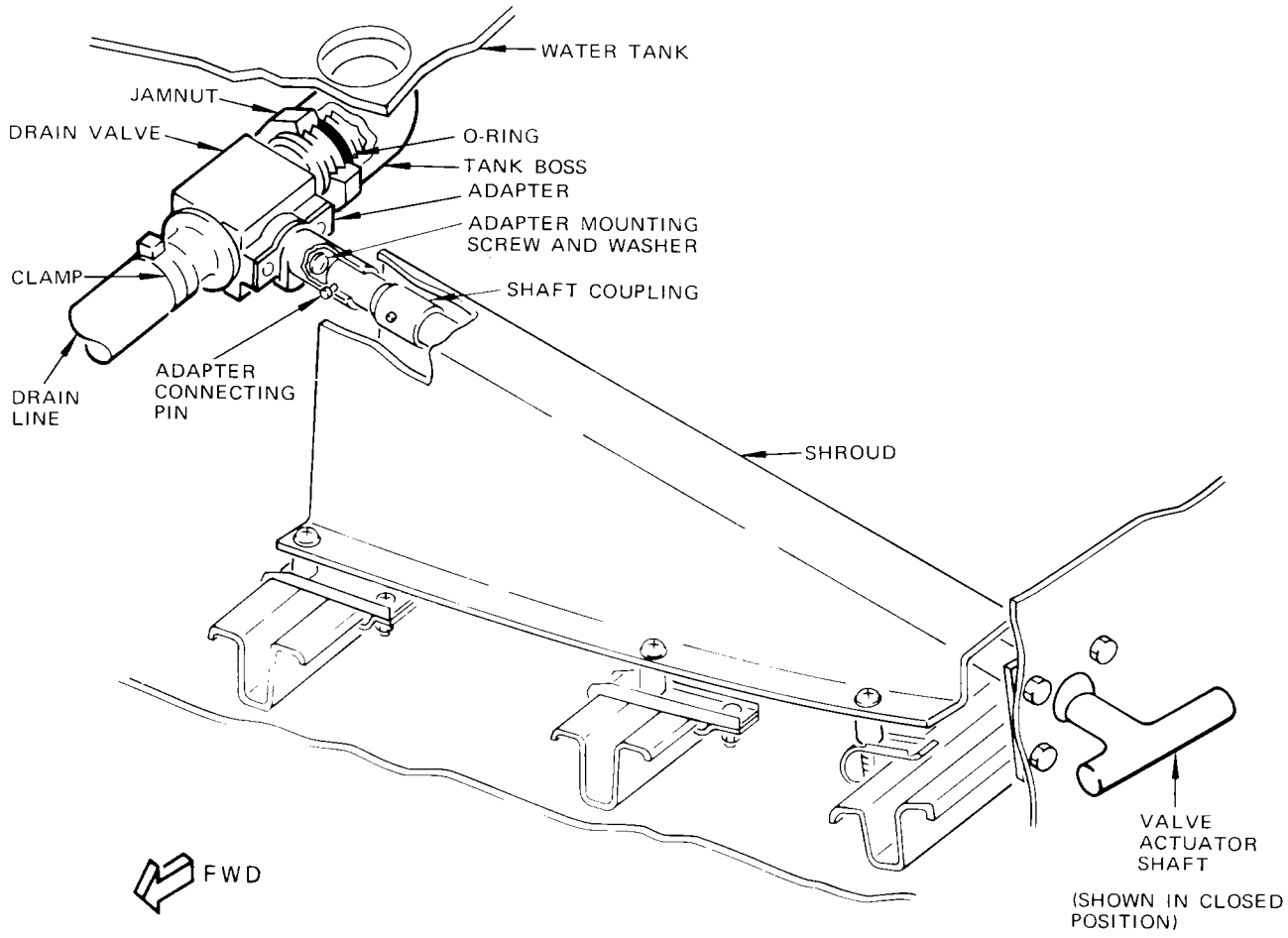

DETAIL B

Passenger Water Tank Installation
Figure 401 (Sheet 2)

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4. Install Passenger Water Tank
   A. Position tank in airplane.

      CAUTION: ENSURE THAT DRAIN VALVE AND QUANTITY TRANSMITTER ARE NOT DAMAGED.

   B. Loosely install or connect the following items:
      (1) Attachment bolt assembly into aft mounting bracket. (See view 1.) Bolt attaches to a nutplate on outboard end.
      (2) Upper attachment bolts and washers on forward side of tank. Adjust inboard strut as necessary. Leave lower bolts loosely attached.
      (3) Air pressure, fill, overflow, supply, and drain lines.
      (4) Drain valve actuator shaft coupling to valve adapter with adapter connecting pin and washers.

         NOTE: Install adapter connecting pin from forward end (valve closed), with shaft handle in closed position, as shown on figure 401, detail B.

      (5) Quantity transmitter electrical connector.
   C. After all items in step D are installed, tighten aft attachment bolt to a torque of 25 to 30 pound-inches, and tighten all other items as necessary.
   D. Provide electrical power.
   E. Fill water tank. Refer to Chapter 12, Water System - Servicing.
   F. Pressurize water tank. Refer to 38-41-0, Water Tank Pressurization System - Maintenance Practices.
   G. Allow pressure in system to stabilize as follows:
      (1) On airplanes with a pressure gage, allow pressure to stabilize to 25 psig.
      (2) On airplanes without a pressure gage, allow 2 minutes for pressure to stabilize.
   H. Open one lavatory cold water faucet until water starts flowing, then close faucet.
   I. Check water tank and line connections for leaks.
5. Restore Airplane to Normal
   A. Replace access panels.
   B. Close WATER QTY IND circuit breaker on panel P18.
   C. If no longer needed, remove electrical power from airplane.

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WATER QUANTITY TRANSMITTER - REMOVAL/INSTALLATION

1. Prepare for Removal
   A. Drain water tank by opening fill and overflow valve and drain valve.
   B. Depressurize water tank. Refer to 38-41-0, Water Tank Pressurization System - Maintenance Practices.
   C. Close drain valve and fill and overflow valve.
   D. Open WATER QTY IND circuit breaker on panel P18.
   E. Remove aft cargo compartment rear bulkhead access panels. (See figure 401.)
   F. Remove water tank. Refer to 38-11-11, Passenger Water Tank - Removal/Installation.

      NOTE: If desired, disconnect all connections to water tank (refer to 38-11-11), lift tank slightly, and rotate 90 degrees until transmitter points forward.

      CAUTION: WHILE ROTATING TANK AVOID CONTACT WITH OTHER METAL PARTS TO PREVENT SCORING OF EITHER, AND ALSO TO PREVENT DAMAGE TO TRANSMITTER OR DRAIN VALVE.

2. Remove Water Quantity Transmitter
   A. Remove tank access door mounting bolts and washers (16 places), and remove door.
   B. Remove transmitter fitting, with bonding lug, screws, and lockwire attached away from boss on tank top. Remove O-ring from boss.
   C. Carefully remove threaded portion of transmitter body from tank boss.
   D. Remove pin at bottom of transmitter tube. Then pull float carefully from bottom of tube and remove float and pin from tank through access door opening.
   E. Slowly pull transmitter through boss and away from tank.
      (1) Install Water Quantity Transmitter.
   F. Check that mounting surfaces on access door transmitter and tank are clear of flaws and foreign material.
   G. Carefully insert transmitter through boss.
   H. Carefully install float and pin on transmitter tube through access door opening.
   I. Carefully thread transmitter body into tank boss.
   J. Install new O-ring on tank boss.
   K. Thread transmitter fitting with bonding lug, screws, and lockwire, attached on top of tank boss.
   L. Install new O-ring in access door groove.

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M. Position access door on tank so that top bolthole, identified by a drill mark, aligns with top bolthole on tank. Install mounting bolts and washers (16 places).

NOTE: Use only MS20033-2 or equivalent mounting bolts to prevent the possibility of breaking seal by using oversize bolts.

N. Install water tank, but do not fill or check for leaks. Refer to 38-11-11, Passenger Water Tank - Removal/Installation.
   (1) If water tank had not been removed from its position, restore to normal as follows:
      (a) Lift tank slightly and carefully rotate 90 degrees until transmitter points upward and tank attachment holes align with holes on brackets and struts.

CAUTION: WHILE ROTATING TANK AVOID CONTACT WITH OTHER METAL PARTS TO PREVENT SCORING OF EITHER, AND ALSO TO PREVENT DAMAGE TO TRANSMITTER OR DRAIN VALVE.

      (b) Connect all connections to water tank. Refer to 38-11-11, Passenger Water Tank - Removal/Installation.

O. Check that step 3. H. has been accomplished.
P. Install quantity transmitter electrical connector.
Q. If necessary, provide electrical power.
R. Close WATER QTY IND circuit breaker on panel P18.
S. Check that water quantity indicator shows zero.
T. Fill water tank (Ref Chapter 12, Servicing).
U. Check that quantity indicator illuminates at F (full) mark.
V. Pressurize water tank (Ref 38-41-0, Maintenance Practices).
W. Allow pressure in system to stabilize as follows:
   (1) On airplanes with a pressure gage, allow pressure to stabilize to 25 psig.
   (2) On airplanes without a pressure gage, allow 2 minutes for pressure to stabilize.
X. Check water tank connections for leaks.
Y. Replace access panels.
Z. If no longer needed, remove electrical power.

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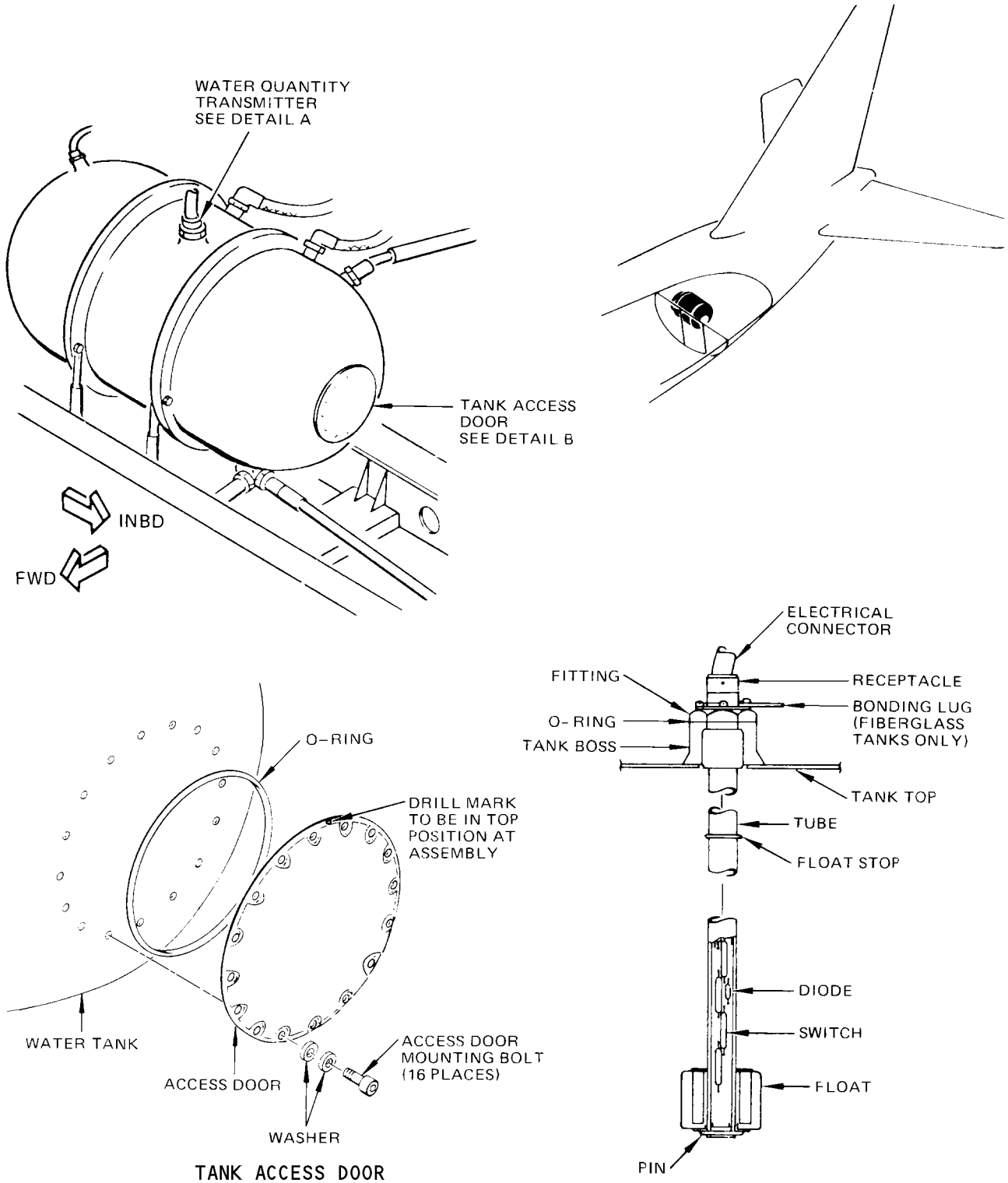

Water Quantity Transmitter Installation
Figure 401

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WATER FILL AND OVERFLOW VALVE - REMOVAL/INSTALLATION

1. Prepare for Removal
   A. Drain water tank by opening drain valve and fill and overflow valve.
   B. Depressurize water tank. Refer to 38-41-0, Water Tank Pressurization System - Maintenance Practices.
   C. Close drain valve and fill and overflow valve.
   D. Remove aft cargo compartment rear bulkhead access panel (Fig. 401).
2. Remove Fill and Overflow Valve
   A. Disconnect and cap four fill and overflow hoses from valve.
   B. Disconnect shaft from valve by removing shaft connecting pin and two washers.
   C. Remove inboard and outboard stop nuts.
   D. Remove inboard mounting bracket mounting bolts and washers.
   E. Remove inboard mounting bracket and valve.
3. Install Fill and Overflow Valve
   A. Position fill and overflow valve in outboard mounting bracket and place inboard bracket in mounting position (Fig. 401).

      NOTE: Check that valve is closed. Valve is closed when adapter tab is perpendicular to airplane centerline.

   B. Install two inboard bracket mounting bolts.
   C. Install inboard and outboard stop nuts.
   D. Connect four fill and overflow hoses to valve.
   E. Connect shaft to valve with shaft connecting pin and washers.
      NOTE: Check that shaft handle on panel is in closed position.
   F. Fill water tank. Refer to Water System - Servicing, Chapter 12.
   G. While filling check all valve connections for leaks.
   H. Replace access panel.
   I. Remove placards from switches.

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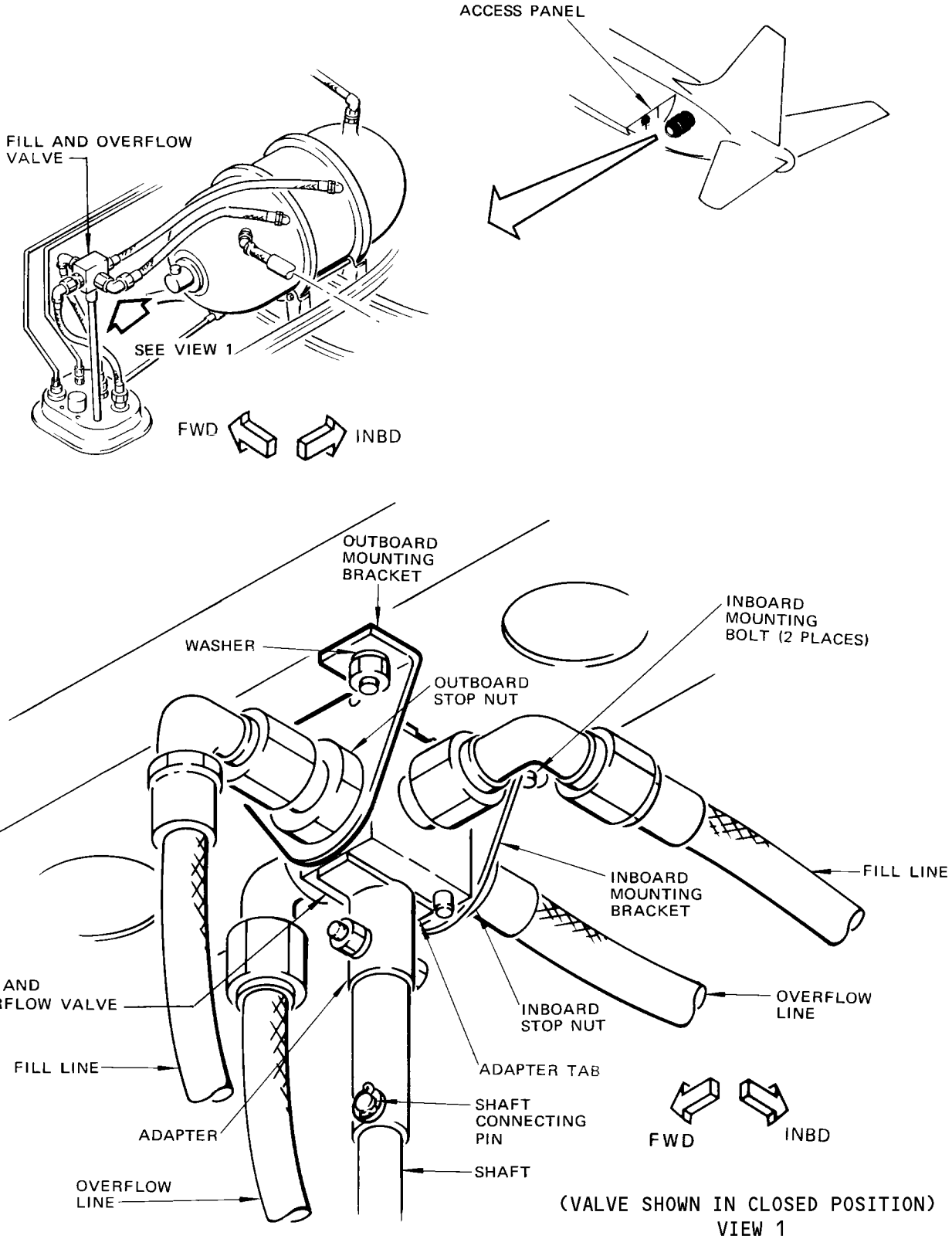

Water Fill and Overflow Valve Installation
Figure 401

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FORWARD LAVATORY SECONDARY DRAIN VALVE - REMOVAL/INSTALLATION

1. Remove Secondary Drain Valve (Fig. 1)
   A. OPEN circuit breakers on P18:
      (1) WATER QTY IND
      (2) Forward LAV WATER HEATER
   B. Depressurize water system (AMM 38-41-0/201).
   C. OPEN faucet in lavatory to release pressure and to drain some of the water from the line.
   D. Position primary drain valve handle to OFF.
   E. Using rags to catch water in the tubes, loosen B-nuts on the tubes to the secondary drain valve.
   F. Remove screws from the drain valve bracket.
   G. Remove drain valve handle, loosen jut, and remove bracket.
   H. Remove drain valve.
2. Install Secondary Drain Valve (Fig. 401)
   A. Install drain valve.
   B. Install bracket, tighten nut, and install drain valve handle.
   C. Install screws to drain valve bracket.
   D. Install and tighten B-nut on the tubes to drain valve.
3. Secondary Drain Valve Leak Test
   A. Pressure water system (AMM 38-41-0/201).
   B. Position the primary drain valve handle to DRAIN.

      NOTE: For test purposes, the primary drain valve should remain in the DRAIN. Water will not reach the secondary drain valve if the primary drain valve is in position OFF or ON.

   C. OPEN the secondary drain valve, check for leaks.
   D. CLOSE the secondary drain valve, check for leaks.
4. Return System to Normal
   A. CLOSE circuit breakers on P18
      (1) WATER QTY IND
      (2) Forward Lavatory Water Heater
   B. Position the primary drain valve handle to the ON position.

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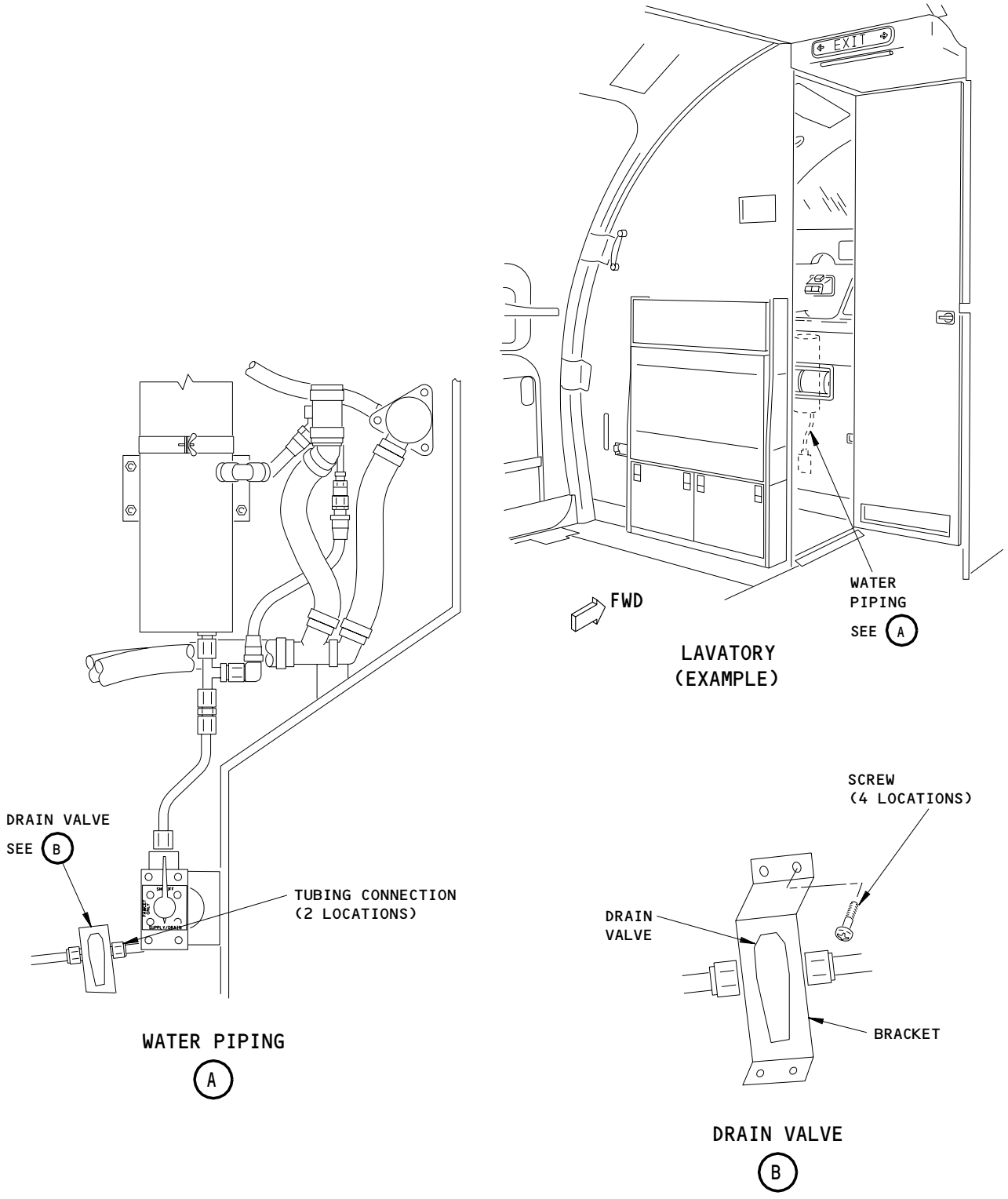

Lavatory Water Drain Installation
Figure 401

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WATER TANK DRAIN VALVE - REMOVAL/INSTALLATION

1. Prepare for Removal
   A. Drain water tank by opening fill and overflow valve and drain valve.
   B. Depressurize water tank. Refer to 38-41-0, Water Tank Pressurization System - Maintenance Practices.
   C. Close drain valve and fill and overflow valve.
   D. Open WATER QTY IND circuit breaker on panel P18.
   E. Remove aft cargo compartment rear bulkhead access panel (Fig. 401).
2. Remove Drain Valve
   A. Obtain access through insulation blanket, attached with Velcro tape.
   B. Disconnect drain line from drain valve.
   C. Remove adapter connecting pin and two washers, and pull valve actuator shaft handle on water service panel to disconnect shaft and coupling from adapter.
   D. Remove adapter mounting screw, washer, and adapter.
   E. Loosen jamnut and remove valve.
   F. Remove O-ring and jamnut from valve.
3. Install Drain Valve
   A. Install jamnut on valve.
   B. Install O-ring in groove on valve.
   C. Install valve on tank boss and tighten jamnut.
   D. Attach adapter to valve with adapter mounting screw and washer.
   E. Connect valve actuator shaft coupling to adapter with connecting pin and washers.

      NOTE: Install adapter connecting pin from forward end (valve closed), with shaft handle in closed position, as shown on Fig. 401.

   F. Connect drain line to valve.
   G. Fill passenger water tank. Refer to Chapter 12, Water System - Servicing.
   H. Provide electrical power.
   I. Pressurize water tank. Refer to 38-41-0, Water Tank Pressurization System - Maintenance Practices.
   J. Allow pressure in system to stabilize as follows:
      (1) On airplanes with a pressure gage, allow pressure to stabilize to 25 psi.
      (2) On airplanes without a pressure gage, allow 2 minutes for pressure to stabilize.
   K. Open drain valve until water starts flowing, then close valve.
   L. Check valve for leaks.
4. Restore Airplane to Normal
   A. Reinstall insulation blanket.
   B. Replace access panel.
   C. If no longer needed, remove electrical power.

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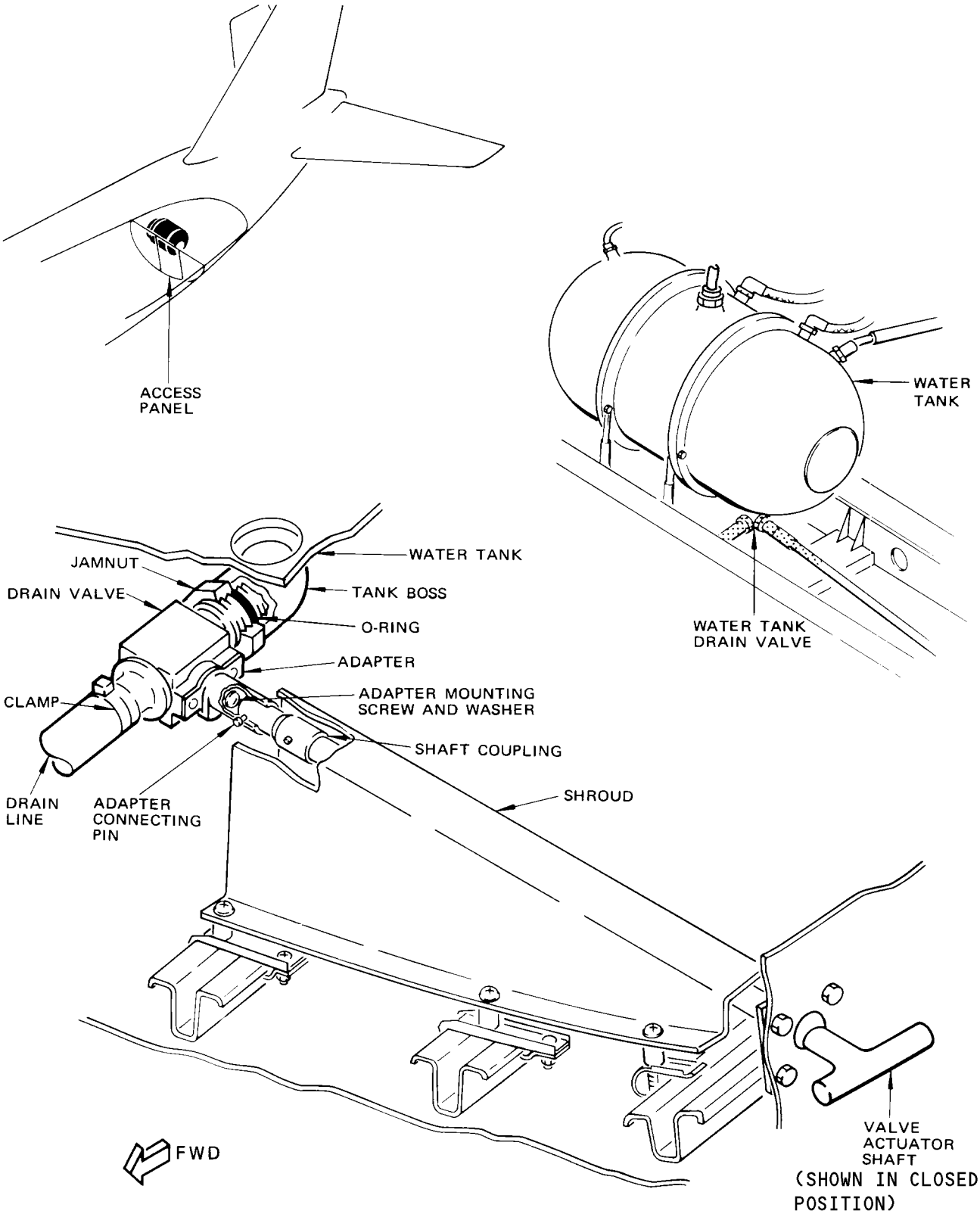

Water Tank Drain Valve Installation
Figure 401

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WATER HEATER - TROUBLESHOOTING

1. Water Heater Troubleshooting Chart

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TROUBLE	PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
Heater switch ON, light does not glow	No electrical power	Check for power and/or ground to heater switch.	
		If there is no power or ground at the heater switch, wiring is defective.	Locate and repair or replace defective wiring
	Indicator bulb faulty	Unscrew amber shield and check bulb.	Replace bulb
	Heater switch faulty	Switch heater switch to ON. Check for continuity through switch. If there is no continuity, heater switch is defective.	Replace heater switch
	Overheat switch open	Overheat switch will trip only if the cycling switch loses control. Remove cover and manually reset overheat switch. Turn heater switch to ON and observe if bulb lights.	RESET OVERHEAT SWITCH 1) Turn heater power off 2) Ensure heater is cool,flush with cold water by opening hot water faucet. 3) Depress reset button using finger pressure only. CAUTION: DO NOT USE TOOLS 4) Turn heater power on (lights should come on) 5) If overheat switch(s) trip again (light out) investigate cause

Water Heater Troubleshooting Chart
Figure 101 (Sheet 1)

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TROUBLE	PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
		If bulb fails to light, overheat switch is defective.	Replace overheat switch
		If bulb lights, operate heater for five minutes and check water temperature.	Replace cycling switch
		If water temperature is above 125°F, cycling switch is defective.	
Heater switch ON, light glows but no hot water	Cycling switch stuck open	Check cycling switch for continuity NOTE: Water temperature must be below 94°F.	
		If there is no continuity through the cycling switch, the switch is defective.	Replace cycling switch
	Immersion heater(s) faulty	If the cycling switch is OK, an immersion heater(s) is defective.	Replace immersion heater(s)

Water Heater Troubleshooting Chart
Figure 101 (Sheet 2)

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WATER HEATER - REMOVAL/INSTALLATION

1. Remove Water Heater
   A. Open applicable LAVATORY WATER HEATER circuit breaker on panel P18-4.
   B. Open sink cabinet disposal compartment door.
   C. Turn off water heater switch.
   D. Disconnect electrical plug on compartment wall. (See figure 401.)
   E. Close lavatory 3-way drain valve.
   F. Disconnect inlet and outlet tubing. Install protective cover on inlet and outlet tubing.

      NOTE: A container will be necessary to catch any water when disconnecting water lines.

   G. Disconnect mounting clamp and remove heater.
2. Install Water Heater
   A. Place heater in position and connect mounting clamp. (See figure 401.)
   B. Connect inlet and outlet tubing.
   C. Connect electrical plug at compartment wall.
   D. Open lavatory 3-way drain valve and check for leaks.
   E. Close circuit breaker and check that water heater switch is in ON position.

      CAUTION: DO NOT APPLY POWER TO HEATER UNTIL HEATER IS COMPLETELY FILLED WITH WATER.

   F. Close sink cabinet disposal compartment door.

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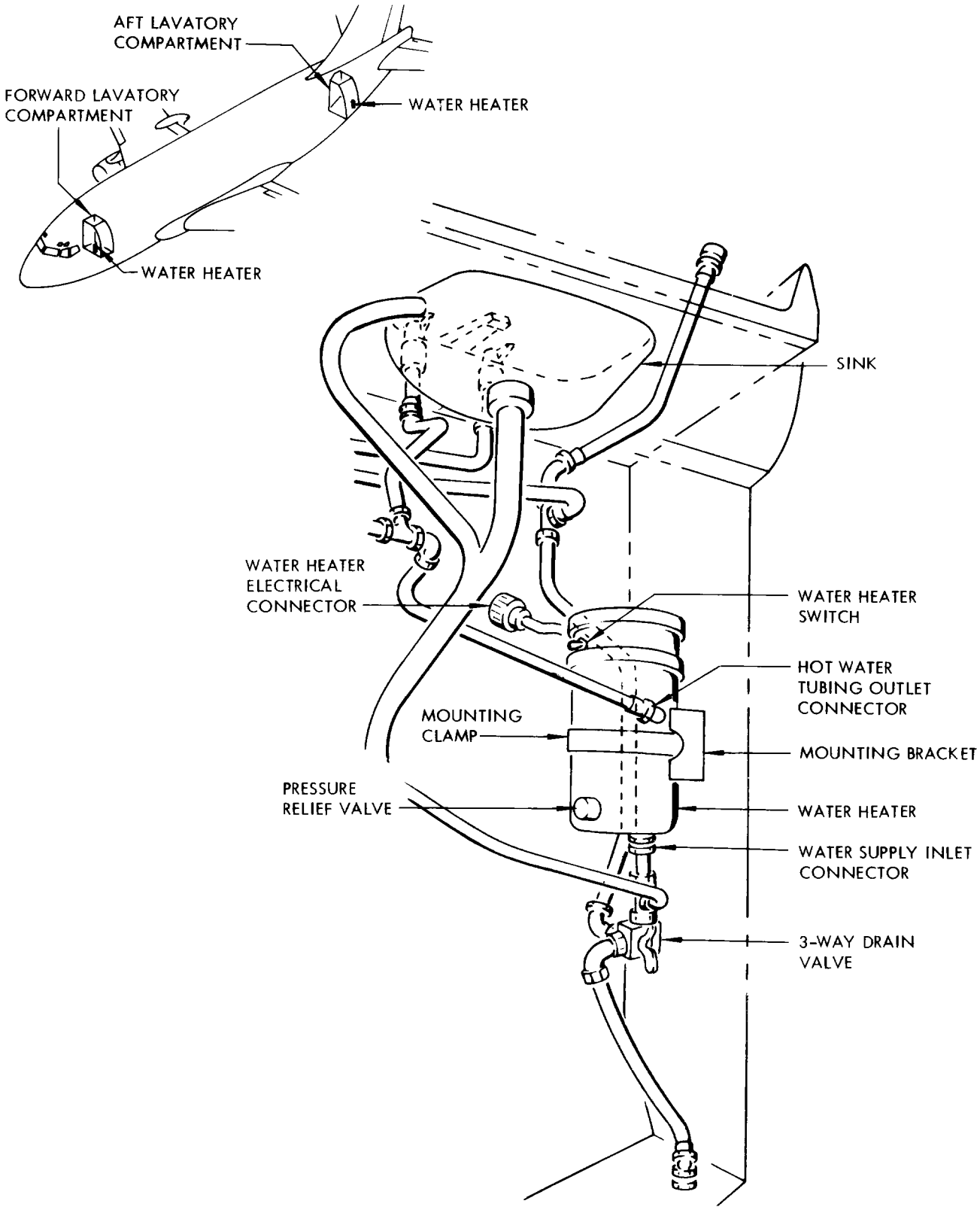

Water Heater Installation
Figure 401

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WASH BASIN - MAINTENANCE PRACTICES

1. General
   A. The washbasin faucet may be repaired to eliminate water leakage. The repair consists of replacement of the gasket and/or repair of the gasket seat.
2. Water Faucet Repair (Fig. 201)
   A. Depressurize water system by opening fill and overflow valve.
   B. Open hot and cold faucets and hold open as necessary to exhaust residual water.
   C. Remove screw, washer, and handle of leaking faucet.
   D. Remove valve from faucet body.
   E. Check valve and gaskets and gasket seats and repair or replace as necessary.
   F. Install valve with gaskets. Tighten hexnut sufficiently to tightly seat upper (larger) gasket.
   G. Install handle with washer and screw.
   H. Close fill and overflow valve, pressurize system, (Ref 38-41-0, Maintenance Practices), and check for leaks.

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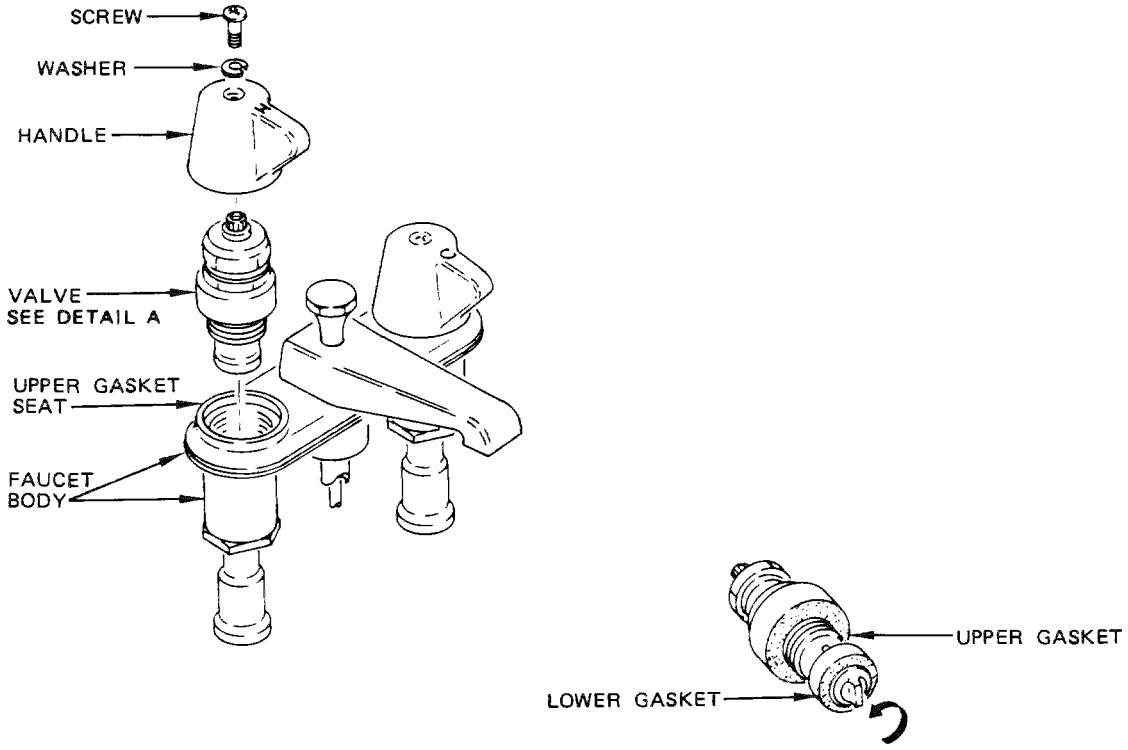

Faucet Assembly
Figure 201

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WASTE WATER SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The waste water system disposes of all waste water from the lavatory compartments. The system consists of plumbing necessary to drain the waste water into the toilet tank and moisture condensation and seepage to the toilet drain tube. (See figure 1.)
2. Lavatory Sink
   A. The lavatory sinks are mad e of stainless steel. Sink fixtures consist of spring-loaded hot and cold water valves with a common outlet, an overflow outlet, and a lever-operated stopper. The stopper is spring loaded to the closed position to reduce cabin pressure loss through the drain line.
3. Lavatory Floor Drain
   A. In some airplanes a lavatory floor drain, located under the toilet tank in the forward lavatory, is provided for draining condensation and seepage from the lavatory area. It consists of a floor drain fitting, a check valve and two plastic hoses. (See figure 2 for effectivity.) The check valve allows moisture to drain into the toilet drain tube, but prevents objectionable odors and waste from entering the lavatory compartment.
4. Waste Water Plumbing
   A. Waste water plumbing in the lavatory compartments is made of flexible plastic hose and is connected to the toilet tanks. (For specific material of any hose assembly refer to Boeing Illustrated Parts Catalog.) Sink overflow waste water passes through the overflow line and sink drain line on the way to the toilet tank.

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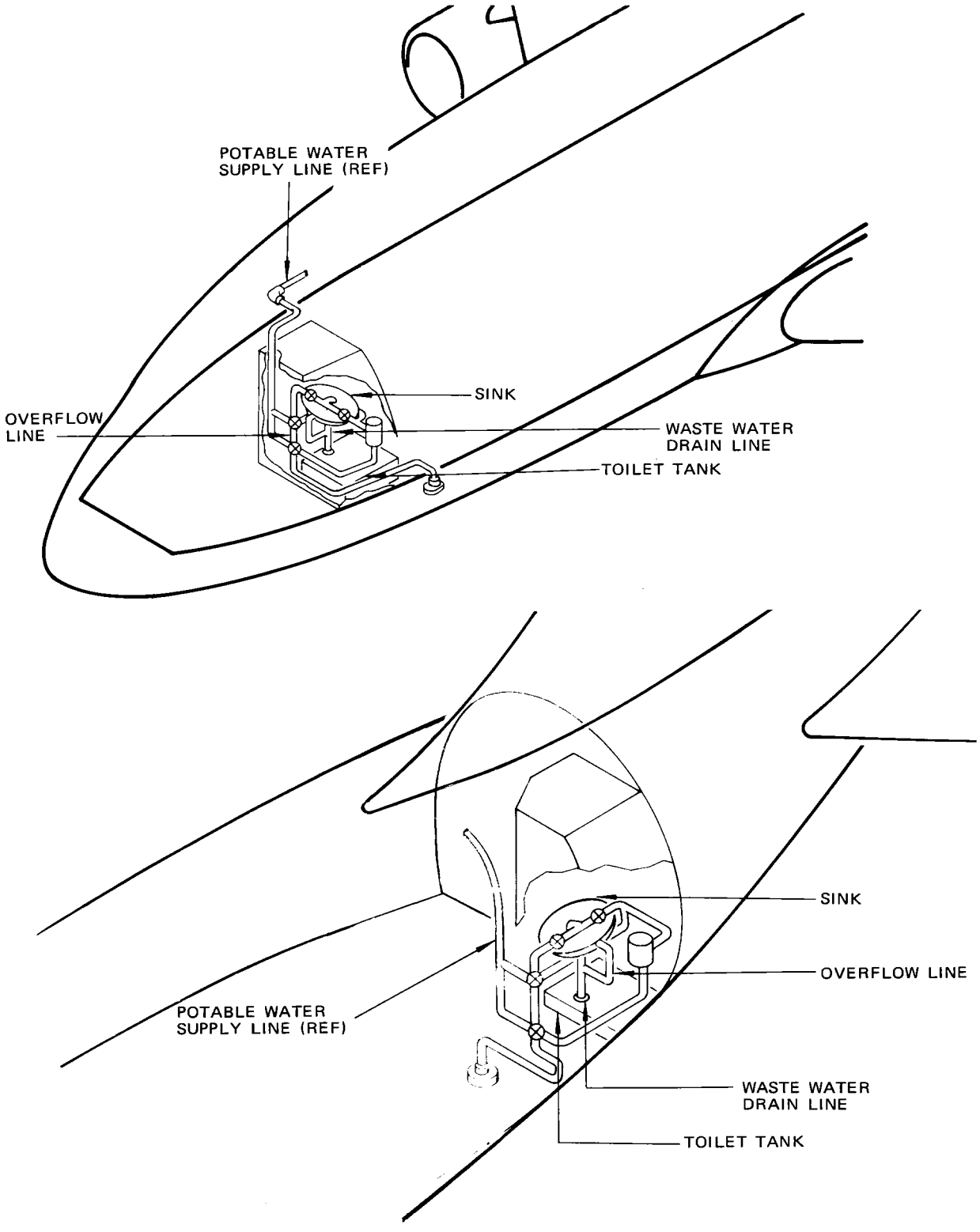

Waste Water System Components Location
Figure 1

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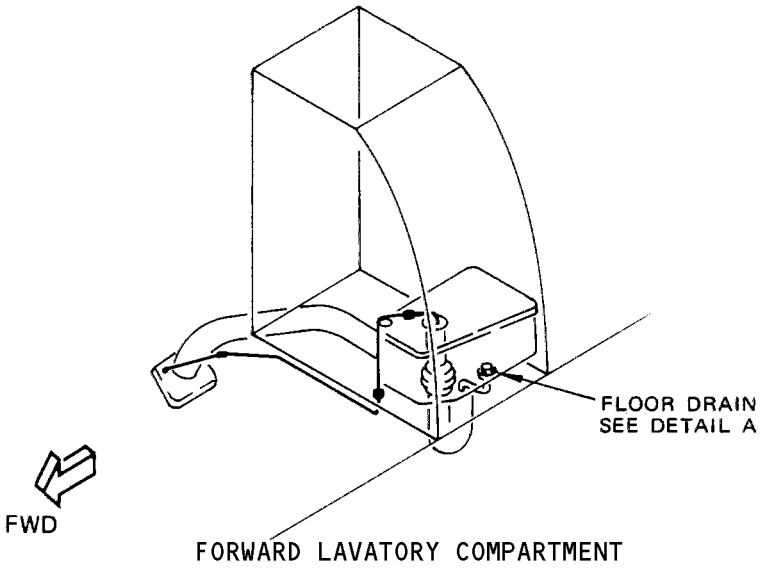
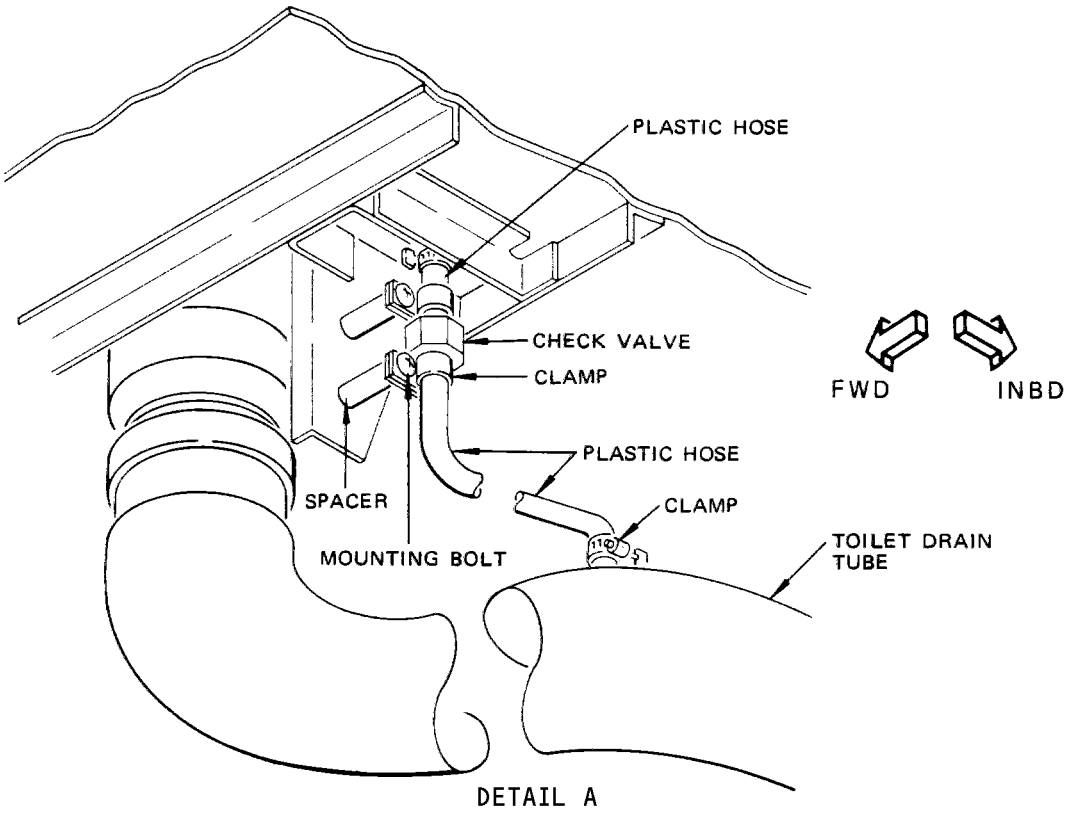
EFFECTIVITY

LV–JMW thru LV–JMZ,
LV–JTD, LV–JND, LV–JNE





Lavatory Floor Drain Location
Figure 2

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WASTE WATER - MAINTENANCE PRACTICES

1. Lavatory Sink Cabinet Drain Lines
   A. General
      (1) Water system drain lines are made of nylon tubing. Care should be exercised in handling them to avoid nicks, scrapes and abrasions.
      (2) When installing sink cabinet drain lines, ensure that line has protective sleeving.

      CAUTION: IF PROTECTIVE SLEEVING IS NOT INSTALLED, CIGARETTES, WHICH ARE OCCASIONALLY EXTINGUISHED IN LAVATORY WASTE CONTAINERS, MAY CAUSE PLASTIC DRAIN LINE TO BURN.

2. Waste Water Drain Line Unclogging
   A. General
      (1) The lavatory and galley drains are subject to clogging if debris and greasy material are introduced into the system. To prevent clogging, ensure that only freely flowing waste water is allowed into drains.
   B. Equipment
      (1) Flexible rotating cable (snake) (commercially available)
   C. Materials
      (1) Alkaline cleaner - ALTREX B (Ref 20-30-31) mixed with hot water to yield a six percent solution.
   D. Clear Blockage in Drain Line
      (1) Blockages in waste water drain lines may be cleared using one (or more) of the following methods. The method used depends upon the availability of resources at the operator's station and the suspected severity of blockage. Methods 2, 3 or 4 are suitable for lines that are lightly blocked and method 5 is recommended for heavily blocked lines.
      (2) Method 1
         (a) If blockage is located in galley drain line with drain line strainer installed below sink, remove and check strainer. Also check drain line between strainer and sink drain fitting. If OK, proceed with method 2, 3, 4 or 5 as applicable using drain tube below strainer as point of origin in lieu of sink drain fitting. Do not apply water under pressure, insert "snake", or introduce alkaline detergent to sink drain on sinks equipped with drain line strainer.
      (3) Method 2
         (a) Apply water under pressure (do not exceed 35 psi) at origin of drain line. Ensure that any connecting drains are plugged to avoid flooding during application of pressurized water.

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(4) Method 3
  (a) Insert flexible revolving cable (snake). Take care at sharp bends to avoid damage to connections; do not force, work "snake" past bend by using back and forth motion.
(5) Method 4
  (a) If line is slow in draining, fill and flush with alkaline detergent.
(6) Method 5
  (a) Remove drain line sections which are suspected to contain blockage per steps below. The first elbow fitting below sink, the lines in the vicinity of drain mast, and the "Y" sections where the lateral drain lines join the longitudinal drain lines are the most common trouble areas.
    1) For blocked section with ribbon heater installed, open applicable waste line heater circuit breaker and disconnect or remove heater as necessary (Ref 30-71-11).
    2) Remove drain line fasteners, clamps and drain line section.
    3) Remove blockage by blowing out with air and flush with alkaline detergent.
    4) Reinstall drain line section, drain line heater (Ref 30-71-11), and drain line strainer as applicable.

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TOILET SYSTEM - DESCRIPTION AND OPERATION

1. General (Fig. 1)
   A. Separate independent toilet systems are provided in the forward and aft passenger cabin. (See figure 1.) The toilet in each lavatory compartment is an electrically powered flushing unit which collects the waste material in a waste tank and combines it with the flushing agent by chemical and mechanical treatment. The unit is primed initially with no more than 3.0 gallons of a concentrated solution of disinfectant, deodorant and dye.
   B. The toilet unit is installed in each lavatory compartment entirely above the lavatory compartment floor. Each unit consists of a toilet shroud assembly, flushing components and a waste tank. (See figure 2.)
   C. Servicing components in the toilet systems allow ground draining and cleansing of the toilet units.
   D. Toilet flushing action is initiated by turning the toilet flush handle. This begins a cycle in which flushing liquid is drawn into a rotating filter and pumped through the toilet bowl flush ring into the bowl with a swirling action. Waste material and flushing liquid flow out the bottom of the bowl into the waste tank.
   E. A separator between the tank and the bowl prevents splash and vision of tank contents. Should mechanical or power failure occur, the hinged separator can be dropped allowing the toilet to be operated as a conventional static unit.
2. Toilet Shroud Assemblies (Fig. 2)
   A. Each toilet shroud assembly consists of a standard commercial seat and cover attached to a shroud which covers the flushing components mounted on the tank top. The shroud is attached to the upper and lower ends of the shroud support angles.
3. Toilet Flushing Components (Fig. 2)
   A. The flushing components include a flush handle, timer, flush motor and the required tubing. The flush motor and tubing are on the tank top. The flush handle and timer are on the cabinet aft of the toilet unit.
4. Toilet Flush Handle
   A. The flush handle is rotated to start the timer for the flushing cycle.
5. Toilet Timer
   A. The timer is mounted behind the flush handle, which must be turned 15 degrees to operate the timer.

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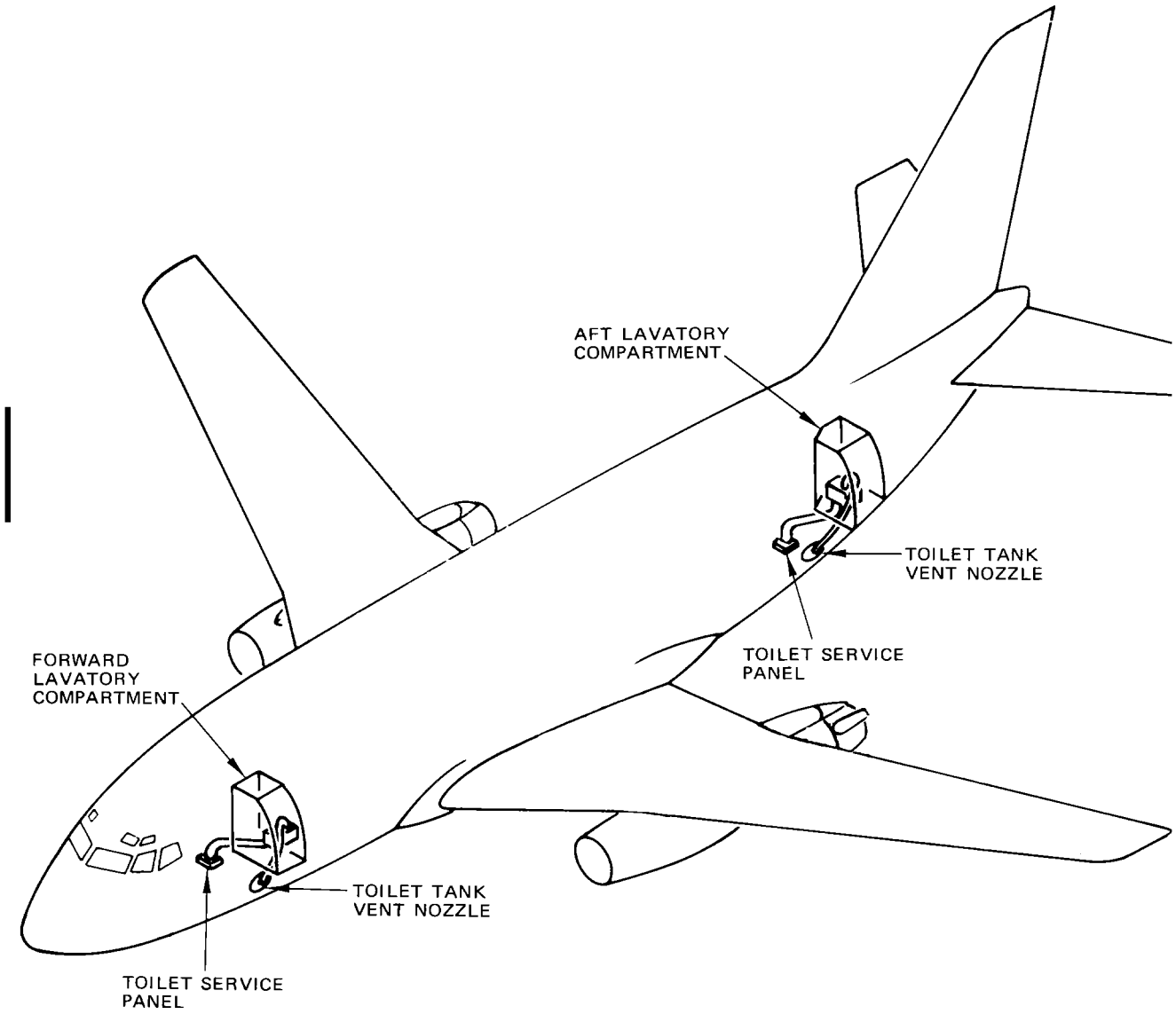

Toilet Compartment Equipment Location
Figure 1

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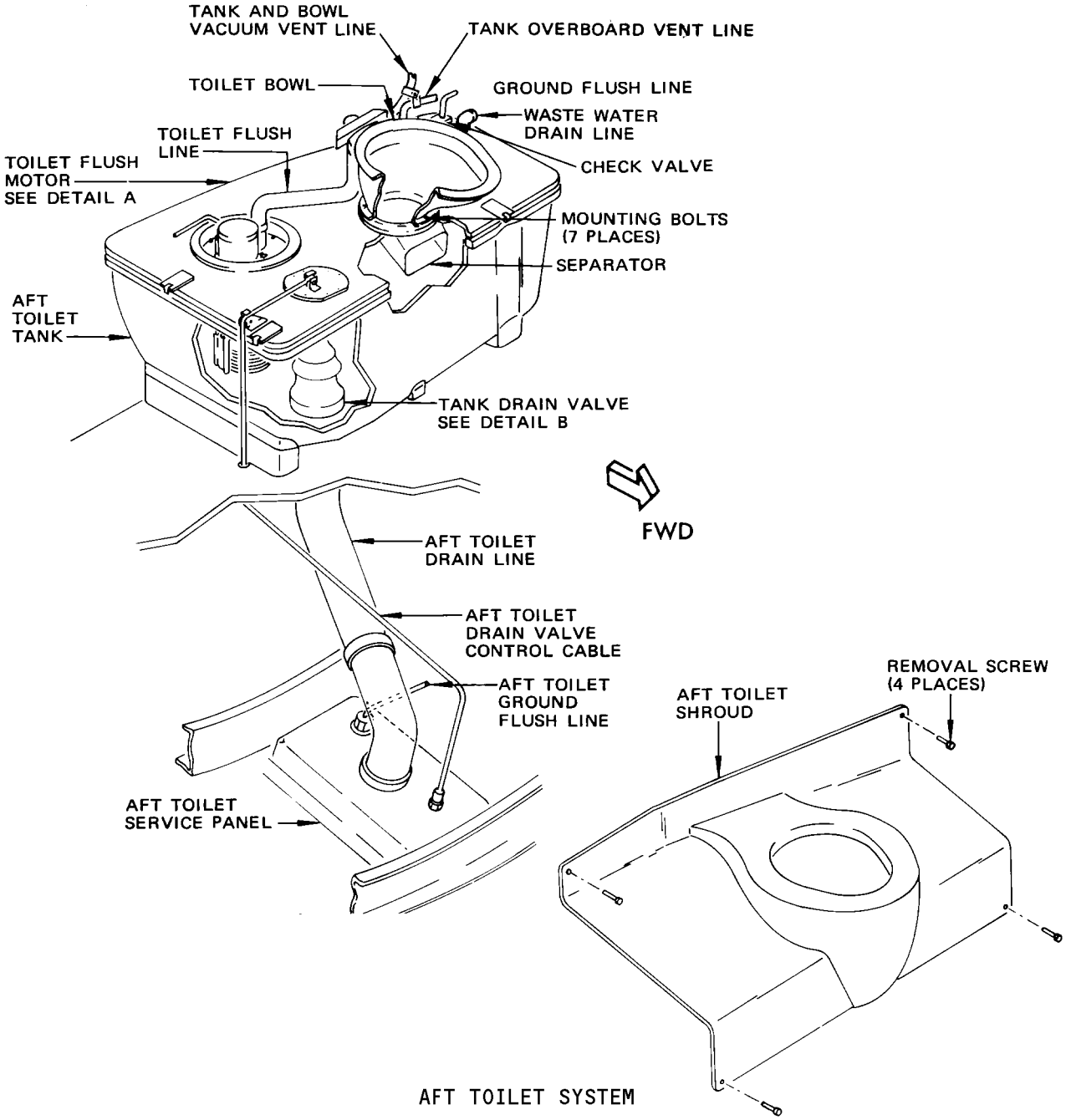

AFT TOILET SYSTEM

Toilet System
Figure 2 (Sheet 1)

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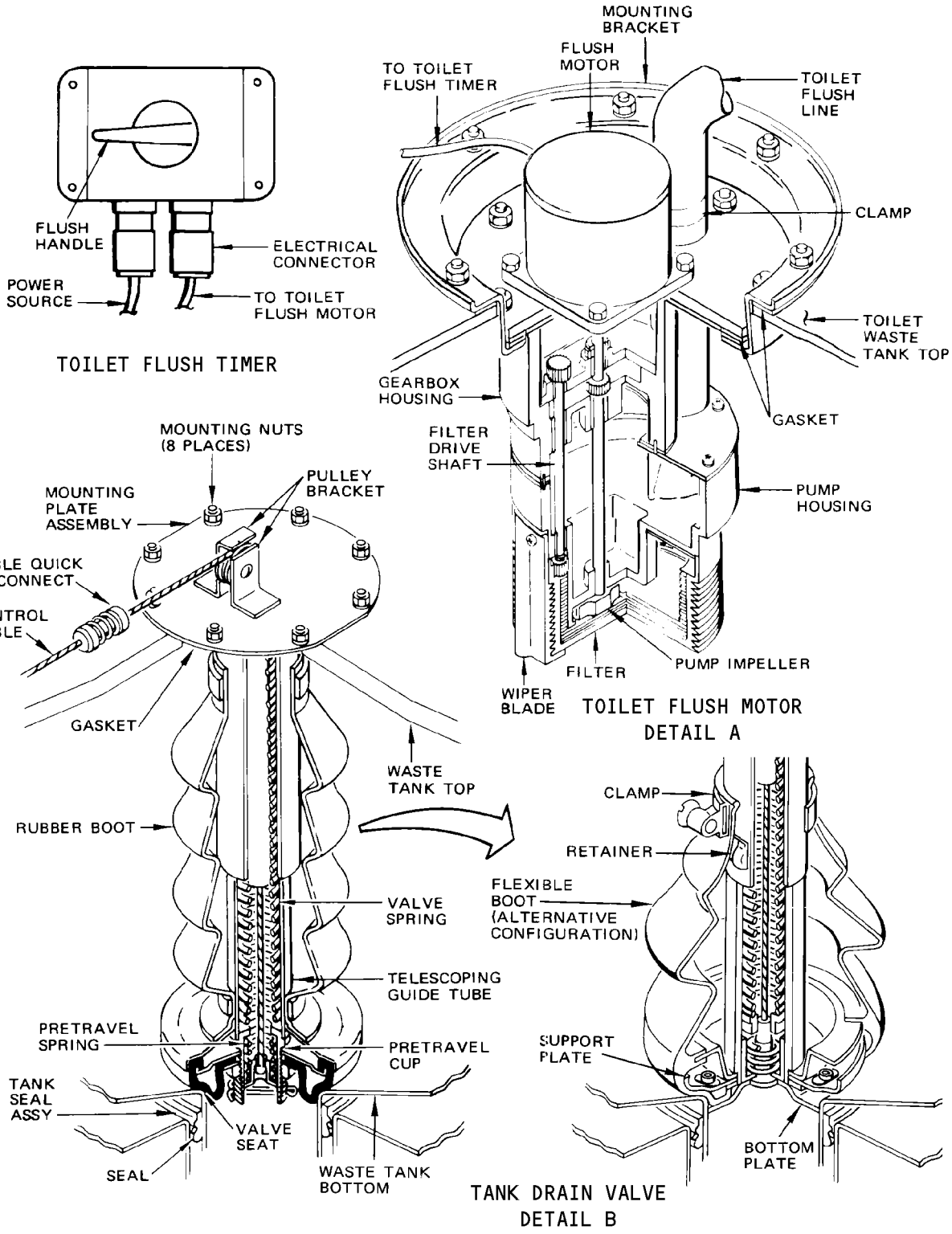

Toilet System
Figure 2 (Sheet 2)

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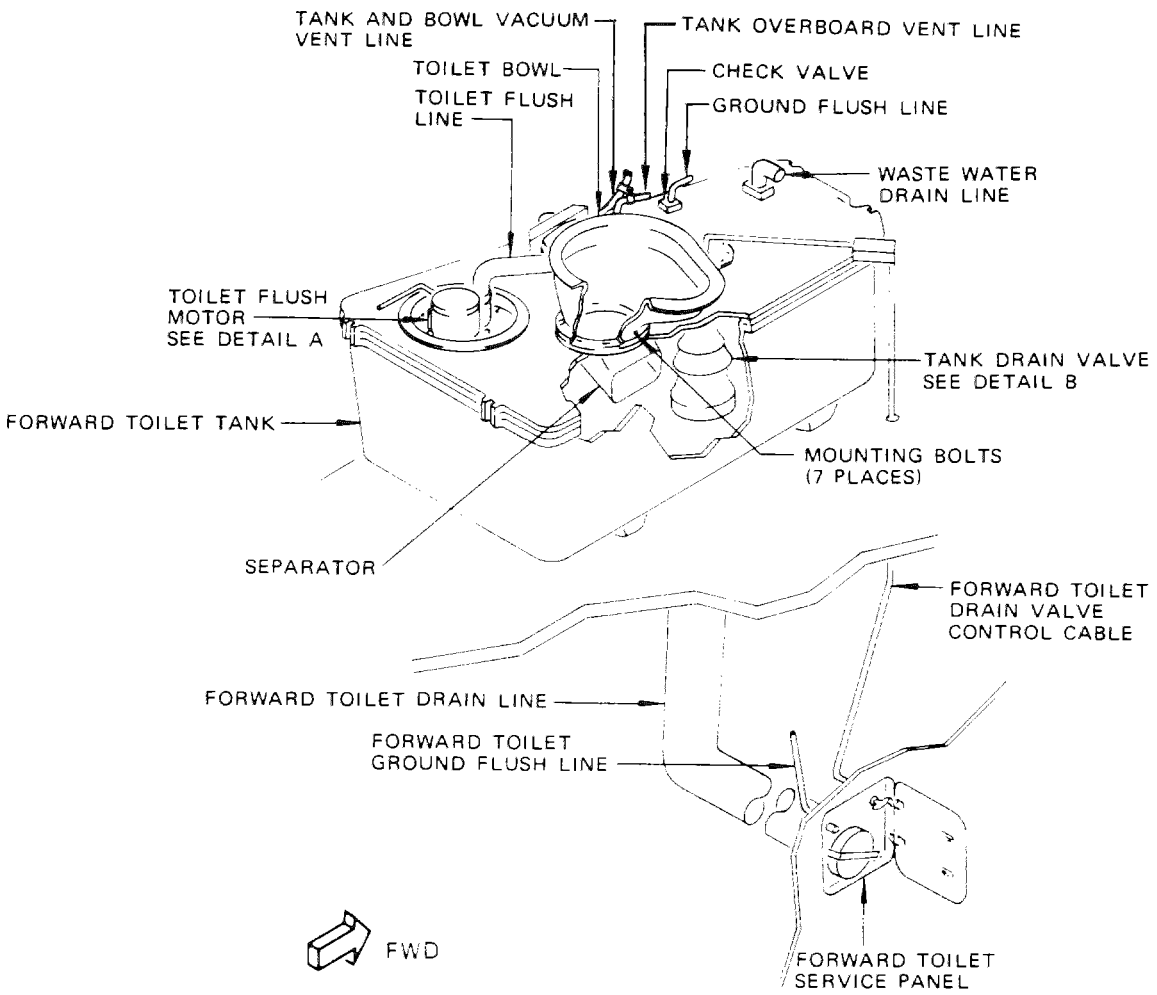

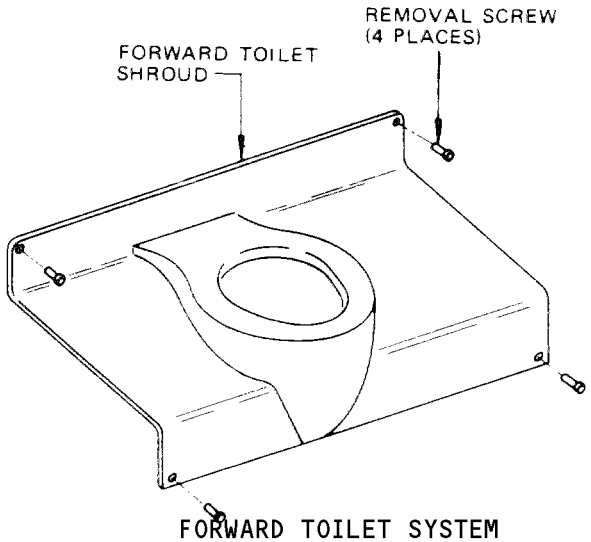

FORWARD TOILET SYSTEM

Toilet System
Figure 2 (Sheet 3)

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B. On some airplanes the timer is a mechanical unit. (See Fig. 3 for effectivity.) Rotating the flush handle winds a spring and closes a cam operated microswitch. The tensioned spring, through a clockwork system of gears causes the cam and flush handle to rotate back to the original position, opening the microswitch. This cycle provides power to the flush motor for 10 ±2 seconds.

C. On other airplanes (see Fig. 3 for effectivity), the same results are accomplished by a solid state timer operating the motor through relay switches. Both timers are interchangeable.

D. Every time the flush handle is operated, the flush motor reverses its direction of rotation relative to the previous time. On mechanical timers this is caused by a sliding cam arrangement in the timer mechanism which reverses the direction of current flow through the motor. This feature tends to prevent clogging of the filter unit.

6. Toilet Flush Motor (Fig. 2 and 3)

A. The flush motor consists of a motor, pump and filter unit assembly. This assembly is secured to the tank top by a mounting plate which is retained in position beside the toilet bowl by six mounting bolts.

(1) The motor drives the pump impeller by direct drive and rotates the filter through a reduction gear train.

(2) The filter consists of a one-piece molded part. Flushing liquid is drawn through holes into the center of the filter and up through the flush line connection into the toilet bowl. The filter is driven by the motor and as it rotates, one stationary blade cleans its outer surface.

7. Toilet Tubing

A. Tubing from the pump outlet connects to a flush ring attached to the toilet bowl. Nozzles on the flush ring direct a stream of liquid into the bowl.

8. Toilet Waste Tank

A. Each toilet waste tank assembly includes a fiberglass tank fitted with a bulb-type spring-loaded drain valve and a tank top. (See figure 2.) The capacity of the forward lavatory compartment tank is 16 gallons and the aft lavatory compartment tank 17 gallons. The drain valve is operated by a cable from the toilet service panel. A rubber gasket is placed along the top edge of the tank to form a water tight seal when the tank top is installed. The hinged separator can be dropped for access to the tank interior through the bowl.

B. The drain valve, when fully open, permits unrestricted passage of waste from the tank to a service cart. In the closed position, it forms a positive seal. It is a spring-loaded self-closing valve and does not require lubrication. It is opened by pulling a handle on its related exterior service panel. When the handle is in the extended position, it can be rotated to latch it. A toilet drain plug, which is opened by means of a control on the service cart attachment, is installed in the drain tube. This drain plug is to prevent waste, which may have accumulated in the drain tube because of a faulty drain valve, from being suddenly discharged on the ramp when the drain cap is removed.

C. The tank top is made of fiberglass. The flushing components and the toilet bowl are attached to the top. The tank top may be removed as a unit for maintenance of the flushing components.

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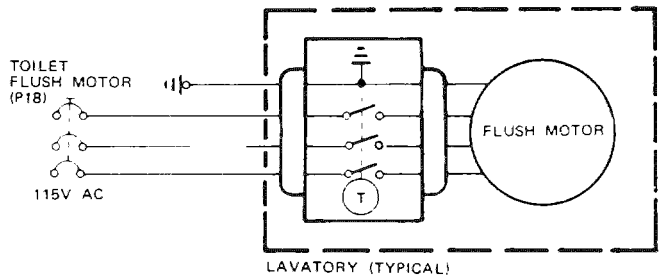
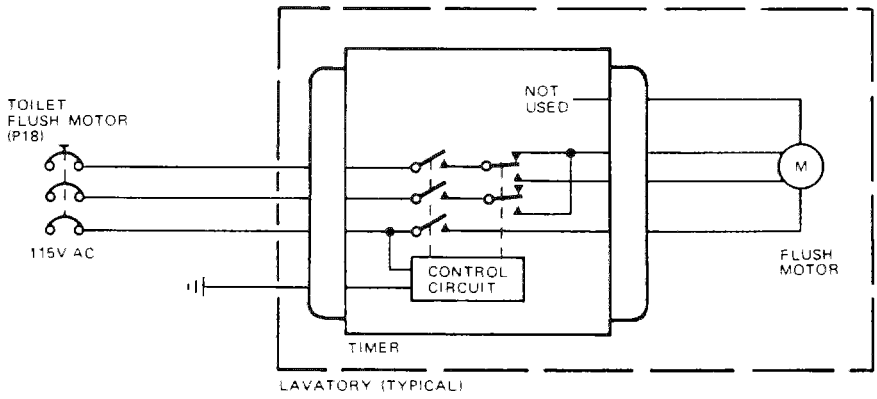


CIRCUIT DIAGRAM 1



CIRCUIT DIAGRAM 2

1 NZ ZK-NAC THRU ZK-NAE, ZK-NAJ, ZK-NAM
AH 7T-VEC, 7T-VEF, 7T-VEG
TZ CF-TAO, CF-TAN
PV CF-EPL, CF-EPO, CF-EPP, CF-EPR, CF-EPU
AR LV-JMW THRU LV-JMZ, LV-JND, LV-JNE, LV-JTD, LV-JTO, LV-LEB, LV-LIU, LV-LIV
IR EP-IRF THRU EP-IRI

2 ALL EXCEPT 1

Toilet Flushing System Circuit
Figure 3

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D. An overboard vent line is connected from the top of the tank, through a muffler, to a vent nozzle on the skin of the airplane. A lavatory compartment vent line is also connected to the muffler.

E. A vacuum vent line equalizes the pressure in the lavatory compartment, the waste tank, and the inside of the toilet bowl. Refer to Sink Cabinet Passenger Water System Components illustration, 38-11-0.

F. A cleansing spray ring beneath the tank top is connected to the ground flush line permitting flushing of the waste tank from the service panel. A normally closed ball type check valve is in the spray tube inlet fitting on the tank to prevent air leakage and prevent the possibility of waste fluid spilling into ground flush line when the waste tank is full.

9. AIRPLANES WITH FWD LAVATORY TANK OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;
Tank Overfill Sensor and Shutoff Valve.

A. A motor operated rinse/fill shutoff valve is mounted on the top of the forward lavatory toilet tank. The valve is installed in the forward lavatory tank rinse/fill line. The valve prevents an overfilled tank from receiving additional liquid that could result in flooding the lavatory compartment during toilet tank servicing. The valve also allows the tank rinse/fill line to drain after servicing and prevents liquid from siphoning out of the toilet tank during usage. The valve is activated by an overfill sensor that monitors the tank liquid level, and by the airplane ground sensing relays. On the ground, the valve closes when the overfill sensor detects a tank full condition. The valve is closed by the ground sensing relays when the airplane goes airborne. The valve is fitted with a manual override handle, permitting valve actuation in the event of electrical malfunctions. Refer to AMM 38-32-71-4 and AMM 38-32-72-4 for further details.

10. Toilet Service Panels

A. Each toilet service panel includes one 4-inch drain outlet, a flush line fitting and drain valve handle for each waste tank. The drain cap and drain fitting are anti-iced by a heater pad. Refer to Chapter 30, Toilet Drain Anti-Icing System.

B. The toilet service panels for the forward and aft toilet systems are on the right side of the airplane. The forward service panel is to the right of the nose wheel well door. The aft one is near the centerline of the airplane, forward of the APU access door.

11. Toilet Operation

A. As the flush handle is rotated 15 degrees to the stop position, the mechanical timer is wound. The timer allows 115-volt ac power to the toilet flush motor for 10 (????? 2) seconds. The flush motor operates the flush pump and through a system of gears the filter. Approximately 2 gallons of liquid is pumped through the toilet in each cycle. At the end of the cycle the motor stops and the liquid drains into the waste tank.

B. The waste tank is drained by pulling the waste drain valve handle on the toilet service panel after attaching the ground service cart to the 4-inch drain outlet and opening the toilet drain plug. The tank is cleaned by attaching water pressure to the ground flush connection. The water enters the tank through the cleansing ring, washing down the sides and draining out the bottom. (Fig. 5)

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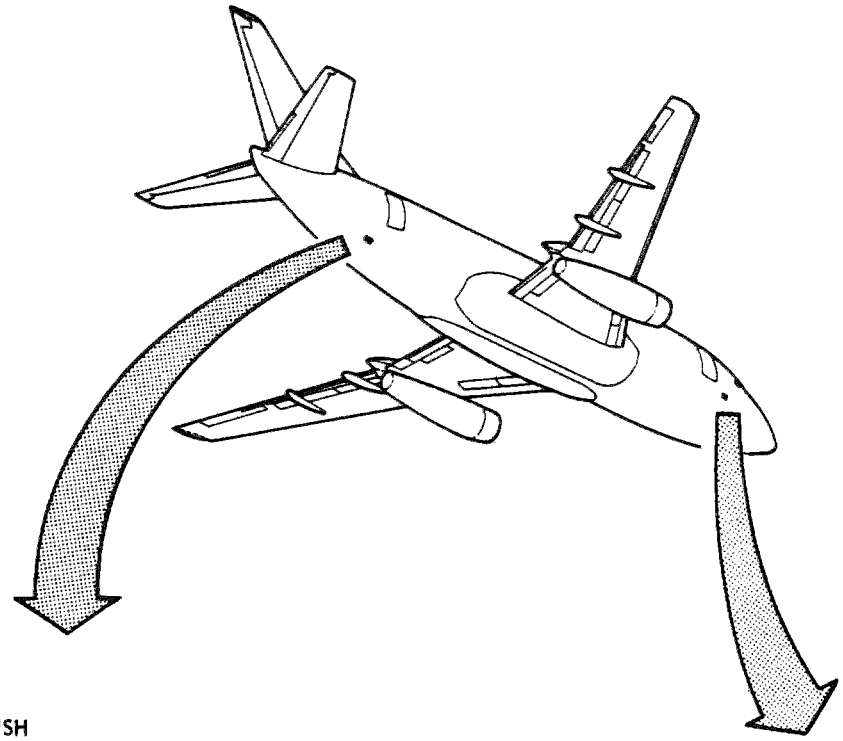
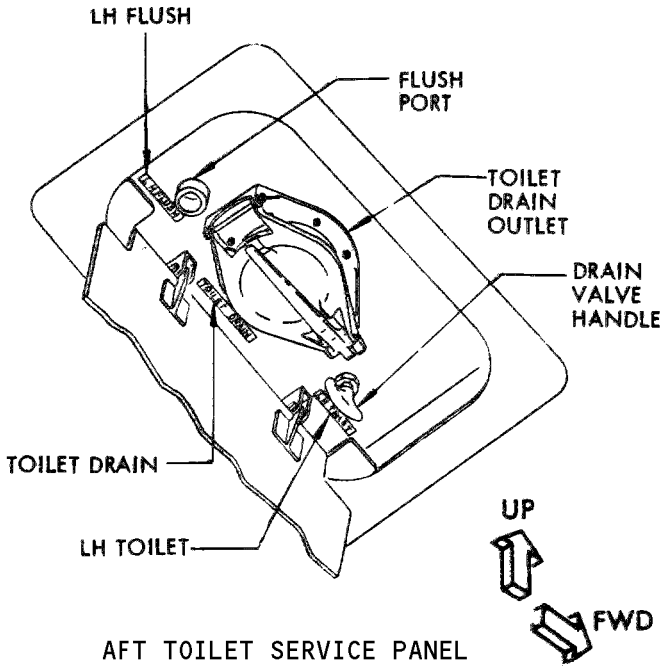
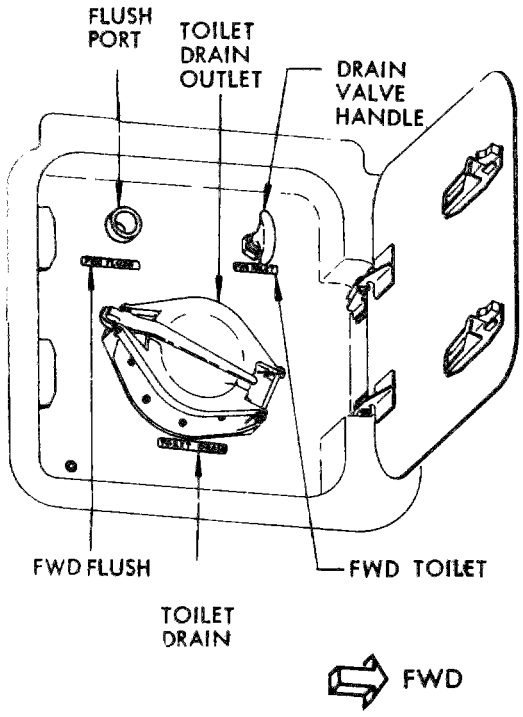




AFT TOILET SERVICE PANEL



FORWARD TOILET SERVICE PANEL

Toilet Service Panels
Figure 4

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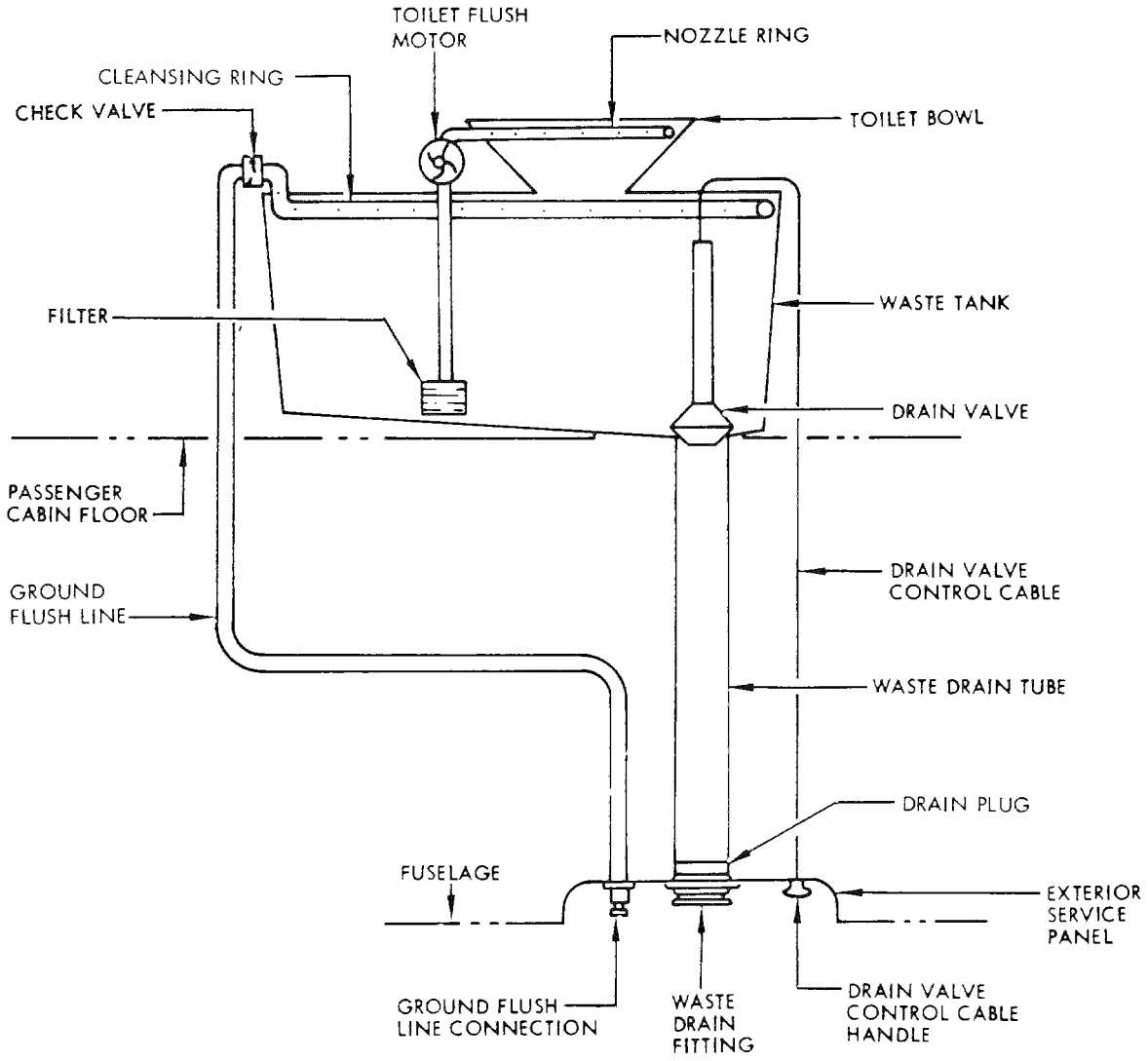

Toilet System Schematic
Figure 5

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TOILET SYSTEM - TROUBLESHOOTING

1. General
   A. These procedures apply to each toilet system. Troubleshooting of the toilet flushing system is outlined in the troubleshooting chart. Procedures for correction of problems not directly related to the flushing system are described in par. 2.

      CAUTION: WHEN TROUBLESHOOTING THE TOILET FLUSHING SYSTEM, DO NOT OPERATE THE FLUSH PUMP WHEN THE TANK IS DRY.

2. Toilet System - Troubleshooting
   A. An unpleasant odor from the toilet unit indicates improper servicing of the toilet system. To correct, drain and flush the toilet system and ensure that recommended service procedure is being followed including use of proper chemical solution.
   B. If liquids are present in the drain tube prior to opening the drain valve, a damaged or obstructed drain valve or valve seat is indicated. Remove waste tank cover and check the drain valve. If valve is obstructed, remove obstruction. If valve is damaged, replace valve. If valve seat is damaged, replace toilet tank.

      NOTE: On airplanes with floor drains, the presence of liquids in the forward toilet drain tube does not necessarily mean that the drain valve or valve seat is defective. On these airplanes, check drain valve and valve seat only if it is apparent that the liquids came from the toilet tank.

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3. Toilet Flushing System Troubleshooting Chart

TROUBLE	PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
Toilet flushes continuously	Defective timer		Replace timer
Flushing starts and stops properly, but with insufficient fluid flow	Defective tubing	Visually check flush tubing between flush motor and toilet bowl while toilet is operating. If leakage is observed in tubing or at connections, it is defective	Replace or repair defective tubing or connections
	Filter clogged	1. Open separator and visually check slots or holes. If plugged with debris, filter is clogged	Service toilet tank (AMM 12-17-0) and check flushing action again
		2. If servicing toilet tank does not clear filter debris, filter must be cleaned manually	Open separator amd use suitable rod or bent wire or long handled brush to remove debris from filter. Check flushing action again
		3. If fluid flow is still insufufficient	Remove motor-pump-filter assembly. Clean filter using steam and/or bristle brush (AMM 38-32-21)
	Defective motor-filter-pump assembly	If leakage was not observed in tubing and filter not clogged, the motor-pump-filter assembly is defective	Replace defective motor-pump-filter assembly (AMM 38-32-21)

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TROUBLE	PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
Toilet does not flush	Defective wiring	Check for power to timer and continuity of wiring between timer and flush motor. If power is not available or continuity is not present, the wiring is defective	Replace or repair defective wiring
Toilet does not flush	Defective timer	Check for continuity through timer with flush handle depressed. If continuity is not present, the timer is defective	Replace timer (AMM 38-32-11)
Toilet does not flush or flushes occasionally	Defective motor-filter-pump assembly	If the timer and wiring are not defective, the flush motor-pump-filter is defective	Replace defective motor-pump-filter assembly (AMM 38-32-21)
Toilet drain system leaking	Foreign substance between drain valve and valve seat, plug and plug seat (if installed) and/or drain tube cap and seal		Connect toilet service cart and flush system with minimum of 6 gallons of water (AMM 12-17-0)
	Drain valve and/or seat defective	Visually check valve and seat for defects	Replace defective component (AMM 38-32-31)
	Drain valve cable damaged or improperly rigged	Visually check cable for defects and proper rigging	Replace damaged cable and/or rerig as required (AMM 38-32-41)
	Drain tube plug and/or plug seat defective (if installed)	Visually check plug and seat for defects	Replace damaged plug and plug seat
	Drain tube cap and/or seal defective	Visually check drain tube cap and seal for defects	Replace damaged cap and/or seal as required

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TROUBLE	PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
*(1) Ground flush connection leaking	*(1) Check Valve defective	Disconnect flush line at toilet tank. Using non-metallic instrument, depress and release check valve several times. Verify valve closes completely with on tendency to stick or bind. Check for deformation, cracks, chips and/or buildup of chemical solids	Replace any valve which does not seat properly or provide correct directional control (AMM 38-32-31)

*(1) PRE SB 38-1045R1; FORWARD LAVATORIES. ALL AFT LAVATORIES.

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4. AIRPLANES WITH OVERFILL SENSOR AND SHUTOFF VALVE (POST-SB 38-1045);
Forward Lavatory Servicing - Troubleshooting

TROUBLE	PROBABLE CAUSE	ISOLATION PROCEDURE	REMEDY
Forward Lav. Ground flush connection leaking	V136 toilet tank fill/rinse line shutoff valve ports partially blocked or leaking	Remove flush lines from valve and examine for blockage. Check area of valve mounting for signs of leakage	Remove blockage. Replace valve adapter gasket if necessary
Toilet tank inadvertantly overflowed	T459 toilet tank level sensor defective	Examine for 115V ac between pins 1 and 3 on plug to valve. If 115V ac not present, sensor is defective	Replace defective sensor
	V136 shutoff valve defective	If 115V ac is present in above check, the valve is defective	Replace defective valve
Toilet tank cannot be filled during servicing	Tank full from previous flight	Examine the tank level through the toilet bowl separator	Drain tank
	Ground Sensing Relay at Landing Gear Accy. Unit Module, E3-2 Electronics Shelf, defective	Examine for 28V dc between pin 9 and pin 4 on plug to T459 sensor. If 28V dc is not present, the relay is defective	Troubleshoot defective relay (AMM32-09-100/501)
	T459 sensor defective	Remove plug from V136 valve and check for 115V ac between pins 2 and 3. If 115V ac is not present, the sensor is defective	Replace sensor
	V136 shutoff valve defective	If 115V ac is present in the above check, the V136 rinse/fill shutoff valve is defective	Replace the V136 rinse/fill shutoff valve

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TOILET SYSTEM - MAINTENANCE PRACTICES

1. General
   A. This procedure supplies instructions to perform the following tasks:
      (1) Toilet waste blockage removal (forward lavatory).
      (2) Toilet waste blockage removal (aft lavatory).
   B. This section supplies the procedure to perform when a blockage of the toilet waste drain has occurred.
   C. When a blockage to the waste system of a toilet occurs, it is possible that toilet flush/waste liquid can spill inside the airplane. If this situation should occur, all signs of contamination must be removed immediately and the areas of contamination fully cleaned and disinfected (AMM 05-51-12).
   D. In extreme cold conditions, the toilet fluid can freeze. If a blockage to the toilet system should occur, extreme cold weather could be the cause.
   E. A blockage of the toilet system can occur in the following areas:
      (1) Forward lavatory
      (2) E/E compartment
      (3) Aft lavatory(s)
      (4) Aft cargo compartment equipment bay
2. Toilet Waste Blockage Removal (Forward Lavatory)
   A. General
      (1) This inspection procedure is to be accomplished when a blockage occurs to the waste drain of the forward toilet system.
      (2) This inspection procedure is for the forward toilet system.
   B. References
      (1) AMM 12-17-0, Toilet Servicing
      (2) AMM 12-40-0, Cleaning and Washing
      (3) AMM 20-30-51, Miscellaneous Materials
      (4) AMM 38-32-0, Toilet System
      (5) AMM 38-32-0, Toilet System - Cleaning/Painting
      (6) AMM 38-32-21, Toilet Flush Motor Assembly
      (7) AMM 38-32-22, Toilet Filter
      (8) AMM 38-32-31, Toilet Drain Valve(s)
      (9) AMM 38-32-41, Toilet Drain Valve Control Cable
      (10) AMM 38-32-51, Toilet Waste Tank
      (11) AMM 51-31-0, Seals and Sealing
      (12) AMM 52-48-41, E/E Compartment Door
   C. Equipment
      (1) Maintenance Stand
   D. Consumable Materials
      (1) Brush, drain, extendable (4-inch) - Commercially available
      (2) Brush, soft-bristle - Commercially available
      (3) G01043 Cloth, lint-free
      (4) G00027 Cheesecloth

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(5) B00051 Disinfectant - Deodorizer Lysol
(6) G00000 Gloves - Disposable
(7) G00000 Shop Coat - Disposable
(8) G00000 Mask, face - Disposable
(9) G01915 Glasses - Safety

E. Access
(1) Location Zones 103 Forward Lavatory (A) 205 E/E Compartment
(2) Access Panels 1104 Forward Toilet Service Panel 1201 E/E Compartment Door

F. Procedure
(1) If there is a bad localized smell in the airplane, fully ventilate the area in an effort to stop the spread of contamination.
(2) Open the E/E compartment door for access (AMM 52-48-41).
(3) Open the forward toilet service panel.
(4) Position the maintenance stand under the E/E compartment and install a strong light source inside the compartment.
(5) Open this circuit breaker on the load control center panel, P18, and attach a DO-NOT-CLOSE tag:
(a) Applicable lavatory flush motor circuit breaker.
(6) Connect the service cart to the forward toilet service panel and perform the procedure to drain the toilet system (AMM 12-17-0).

NOTE: Try to drain the system only. Do not complete a full service of the toilet system.

(a) On the forward toilet service panel, perform the following applicable step(s):
1) Ensure the drain plug is removed on the service panels without levers for the flapper valve.
2) Ensure the OPEN lever is set so that the flapper valve is open on service panels with OPEN/CLOSE levers.
3) Ensure that the toilet tank drain valve handle is extended and locked in the open position.
(7) In the forward lavatory, open the separator in the lavatory bowl and check for toilet flush/waste liquid in the toilet tank.
(8) If the toilet tank has not drained and appears to be blocked, accomplish these steps:
(a) In the E/E compartment, make sure the toilet tank drain valve control cable is correctly installed (AMM 38-32-41).

NOTE: The cable tension should show the toilet tank drain valve is in the open position.

(b) At the forward toilet service panel, accomplish these steps:
1) Release and push in the toilet tank drain valve handle to close the toilet tank drain valve.

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2) Pull and push on the toilet tank drain valve handle several times quickly to open and close the toilet tank drain valve.
3) Pull on the toilet tank drain valve handle and lock in the open position.

CAUTION: DO NOT TRY TO CLEAR TOILET TANK BLOCKAGES BY THE USE OF UNAUTHORIZED SHARP OR POINTED TOOLS. DAMAGE CAN BE CAUSED TO THE PROTECTIVE RUBBER BOOT ON THE DRAIN VALVE AND PREVENT THE CORRECT OPERATION OF THE VALVE.

(c) In the forward lavatory, open the separator in the lavatory bowl and very carefully use a long handle brush to clear possible blockages at the drain outlet of the tank.

NOTE: The brush must have a round head and soft bristles to prevent possible damage to the rubber boot on the drain valve.

(d) If the blockage in the toilet drain tube has not cleared, continue with this procedure.

(9) In the forward toilet, remove the toilet tank shroud assembly using the procedure to remove the toilet waste tank (AMM 38-32-51).
(10) Use polyethylene sheeting in the forward lavatory area to prevent the possibility of contamination if toilet waste is spilled.
(11) Remove the toilet drain valve (AMM 38-32-31).
(12) Remove the blockage as follows:
(a) Insert the flexible, extendable drain brush through the tank drain valve access hole.
(b) Slowly and carefully push the drain brush into the 4-inch toilet tank drain tube.
(c) Slowly and with the minimum force necessary, move the drain brush down the drain tube until the blockage is clear.
(d) Flush water into the toilet tank and make sure the blockage has been fully removed.
(e) Stop the flush water and remove the flexible drain brush.
(f) Use the long handle brush to clean the toilet tank drain valve seat inside the toilet tank.

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(13) If you cannot free the blockage in the toilet drain tube, you must make an assessment of where the blockage is to be found and replace the drain tube as applicable.

NOTE: If the removal of the toilet drain tube is necessary, ensure you take full precautions to prevent blue water contamination of local area. It is recommended to use suction methods to remove waste from the drain tube before removal.

(14) Perform an inspection of the toilet drain valve (AMM 38-32-31).
(15) Install the toilet drain valve (AMM 38-32-31).
(16) Clean all contaminated areas with an approved disinfectant to kill all harmful micro-organisms and remove bad smells.
(17) Install the toilet shroud in the forward lavatory using the procedure to install the toilet waste tank (AMM 38-32-51).
(18) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the load control center panel, P18:
(a) Applicable lavatory flush motor circuit breaker.
(19) Accomplish the toilet tank cleaning procedure (AMM 38-32-0).

G. Return the airplane to its usual condition
(1) Accomplish the forward toilet servicing procedure (AMM 12-17-0).
(2) Remove all tools and equipment from the work area.
(3) Close the forward toilet service panel.
(4) Close the E/E compartment door (AMM 52-48-41).

3. Toilet Waste Blockage Removal (Aft Lavatory)
A. General
(1) This inspection procedure is to be accomplished when a blockage occurs to the waste drain in the aft toilet system.
(2) This inspection procedure is for a toilet system with one aft lavatory installed.
(3) For operators with more than one lavatory installed in the aft toilet system, the inspection procedure is the same and is to be repeated on each additional lavatory installation.

B. References
(1) AMM 12-17-0, Toilet Servicing
(2) AMM 12-40-0, Cleaning and Washing
(3) AMM 20-30-51, Miscellaneous Materials
(4) AMM 38-32-0, Toilet System
(5) AMM 38-32-0, Toilet System - Cleaning/Painting
(6) AMM 38-32-21, Toilet Flush Motor Assembly
(7) AMM 38-32-22, Toilet Filter
(8) AMM 38-32-31, Toilet Drain Valve
(9) AMM 38-32-41, Toilet Drain Valve Control Cable
(10) AMM 38-32-51, Toilet Waste Tank
(11) AMM 51-31-0, Seals and Sealing
(12) AMM 52-48-41, Aft Cargo Compartment Door

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C. Equipment
   (1) Maintenance Stand
D. Consumable Materials
   (1) Brush, drain, extendable (4-inch) - Commercially available
   (2) Brush, soft-bristle - Commercially available
   (3) GO1043 Cloth, lint-free
   (4) GOOO27 Cheesecloth
   (5) BOOO51 Disinfectant - Deodorizer Lysol
   (6) GOOOOO Gloves - Disposable
   (7) GOOOOO Shop Coat - Disposable
   (8) GOOOOO Mask, face - Disposable
   (9) GO1915 Glasses - Safety
E. Access
   (1) Location Zones 109 Aft Lavatory (E) 113 Aft Lavatory (B) 114 Aft Lavatory (C) 118 Aft Lavatory (D) 218 Aft Cargo Compartment 220 Aft Cargo Compartment Equipment Bay
   (2) Access Panels 1104 Aft Toilet Service Panel 4504 Aft Cargo Compartment Door
F. Procedure
   (1) If there is a bad localized smell in the airplane, fully ventilate the area in an effort to stop the spread of contamination.
   (2) Open the aft toilet service panel.
   (3) Open the aft cargo compartment door for access.
   (4) Remove the access panel from the rear bulkhead of the aft cargo compartment.
   (5) Open this circuit breaker on the load control center panel, P18, and attach a DO-NOT-CLOSE tag:
      (a) Applicable lavatory flush motor circuit breaker.
   (6) Connect the service cart to the aft toilet service panel and perform the procedure to drain the toilet system (AMM 12-17-0).

      NOTE: Try to drain the system only. Do not complete a full service of the toilet system.

      (a) On the aft toilet service panel, ensure the toilet tank drain valve handle is extended and locked in the open position (for example: R.H. AFT TOILET).
   (7) In the aft lavatory, open the separator in the lavatory bowl and check for toilet flush/waste liquid in the toilet tank.

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(8) If the toilet tank has not drained and appears to be blocked, accomplish the following steps:
   (a) In the aft cargo compartment equipment bay, make sure the toilet tank drain valve control cable is correctly installed (AMM 38-32-41).

      NOTE: The cable tension should show the toilet tank drain valve is in the open position.

   (b) At the aft toilet service panel, perform these steps:
      1) Release and push in the toilet tank drain valve handle to close the toilet tank drain valve (for example: R.H. AFT TOILET).
      2) Pull and push on the toilet tank drain valve handle several times quickly to open and close the toilet tank drain valve.
      3) Pull on the toilet tank drain valve handle and lock in the open position.

         CAUTION: DO NOT TRY TO CLEAR TOILET TANK BLOCKAGES BY THE USE OF UNAUTHORIZED SHARP OR POINTED TOOLS. DAMAGE CAN BE CAUSED TO THE PROTECTIVE RUBBER BOOT ON THE DRAIN VALVE AND PREVENT THE CORRECT OPERATION OF THE VALVE.

   (c) In the aft lavatory, open the separator in the lavatory bowl and very carefully use a long handle brush to clear possible blockages at the drain outlet of the tank.

      NOTE: The brush must have a round head and soft bristles to prevent possible damage to the rubber boot on the drain valve.

   (d) If the blockage of the toilet drain tube has not cleared, continue with this procedure.
(9) In the aft toilet, remove the toilet tank shroud assembly using the procedure to remove the toilet waste tank (AMM 38-32-51).
(10) Use polyethylene sheeting in the aft lavatory area to prevent the possibility of contamination if toilet waste is spilled.
(11) Remove the toilet drain valve (AMM 38-32-31).
(12) Remove the blockage as follows:
   (a) Insert the flexible, extendable drain brush through the tank drain valve access hole.
   (b) Slowly and carefully push the drain brush into the 4-inch toilet tank drain tube.

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(c) Slowly and with the minimum force necessary, move the drain brush down the drain tube until the blockage is clear.
(d) Flush water into the toilet tank and make sure the blockage has been fully removed.
(e) Stop the flush water and remove the flexible drain brush.
(f) Use the long handle brush to clean the toilet tank drain valve seat inside the toilet tank.

(13) If you cannot free the blockage in the toilet drain tube, you must make an assessment of where the blockage is to be found and replace the drain tube as applicable.

NOTE: If the removal of the toilet drain tube is necessary, ensure you take full precautions to prevent blue water contamination of local area. It is recommended to use suction methods to remove waste from the drain tube before removal.

(14) Perform an inspection of the toilet drain valve (AMM 38-32-31).
(15) Install the toilet drain valve (AMM 38-32-31).
(16) Clean all contaminated areas with an approved disinfectant to kill all harmful micro-organisms and remove bad smells.
(17) Install the toilet shroud in the aft lavatory using the procedure to install the toilet waste tank (AMM 38-31-51).
(18) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the load control center panel, P18:
(a) Applicable lavatory flush circuit breaker
(19) Accomplish the toilet tank cleaning procedure (AMM 38-32-0).

G. Return the airplane to its usual condition
(1) Accomplish the aft toilet servicing procedure (AMM 12-17-0).
(2) Remove all tools and equipment from the work area.
(3) Close the aft toilet service panel.
(4) Install the access panel at the rear bulkhead of the aft cargo compartment equipment bay.
(5) Close the aft cargo compartment door (AMM 52-48-41).

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TOILET SYSTEM - ADJUSTMENT/TEST

1. General
   A. This test is provided to verify toilet component installation. The following procedures check the toilet installation for leaks and verify flushing component operation.
   B. There are three pressure test methods available at the discretion of the operator for testing the toilet system for leaks.
      (1) By use of the airplane cabin pressurization system paragraph 4. below: applicable to both the FWD and AFT toilet drain caps.
      (2) By using this Vacuum Test Fixture (F73010-27) paragraph 5. below; applicable to the FWD toilet service panel only.
      (3) By using this Vacuum Test Fixture (G38005) paragraph 6. below; applicable to both the FWD and AFT toilet service panels with the proper adapter.
2. Equipment and Materials
   A. Toilet service cart
   B. Y-Fitting - Roylyn Part No. 2651-133; Roylyn Inc., Glendale, CA
   C. Drain line plug - Kaiser Aerospace and Electronics Corp., Part No. 4259-20 or equivalent; Orange County Plant, 17000 S. Red Hill Ave., Ervine, CA
   D. Vacuum Test Fixture - Part No. F73010-27, with vacuum source, gage and vacuum relief valve (Fig. 501)
   E. Vacuum Test Fixture - Part No. G38005, with vacuum source, gage, vacuum relief valve and the correct adapter for the FWD or AFT toilet service panel (Fig. 501)
   F. High vacuum grease, Dow Corning or equivalent
   G. Solvent, cleaning, commercial
   H. Sealant, putty, commercial
3. Test Toilet System for Leaks

   NOTE: This procedure covers the test of a single toilet, and it assumes that the toilet is empty, having been previously drained and flushed.

   A. Open the applicable FLUSH MOTOR circuit breaker on panel P18.

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B. AIRPLANES WITH FWD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;

Supply External or APU Generator Power to the buses (AMM 24-22-0/201) if you are testing the forward lavatory .

NOTE: The necessary airplane power must be supplied for the overfill/shutoff protection system to operate. Electric power is not available to the overfill sensor at the ground service bus. If it is not practical to supply electric power use the procedure, Manual Operation of the Toilet Tank Rinse/Fill Shutoff Valve (AMM 12-17-0/201).

C. Remove the toilet shroud to get access to the toilet tank.
D. Open the access door for the toilet service panel.
E. Make sure that the toilet tank drain valve handle on the toilet service panel is in the fully closed position (pushed in).
F. Open the toilet drain cap on the toilet service panel.

WARNING: IF COVERAGE IS NOT USED, LEAKAGE WILL OCCUR AROUND THE TOILET TANK DUMP VALVE CABLE

G. Use sufficient amount of towels to wrap around the toilet tank dump valve cable.
H. Do the applicable steps which follow:
   (1) AIRPLANES WITH TOILET DRAIN CAP ASSY P/N 2651-269-( ) OR 2651-232-( ); Do these steps:
      (a) Make sure the drain line plug (p/n 4259-20, -31) is installed in the waste drain fitting on the toilet service panel.
      (b) Connect the lavatory drain coupling (Y-fitting p/n 2651-133) to the waste drain fitting on the toilet service panel and to the waste drain hose connected to a toilet service cart.
      (c) Operate the T-handle on the lavatory drain coupling to remove the drain line plug (T-handle pulled out) from the waste drain fitting.
      (d) Disconnect the lavatory drain coupling from the waste drain fitting.
   (2) AIRPLANES WITHOUT TOILET DRAIN CAP ASSY P/N 2651-269-( ) OR 2651-232-( ); Do these steps:
      (a) Connect the lavatory drain coupling to the waste drain fitting on the toilet service panel and to the waste drain hose connected to a toilet service cart.
      (b) Operate the control lever on the toilet service panel to open the flapper valve.
      (c) Disconnect the lavatory drain coupling from the waste drain fitting.
I. Connect the water supply hose from the toilet service cart to the flush line fitting on the toilet service panel.
J. Pump water into the toilet tank through the flush line fitting until the toilet tank is about 3/4 full.

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K. Make sure no water leaks past the toilet tank drain valve out through the waste drain fitting.
L. Continue to pump water into the toilet tank until the toilet bowl is 1/2 full.
M. Disconnect the flush line hose from the check valve on the toilet tank.
N. Make sure no water leaks past the check valve.
O. Make sure no water leaks out of the top of the toilet tank and around the outside of the toilet bowl.
P. Make sure no water leaks past the toilet tank drain valve out through the waste drain fitting.
Q. Re-connect the flush line hose to the check valve on the top of the toilet tank.
R. AIRPLANES WITH FORWARD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;
Connect the water supply hose from the toilet service cart to the flush line fitting on the toilet service panel.

(1) Pump water into the forward lavatory toilet tank until the rinse/fill shutoff valve closes.
(2) Make sure no water leaks past the toilet tank drain valve out through the waste drain fitting. If there are leaks repair or replace the toilet tank drain valve (AMM 38-32-31/401).
(3) Add water through the forward lavatory toilet bowl until the toilet bowl is one half full.
(4) Disconnect the forward lavatory flush line hose from the rinse/fill shutoff valve on the toilet tank.
(5) Make sure no water leaks past the rinse/fill shutoff valve. If there are leaks repair or replace the rinse/fill shutoff valve (AMM 38-32-72/401). Do the test again.
(6) Re-connect the flush line hose to the rinse/fill shutoff valve.

S. Do the applicable steps which follow:
(1) AIRPLANES WITH TOILET DRAIN CAP ASSY P/N 2651-269-( ) OR 2651-232-( ); Do these steps:
(a) Connect the lavatory drain coupling to the waste drain fitting on the toilet service panel.
(b) Operate the T-handle on the lavatory drain coupling to install the drain line plug into the waste drain fitting.
(c) Disconnect the lavatory drain coupling from the waste drain fitting.
(2) AIRPLANES WITHOUT TOILET DRAIN CAP ASSY P/N 2651-269-( ) OR 2651-232-( ); Do these steps:
(a) Connect the lavatory drain coupling to the waste drain fitting on the toilet service panel and to the waste drain hose connected to a toilet service cart.
(b) Operate the control lever on the toilet service panel to close the flapper valve.
(c) Disconnect the lavatory drain coupling from the waste drain fitting.

T. Pull the toilet tank drain valve handle on the toilet service panel to the fully open position.

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U. Do the applicable steps which follow:
   (1) AIRPLANES WITH TOILET DRAIN CAP ASSY P/N 2651-269-( ) OR 2651-232-( ); Do these steps:
      (a) Make sure no water leaks past the drain line plug out through the waste drain fitting.
      (b) Connect the lavatory drain coupling to the waste drain fitting on the toilet service panel.
      (c) To drain the water into the toilet service cart, operate the T-handle on the lavatory drain coupling to remove the drain line plug (T-handle pulled out) from the waste drain fitting.
   (2) AIRPLANES WITHOUT TOILET DRAIN CAP ASSY P/N 2651-269-( ) OR 2651-232-( ); Do these steps:
      (a) Make sure no water leaks out past the flapper valve out through the waste drain fitting.
      (b) Connect a waste drain hose to the waste drain fitting on the toilet service panel and to a toilet service cart.
      (c) To drain the water into the toilet service cart, operate the control lever on the toilet service panel to open the flapper valve.

V. Wait for the water to drain completely.

W. Do the applicable steps which follow:
   (1) AIRPLANES WITH TOILET DRAIN CAP ASSY P/N 2651-269-( ) OR 2651-232-( ); Do these steps:
      (a) Operate the T-handle on the lavatory drain coupling to install the drain line plug into the waste drain fitting (T-handle pushed in).
      (b) Disconnect the lavatory drain coupling from the waste drain fitting.
   (2) AIRPLANES WITHOUT TOILET DRAIN CAP ASSY P/N 2651-269-( ) OR 2651-232 ( ); Do these steps:
      (a) Operate the control lever on the toilet service panel to close the flapper valve.
      (b) Disconnect the waste drain hose from the waste drain fitting on the toilet service panel.

X. Close the toilet drain cap on the toilet service panel.

Y. Disconnect the water supply hose from the flush line fitting on the toilet service panel.

Z. Close the access door for the toilet service panel.

AA. Install the toilet shroud.

AB. Close applicable FLUSH MOTOR circuit breaker on panel P18.

AC. AIRPLANES WITH FWD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;

Remove External or APU Generator Power, as applicable, if it is no longer necessary (AMM 24-22-0/201).

4. Test Toilet System Drain Cap for Leaks Using Airplane Pressurization

A. Do this task:
   (1) Toilet Tank Servicing (Ref 12-17-0, MP) but do not add the chemical precharge to the toilet tank.

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B. Make sure the applicable FLUSH MOTOR circuit breaker is open on the panel P18.
C. AIRPLANES WITH FWD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;

Supply External or APU Generator Power to the buses (AMM 24-22-0/201) if you are testing the forward lavatory .

NOTE: The necessary airplane power must be supplied for the overfill/shutoff protection system to operate. Electric power is not available to the overfill sensor at the ground service bus. If it is not practical to supply electric power use the procedure, Manual Operation of the Toilet Tank Rinse/Fill Shutoff Valve (AMM 12-17-0/201).

D. Remove the toilet shroud to get access to the toilet tank.
E. Open the access door for the toilet service panel.
F. Make sure the toilet tank drain valve handle on the toilet service panel is in the fully closed position (pushed in).
G. Make sure the toilet drain cap on the toilet service panel is closed.
H. Connect the water supply hose from the toilet service cart to the flush line fitting on the toilet service panel.
I. Pump water into the toilet tank through the flush line fitting until the toilet tank is about 3/4 full.
J. Pull the toilet tank drain valve handle on the toilet service panel to the fully open position.
K. Continue to pump water into the toilet tank until the toilet bowl is 1/2 full.
L. AIRPLANES WITH FORWARD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;

Pump water into the toilet tank through the flush line fitting until the toilet tank rinse/fill shutoff valve closes.
(1) Pull the toilet tank drain valve handle on the toilet service panel to the fully open position.
(2) Add water through the forward lavatory toilet bowl until the bowl is one half full.
M. Pressurize the passenger cabin to 3 psi above ambient pressure (Ref 21-31-0 and 05-51-101).

CAUTION: PRESSURE MORE THAN 19 PSI ABSOLUTE (APPROXIMATELY 4 PSI ABOVE AMBIENT) WILL DAMAGE OXYGEN EQUIPMENT.

N. Maintain 3 psi pressure for five minutes. Frequently check the drain cap for leaks. If leaks are present, stop test and inspect drain cap and drain cap seal for damage or deterioration. Replace drain cap or drain cap seal as necessary to prevent leakage with a cabin pressure of 3 psi (Ref 38-32-31).
O. Close the toilet tank drain valve.
P. Open the toilet drain cap on the toilet service panel.
Q. Make sure no water leaks past the toilet tank drain valve out through the waste drain fitting on the toilet service panel.

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R. Depressurize the airplane cabin.
S. Drain and service the toilet tank (Ref 12-17-0, TS).
T. Close the toilet drain cap on the toilet service panel.
U. Close the access door for the toilet service panel.
V. Install the toilet shroud.
W. Close applicable FLUSH MOTOR circuit breaker on panel P18.
X. AIRPLANES WITH FWD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;
Remove External or APU Generator Power, as applicable, if it is no longer necessary (AMM 24-22-0/201).

5. Test Forward Toilet System Drain Cap for Leaks Using Vacuum Test Fixture (Fig. 501)
A. Make sure the applicable FLUSH MOTOR circuit breaker is open on the panel P18.
B. AIRPLANES WITH FWD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;

Supply External or APU Generator Power to the buses (AMM 24-22-0/201) if you are testing the forward lavatory .

NOTE: The necessary airplane power must be supplied for the overfill/shutoff protection system to operate. Electric power is not available to the overfill sensor at the ground service bus. If it is not practical to supply electric power use the procedure, Manual Operation of the Toilet Tank Rinse/Fill Shutoff Valve (AMM 12-17-0/201).

C. Remove the toilet shroud to get access to the toilet tank.
D. Clean the skin of the airplane with solvent in the area of the toilet service panel to remove any oil to ensure the vacuum test fixture does not slip.
E. Open the access door for the toilet service panel.
F. Make sure the toilet tank drain valve handle on the toilet service panel is in the fully closed position (pushed in).
G. Make sure the toilet drain cap on the toilet service panel is closed.
H. Connect the water supply hose from the toilet service cart to the flush line fitting on the toilet service panel.
I. Pump water into the toilet tank through the flush line fitting until the toilet tank is about 3/4 full.
J. Pull the toilet tank drain valve handle on the toilet service panel to the fully open position.

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K. Continue to pump water into the toilet tank until the toilet bowl is 1/2 full.

L. AIRPLANES WITH FORWARD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;

Pump water into the forward lavatory toilet tank through the flush line fitting until the toilet tank rinse/fill shutoff valve closes.

(1) Pull the toilet tank drain valve handle on the toilet service panel to the fully open position.

(2) Add water through the forward lavatory toilet bowl until the bowl is one half full.

WARNING: HEARING PROTECTION REQUIRED DURING VACUUM PUMP OPERATION.

M. Position vacuum test fixture over toilet service panel and start airflow through evacuator.

WARNING: IF THE VACUUM IS NOT MADE, THE VACUUM TEST FIXTURE WILL NOT STAY IN ITS POSITION. IF THE VACUUM TEST FIXTURE DROPS, INJURY TO PERSONS OR DAMAGE TO EQUIPMENT MAY OCCUR.

NOTE: Hold the vacuum test fixture in place at all times until vacuum has been made within the chamber. Vacuum made within the chamber will hold the vacuum test fixture in place.

N. Regulate the airflow to the evacuator to produce 3 psi on the vacuum gage.

NOTE: Relief valve will limit vacuum to approximately 4 psi.

O. Maintain 3 psi vacuum for five minutes. Frequently check through the view port for drain cap leakage. If leaks are present stop test and inspect drain cap and drain cap seal for damage or deterioration. Replace drain cap or drain cap seal as necessary to prevent leakage at a vacuum of 3 psi (Ref 38-32-31)

(1) Remove the vacuum test fixture as follows:

(a) Hold the vacuum test fixture.

(b) Stop the airflow through the evacuator.

(c) Disconnect the shop air.

(d) Open the bleed valve until the pressure becomes equal.

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(e) Remove the vacuum test fixture.

P. Close the access door for the toilet service panel.

Q. Install the toilet shroud.

R. Close applicable FLUSH MOTOR circuit breakers on panel P18.

S. AIRPLANES WITH FWD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;
Remove External or APU Generator Power, as applicable, if it is no longer necessary (AMM 24-22-0/201).

6. Toilet System Vacuum Leak Test (Fig. 501)

A. Do this task:
(1) Toilet Tank Servicing (Ref 12-17-0, MP) but do not add the chemical pre-charge to the toilet tank.

B. Make sure the applicable FLUSH MOTOR circuit breaker is open on the panel P18.

C. Clean the skin of the airplane with the solvent in the area of the toilet service panel to make sure there is no oil to prevent the vacuum test fixture from slipping.

D. Clean the skin of the airplane with solvent in the area of the toilet service panel to remove any oil which might prevent the vacuum test fixture from holding securely.

E. If it is necessary to do a leakage test of the toilet tank drain valve from the toilet service panel, do these steps:
(1) Make sure that the waste drain valve assembly is open with the cap open.
(2) Make sure the handle for the tank drain valves is in the closed position.
(3) Fill the toilet tank with water to approximately half full.

NOTE: If water leaks from the waste drain valve assembly, the toilet tank drain valve is damaged or not correctly engaged.

(4) If the toilet tank drain valve leaks, repair or replace the valve (Ref. 38-32-31, RI).

F. Select the correct adapter so vacuum test fixture fits on the toilet service panel being tested.

NOTE: The toilet service panels on the airplane have different contours. The correct adapter must be used to get a satisfactory test.

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G. Install the adapter on the vacuum test fixture with high vacuum grease on the surfaces that engage.

H. Do the leakage test of the waste drain valve assembly on the toilet service panel as follows:

(1) Make sure that the waste drain valve assembly is closed with the cap open.

(2) Pull the handle for the toilet tank drain valves to let the piping fill with water.

(3) Fill the toilet tank with water until the toilet bowl is approximately half full.

NOTE: The water in the toilet tank will fill the drain tube. If water leaks from the waste drain valve assembly, the waste drain valve assembly is damaged or not correctly engaged.

(4) AIRPLANES WITH FORWARD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE, POST SB 38-1045;

Pump water into the toilet tank through the flush line fitting until the toilet tank rinse/fill shutoff valve closes.

(a) Add water through the toilet bowl until the toilet bowl is one half full.

NOTE: The water in the toilet tank will fill the drain tube. If water leaks from the waste drain valve assembly, the waste drain valve assembly is damaged or not correctly engaged.

(5) Apply a bead of high vacuum grease or sealant putty to the surface of the vacuum test fixture that engaged at the toilet service panel.

(6) Make sure that the bleed valve on the vacuum test fixture is closed.

WARNING: HEARING PROTECTION REQUIRED DURING PUMP OPERATION.

(7) Lift the vacuum test fixture to the toilet service panel.

(8) To start the test, do these steps at the same time:

(a) Hold the vacuum test fixture to the toilet service panel.

NOTE: Hold the vacuum test fixture in place at all times until vacuum has been made within the chamber. Vacuum made within the chamber will hold the vacuum test fixture in place.

(b) Connect the shop air supply.

WARNING: IF THE VACUUM IS NOT MADE, THE VACUUM TEST FIXTURE WILL NOT STAY IN ITS POSITION. IF THE VACUUM TEST FIXTURE DROPS, INJURY TO PERSONS OR DAMAGE TO THE EQUIPMENT CAN OCCUR.

(c) Start the airflow through the evacuator.

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(d) If a vacuum is not possible, or is lower than 3 psi, the system has a leak.
(e) Regulate the airflow to the vacuum test fixture to produce 3 psi (6 inches of mercury) on the vacuum gage.

NOTE: The relief valve will keep the vacuum to a limit of approximately 4 psi.

(f) Do these steps:
1) Keep 3 psi of vacuum for 5 minutes.
2) Look through the window of the vacuum test fixture for the leakage at the toilet service panel.
(g) AIRPLANES WITH CAPS ON THE TOILET SERVICE PANEL FLUSH FITTINGS; If there is a leakage from the flush port, replace the cap or the seal for the cap at the toilet service panel.
(h) AIRPLANES WITHOUT CAPS ON THE TOILET SERVICE PANEL FLUSH FITTINGS; If there is leakage from the flush port, replace the check valve at the toilet tank.
(i) If there is leakage from the cap of the waste drain valve assembly, do these steps:
1) Replace the seal on the waste drain valve assembly if it is damaged.
2) Replace or resurface the seal surface of the waste drain valve assembly if it is damaged.
(j) Remove the vacuum test fixture as follows:
1) Hold the vacuum test fixture.
2) Stop the airflow through the evacuator.
3) Disconnect the shop air.
4) Open the bleed valve until the pressure becomes equal.
5) Remove the vacuum test fixture.

I. Do the leakage test of the cap for the waste drain valve assembly on the toilet service panel as follows:
(1) Make sure that the cap for the waste drain valve assembly is closed.
(2) Apply a bead of high vacuum grease or sealant putty to the surface of the vacuum test fixture that engages at the toilet service panel.
(3) Make sure that the bleed valve on the vacuum test fixture is closed.
(4) Lift the vacuum test fixture to the toilet service panel.
(5) To start the test, do these steps at the same time:

NOTE: Hold the vacuum test fixture in place at all times until vacuum has been made within the chamber. Vacuum made within the chamber will hold the vacuum test fixture in place.

(a) Hold the vacuum test fixture to the toilet service panel.

WARNING: HEARING PROTECTION REQUIRED DURING VACUUM PUMP OPERATION.

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(b) Connect the shop air supply.

WARNING: IF THE VACUUM IS NOT MADE, THE VACUUM TEST FIXTURE WILL NOT STAY IN ITS POSITION. IF THE VACUUM TEST FIXTURE DROPS, INJURY TO PERSONS OR DAMAGE TO THE EQUIPMENT CAN OCCUR.

(c) Start the airflow through the evacuator.
(d) If a vacuum is not possible, or is lower than 3 psi, the system has a leak.
(e) Regulate the airflow to the vacuum test fixture to produce 3 psi (6 inches of mercury) on the vacuum gage.

NOTE: The relief valve will keep the vacuum to a limit of approximately 4 psi.

(f) Do these steps:
1) Keep 3 psi of vacuum for 5 minutes.
2) Look through the window of the vacuum test fixture for the leakage at the toilet service panel.
(g) If there is leakage from the cap of the waste drain valve assembly, do these steps:
1) Replace the seal on the cap of the waste drain valve assembly if it is damaged.
2) Replace or resurface the seal surface of the waste drain valve assembly if it is damaged.
(h) Remove the vacuum test fixture as follows:
1) Hold the vacuum test fixture.
2) Stop the airflow through the evacuator.
3) Disconnect the shop air.
4) Open the bleed valve until the pressure becomes equal.
5) Remove the vacuum test fixture.
(i) Close the access door for the toilet service panel.
(j) Install the toilet shroud.
(k) Close applicable FLUSH MOTOR circuit breakers on panel P18.

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7. PRE SB 38-1045, AIRPLANES WITHOUT THE FWD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE INSTALLATION;

   All Lavatories Check Valve Test.

   A. Open applicable FLUSH MOTOR circuit breakers on panel P18.
   B. Remove the toilet shroud to get access to the toilet tank.
   C. Disconnect ground flush line from toilet tank to provide access to check valve.
   D. Using finger or nonmetallic instrument, depress and release check valve several times to verify that it closes completely. Check for deformation, cracks, chips, and buildup of chemical solids. Replace any check valve that does not seat properly.
   E. Reconnect flush line to toilet tank.
   F. Close the access door for the toilet service panel.
   G. Install the toilet shroud.
   H. Close applicable FLUSH MOTOR circuit breakers on panel P18.

8. AIRPLANES WITH FWD LAVATORY OVERFILL SENSOR AND SHUTOFF VALVE INSTALLATION, POST SB 38-1045;

   AFT Lavatories Check Valve Test.

   NOTE: The Forward Lavatory Check Valve is removed by the overfill sensor and rinse/fill shutoff valve installation. You do not need to do this test for the FWD Lavatory.

   A. Open the applicable FLUSH MOTOR circuit breakers on panel P18.
   B. Remove the toilet shroud to get access to the toilet tank.
   C. Disconnect the ground flush line from the toilet tank to provide access to the check valve.
   D. Use a nonmetallic instrument to depress and release the check valve several times. Make sure that the check valve closes when released. Check for deformation, cracks, chips, and buildup of chemical solids in the valve. Replace or repair any check valve that does not seat properly (Refer to the lavatory manufacturer CMM).

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E. Reconnect flush line to toilet tank.
F. Close the access door for the toilet service panel.
G. Install the toilet shroud.
H. Close the applicable FLUSH MOTOR circuit breakers on panel P18.

9. Check Toilet Flushing Components
   A. Remove the toilet shroud to get access to the toilet tank.
   B. Pump 3 to 5 gallons of water into toilet tank.
   C. Provide electrical power.
   D. Close applicable FLUSH MOTOR circuit breakers on panel P18.
   E. Operate toilet flush handle and check that flushing action is vigorous and without interruption. The flushing cycle should last 10 +2 seconds. During flushing cycle, check fluid connection to and from pump for leaks.
   F. Open tank drain valve and drain toilet tank.
   G. Disconnect waste drain hose and install toilet drain cap.
   H. Install the toilet shroud.
   I. Remove electrical power if no longer required.
10. Return Airplane to Normal Configuration
   A. Install all panels.
   B. Add the chemical precharge to the waste tank and accomplish the remaining steps of the toilet servicing procedure (Ref 12-17-0, MP).

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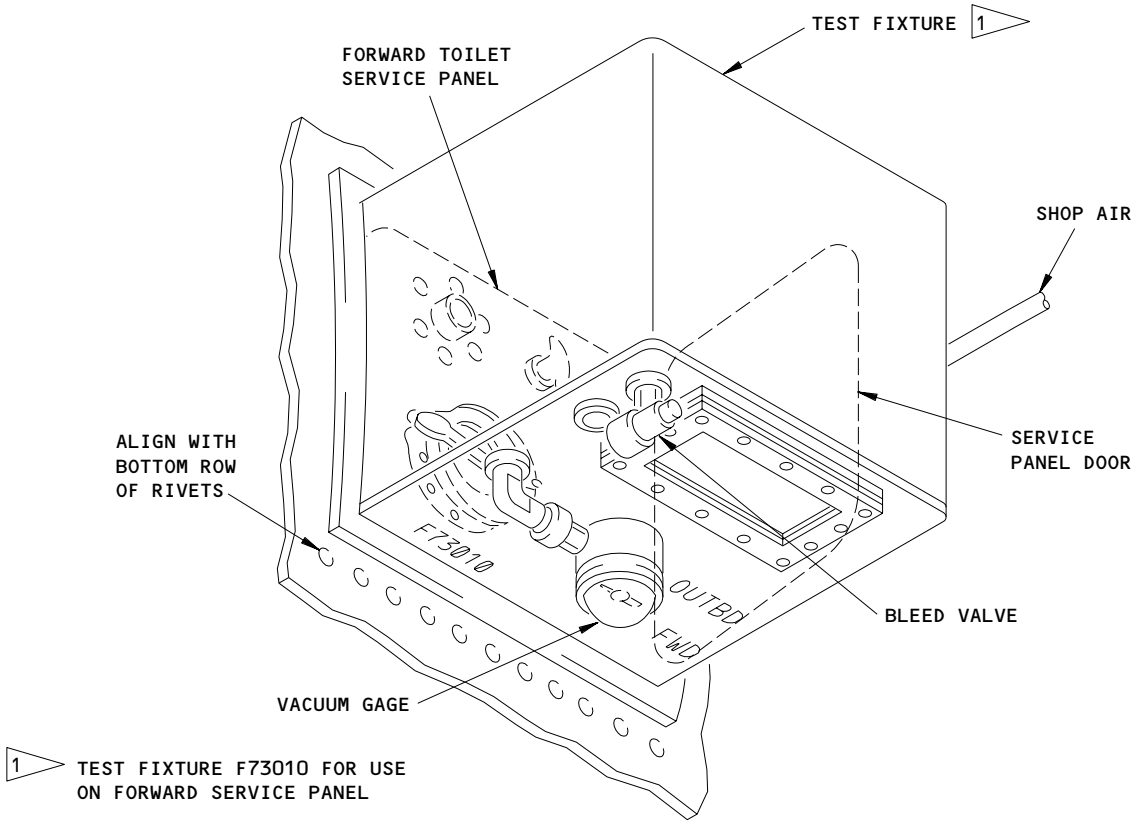

Vacuum Test Fixture
Figure 501 (Sheet 1)

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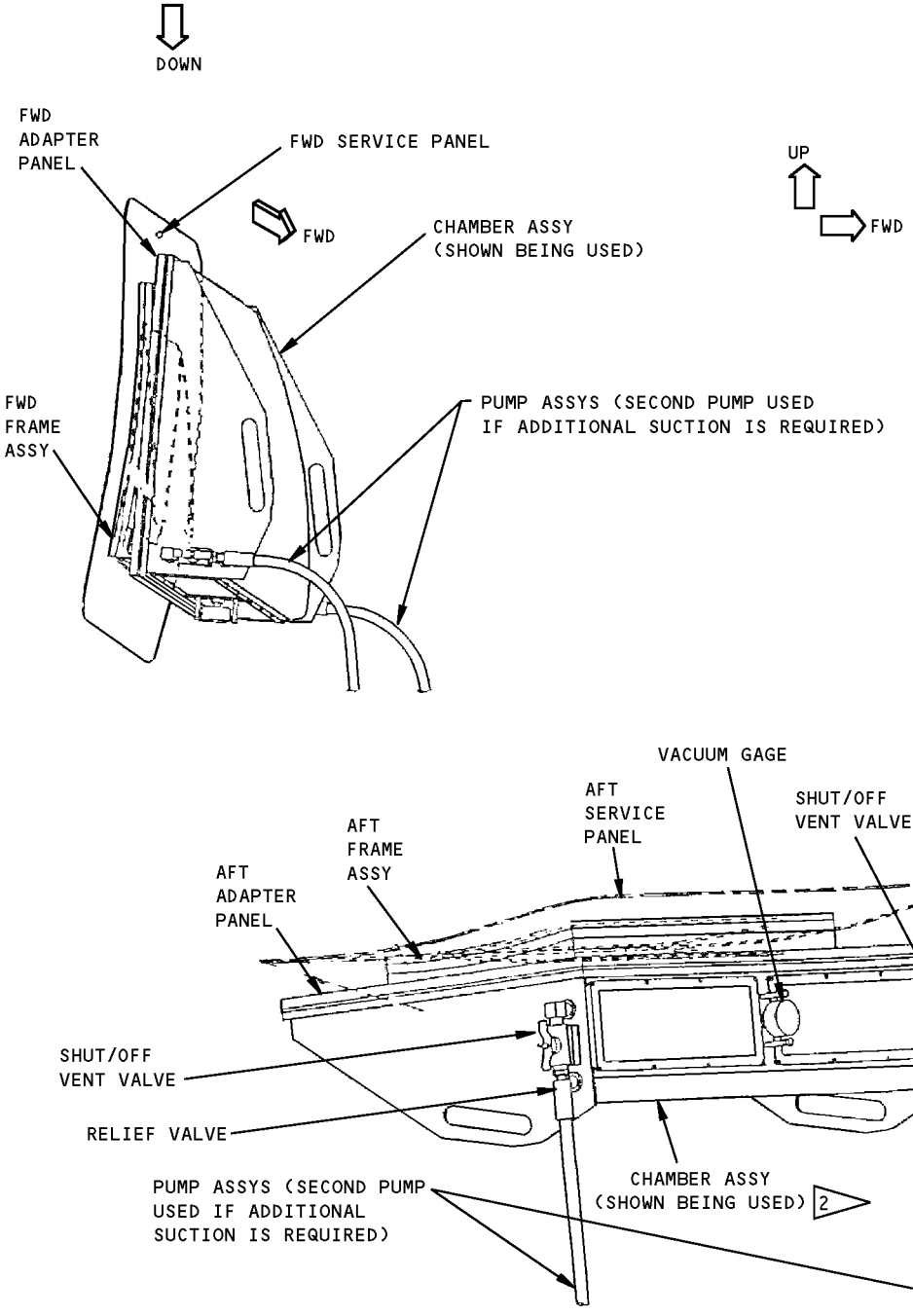

2 TEST FIXTURE G38005 FOR USE WITH BOTH FORWARD AND AFT SERVICE PANELS

Vacuum Test Fixture
Figure 501 (Sheet 2)

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TOILET SYSTEM - INSPECTION/CHECK

1. General
   A. This procedure supplies instructions to accomplish the following tasks:
      (1) Inspection of the forward toilet waste system.
      (2) Inspection of the aft toilet waste system.
   B. If a leak of toilet flush/waste water (blue water) is reported, perform this inspection of the toilet system.

      NOTE: The surface where the blue water has dried will show up as a blue stain.

   C. Contamination of toilet flush/waste liquid is possible in the following areas:
      (1) Forward Lavatory
      (2) E/E Compartment
      (3) Aft Lavatory
      (4) Aft Cargo Compartment E/E Bay
2. Toilet System Inspection (Forward Toilet)
   A. General
      (1) This inspection procedure is to be accomplished when a check of the forward toilet waste system is necessary.
      (2) The inspection procedure is for the forward toilet waste system.
   B. References
      (1) AMM 12-17-0, Toilet Servicing
      (2) AMM 38-32-0, Toilet System
      (3) AMM 38-32-21, Toilet Flush Motor
      (4) AMM 38-32-22, Toilet Filter
      (5) AMM 38-32-31, Toilet Drain Valve
      (6) AMM 38-32-41, Toilet Drain Valve Control Cable
      (7) AMM 38-32-42, Toilet Ground Flush Line
      (8) AMM 38-32-51, Toilet Waste Tank
      (9) AMM 38-32-81, Service Panel Drain Valve
      (10) AMM 38-32-82, Waste Tank Drain Duct Nipple
      (11) AMM 51-31-0, Seals and Sealing
      (12) AMM 52-48-41, E/E Compartment Door
   C. Equipment
      (1) Maintenance Stand
   D. Consumable Materials
      (1) G00000 Gloves - Disposable
      (2) G00000 Shop Coat - Disposable
      (3) G00000 Mask, Face - Disposable
      (4) G01915 Glasses - Safety
   E. Access
      (1) Location Zones 103 Forward Lavatory 205 Electronic Equipment Compartment

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(2) Access Panels 1104 Forward Toilet Service Panel 1201 E/E Compartment Door

F. Procedure

(1) Open the E/E compartment door for access (AMM 52-48-41).
(2) Open the forward toilet service panel.
(3) Position the maintenance stand under the E/E compartment and install a strong light source inside the compartment.
(4) Open this circuit breaker on the load control center panel, P18, and attach a DO-NOT-CLOSE tag:
(a) Applicable lavatory flush motor circuit breaker.
(5) Drain the forward toilet system (AMM 12-17-0).

NOTE: It is only necessary to drain the system. Do not complete the full service procedure.

(6) At the forward toilet service panel, perform the following steps:
(a) Release and close the tank drain valve handle (FWD TOILET).

NOTE: Let the handle snap to the closed position to ensure that the drain valve in the toilet tank gets a good seal (closed).

(b) Disconnect the service cart toilet drain hose (TOILET DRAIN).
(c) Perform a full visual inspection of the service panel drain valve assembly.
(d) If you find wear or damage to a toilet service panel component, perform the related maintenance procedure and replace as necessary (AMM 38-32-81).
(e) Do not close the drain cap, at the fwd toilet service panel.
(f) At the fwd toilet service panel, perform the following applicable checks:
1) Ensure the drain plug is removed on service panels without levers for a flapper valve.
2) Ensure the OPEN lever is set so the flapper valve is open on service panels with OPEN/CLOSE levers.
(7) Reconnect the service cart toilet drain hose to the forward service panel.

WARNING: DO NOT OVERFILL THE SYSTEM WITH WATER. CONTAMINATION OF ELECTRICAL EQUIPMENT WITH WATER CAN CAUSE SERIOUS DAMAGE TO COMPONENTS AND HAVE AN UNWANTED EFFECT ON THE FLIGHT SAFETY OF THE AIRPLANE.

(8) Fill the forward toilet system with water until the lavatory bowl is half full with water (AMM 12-17-0).

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(9) In the forward lavatory, remove toilet shroud assembly using the removal procedure for the toilet waste tank (AMM 38-32-51).
(10) In the forward lavatory, perform a full visual inspection of the following components:
  (a) Toilet tank
  (b) Drain adapter (floor)
  (c) Drain valve and gasket seal
  (d) Toilet flush motor, pump gasket seal and filter assembly
  (e) Toilet filter and gasket seal
  (f) Ground flush fitting on the service panel
(11) If you find the toilet tank is damaged and has a leak, replace the toilet tank (AMM 38-32-51).
(12) If you find the toilet floor drain adapter is cracked or damaged, replace the adapter.
(13) If you find a leak in the drain valve gasket on top of the toilet tank, replace the gasket (AMM 38-32-51).
(14) If you find a leak in the toilet flush motor pump or filter assembly gasket, replace the gasket (AMM 38-32-21, AMM 38-32-22).
(15) If you find a leak at the ground flush fitting, tighten the coupling(s) or replace the tubing (AMM 38-32-31).
(16) Disconnect the service cart toilet drain hose from the forward toilet service panel (TOILET DRAIN).
(17) Do not close the drain cap, at the forward toilet service panel.
(18) On the forward toilet service panel, perform the following steps:
  (a) Ensure the drain plug is removed on service panels with no levers for a flapper valve.
  (b) Ensure the OPEN lever is set so the flapper valve is open on service panels with OPEN/CLOSE levers.
(19) If you see water in the drain tube, perform the following steps:
  (a) Connect the toilet drain tube from the service cart to the forward toilet service panel (TOILET DRAIN).
  (b) Pull the tank drain valve handle on the fwd toilet service panel to drain the tank.
  (c) Remove the toilet tank drain valve from the top of the toilet tank (AMM 38-32-31).
  (d) Examine the toilet tank drain valve and the valve seat in the tank for damage.
    1) If you see damage to the valve seat, clean and repair the toilet tank as necessary.
    2) If the rubber boot is damaged, replace the toilet drain valve (AMM 38-32-31).
    3) If the toilet tank drain valve is unserviceable, repair or replace as necessary.
  (e) Install the toilet tank drain valve (AMM 38-32-31).
  (f) Fill the forward toilet system with water until the lavatory bowl is half full with water.

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(g) At the forward toilet service panel, examine the inside of the toilet drain tube to ensure no water flows from the toilet tank.

(20) On the forward toilet service panel, perform the following applicable steps:
(a) Install the drain plug on the service panel without levers for a flapper valve.
(b) Set the CLOSED lever so the flapper valve is closed on service panels with OPEN/CLOSED levers

(21) Close the drain cap, on the forward toilet service panel.

(22) Pull and lock the tank drain valve handle on the forward toilet service panel (FWD TOILET).

(23) In the electronic equipment compartment, perform a full visual inspection of the following components:
(a) The 4-inch toilet drain tube at these connections:
1) The connection under the toilet tank.
2) The connections at the waste drain valve.
3) The connection at the forward toilet service panel.
(b) For airplanes with modular toilets installed:
1) The ground flush hose connection at the forward toilet service panel.
(c) The toilet drain valve control cable.

(24) If you find a leak on the forward toilet drain tube, perform the following steps:
(a) If the leak is from a coupling, replace packing(s) as necessary and tighten the clamps to stop the leak.
(b) If the leak is from a damaged drain tube, replace the drain tube.
(c) If the leak is from an unserviceable drain valve, replace the valve (AMM 38-32-31).

(25) If you find a leak on the forward toilet ground flush hose, tighten the couplings or replace the ground flush hose (AMM 38-32-51).

(26) If you find a damaged drain valve control cable, perform the following steps:
(a) If the control cable is unserviceable, replace the cable (AMM 38-32-41).
(b) If you find the control cable is installed incorrectly, perform the correct installation and adjustment procedure (AMM 38-32-41).

(27) At the forward toilet service panel, perform a full visual inspection of the drain valve assembly.
(a) If you find a leak on the drain valve assembly, perform the appropriate maintenance procedure (AMM 38-32-31).

(28) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the load control center panel, P18:
(a) Applicable lavatory flush motor circuit breaker.

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G. Return the airplane to its usual condition
(1) Perform the forward toilet service procedure (AMM 12-17-0).
(2) Remove all tools and equipment from the work area.
(3) Close the forward toilet service panel.
(4) Close the E/E compartment door (AMM 52-48-41).

3. Toilet System Inspection (Aft Toilet)

A. General
(1) This inspection procedure is to be performed when a check on the aft toilet waste system is necessary.
(2) The inspection procedure shows a toilet system with one aft lavatory installed.
(3) For operators with more than one lavatory installed in the aft toilet system, the inspection procedure is the same and is to be repeated on each additional lavatory installation.

B. References
(1) AMM 12-17-0, Toilet Servicing
(2) AMM 38-32-0, Toilet System
(3) AMM 38-32-21, Toilet Flush Motor
(4) AMM 38-32-22, Toilet Filter
(5) AMM 38-32-31, Toilet Drain Valve
(6) AMM 38-32-41, Toilet Drain Valve Control Cable
(7) AMM 38-32-42, Toilet Ground Flush Line
(8) AMM 38-32-51, Toilet Waste Tank
(9) AMM 38-32-81, Service Panel Drain Valve
(10) AMM 38-32-82, Waste Tank Drain Duct Nipple
(11) AMM 51-31-0, Seals and Sealing
(12) AMM 52-13-0, Aft Cargo Compartment Door

C. Equipment
(1) Maintenance Stand

D. Consumable Materials
(1) G00000 Gloves - Disposable
(2) G00000 Shop Coat - Disposable
(3) G00000 Mask, Face - Disposable
(4) G01915 Glasses - Safety

E. Access
(1) Location Zones
(a) 109 Aft Lavatory (E)
(b) 113 Aft Lavatory (B)
(c) 114 Aft Lavatory (C)
(d) 118 Aft Lavatory (D)
(e) 218 Aft Cargo Compartment
(f) 220 Aft Cargo Compartment Equipment Bay
(2) Access Panels
(a) 1502 Aft Toilet Service Panel
(b) 4504 Aft Cargo Compartment Door

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F. Procedure

(1) Open the aft cargo compartment door for access (AMM 52-31-0).
(2) Open the aft toilet service panel.
(3) Remove the access panel from the rear bulkhead of the aft cargo compartment.
(4) Open this circuit breaker on the load control center panel, P18, and attach a DO-NOT-CLOSE tag:
    (a) Applicable lavatory flush motor circuit breaker.
(5) Drain the aft toilet system (AMM 12-17-0).

NOTE: It is only necessary to drain the system. Do not complete the full service procedure.

(6) At the aft toilet service panel, perform the following steps:
    (a) Release and close the toilet tank drain valve handle (for example: R.H. AFT TOILET).

NOTE: Let the handle snap to the closed position to ensure the drain valve in the toilet tank gets a good seal (closed).

    (b) Disconnect the service cart toilet drain hose (TOILET DRAIN).
    (c) Perform a full visual inspection of the drain valve assembly.
    (d) If you find wear or damage to a toilet service panel component, perform the related maintenance procedure and replace as necessary (AMM 38-32-31).
    (e) Do not close the drain cap, at the aft toilet service panel.
    (f) At the aft toilet service panel, perform the following applicable checks:
        1) Ensure the drain plug is removed on service panels without levers for a flapper valve.
        2) Ensure the OPEN lever is set so the flapper valve is open on service panels with OPEN/CLOSE levers.
(7) Reconnect the service cart drain hose to the aft service panel.

WARNING: DO NOT OVERFILL THE SYSTEM WITH WATER. CONTAMINATION OF ELECTRICAL EQUIPMENT WITH WATER CAN CAUSE SERIOUS DAMAGE AND HAVE AN UNWANTED EFFECT ON THE FLIGHT SAFETY OF THE AIRPLANE

(8) Fill the aft toilet system with water until the lavatory bowl is half full with water (AMM 12-17-0).
(9) In the aft lavatory, remove the toilet shroud assembly using the removal procedure for the toilet waste tank (AMM 38-32-51).

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(10) In the aft lavatory, perform a full visual inspection of the following components:
  (a) Toilet tank
  (b) Drain adapter (floor)
  (c) Drain valve and gasket seal
  (d) Toilet flush motor, pump gasket seal and filter assembly
  (e) Toilet filter and gasket seal
  (f) Ground flush fitting on the service panel
(11) If you find the toilet tank is cracked and has a leak, replace the toilet tank (AMM 38-32-51).
(12) If you find the toilet floor drain adapter is cracked or damaged, replace the adapter.
(13) If you find a leak in the drain valve gasket on the top of the toilet tank, replace the gasket (AMM 38-32-51).
(14) If you find a leak in the toilet flush motor pump or filter assembly gasket, replace the gasket (AMM 38-32-21, AMM 38-32-22).
(15) If you find a leak on a ground flush fitting, tighten the coupling(s) or replace the tubing (AMM 38-32-51).
(16) Disconnect the service cart toilet drain hose from the aft toilet service panel toilet drain.
(17) Do not close the drain cap, at the aft toilet service panel.
(18) On the aft toilet service panel, perform the following steps:
  (a) Ensure the drain plug is removed on service panels with no levers for a flapper valve.
  (b) Ensure the OPEN lever is set so that the flapper valve is open on service panels with OPEN/CLOSE levers.
(19) If you see water in the toilet drain tube, perform the following steps:
  (a) Connect the toilet drain tube from the service cart to the aft toilet service panel (TOILET DRAIN).
  (b) Pull the tank drain valve handle on the aft toilet service panel to drain the tank (for example: R.H. AFT TOILET).
  (c) Remove the toilet tank drain valve from the top of the toilet tank (AMM 38-32-31).
  (d) Examine the tank drain valve and the valve seat in the tank for damage.
    1) If you see damage to the valve seat, clean and repair the tank as necessary.
    2) If the protective rubber boot is damaged, replace the drain valve (AMM 38-32-31).
    3) If the tank drain valve is unserviceable, repair or replace as necessary.
  (e) Install the toilet tank drain valve (AMM 38-32-31).
  (f) Fill the aft toilet system with water until the lavatory bowl is half full of water.

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(g) At the aft toilet service panel, examine the inside of the toilet drain tube to ensure no water flows from the toilet tank.

(20) On the aft toilet service panel, as applicable, perform the following steps:
(a) Install the drain plug on the service panels without levers for the flapper valve.
(b) Set the CLOSED lever so the flapper valve is closed on service panels with OPEN/CLOSE levers.

(21) Close the drain cap, on the aft toilet service panel.

(22) Pull and lock the tank drain valve handle on the aft toilet service panel (for example R.H. AFT TOILET).

(23) In the aft cargo compartment equipment bay, perform a full visual inspection of the following components:
(a) The 4-inch toilet tank drain tube at these connections:
1) The connection under the toilet tank(s).
2) The connection at the waste drain valve.
3) The connection at the aft toilet service panel.
4) For installations with more than one lavatory visually inspect at the junction ducting.
(b) The ground flush hose(s) at these connections:
1) The aft toilet service panel.
(c) The toilet tank drain valve control cable(s).

(24) If you find a leak on the aft toilet drain tube(s), perform the following steps:
(a) If the leak is from the coupling, replace packing(s) as necessary and tighten the coupling to stop the leak.
(b) If the leak is from a damaged drain tube, replace the drain tube.
(c) If the leak is from an unserviceable drain valve, replace the valve (AMM 38-32-31).

(25) If you find a leak on the aft toilet ground flush hose(s), tighten the couplings or replace the ground flush line (AMM 38-32-21).

(26) If you find a damaged drain valve control cable, perform the following steps:
(a) If the drain valve control cable is unserviceable, replace the control cable (AMM 38-32-41).
(b) If you find the control cable is installed incorrectly, perform the installation and adjustment procedure (AMM 38-32-11).

(27) At the aft toilet service panel, perform a full visual inspection of the drain valve assembly.
(a) If you find a leak on the drain valve assembly, perform the appropriate maintenance procedure (AMM 38-32-31).

(28) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the load control center panel, P18:
(a) Applicable lavatory flush motor circuit breaker.

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G. Return the airplane to its usual condition
   (1) Perform the aft toilet servicing procedure (AMM 12-17-0).
   (2) Remove all tools and equipment from the work area.
   (3) Close the aft toilet service panel.
   (4) Replace the access panels at the rear bulkhead of the aft cargo compartment.
   (5) Close the aft cargo compartment door (AMM 52-31-0).

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TOILET SYSTEM - CLEANING/PAINTING

1. General
   A. This procedure has the steps to clean the toilet service panel and the steps to clean the toilet tank and the areas adjacent to the toilet tank.
2. Toilet Service Panel Cleaning
   A. Standard Tools and Equipment
      (1) Manual alkaline emulsion cleaner (AMM 12-40-0)
      (2) Soft-bristle brush or sponge
   B. References
      (1) AMM 12-40-0, Cleaning and Washing
   C. Access Panels
      1104 Forward Toilet Panel
      1502 Toilet Service Door
   D. Clean the Panel
      (1) Regularly clean the toilet service panel with water and a cleaner.
      (2) If it is necessary, use a soft bristle brush or a sponge to remove the contamination.
      (3) Dry the toilet service panel with a clean cloth.
3. Toilet Tank Cleaning
   A. General
      (1) The recommended method to clean the toilet tank is to rinse the tank for one to two minutes each time the waste tank is drained during servicing. A regular rinse of the toilet tank will keep the unscheduled maintenance to a minimum.
   B. Consumable Materials
      (1) B00051 Disinfectant - Deodorizer Lysol Spray and Concentrated Deodorizer Lysol
      (2) B00000 Honey Bee 76, MC Gean-Rohco, Downey, CA
   C. Reference
      (1) AMM 12-17-0, Toilet Servicing
   D. Access
      (1) Location Zones
          100 Upper Half of Fuselage
          200 Lower Half of Fuselage
      (2) Access Panels
          1104 Forward Toilet Panel
          1502 Toilet Service Door
   E. Prepare to Clean the Toilet Tank
      (1) Drain and flush the toilet tank (AMM 12-17-0).
      (2) Allow the toilet tank to drain fully.

          NOTE: Do not add the precharge for the toilet tank.

      (3) Push the drain valve handle to close the drain valve.
      (4) Remove the toilet shroud.

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(5) Use a vacuum cleaner to remove loose dirt from the lavatory.

NOTE: Make sure you clean the toilet tank vent, water separator, the inner part of the muffler (for the sink drain), and the bowl vent inlet if it is necessary.

F. Clean the Toilet Tank (Internal Surfaces) and Bowl.
(1) Fill the toilet tank to 5 inches below top of toilet bowl with a mixture of water and liquid Lysol-type products (Optional Honey Bee 76 or per Manufacturer's Recommendation).
(2) Let the liquid stand overnight or longer.
(3) Activate flush motor several times each hour while the mixture is in the toilet tank.
(4) Use the mixture and a soft-bristle brush to clean the toilet bowl separator, ring, and baffle.

G. Clean the Areas on and Adjacent to the Toilet Tank.
(1) Remove the lint from the gap between the toilet bowl and shroud.
(2) Use an approved disinfectant spray, a soft bristle brush and/or shop rag to clean these parts:

CAUTION: USE ONLY APPROVED MATERIALS ON THE FLOOR PAN, LIGHT LENSES, GASPER AIR FIXTURE, MUFFLER, TOILET TANK VENT, WATER SEPARATOR, HOSES, AND ELECTRICAL WIRES. OTHER MATERIALS CAN CAUSE DAMAGE TO THESE PARTS.

(a) The top and side surfaces of the toilet tank.
(b) The external surfaces of the toilet bowl, flush motor and drain valve.
(c) The toilet tank vent.
(d) The toilet bowl vent.
(e) The supports for the toilet shroud.
(f) All cracks and corners of the walls and floor.
(g) The floor pan.
(h) The light lenses.
(i) The gasper air fixture.
(j) The muffler.
(k) The water separator.

(3) Remove the toilet shroud from the airplane and clean it with a soft bristle brush and disinfectant spray.
(4) Install the toilet shroud.
(5) Do the steps to service the toilet tank (AMM 12-17-0).

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TOILET TIMER - REMOVAL/INSTALLATION

1. Remove Toilet Timer (Fig. 401)
   A. Open applicable LAV FLUSH MOTOR circuit breaker on panel P18.
   B. Obtain access to timer.
      (1) In lavatories with hinged access panel, open panel below toilet timer handle.
      (2) In lavatories with fastened access panel, remove fasteners and remove panel.
      (3) In lavatories without access panel, remove fasteners and disengage toilet back shroud from spring clip. Remove shroud enough to gain access to electrical connectors.
   C. Disconnect electrical connectors from timer.
   D. Remove timer handle attachment screw and remove handle.
   E. Remove timer mounting nuts (4 places).
   F. Remove timer.
2. Install Toilet Timer (Fig. 401)
   A. Position timer on timer panel.
   B. Install timer mounting nuts.
   C. Position timer handle on timer shaft and install handle attachment screw.
   D. Connect electrical connectors.
   E. Replace access panel or toilet back shroud.
      (1) In lavatories with hinged access panel, close panel.
      (2) In lavatories with fastened access panel, replace panel and install fasteners.
      (3) In lavatories without access panel, engage toilet back shroud to spring clip and install fasteners.
   F. Close circuit breaker.
   G. Ensure that toilet tank has been replenished.
   H. Check timer operation by flushing toilet and observing that motor operates.

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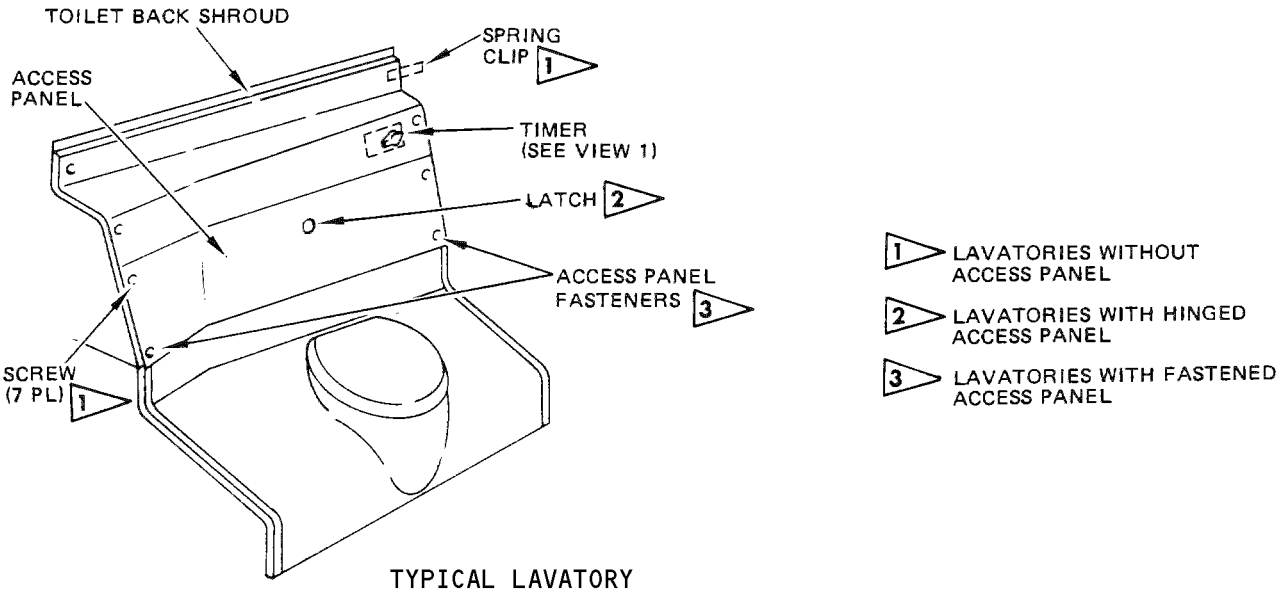
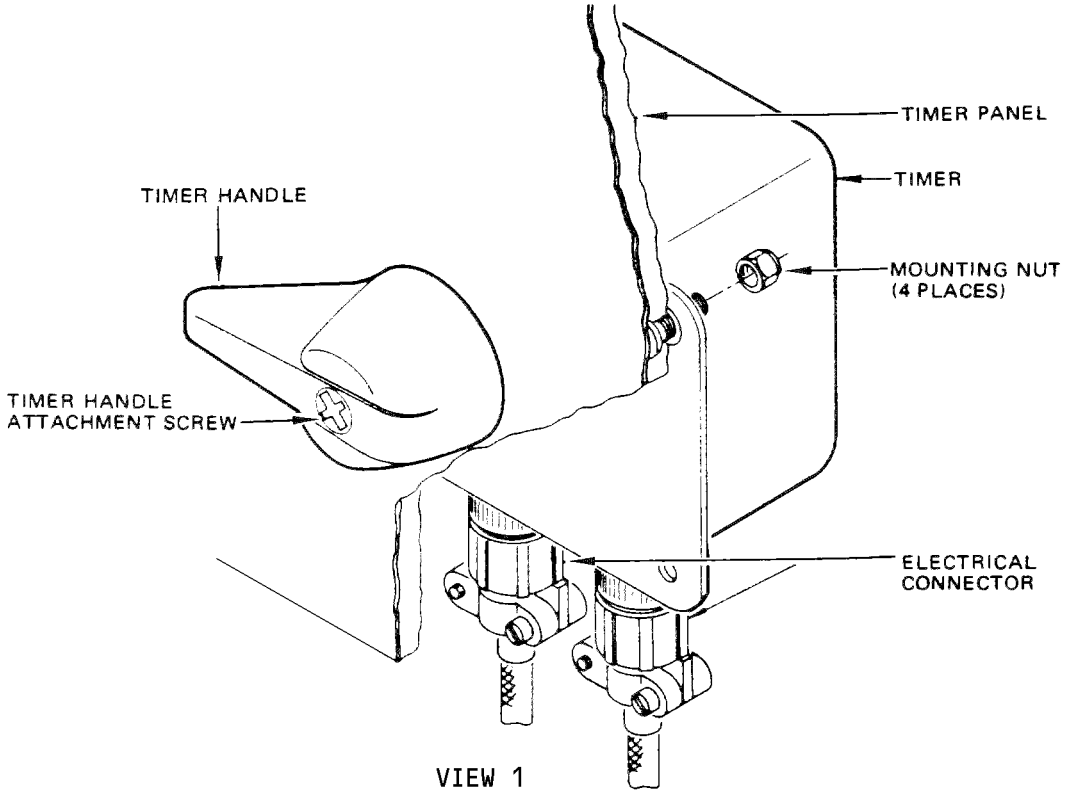


TYPICAL LAVATORY



VIEW 1

Toilet Timer Installation
Figure 401

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TOILET FLUSH MOTOR - REMOVAL/INSTALLATION

1. Remove Toilet Flush Motor (Fig. 401)
   A. Drain and flush toilet (Ref 12-17-0).
   B. Open applicable LAV FLUSH MOTOR circuit breaker on panel P18.
   C. Remove four shroud attachment crews and remove shroud.
   D. Open hinged access panel below timer handle on toilet unit.
   E. Disconnect flush motor electrical connector from toilet timer.
   F. Remove wire bundle clamps as necessary.
   G. Disconnect bonding jumper at ground stud on flush motor.
   H. Loosen clamp and remove toilet flush line from toilet flush motor.
   I. Remove mounting nuts and washers (6 places) between motor-filter pump assembly and mounting bracket.
   J. Remove toilet flush motor and gasket from mounting bracket.
2. Install Toilet Flush Motor (Fig. 401)
   A. Place new gasket over studs on mounting bracket.
   B. Position toilet flush motor on mounting bracket.
   C. Install washers and nuts and apply torque at 12 to 15 pound-inches.
   D. Install toilet flush line on toilet flush motor and tighten clamp.
   E. Connect bonding jumper at ground stud on flush motor.

      NOTE: Bonding jumper mounting bolts, washers, nuts and faying surfaces must be clean to provide an adequate electrical ground.

   F. Connect electrical connectors on toilet timer and install wire bundle clamps as necessary.
   G. Close hinged access panel.
   H. Install toilet shroud.
   I. Close circuit breaker.
   J. Replenish waste tank with flushing compound (Ref 12-17-0).
   K. Check toilet flush motor operation by flushing toilet.

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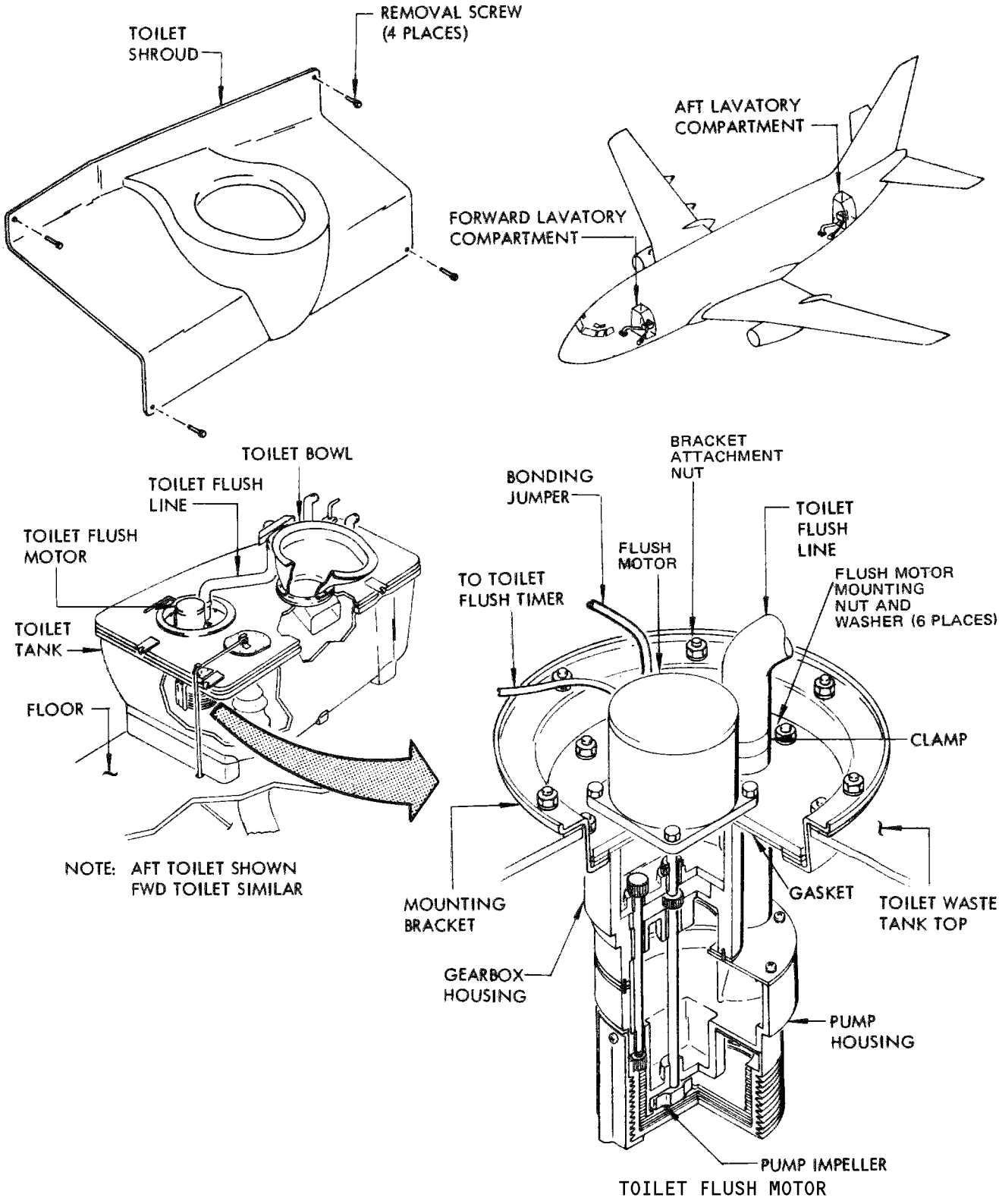

Toilet Flush Motor Installation
Figure 401

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TOILET FILTER - CLEANING/PAINTING

1. General
   A. A clogged filter may cause an insufficient fluid flow during the flushing cycle. To restore proper operation, the filter may be cleaned using steam.
2. Equipment and Materials
   A. Soap - Specification P-D-619 (Ref 20-30-31)
   B. Disinfectant - Lysol (Ref 20-30-31)
   C. Grease - Lubriplate 105 (Ref 20-30-21)
   D. Soft bristle brush
   E. Steam cleaning equipment
   F. Hot water
   G. Dry, compressed air
3. Prepare Filter for Cleaning (Fig. 701)
   A. Service toilet unit (Ref 12-17-0). Operate flush motor, pump, and filter assembly through one cycle with fresh fluid.
   B. Remove motor, pump, and filter assembly from toilet tank top (Ref 38-32-21).
   C. Clean exterior surfaces of unit using one of the following:
      (1) A strong solution of hot soapy water and disinfectant using a soft bristle brush
      (2) Steam cleaning

      WARNING: STEAM OR VAPOR PRESSURE CLEANING CREATES HAZARDOUS NOISE LEVELS AND SEVERE BURN AND EYE INJURY POTENTIAL. FACE SHIELD, RUBBER APRON, RUBBER BOOTS, EAR PLUGS/MUFFS AND NONASBESTOS HEAT RESISTANT GLOVES WILL BE WORN. USE APPROVED PERSONAL PROTECTIVE EQUIPMENT (GOGGLES/FACE SHIELD) WHEN USING COMPRESSED AIR. AIR PRESSURE IS RESTRICTED TO LESS THAN 30 PSI. PROVIDE PROTECTION FROM FLYING PARTICLES. DO NOT DIRECT AIRSTREAM TOWARDS SELF OR OTHER PERSONNEL.

   D. Dry all surfaces of the unit with dry, compressed air.
   E. Remove retainer attaching screws and washers. Remove retainer.
   F. Remove wiper blade attaching screws and washers. Remove wiper blade.
   G. Remove filter basket. Remove and discard teflon seal.
4. Clean Toilet Filter
   A. Steam clean inside the filter basket by directing steam through the discharge tube and filter screen.
   B. Dry all surfaces with dry, compressed air.
5. Restore Airplane to Normal Configuration
   A. Lubricate seal groove and teeth of filter basket with grease.
   B. Place new teflon seal in groove of filter basket and install filter basket until it meshes with pinion.

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C. Holding filter basket in place, install wiper blade, retainer, attaching screws and washers. Torque all screws from 3 to 5 inch-pounds.
D. Install motor, pump, and filter assembly (Ref 38-32-21, Removal/Installation).

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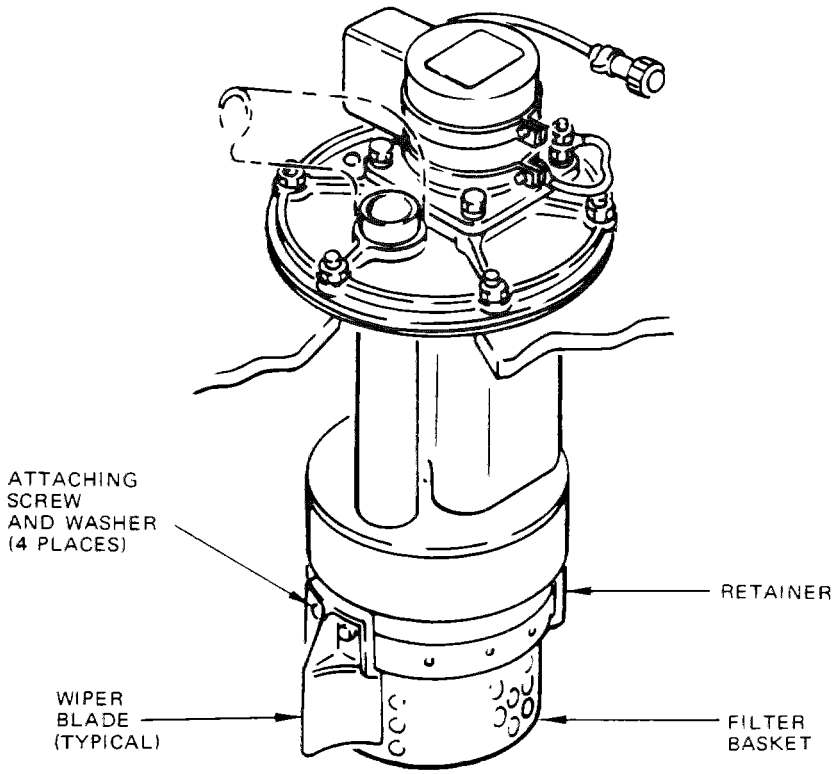

TOILET MOTOR-PUMP-FILTER

Toilet Motor - Pump-Filter Assembly
Figure 701

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TOILET DRAIN VALVE - REMOVAL/INSTALLATION

1. Remove Toilet Drain Valve (Fig. 401)
   A. Drain and flush toilet waste tank (Ref 12-17-0).
   B. Remove four toilet shroud attachment screws and remove shroud.
   C. Disengage drain valve control cable at cable quick-disconnect.
   D. Loosen drain valve mounting nuts, press down on top of the drain valve then remove mounting nuts and washers (8 places).
   E. Remove drain valve and gasket.

      CAUTION: WEAR GLOVES AND PROTECTIVE SLEEVES WHEN WORKING WITH PARTS INSIDE THE TANK.

2. Install Toilet Drain Valve (Fig. 401)
   A. Clean drain valve seat.

      NOTE: Ensure valve seat is smooth, free of debris and no scratches, dents, abrasions or other evidence of damage.

   B. Place new gasket over mounting studs.
   C. Place drain valve on toilet waste tank so control cable is in the engage position.

      NOTE: Ensure flexible boot is free of breaks or holes and drain valve is installed spring loaded toward the close position.

   D. Install mounting nuts and washers. Torque to 40-50 pound-inches.
   E. Engage control cable at cable quick-disconnect.

      NOTE: With drain valve closed check that there is a 1/2-inch cable movement, with a cable load of approximately 5 pounds, before the valve starts to open.

   F. Service toilet waste tank (Ref 12-17-0).
   G. Check drain valve for leakage and for proper operation.
   H. Install toilet shroud.

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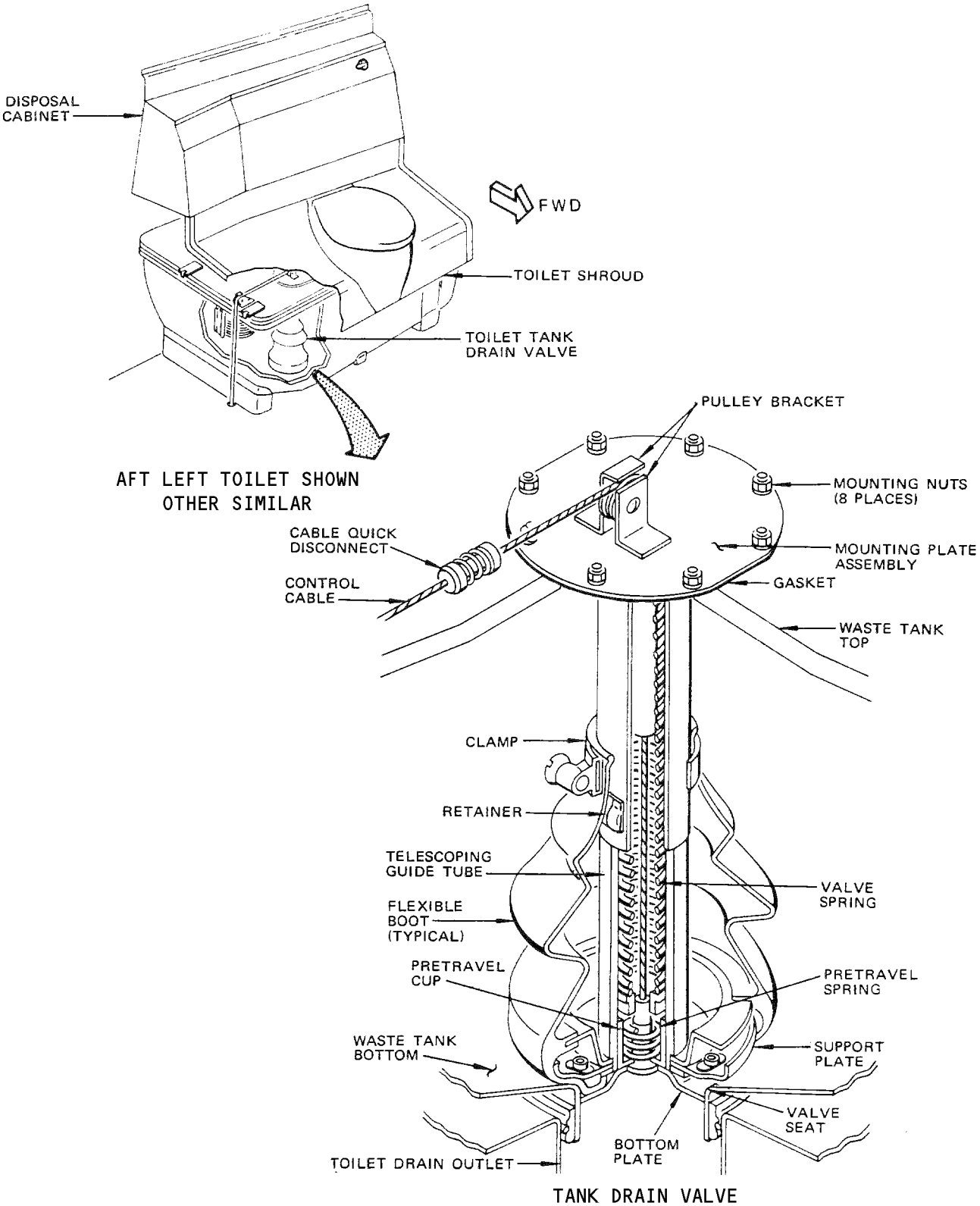

Toilet Drain Valve Installation
Figure 401

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TOILET DRAIN VALVE - INSPECTION/CHECK

1. Toilet Drain Valve Inspection
   A. General
      (1) The toilet drain valve provides a positive seal within the toilet tank against varying atmospheric pressures during all altitude conditions. Should fluid leak through, a drain cap located in the service panel holds the fluid within the drain tube and prevents it from draining overboard. The drain cap seal should be checked when the cap is removed to ensure that the sealing capability is maintained.
      (2) A floor drain fitting is provided in the forward lavatory compartment to drain moisture condensation and seepage from the lavatory area to the toilet drain tube. Fluid in the toilet drain tube therefore, does not necessarily mean that the toilet drain valve is leaking. Before removing the drain valve because of leakage it should be determined that the fluid actually came from the toilet tank.
      (3) The Inspection/Check procedures applicable to either forward or aft drain valve and its components are included in the Removal/Installation procedures because the only time the valve can be inspected is when it is removed from the toilet tank.

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TOILET DRAIN VALVE CONTROL CABLE - REMOVAL/INSTALLATION

1. General
   A. Two removal/installation procedures are given. The first removes/installs the entire cable assembly, including the casing. The second removes/installs the cable without the casing, and is useful when only an inner cable has been broken or damaged.
   B. Before performing maintenance, drain and flush toilet (Ref 12-17-0).
2. Remove Cable with Casing (Fig. 401)
   A. Remove fasteners and remove toilet shroud.
   B. Disengage drain valve control cable at cable quick disconnect.
   C. Remove control cable pin and tee handle on toilet service panel.
   D. Remove hexnut, tab washer and rubber seal from top side of cable floor sleeve subassembly.
   E. Gain access to control cable below passenger cabin floor level as necessary.
      (1) For forward lavatory, remove nose wheel access panels 3105 and/or 3106 (Ref 12-31-11).
      (2) For aft lavatory, remove aft cargo compartment aft bulkhead access panels as needed.
   F. Remove all clamps.
   G. Disconnect slider housing and casing and cable assembly at hexnut.
   H. Pull casing and cable assembly out of floor panel and slider housing.

      NOTE: Assist cable through pulley assembly as necessary.

3. Install Cable with Casing (Fig. 401)
   A. Insert casing and cable assembly in floor panel and slider housing. Install clamps.
   B. Connect slider housing and casing and cable assembly with hexnut.
   C. Align cable thru pulley to drain control valve.
   D. Install nut, washer and seal on top side of cable floor sleeve subassembly.
   E. Install tee handle and pin on toilet service panel.
   F. Engage drain valve control cable at cable quick disconnect.

      NOTE: With drain valve closed check that there is a 1/2-inch cable movement, with a cable load of approximately 5 pounds, before the valve starts to open.

   G. Check that drain valve operates correctly.
   H. Replace toilet shroud.
   I. Replace access panel.
4. Remove Cable without Casing (Fig. 401).
   A. Remove Cable
      (1) Remove fasteners and remove toilet shroud.

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(2) Disengage cable at quick disconnect on toilet tank.
(3) Remove clamps as necessary and relieve or remove all casing bend radii of 10 inches or less.
(4) If cable is broken at control panel, proceed as follows:
(a) Obtain access to inner side of panel by removing insulation as necessary (Ref 25-21-51 or 25-52-141).
(b) Disconnect connecting nut and carefully retract casing from slider housing to expose broken cable.
(c) Carefully cut end of control cable at right angles to cable centerline. Avoid sharp edges.

CAUTION: SHARP EDGES WILL DAMAGE CASING WHEN PULLING CABLE OUT.

(5) If cable is not broken at control panel, proceed as follows:
(a) Just above cable ball end, carefully cut through cable at right angles to cable centerline. Avoid sharp edges.

CAUTION: SHARP EDGES WILL DAMAGE CASING WHEN PULLING CABLE OUT.

NOTE: If cable is broken at this point, it must still be cut to eliminate sharp edges.

(b) Remove cable by pulling handle at control panel.

5. Install Cable without Casing (Fig. 401)
A. Equipment and Materials
(1) Ball End (use either of the following):
(a) Part No. 24835, Teleflex Inc. (V78710)
(b) MS20664C3
(2) Portable Swager - AT520J, ATI Industries (V00784)
(3) Swaging Die - AT520CSB-3-332, Ball Type, ATI Industries (V00784)
(4) Grease - Dow Corning 33, light consistency
(5) Grease - BMS 3-33 (Preferred)

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(6) Grease - MIL-PRF-23827 (Supercedes MIL-G-23827) (Alternate)

B. Install Cable

(1) Lubricate entire length of cable with a light film of Dow Corning 33 grease.

(2) Lubricate slider assembly with grease.

(3) Insert cable and slider assembly into panel.

(4) Install handle in locked position.

(5) Swage ball end to cable using swaging die and portable swager.

NOTE: Swage ball to conform to MS20664C3 contour.

(6) Engage cable at quick disconnect.

NOTE: With drain valve closed check that there is a 1/2-inch cable movement, with a cable load of approximately 5 pounds, before the valve starts to open. If necessary, reroute casing and reinstall clamps. Reinstal1 insulation as necessary (Ref 25-21-51 or 25-52-141).

(7) Check that drain valve operates properly.

C. Install shroud(s) and/or access panels as necessary.

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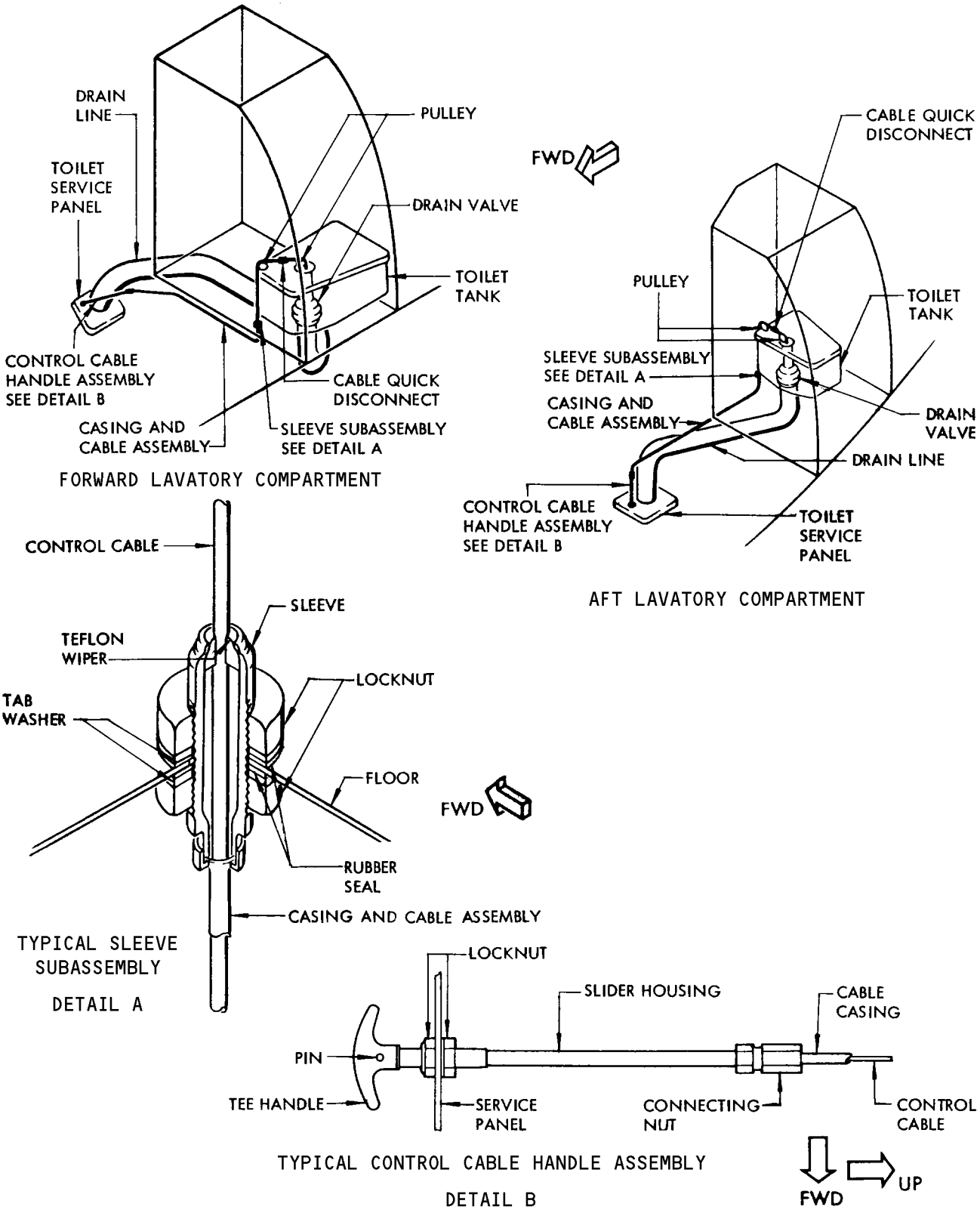

Toilet Drain Valve Control Cable Installation
Figure 401

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TOILET GROUND FLUSH LINE - REMOVAL/INSTALLATION

1. General
   A. This procedure gives the data to remove and install the ground flush line for the toilet waste tank(s).
   B. The ground flush lines for the modular lavatories have a routing that begins at the service panel and follows the drain line to the area below the lavatory. The ground flush lines go through a hole in the crease beam just outboard of the lavatory and enter the lavatory through the outboard partition.
   C. The toilet flush lines for the non-modular lavatories A, B, and C have two sections, the top and the bottom. The bottom section is connected at the service panel and the connection (union) is under the lavatory. The top section is attached to the bottom section at the connection at the lavatory floor and then is connected to the toilet tank. If only the top or bottom section is damaged, it is not necessary to replace the remaining section.
2. Toilet ground Flush Line Removal
   A. References
      (1) AMM 12-17-0, Toilet Servicing
      (2) AMM 12-31-11, Body Section 41 Access doors and Panels
      (3) AMM 25-40-01, Modular Lavatory Compartment
   B. Access
      (1) Location Zones 103 Forward Lavatory A 113 Aft Left Lavatory B 114 Aft Right Lavatory C 118 Aft left Lavatory D 109 Aft Right Lavatory E

      NOTE: Not all Lavatories are installed on each airplane.

   C. Procedure
      (1) Drain the toilet tank (AMM 12-17-0).
      (2) Remove the fasteners and remove the toilet shroud assembly, using the removal procedure for the lavatory waste tank (AMM 38-32-51).
      (3) Disconnect the ground flush line from the toilet tank.
      (4) Remove the clamps that hold the ground flush line in the lavatory compartment.
      (5) For the modular lavatories, perform these steps to remove the clamp that is just outboard of the lavatory.
         (a) For lavatories A, C, D, E, or F, move the lavatory module inboard approximately 6 inches (AMM 25-40-01).
         (b) For lavatory B, remove the fasteners and the attendant's panel at the lower outboard corner of the forward partition.
         (c) Remove the clamp that holds the ground flush line to the crease beam.

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(6) In the non-modular lavatories A, B, C:
(a) Disconnect the top ground flush line from the connection on the lavatory floor.
(b) Remove the top ground flush line.
(7) In the modular lavatories, remove the plate and gasket that holds the ground flush line as it passes through the lavatory partition.
(8) For the non-modular lavatories, D or E, remove the air seal that holds the ground flush line as it passes through the fire shroud.
(9) For the ground flush line lavatory A, remove the access panels in the nose wheel well (AMM 12-31-11).
(10) For the ground flush line for an aft lavatory, remove the access panels from the bulkhead in the aft cargo compartment.
(11) Remove the clamps that hold the ground flush line to the drain line and structure under the lavatory.
(12) Disconnect the ground flush line from the connection on the internal side of the service panel.
(13) For the ground flush line to modular lavatories A, B, C, D, E, or F, and non-modular lavatories D or E:
(a) Carefully feed the ground flush line out of the lavatory and into the area below the lavatory.
(14) For the bottom ground flush line to non-modular lavatories A, B, or C:
(a) Disconnect the ground flush line from the connection under the lavatory.
(15) Remove the ground flush line from the airplane.

3. Toilet Ground Flush Line Installation

A. References
(1) AMM 12-17-0, Toilet Servicing
(2) AMM 12-31-11, Body section 41 Access Doors and Panels
(3) AMM 25-40-01, Modular Lavatory Compartment
(4) SOPM 20-50-12

B. Access
(1) Location Zones 103 Forward Lavatory A 113 Aft Left Lavatory B 114 Aft Right Lavatory C 118 Aft Left Lavatory D 109 Aft Right Lavatory E

NOTE: Not all Lavatories are installed on each airplane.

C. Procedure
(1) Put the ground flush line into its approximate position under the lavatory.
(2) For the ground flush line to modular lavatories A, B, C, D, E, or F, and non-modular lavatories D or E.
(a) Carefully feed the ground flush line through the floor or crease beam.

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(b) Carefully feed the ground flush line through the lavatory partition.

(3) For the ground flush line to non-modular lavatories A, B, or C, attach the ground flush line to the connection under the lavatory.

(4) Connect the ground flush line to the internal side of the service panel.

(5) Install the clamps that hold the ground flush line to the drain line and the structure under the lavatory.

(6) For the modular lavatories:

(a) Install the clamp that holds the ground flush line to the crease beam.

(b) Put the gasket and the plate on the ground flush line.

(7) For the non-modular lavatories D and E; install the air seal on the ground flush line.

(8) For the non-modular lavatories A, B, or C, connect the top ground flush line to the connection on the lavatory floor.

(9) Connect the ground flush line to the valve on the toilet tank.

(10) Install the clamps that hold the ground flush line to the lavatory.

(11) In the modular lavatories, install the gasket and plate on the lavatory partition.

(12) In the non-modular lavatories D or E, install the air seal on the fire shroud.

NOTE: Bond the air seal to the ground flush line and the fire shroud. Use the method in SOPM 20-50-12.

(13) Flush the toilet tank with water (AMM 12-17-0).

(14) Ensure that there are no leaks from the connections for the toilet ground flush line.

(15) Install the toilet tank shroud assembly, using the installation procedure for the lavatory waste tank (AMM 38-32-51).

D. Return the airplane to its normal condition

(1) Install the panels that were removed to gain access to the ground flush hose.

(2) Accomplish the toilet servicing procedure (AMM 12-17-0).

(3) Remove all tools and equipment from the work area.

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TOILET WASTE TANK - REMOVAL/INSTALLATION

1. Equipment and Materials
   A. Graphite Lubrication Grease - MIL-G-81322
2. Prepare to Remove Tank
   A. In forward lavatory, remove aft partition (Ref Chapter 25, Forward Lavatory Partition - R/I).
   B. In aft lavatory, remove sink cabinet (Ref Chapter 25, Lavatory Sink Cabinet - R/I).
   C. Drain and flush waste tank from exterior service panel (Ref 12-17-0).
   D. In aft lavatory, proceed as follows:
      (1) Open applicable lavatory flush motor circuit breaker on panel P18.
      (2) Remove fasteners and disengage disposal cabinet access panel from spring clip. Remove panel enough to gain access to electrical connectors.
      (3) Disconnect electrical connectors from toilet timer.
3. Remove Tank (Fig. 401)
   A. Remove fasteners and remove toilet shroud.
   B. Remove wire bundle clamps as necessary to free wire bundle to toilet flush motor.
   C. Disconnect bonding jumper.
   D. Disconnect tank overboard vent line, ground flush line and waste water drain line from sink as applicable.
   E. Disengage drain valve control cable at cable quick-disconnect.
   F. Loosen fasteners, swing away tiedown rods and, on aft tank, tiedown strap.
   G. Rotate tank slightly to loosen from floor drain adapter.
   H. Lift tank upward evenly.

      CAUTION: UNEVEN LIFTING MAY DAMAGE TANK OUTLET AND/OR FLOOR DRAIN ADAPTER.

   I. Handle tank with care to prevent damage to tank outlet. Store tank with adequate supports to prevent outlet contact with other surfaces.

      CAUTION: TANK OUTLET MAY BE EASILY DAMAGED.

4. Install Tank (Fig. 401)
   A. Lower tank evenly onto floor drain adapter and floor structure.

      CAUTION: UNEVEN HANDLING MAY DAMAGE TANK OUTLET AND/OR FLOOR DRAIN ADAPTER.

      NOTE: Use new O-ring. Lubricate O-ring with graphite grease.

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B. Position cable assembly and tiedown rods (and strap as applicable) on waste tank.
C. Tighten and lockwire fasteners.
D. Engage toilet drain valve control cable.
E. Connect tank overboard vent line and ground flush line.
F. Connect bonding jumper.
G. Connect electrical connectors to timer and clamp wire bundle.
H. Engage disposal cabinet access panel in spring clip and install screws.
I. Install toilet shroud.
J. Service toilet unit (Ref Chapter 12, Toilet Servicing).
K. Close applicable lavatory flush motor circuit breaker on P18 panel and check toilet operation.

5. Restore Airplane to Normal
   A. In forward lavatory, install aft partition (Ref Chapter 25, Forward Lavatory Partition - Removal/Installation).
   B. In aft lavatory, install sink cabinet (Ref Chapter 25, Lavatory Sink Cabinet - Removal/Installation).

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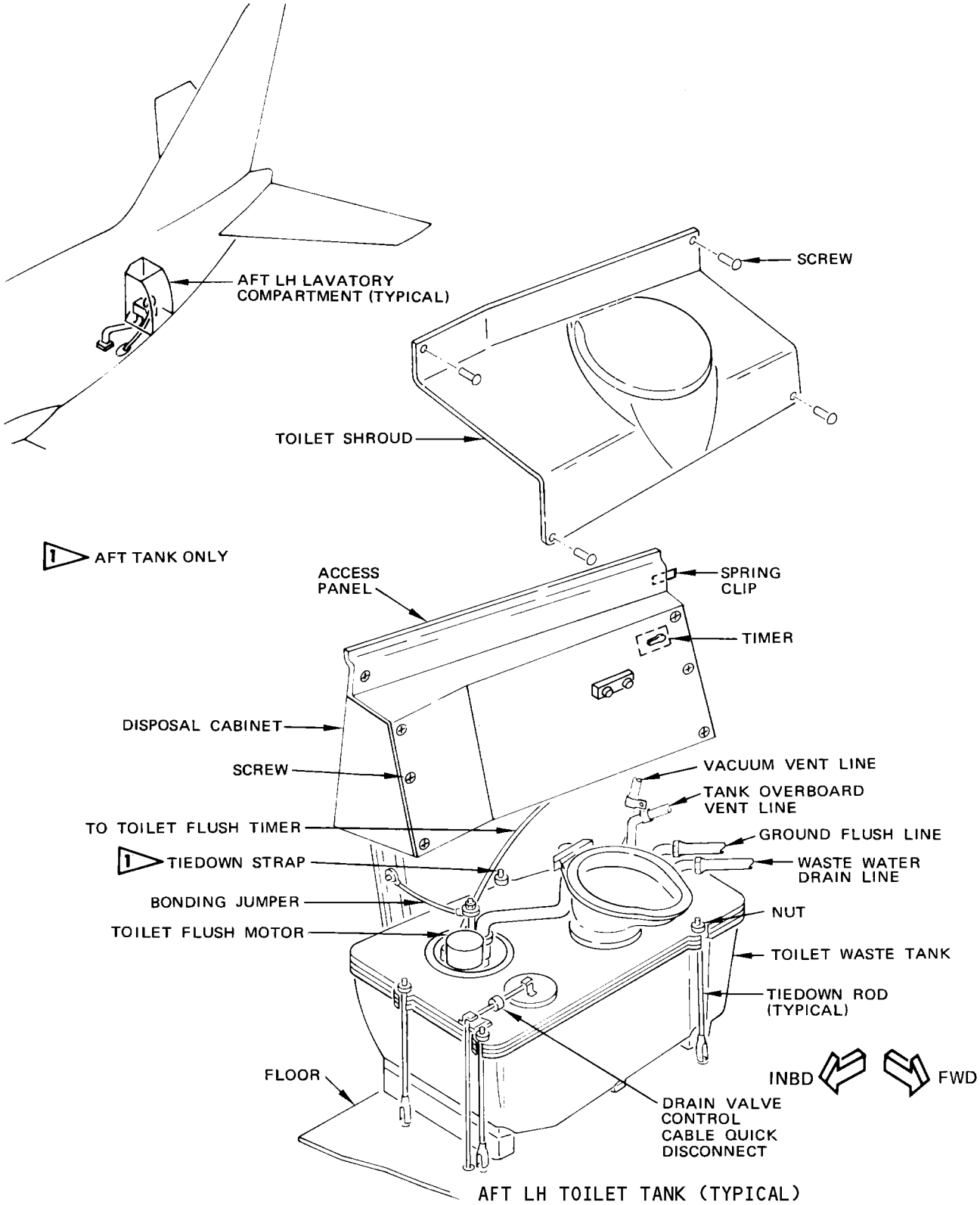

Toilet Waste Tank Installation
Figure 401 (Sheet 1)

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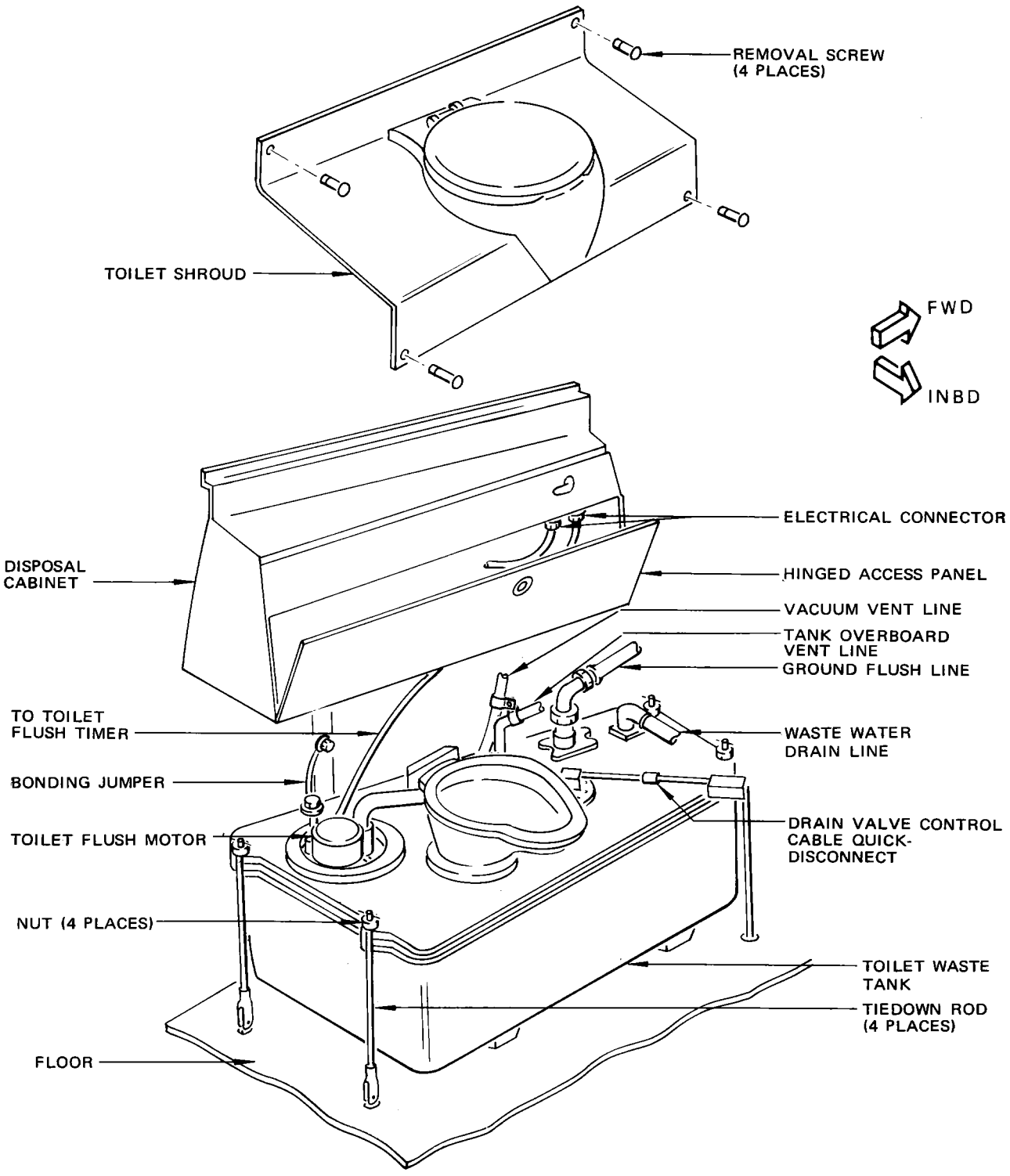

FORWARD TOILET TANK

Toilet Waste Tank Installation
Figure 401 (Sheet 2)

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FORWARD LAVATORY TANK OVERFILL SENSOR - REMOVAL/INSTALLATION

1. General
   A. This procedure has these tasks:
      (1) The removal of the overfill sensor
      (2) The installation of the overfill sensor
2. Overfill Sensor Removal (Fig. 401)
   A. References
      (1) AMM 12-17-0/201, Toilet
   B. Access
      (1) Location Zones
          Forward Lavatory
      (2) Access Panels
          1104 Forward Toilet Panel
          1502 Toilet Service Door

   C. Prepare to Remove the Overfill Sensor
      (1) Do the servicing for the applicable toilet tank (AMM 12-17-0/201).
          (a) Do not add precharge.
      (2) Open these circuit breakers on the P18 circuit breaker panel and attach DO-NOT-CLOSE tags:
          (a) TOILET TANK SHUTOFF VALVE, C1104
          (b) TOILET TANK FILL CONTROL, C1105
      (3) Remove these parts to get access to the top of the toilet tank:
          (a) The toilet seat
          (b) The toilet cover
          (c) The toilet shroud.
      (4) Disconnect the electrical connector.
   D. Remove the Forward Lavatory Overfill Sensor.
      (1) Remove the nuts and the washers that attach the sensor to the top of the toilet tank.
      (2) Remove the overfill sensor.
          (a) Remove and discard the gasket.
3. Overfill Sensor Installation (Fig. 401)
   A. Consumable Materials
      (1) Precharge
   B. References
      (1) AMM 12-17-0/201, Toilet
      (2) AMM 24-22-0/201, Manual Control
   C. Access
      (1) Location Zones
          103 Forward Lavatory
      (2) Access Panels
          1104 Forward Toilet Panel
          1502 Toilet Service Door

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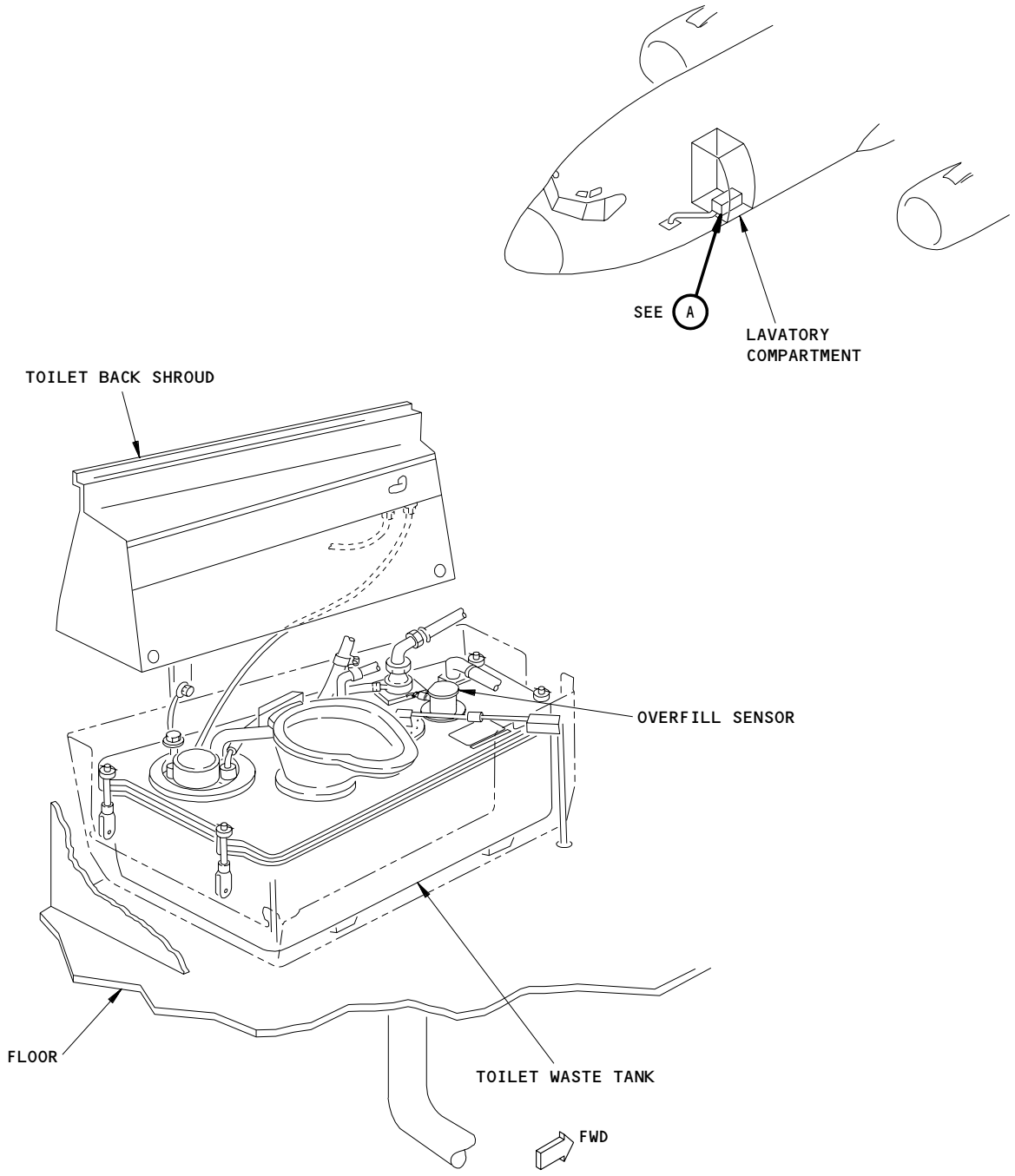

TOILET LEVEL SENSOR INSTALLATION
(TYPICAL)
A

Forward Lavatory Toilet Level Sensor Installation
Figure 401

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D. Install the Overfill Sensor
   (1) Clean the mounting area for the sensor.
   (2) Install a new gasket.
   (3) Put the sensor in the correct position for the installation.
      (a) Install the washers and the nuts.
   (4) Connect the electrical connector.
   (5) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P18 circuit breaker panel.
      (a) TOILET TANK SHUTOFF VALVE, C1104
      (b) TOILET TANK FILL CONTROL, C1105
   (6) Supply electrical power (AMM 24-22-0/201).
   (7) Make sure the shutoff valve is open.
   (8) Fill the toilet tank with water (AMM 12-17-0/201).
      (a) Make sure the shutoff valve closes when the tank is almost full.
   (9) Drain the toilet tank (Ref 12-17-0/201).
      (a) Make sure the shutoff valve is open.
   (10) Add precharge to the toilet tank (AMM 12-17-0/201).

E. Put the Airplane To Its Usual Condition
   (1) Remove the electrical power if it is not necessary (AMM 24-22-0/201).
   (2) Make sure the shutoff valve is closed.
   (3) Install these parts:
      (a) The toilet shroud
      (b) The toilet cover
      (c) The toilet seat.

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RINSE/FILL SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure has these tasks.
      (1) The removal of the shutoff valve.
      (2) The installation of the shutoff valve.
2. Shutoff Valve Removal (Fig. 401)
   A. References
      (1) AMM 12-17-0/201, Toilet - Servicing
   B. Access
      (1) Location Zones
          103 Forward Lavatory
      (2) Access Panels
          1104 Forward Toilet Panel
          1502 Toilet Service Door

   C. Prepare to Remove the Shutoff Valve
      (1) Do the servicing of the forward toilet tank (AMM 12-17-0/201).
          (a) Do not add precharge.
      (2) Open these circuit breakers on the P18 circuit breaker panel (P18-4, or optional location P18-1) and attach a DO-NOT-CLOSE tags:
          (a) TOILET TANK SHUTOFF VALVE, C1104
          (b) TOILET TANK FILL CONTROL, C1105
      (3) Remove these parts to get access to the top of the toilet tank:
          (a) The toilet seat
          (b) The toilet cover
          (c) The toilet shroud.
   D. Remove the Shutoff Valve
      (1) Disconnect the electrical connector.
      (2) Disconnect the inlet and the outlet hoses.
      (3) Remove the nuts and the washers which attach the shutoff valve adapter to the top of the toilet tank.
      (4) Remove the shutoff valve.

          NOTE: Lift the shutoff valve straight up to remove it.

      (5) Remove the gasket for the shutoff valve adapter.
          (a) Discard the gasket.
3. Shutoff Valve Installation (Fig. 401)
   A. Consumable Materials
      (1) Precharge
   B. References
      (1) AMM 12-17-0/201, Toilet - Servicing
      (2) AMM 24-22-0/201, Manual Control

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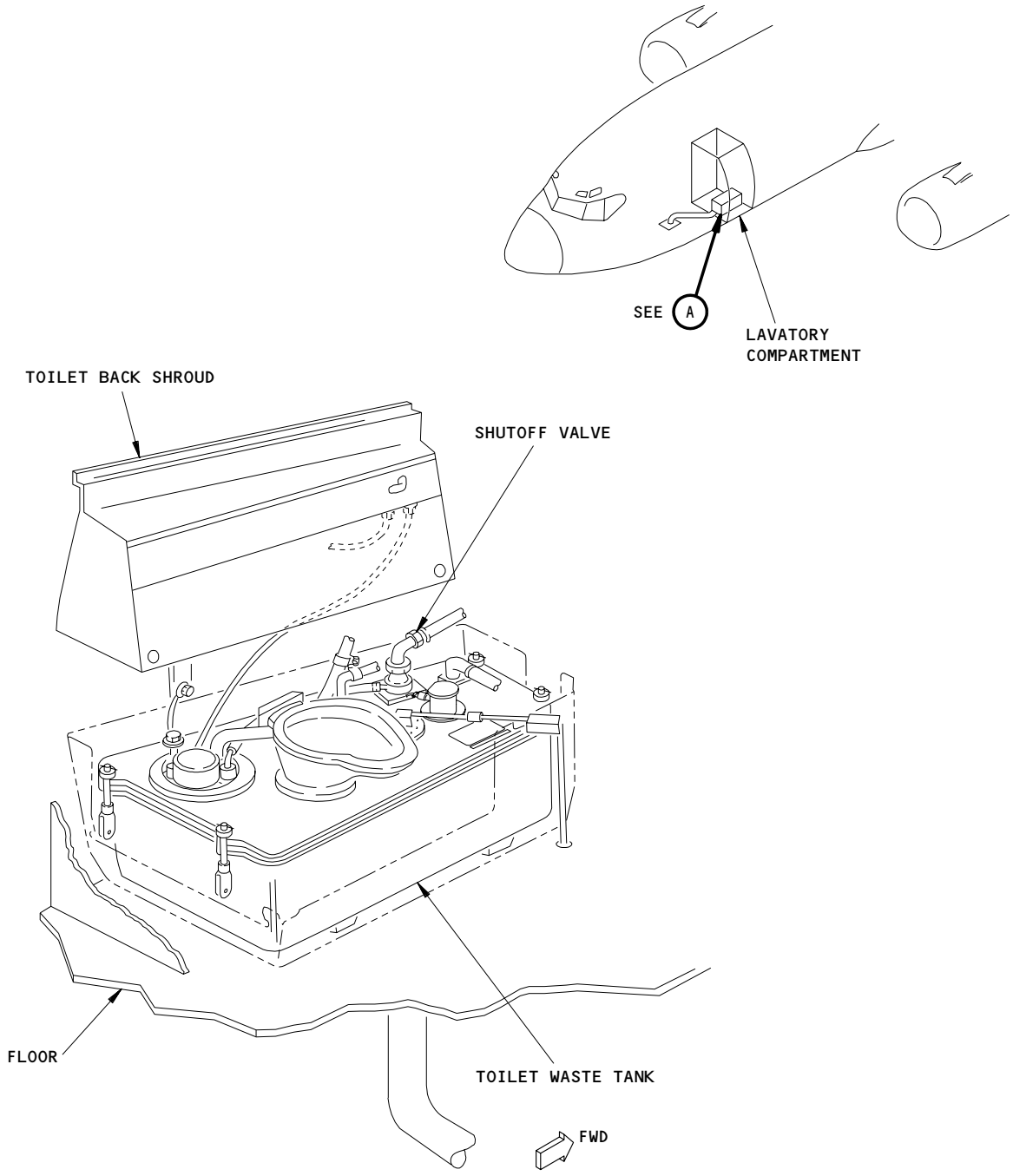

RINSE/FILL SHUTOFF VALVE INSTALLATION
(TYPICAL)

A

Forward Lavatory Rinse/Fill Shutoff Valve Installation
Figure 401

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C. Access
   (1) Location Zones
       103 Forward Lavatory
   (2) Access Panels
       1104 Forward Toilet Panel
       1502 Toilet Service Door

D. Install The Shutoff Valve
   (1) Clean the mounting area for the shutoff valve.
   (2) Install a new gasket.
   (3) Put the shutoff valve in the correct position for the installation.
       (a) Install the washers and the nuts.
   (4) Connect the inlet and the outlet hoses.
   (5) Connect the electrical connector.
   (6) Remove the DO-NOT-CLOSE tag and close these circuit breakers on the circuit breaker panel, P18-4:
       (a) TOILET TANK SHUTOFF VALVE, C1104.
       (b) TOILET TANK FILL CONTROL, C1105.
   (7) Supply electrical power (AMM 24-22-0/201).
   (8) Make sure the shutoff valve is open.
   (9) Fill the toilet tank with water (AMM 12-17-0/201).
       (a) Make sure the shutoff valve closes when the tank is almost full.
   (10) Drain the toilet tank (AMM 12-17-0/201).
       (a) Make sure the shutoff valve is open.
   (11) Add precharge to the toilet tank (AMM 12-17-0/201).

E. Put the Airplane To Its Usual Condition
   (1) Remove the electrical power if it is not necessary (AMM 24-22-0/201).
   (2) Make sure the shutoff valve is closed.
   (3) Install these parts:
       (a) The toilet shroud
       (b) The toilet cover
       (c) The toilet seat.

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SERVICE PANEL DRAIN VALVE - MAINTENANCE PRACTICES

1. General
   A. This procedure has these task(s):
      (1) Replacement of seals on service panel drain valves with OPEN/CLOSE levers (Fig. 201).
      (2) Replacement of seals on the forward and aft service panel drain valves (Fig. 202, 203).
   B. The term "seals" includes O-rings, molded seals, and packings.
2. Drain Valve Seal Replacement - Service Panel with OPEN/CLOSE Levers
   A. Equipment
      (1) Protective Eye Glasses
   B. Consumable Materials
      (1) D00504, VV-P-236 Lubricant
   C. References
      (1) AMM 12-17-0, Toilet - Servicing
      (2) AMM 38-32-0, Toilet System - Adjustment/Test
   D. Access
      (1) Location Zones 203 Nose Wheel Well 208 Forward Cargo Compartment 218 ft Cargo Compartment
      (2) Access Panels 1104 Forward Toilet Panel 1502 Toilet Service Door 3105R Forward Nose Wheel Well Panel
   E. Procedure
      (1) Service the applicable toilet tank (AMM 12-17-0).

          NOTE: Keep the drain hose connected to the drain outlet.

      (2) Accomplish the following steps to drain the precharge:
          (a) Close the flapper valve.
          (b) Open the toilet tank drain valve.
          (c) After 5 minutes open the flapper valve to drain the precharge.
          (d) Disconnect the drain hose from the service panel.
      (3) Accomplish the following steps to gain access to the seals (Fig. 201).
          (a) Remove the eight mounting screws.
          (b) Remove the retainer plate.
          (c) Install two mounting screws, but do not tighten the screws.

              NOTE: This will keep the end nipple in position.

          (d) Remove the shaft retainers and the drive shaft assemblies.

              NOTE: Note the location of the drive shaft assemblies and orientation of the levers to help during the assembly.

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(4) To replace the seals, perform these steps (Fig. 201):
  (a) Remove and discard the seal on the drain cap.
  (b) Apply a thin layer of lubricant on the seal for the drain cap.
  (c) Install the seal for the drain cap.

CAUTION: USE A COTTON-TIPPED SWAB TO REMOVE THE O-RINGS IN THE DRIVE SHAFT CAVITIES. IF A COTTON-TIPPED SWAB IS NOT USED, YOU CAN CAUSE SCRATCHES ON THE SEALING SURFACE.

  (d) Use a lubricated cotton-tipped swab to replace the O-rings in the drive shaft cavities.
  (e) Remove the end nipple from the housing assembly.

NOTE: Note the orientation of the end nipple to help during the assembly.

  (f) Remove the seal retainer.
  (g) Remove and discard the molded seal in the housing assembly.
  (h) Apply a thin layer of lubricant to the surface of the molded seal and install the seal in the housing assembly.
  (i) Remove and discard the O-ring on the end nipple.
  (j) Apply a thin layer of lubricant to the surface of the O-ring and install the O-ring on the end nipple.
  (k) Install the seal retainer.

NOTE: Lubricate the seal retainer to keep it in the correct position.

(5) To assemble the drain valve, perform these steps (Fig. 201):
  (a) Use a 1/8-inch hex drive to turn the flapper valve lock cam so that the cam pin will clear the tab in the housing assembly.
  (b) Close the flapper valve and set the lock cam against the flapper valve.
  (c) Ensure you align the scribe mark on the nipple with the scribe mark on the housing.
  (d) Install the end nipple.
  (e) Install the drive shaft assemblies and the shaft retainers.
  (f) Ensure the drive shafts are fully engaged.
  (g) Remove the mounting screws which were temporarily placed.
  (h) Install the retainer plate.
  (i) Install the mounting screws.

F. Return the Airplane Back to Its Usual Condition
(1) Ensure the flapper valve is closed and then close the drain valve cap.

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(2) Accomplish the leak check for the service panel drain valve (AMM 38-32-0).
(3) Add the chemical precharge to the waste tank and accomplish the remaining steps of the toilet servicing procedure (AMM 12-17-0).

3. Drain Valve Seal Replacement - Forward and Aft Service Panels
A. Consumable Materials
(1) D00504, VV-P-236 Lubricant
B. References
(1) AMM 12-17-0, Toilet - Servicing
(2) AMM 38-32-0, Toilet System - Adjustment/Test
C. Access
(1) Location Zones 203 Nose Wheel Well 208 Forward Cargo Compartment 218 ft Cargo Compartment
(2) Access Panels 1104 Forward Toilet Panel 1502 Toilet Service Door 3105R Forward Nose Wheel Well Panel
D. Procedure
(1) Service the applicable toilet tank (AMM 12-17-0).

NOTE: Keep the drain hose connected to the drain outlet.

(2) Accomplish the following steps to drain the precharge:.
(a) Open the toilet tank drain valve.
(b) Disconnect the drain hose from the service panel.
(3) Perform these steps for the applicable service panel drain valve cap:
(a) For the Forward drain valve cap (Fig.202):
1) Remove and discard the inner door preformed packing.
2) Apply a thin layer of lubricant to the surface of the packing and install it on the inner door.
3) Remove and discard the seal on the outer cap.
4) Apply a thin layer of lubricant to the surface of the seal and install it on the outer cap.
5) Remove the eight mounting bolts on the ring.
6) Remove the cradle.
7) Install two mounting bolts, but do not tighten the bolts.

NOTE: This will keep the ring in place.

8) Remove and discard the preformed packing in the base assembly.
9) Apply a thin layer of lubricant on the preformed packing and install it in the base assembly.
10) Remove the two mounting bolts and install the ring with the eight mounting bolts.
(b) For the Aft drain valve cap (Fig. 203):
1) Remove and discard the outer cap assembly seal.

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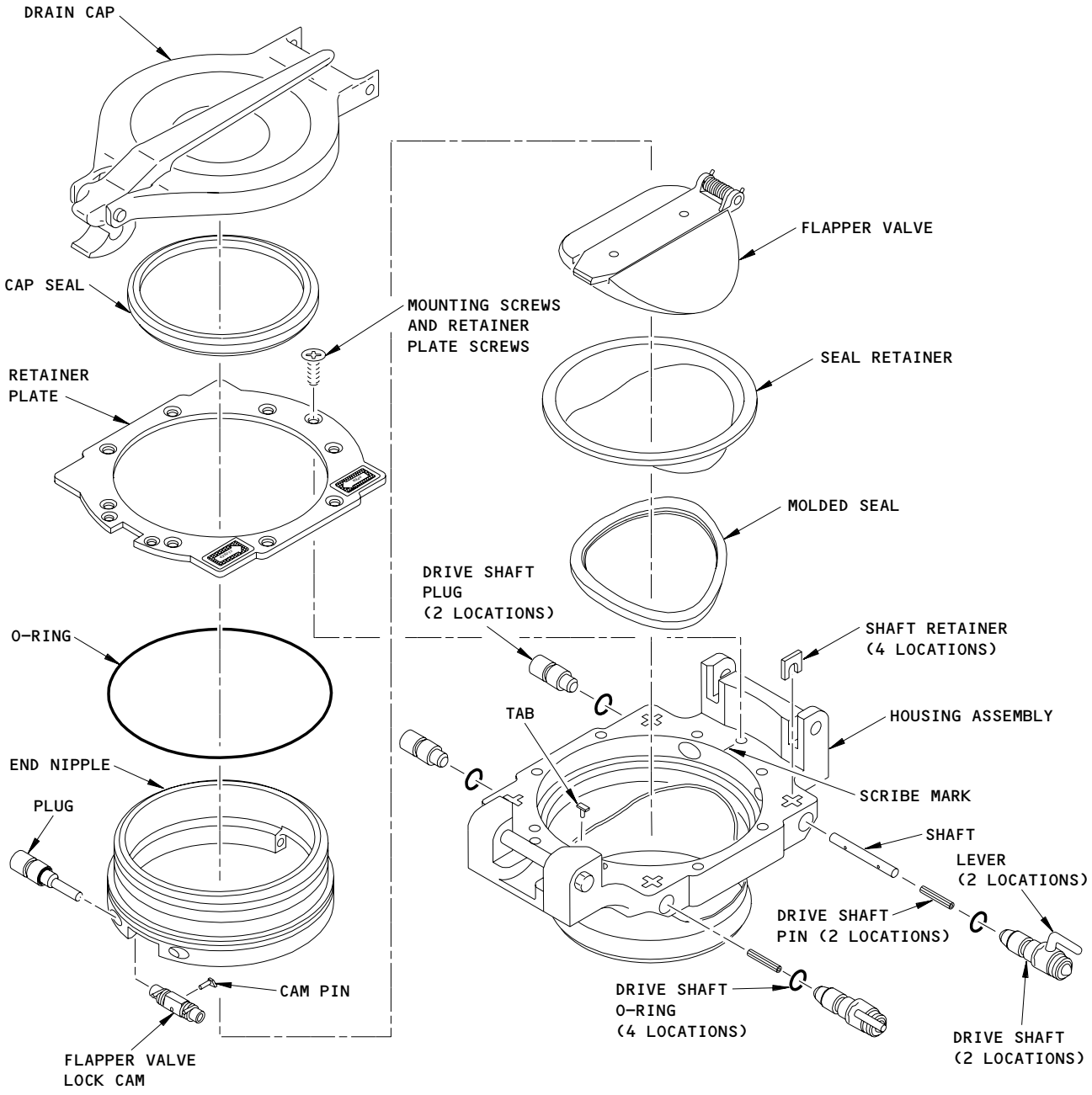

DRAIN VALVE ASSEMBLY (EXPLODED VIEW)

(C)

Service Panel Drain Valve Assembly
Figure 201

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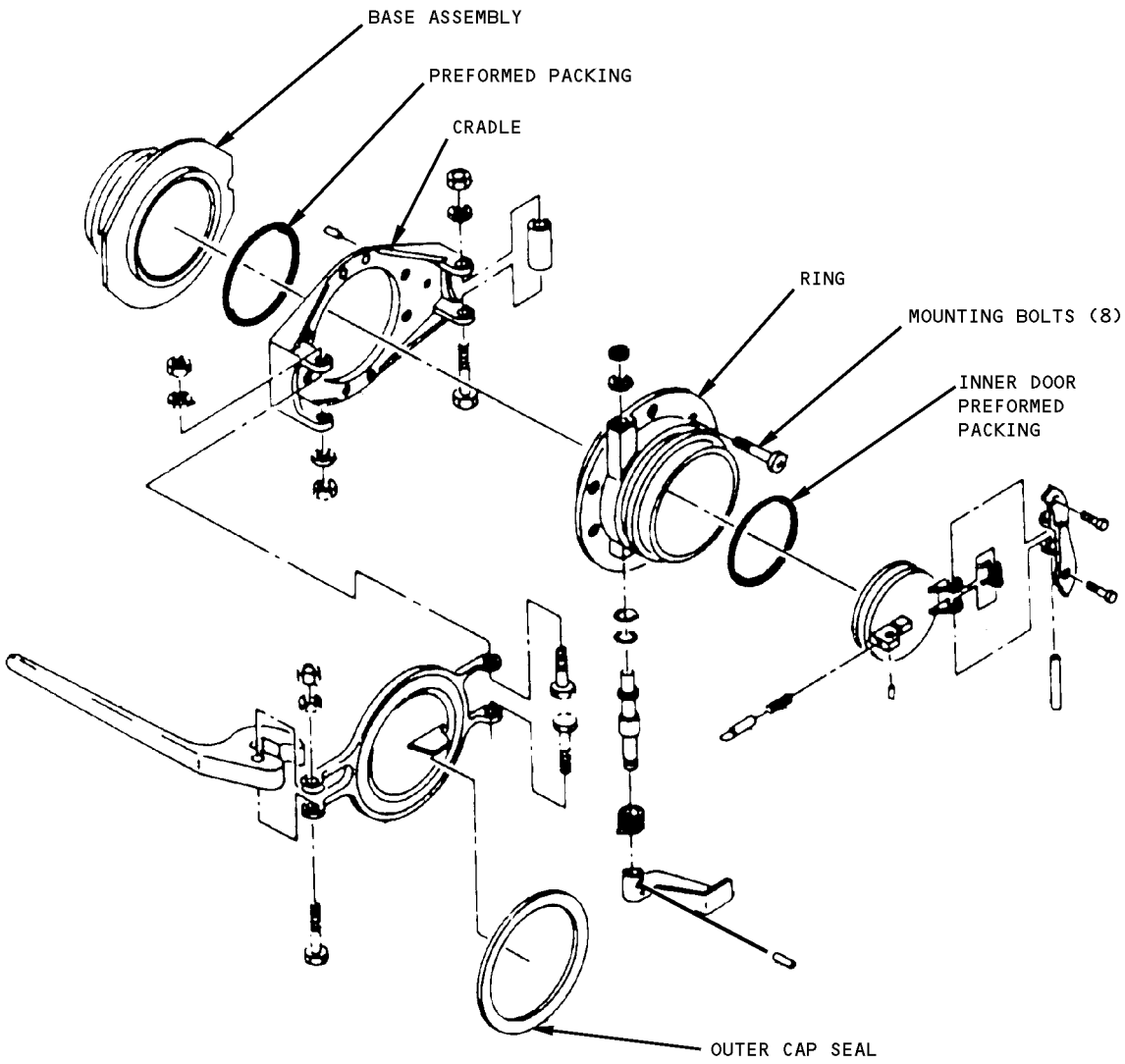

Forward Drain Valve Assembly
Figure 202

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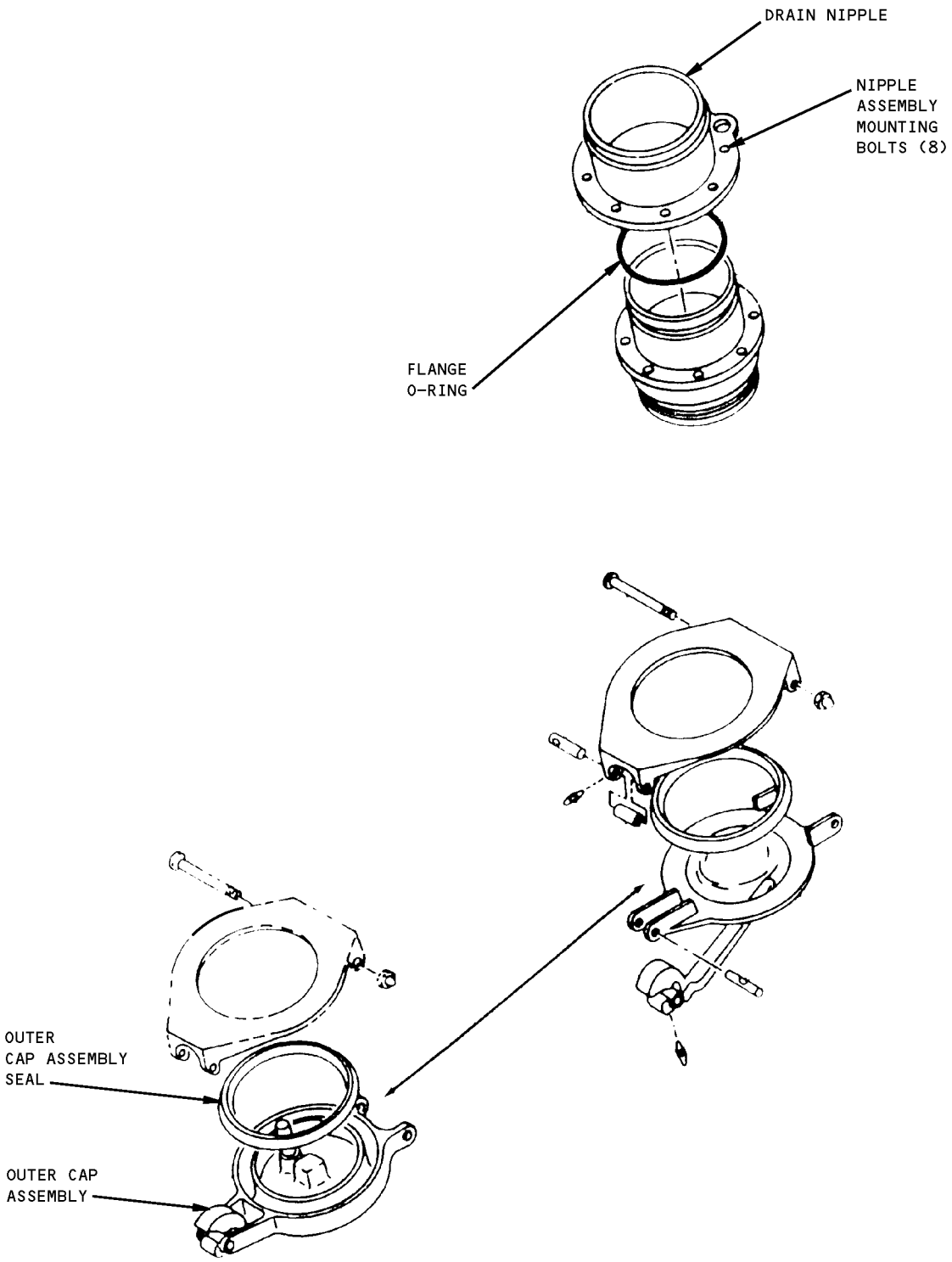

Aft Drain Valve Assembly
Figure 203

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2) Apply a thin layer of lubricant to the surface of the seal and install it on the outer cap.
3) Remove the eight mounting bolts on the drain nipple assembly.
4) Remove the nipple assembly.
5) Install two mounting bolts, but do not tighten the bolts.

NOTE: This will keep the end nipple in place.

6) Remove and discard the flange O-ring.
7) Apply a thin layer of lubricant to the flange O-ring and install it on the drain nipple assembly.
8) Install the eight mounting bolts on the drain nipple assembly.

E. Return the Airplane to Its Usual Condition
(1) Accomplish the leak check for the appropriate service panel drain valve (AMM 38-32-0).
(2) Add the chemical precharge to the waste tank and accomplish the remaining steps of the toilet servicing procedure (AMM 12-17-0).

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WASTE TANK DRAIN DUCT NIPPLE - REMOVAL/INSTALLATION

1. General
   A. This procedure contains two tasks. The first task removes the drain duct nipple for the waste tank. The second task installs the drain duct nipple for the waste tank.
2. Drain Duct Nipple Removal
   A. References
      (1) AMM 12-17-0, Toilet- Servicing
      (2) AMM 24-22-0, Manual Control
   B. Access
      (1) Location Zones 203 Nose Wheel Well 208 Forward Cargo Compartment 218 ft Cargo Compartment
      (2) Access Panels 1104 Forward Toilet Service Panel 1502 Toilet Service Door 3105R Forward Nose Wheel Well Panel
   C. Prepare to Remove the Drain Duct Nipple
      (1) Provide electrical power (AMM 24-22-0).
      (2) Perform the servicing for the applicable waste tank (AMM 12-17-0).
         (a) Do not add the flushing chemical to the waste tank.
         (b) Let the service door stay open.
      (3) Open this circuit breaker on the load control center, P18, and attach a DO-NOT-CLOSE tag:
         (a) DRAIN HEATER
   D. Remove the Drain Duct Nipple
      (1) Perform these steps to get access to the clamp which holds the drain duct nipple to the drain duct:
         (a) For the forward service panel, remove the access door on the right inner wall of the nose wheel well.
         (b) For the aft service panel, remove the aft bulkhead lining panel in the aft cargo compartment.
      (2) Remove the clamp which holds the waste drain duct to the drain duct nipple.
      (3) Pull the handle on the waste drain cap to open the cap.
      (4) Remove the mounting bolts from the drain nipple (8 locations).
         (a) Remove seven of the bolts.
            1) Keep one of the bolts loosely attached.
         (b) From behind the service panel, hold the nut ring.
         (c) Remove the last bolt and the nut ring which is attached with rivets to the pan.
      (5) Remove the drain duct nipple from the service panel.

         NOTE: Be careful not to cause damage to the heater gasket.

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(a) Remove and replace the heater gasket if it is damaged.
1) Cut the wires near the heater gasket.

NOTE: Keep the wires in position to help locate the splice. Remove these wires before you install the new heater gasket.

2) Remove the heater gasket.

3. Drain Duct Nipple Installation

A. Consumable Materials
(1) A00246 Sealant - Chromate Type, BMS 5-95 (AMM 20-30-11)
(2) B00148 Solvent - Spec TT-M-261 or JIS-K-8903 methyl ethyl ketone (AMM 20-30-31)
(3) G00150 Tape - Teflon, Permacel P-424 (AMM 20-30-51)

B. References
(1) AMM 12-17-0, Toilet - Servicing
(2) AMM 20-30-11, Adhesives, Cements, and Sealers
(3) AMM 20-30-31, Cleaners and Polishes
(4) AMM 20-30-51, Miscellaneous Materials
(5) AMM 24-22-0, Manual Control

C. Access
(1) Location Zones 203 Nose Wheel Well 208 Forward Cargo Compartment 218 ft Cargo Compartment
(2) Access Panels 1104 Forward Toilet Service Panel 1502 Toilet Service Door 3105R Forward Nose Wheel Well Panel

D. Install the Drain Nipple
(1) Use the solvent to clean all mounting surfaces and bolts.
(a) Remove the used sealant from the bolts.
(2) If the heater gasket was removed, perform these steps to install a new heater gasket:
(a) Remove the used wires.
(b) Splice in the new wires.
(c) Put the heater gasket in the correct position.
(d) Ensure the wires are installed correctly.
(3) Connect the drain duct nipple to the waste duct.
(a) Perform these steps to install the drain duct nipple against the heater gasket:
1) On service panels with the OPEN/CLOSE levers, install the drain duct nipple with the levers in the up position.
(4) Install the mounting bolts.
(a) Install the nut ring from behind the service panel.
(b) Put the bolts in the sealant momentarily.
(c) Install the bolts while the sealant is wet.

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(5) Install the clamp that holds the waste drain duct to the drain duct nipple.

NOTE: Wind teflon tape a minimum of one time around the clamp point of the waste drain duct to make the installation easier. Remove the used teflon tape if it is necessary.

(6) For the forward service panel, install the access door on the right inner wall of the nose wheel well.
(7) For the aft service panel, install the aft bulkhead lining panel in the aft cargo compartment.
(8) Ensure there are no leaks at the service panel when the drain tube is filled with water (AMM 38-32-0).

E. Return the Airplane to Its Usual Condition
(1) Add the chemical precharge to the waste tank and perform the remaining steps of the toilet servicing procedure (AMM 12-17-0).
(2) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the load control center panel, P18:
(a) DRAIN HEATER
(3) Remove the electrical power if no longer required (AMM 24-22-0).

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WATER TANK PRESSURIZATION SYSTEM - DESCRIPTION AND OPERATION

1. General
   A. The water tank pressurization system provides air to maintain pressure in the water system. The pressurized air is normally provided simultaneously by two sources. If both sources are not available, either is capable of providing tank pressure. The two sources are listed below:
      (1) A bleed air line direct from engine No. 1 (Ref Chapter 78, Exhaust).
      (2) The pneumatic manifold, which is in turn pressurized by: either or both engines, the APU, or a ground pneumatic cart (Fig. 2).
   B. An alternate way of pressurizing the water tank on the ground is by connecting a pressure source to the air valve on the water service panel.
   C. All water tank pressurization system air passes through an air filter and pressure regulator on way to the water tank. The air is filtered to prevent contamination. The pressure regulator reduces the air pressure and maintains 25 psi in the water tank. Check valves in the system prevent reverse pressurization (Fig. 2).
2. Pressure Regulator
   A. The pressure regulator is installed above the water tank aft of the aft cargo compartment (Fig. 2). The pressure regulator reduces the air pressure from the No. 1 engine to 25 ±2 psi.
3. Air Filter
   A. The air filter is installed above the water tank aft of the aft cargo compartment (Fig. 2). The filter contains a replaceable 10-micron filtration cellulose element. It filters all air entering the air pressure regulator.
4. Pressure Relief Valve
   A. AIRPLANES WITH P/N RV05-362 PRESSURE RELIEF VALVE, POST SB 38A1047R2; The pressure relief valve is installed above the water tank aft of the aft cargo compartment (Fig. 2). The relief valve prevents the water tank from being damaged by overpressurization. It is set to relieve between 57 psi and 63 psi. Reset pressure is 54 psi minimum.
   B. PRE SB 38A1047; The pressure relief valve is installed above the water tank aft of the aft cargo compartment (Fig. 2). The relief valve prevents the water tank from being damaged by over pressurization. It is set to relieve at 50 ±2.5 psi. Reset pressure is 37 psi minimum.

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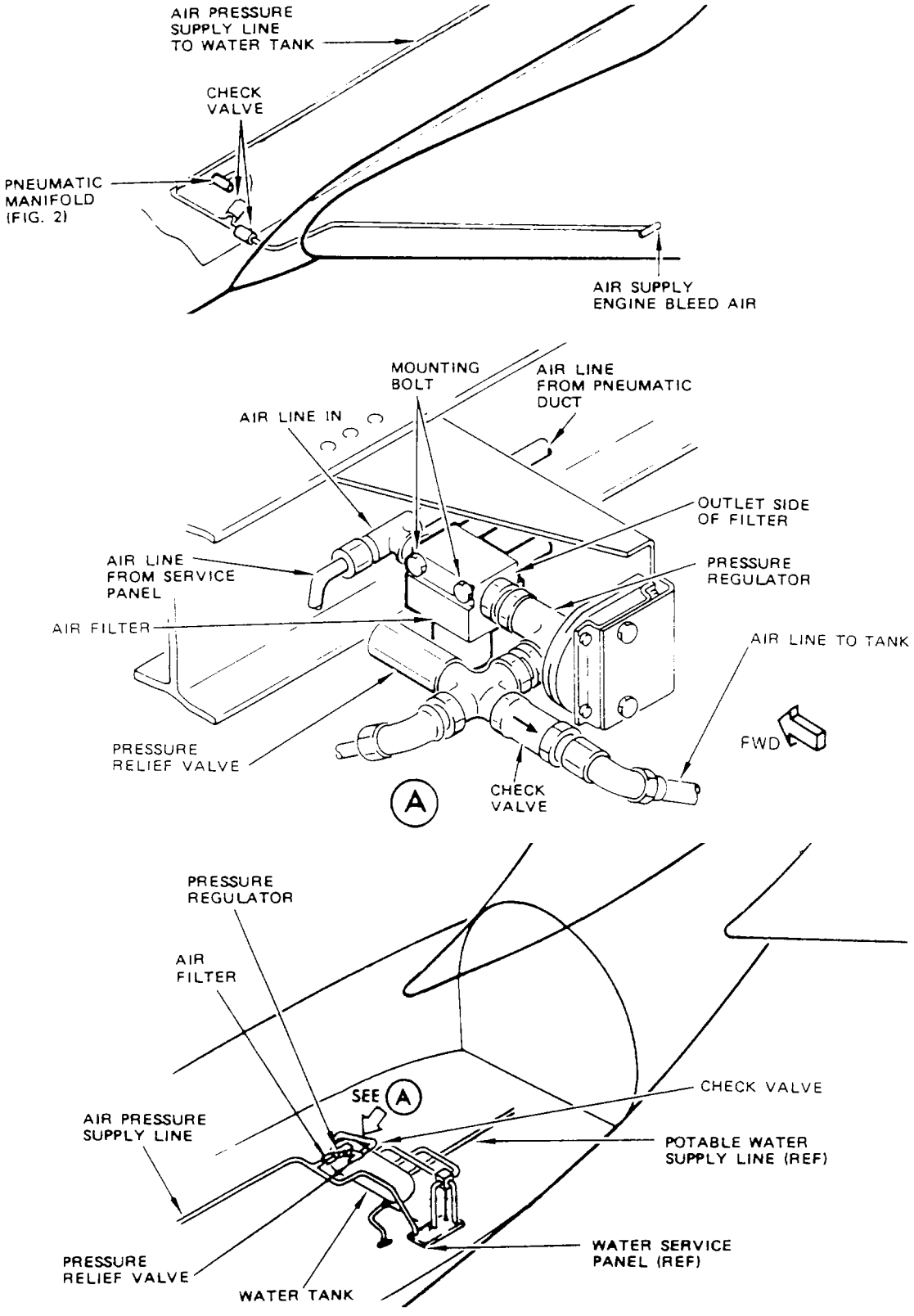

Water Pressurization System
Figure 1

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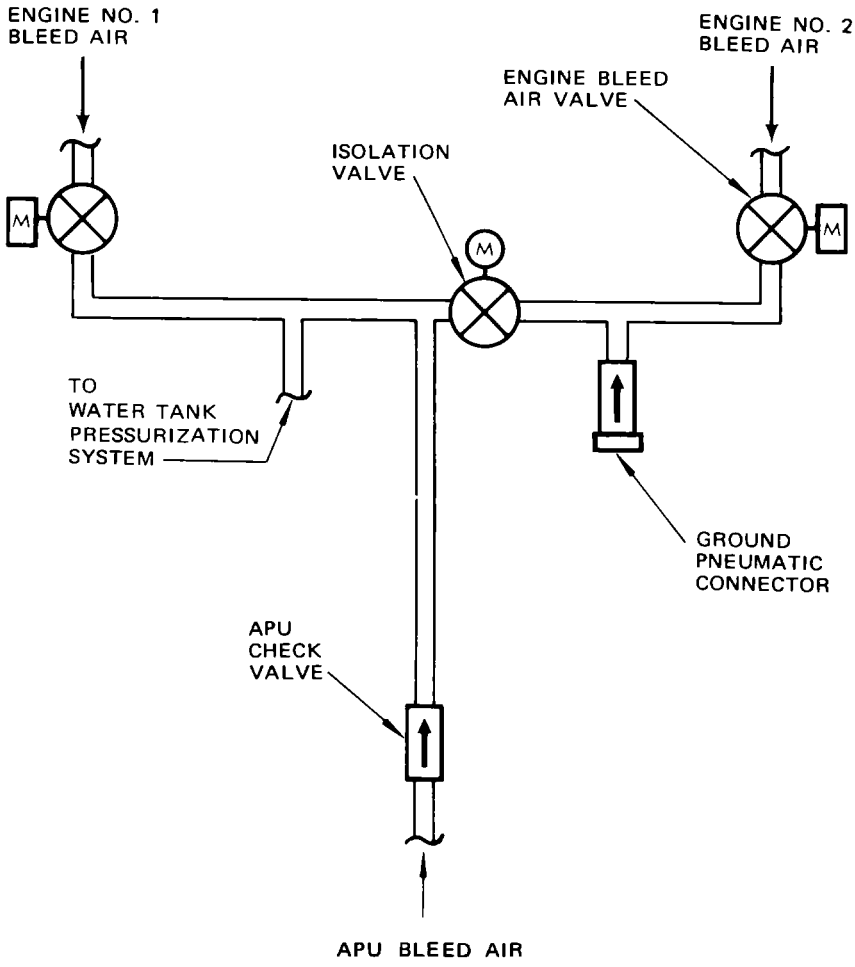

PNEUMATIC MANIFOLD
DETAIL A

Water Tank Pressurization System
Figure 2

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WATER TANK PRESSURIZATION SYSTEM - MAINTENANCE PRACTICES

1. Water Tank Depressurization-Pressurization
   A. General
      (1) The water tank is normally pressurized by engine bleed air coming through a direct line from engine No. 1 and by air from the pneumatic manifold. Either of these two sources can maintain tank pressure. The pneumatic manifold can be pressurized by either or both engines, the APU, or a pneumatic ground cart.
      (2) An alternate way of pressurizing the water tank is by connecting a pressure source to the air valve on the water service panel.
      (3) The water tank must be depressurized prior to performing maintenance on any part of the potable water system.

          WARNING: MAKE SURE POTABLE WATER SYSTEM IS DEPRESSURIZED. HIGH PRESSURE/TEMPERATURE AIR CAN BE DANGEROUS TO PERSONNEL.

          (a) For lavatory components:
              1) Prior to maintenance, turn the lavatory 3-way drain valve to the CLOSED position.
              2) After maintenance, turn the valve to the ON position.
          (b) For water tank and all components of the water tank pressurization system:
              1) Prior to maintenance, depressurize water tank per step B below.
              2) After maintenance, pressurize water tank per step C below.
          (c) For all other components of the potable water system:
              1) Prior to maintenance:
                 a) Gravity drain the potable water system (Ref 38-11-0, Servicing).
                 b) Ensure that the water tank drain valve is in the OPEN position.
                 c) Ensure that the fill and overflow valve is in the OPEN position.
              2) After maintenance, fill the water tank (Ref Chapter 12, Water System - Servicing).
   B. Depressurize Water Tank
      (1) If operating, shut down No. 1 engine (Ref Chapter 71, Power Plant - Operating Procedure).
      (2) If No. 2 engine is operating, close Bleed Air Isolation Valve (Ref Chapter 36, Engine Bleed Air System - Operating Procedure).
      (3) If operating, shut down APU (Ref Chapter 49, APU Power Plant - Operating Procedure).
      (4) If connected, disconnect ground pneumatic card from pneumatic manifold connector.

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(5) Momentarily turn left and right air conditioning pack valve switches on forward overhead panel to ON, then turn to OFF.
(6) If connected, disconnect air pressure source from air valve at water service panel.
(7) Open fill and overflow valve, then close.
(8) If it is desired to pressurize the pneumatic manifold while performing maintenance in the water system, disconnect the water tank pressurization line as follows:
(a) Depressurize both systems by performing steps 1.B.(1) thru .B.(7).

WARNING: IF PRESSURE LINE IS DISCONNECTED BEFORE DEPRESSURIZING, HIGH PRESSURE/TEMPERATURE AIR IN THE LINE MAY CAUSE INJURY TO PERSONNEL.

(b) Open A/C access panel 3303 (Ref Chapter 12, Access Doors and Panels).
(c) Disconnect water tank pressurization line at plugged tee about 20 inches aft of air cycle machine. Cap or plug lines.
(d) Pressurize pneumatic manifold by using the engines, the APU, or a pneumatic ground cart.

C. Pressurize Water Tank
(1) If water tank pressurization line has been disconnected, proceed as follows:
(a) Depressurize pneumatic manifold by performing steps 1.B.(1) thru 1.B.(4).
(b) Remove plugs or caps and connect water tank pressurization line.

WARNING: IF PLUGS OR CAPS ARE REMOVED WITH MANIFOLD PRESSURIZED, HIGH PRESSURE/TEMPERATURE AIR MAY CAUSE INJURY TO PERSONNEL.

(2) Pressurize water tank in either of the following three ways:
(a) Start APU and move APU bleed air switch on panel P6 to ON (Ref Chapter 49, Operating Procedure).
(b) Connect ground pneumatic cart and pressurize pneumatic manifold. Check that isolation valve switch on forward overhead panel is positioned open.
(c) Connect pressure source to air valve on water service panel and pressurize tank.
(3) Allow 2 minutes for pressure to stabilize.

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WATER TANK PRESSURIZATION SYSTEM FILTER - SERVICING

1. Remove Water Tank Pressurization System Filter Element
   A. Depressurize water tank (Ref 38-41-0, MP).
   B. Remove the aft cargo compartment rear bulkhead access panel.
   C. Disconnect lockwire and unscrew filter case and element from filter head (Fig. 301).
   D. Remove filter element and clean filter case.
2. Install Water Tank Pressurization System Filter Element
   A. Insert O-ring in filter element and place new element in filter case (Fig. 301).
   B. Place O-ring on filter case and screw filter case into filter head. Torque filter case to 50 +10 pound-inches.
   C. Lockwire filter case to filter head.
   D. Replace access panel.
   E. Pressurize water tank (Ref 38-41-0, MP).

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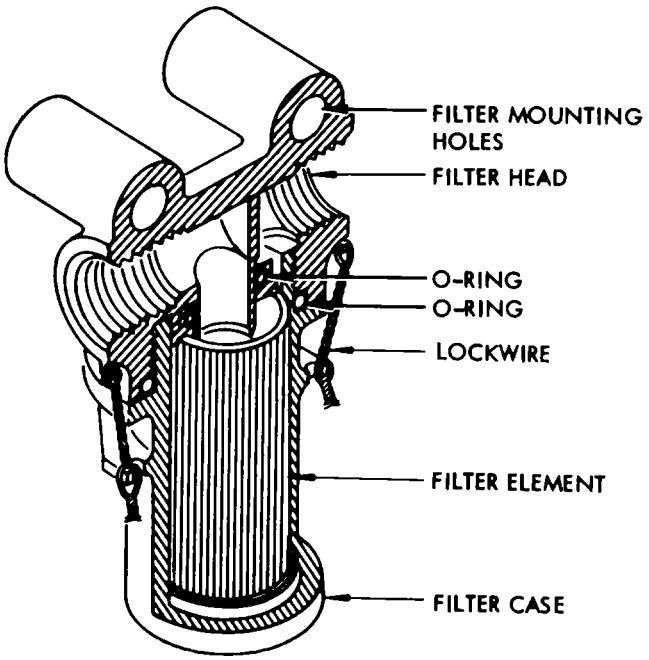

Water Tank Pressurization System Filter Element Installation
Figure 301

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WATER TANK PRESSURIZATION SYSTEM FILTER - REMOVAL/INSTALLATION

1. Remove Water Tank Pressurization System Filter
   A. Depressurize water tank (Ref 38-41-0 MP).
   B. Remove the aft cargo compartment rear bulkhead access panel.
   C. Disconnect air lines from filter (Fig. 401).
   D. Remove filter mounting bolts and remove filter from mounting bracket.
   E. Install air line protective caps.
2. Install Water Tank Pressurization System Filter
   A. Remove protective caps from air lines.
   B. Position assembled filter on mounting bracket and install filter mounting bolts (Fig. 401).

      NOTE: Check that outlet side of filter is aft.

   C. Connect air lines to filter.
   D. Replace access panel.
   E. Pressurize water tank (Ref 38-41-0 MP).

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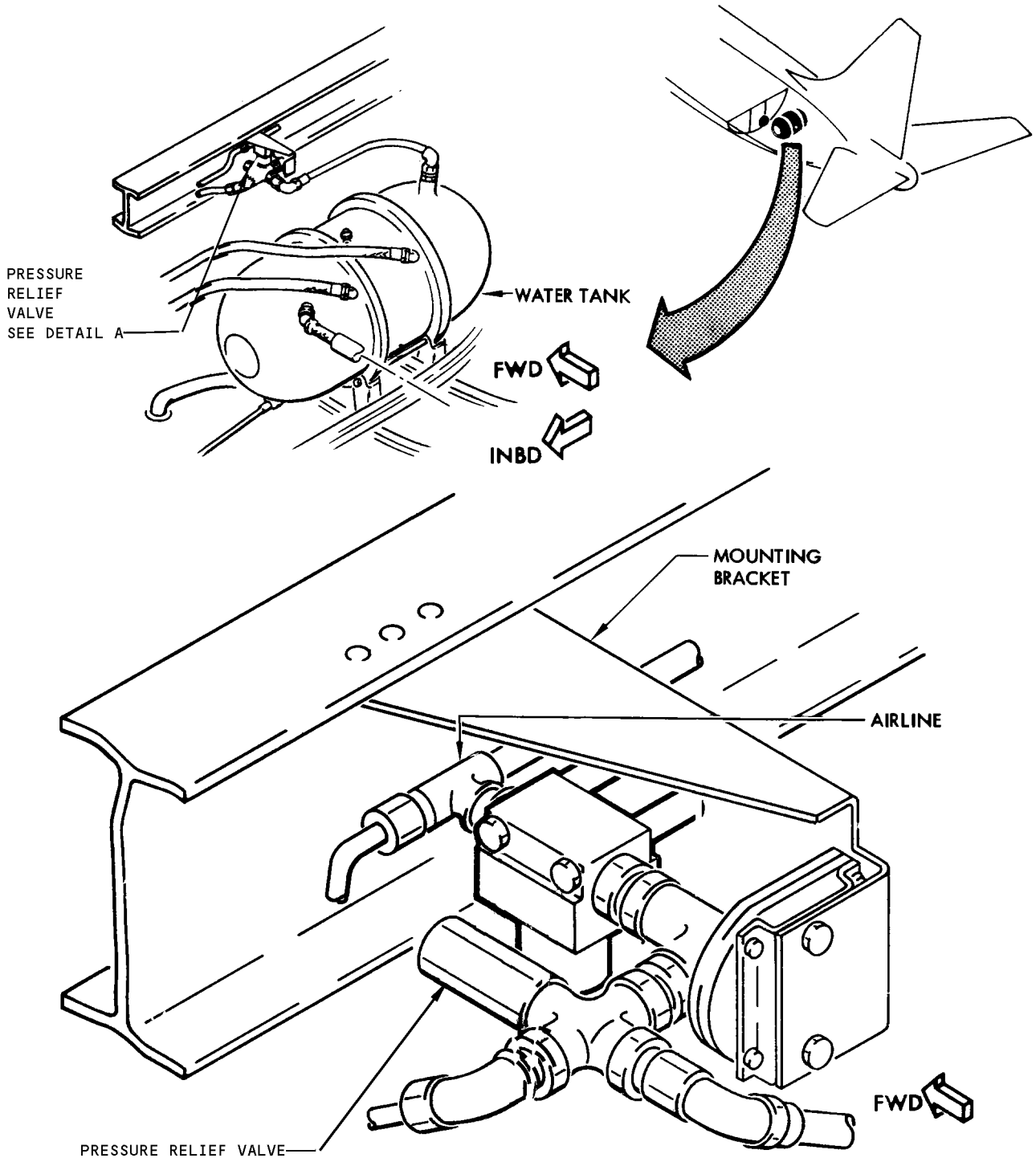

DETAIL A

Pressure Relief Valve Installation
Figure 401

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WATER TANK PRESSURE RELIEF VALVE - REMOVAL/INSTALLATION

1. Remove Water Tank Pressure Relief Valve (Fig. 401)
   A. Reference
      (1) AMM 38-41-0/201, Water Tank Pressurization - Maintenance Practices
      (2) AMM 25-52-123/401, Cargo Compartment Sidewall Lining - Removal Installation
   B. Access
      (1) Location Zone
         (a) 15, Aft Cargo Compartment
   C. Procedure
      (1) Depressurize water tank (AMM 38-41-0/201).
      (2) Remove the aft cargo compartment rear bulkhead access panel (AMM 25-52-123/401).
      (3) Turn pressure relief valve counter clockwise to remove it from fitting.

      WARNING: DO NOT TURN THE DEFLECTOR CAP WHEN YOU REMOVE OR INSTALL THE PRESSURE RELIEF VALVE. THE PRESSURE AT WHICH THE RELIEF VALVE RELEASES PRESSURE CAN CHANGE IF THE DEFLECTOR CAP TURNS. IF THE PRESSURE RELIEF VALVE DOES NOT RELEASE AT THE CORRECT PRESSURE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

      NOTE: If it is necessary, use a suitable tool to hold fitting while loosening pressure relief valve.

      (4) Install protective cap on fitting, if necessary.
      (5) Discard O-ring.

2. Install Water Tank Pressure Relief Valve (Fig. 401)
   A. Reference
      (1) AMM 38-41-0/201, Water Tank Pressurization- Maintenance Practices
      (2) AMM 25-52-123/401, Cargo Compartment Sidewall Lining - Removal Installation

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B. Consumable Material
   (1) A01023 Sealant, silicone (DC-111)
   (2) D00463, Grease, food processing equipment - D0D-G-24650
C. Access
   (1) Location Zone
      (a) 15, Aft Cargo Compartment
D. Procedure

   (1) Apply the grease, D0D-G-24650 or the sealant DC-111 to the packing and threads of the pressure relief valve.
   (2) Remove protective cap from fitting for pressure relief valve, if installed.
   (3) Install pressure relief valve with a new O-ring.

   WARNING: DO NOT TURN THE DEFLECTOR CAP WHEN YOU REMOVE OR INSTALL THE PRESSURE RELIEF VALVE. THE PRESSURE AT WHICH THE RELIEF VALVE RELEASES PRESSURE CAN CHANGE IF THE DEFLECTOR CAP TURNS. IF THE PRESSURE RELIEF VALVE DOES NOT RELEASE AT THE CORRECT PRESSURE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

   NOTE: If it is necessary, use a suitable tool to hold fitting while loosening pressure relief valve.

   (4) Pressurize water tank (AMM 38-41-0/201).
   (5) Inspect fitting at pressure relief valve for air leaks.
   (6) Install the aft cargo compartment rear bulkhead access panel (AMM 25-52-123/401).
E. Return the airplane to its usual condition..

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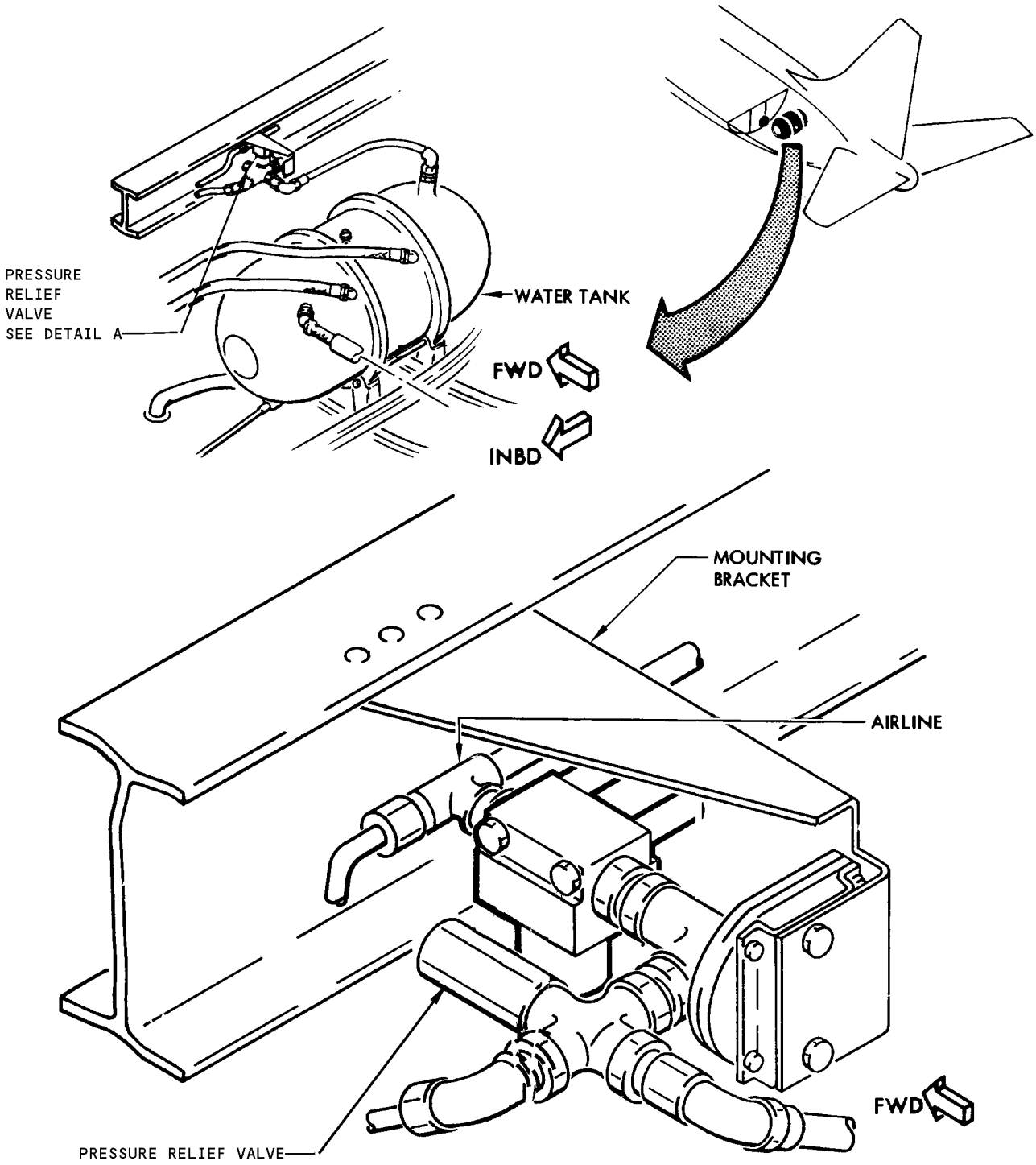

DETAIL A

Pressure Relief Valve Installation
Figure 401

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WATER TANK PRESSURE RELIEF VALVE - ADJUSTMENT/TEST

1. General
   A. The purpose of this test is to verify that the water tank pressure relief valve vents off excess pressure within the correct pressure range.
2. Equipment and Materials
   A. Pressure gage (0-80 psig ±0.5 psig)
   B. Control valve (pressure rating 150 psig minimum, 3/8 inch minimum globe type, 15 scfm minimum, flow at 50 psig)
   C. Pressure regulator (pressure rated for air source, outlet pressure adjustable, zero to 100 psig, 3/8 inch minimum)
   D. Air filter (in-line type)
   E. Compressed air source (regulated 80 psig, 15 scfm minimum)
   F. Flexible air hoses for test setup (pressure rated for air source greater than 100 psig)
3. Water Tank Pressure Relief Valve Test (Fig. 501)
   A. Remove pressure relief valve (AMM 38-41-51/401).

      WARNING: DO NOT TURN THE DEFLECTOR CAP WHEN YOU REMOVE OR INSTALL THE PRESSURE RELIEF VALVE. THE PRESSURE AT WHICH THE RELIEF VALVE RELEASES PRESSURE CAN CHANGE IF THE DEFLECTOR CAP TURNS. IF THE PRESSURE RELIEF VALVE DOES NOT RELEASE AT THE CORRECT PRESSURE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

   B. Using schematic in figure 501 as a guide, connect equipment and pressure relief valve to a regulated clean oil-free source of compressed air.
   C. Close control valve.
   D. Verify zero psig reading on pressure gage.
   E. Gradually open pressure regulator, monitoring pressure gage as pressure increases.
   F. Record pressure at which the onset of airflow or a sudden increase in airflow through pressure relief valve occurs.

      NOTE: The initial pressure to open the relief valve can be higher as much as 10 percent than the set pressure. The subsequent pressure should be within the normal set range of the relief valve.

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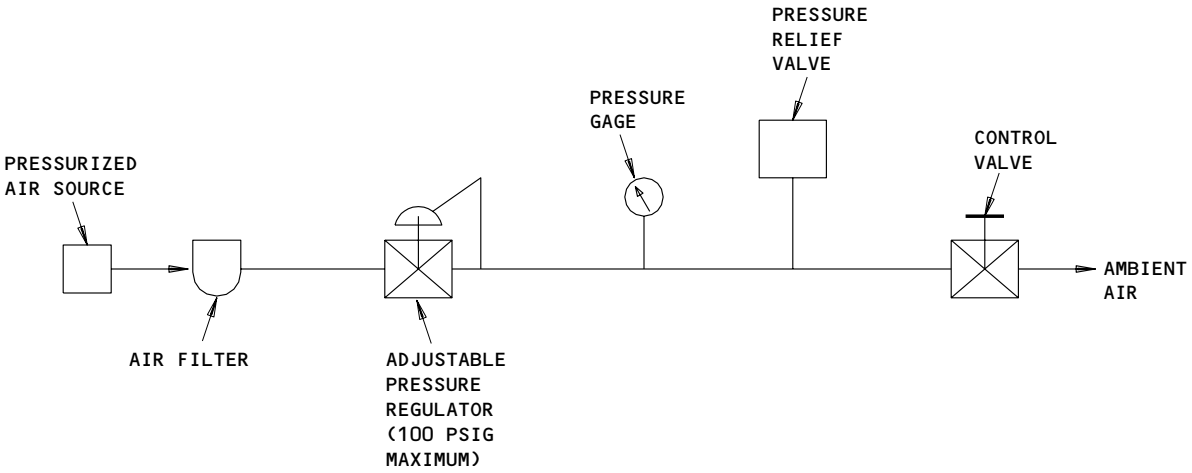

Pressure Relief Valve Test
Figure 501

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G. AIRPLANES WITH P/N RV05-362 VALVE, POST SB 38A1047;
The initial pressure recorded must be more than 57 psig and less than 75 psig.
(1) AIRPLANES WITH P/N RV05-362 VALVE, POST SB 38A1047;
If the initial pressure recorded is less than 57 psig, or more than 75 psig, stop the test. Replace the pressure relief valve then do the test again.

H. PRE SB 38A1047;
The initial pressure recorded must be more than 47 psig and less than 63 psig.
(1) PRE SB 38A1047;
If the initial pressure recorded is less than 47 psig, or greater than 63 psig, stop the test. Replace the pressure relief valve then do the test again.

I. Check reset pressure of pressure relief valve.
(1) With pressure at relief pressure, gradually close the pressure regulator.
(2) Visually monitor pressure gage as pressure decreases.
(3) Record the reset pressure at which the airflow stops or the decrease of pressure stops.
(4) AIRPLANES WITH P/N RV05-362 VALVE, POST SB 38A1047;
The reset pressure recorded should be greater than 54 psig.
(a) AIRPLANES WITH P/N RV05-362 VALVE, POST SB 38A1047.
If the reset pressure is less than 54 psig, stop the test. Replace the pressure relief valve then do the test again.
(5) PRE SB 38A1045;
The reset pressure recorded should be greater than 37 psig.
(a) PRE SB 38A1045;
If the pressure is less than 37 psig stop the test. Replace the pressure relief valve then do the test again.
(6) Reduce pressure to zero psig.

J. Perform a subsequent test by performing steps 3.C. through 3.G.
(1) AIRPLANES WITH P/N RV05-362 VALVE, POST SB 38A1047;
If the pressure is less than 57 psig, or greater than 63 psig, stop the test. Replace the pressure relief valve then do the test again.

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(2) PRE SB 38A1045;
If pressure is less than 47 psig, or greater than 53 psig, replace pressure relief valve. Do the test again.

K. Reduce pressure to zero psig.

WARNING: DO NOT TURN THE DEFLECTOR CAP WHEN YOU REMOVE OR INSTALL THE PRESSURE RELIEF VALVE. THE PRESSURE AT WHICH THE RELIEF VALVE RELEASES PRESSURE CAN CHANGE IF THE DEFLECTOR CAP TURNS. IF THE PRESSURE RELIEF VALVE DOES NOT RELEASE AT THE CORRECT PRESSURE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

L. Install pressure relief valve on airplane (AMM 38-41-51/401).

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WATER TANK PRESSURE REGULATOR - REMOVAL/INSTALLATION

1. Remove Water Tank Pressure Regulator (Fig. 401)
   A. Depressure water tank and pneumatic system, (AMM 38-41-0/201).
   B. Open aft cargo door.
   C. Remove the aft cargo compartment rear bulkhead panel.
   D. Remove air line cross from pressure regulator union, discard O-ring.
   E. Install cap on air line cross to keep contamination out.
   F. Disconnect union between filter and pressure regulator on the pressure regulator side, discard O-ring.

      NOTE: It may be necessary to remove air filter to aid in removing pressure regulator.

   G. Install cap on union to keep contamination out.
   H. While holding pressure regulator, remove two mounting bolts, remove pressure regulator.
2. Install Water Tank Pressure Regulator (Fig. 401)
   A. While holding pressure regulator in place, install two mounting bolts.
   B. Remove cap from air filter and pressure regulator union.
   C. If removed, install air filter (AMM 38-41-11/401).
   D. Install pressure regulator with new O-ring on union.
   E. Remove cap from union on air line cross.
   F. Install air line cross with new O-ring to pressure regulator.
   G. Pressurize water tank (AMM 38-41-0/201).
   H. Inspect pressure regulator and its connections for air leaks.
   I. Restore airplane to normal.

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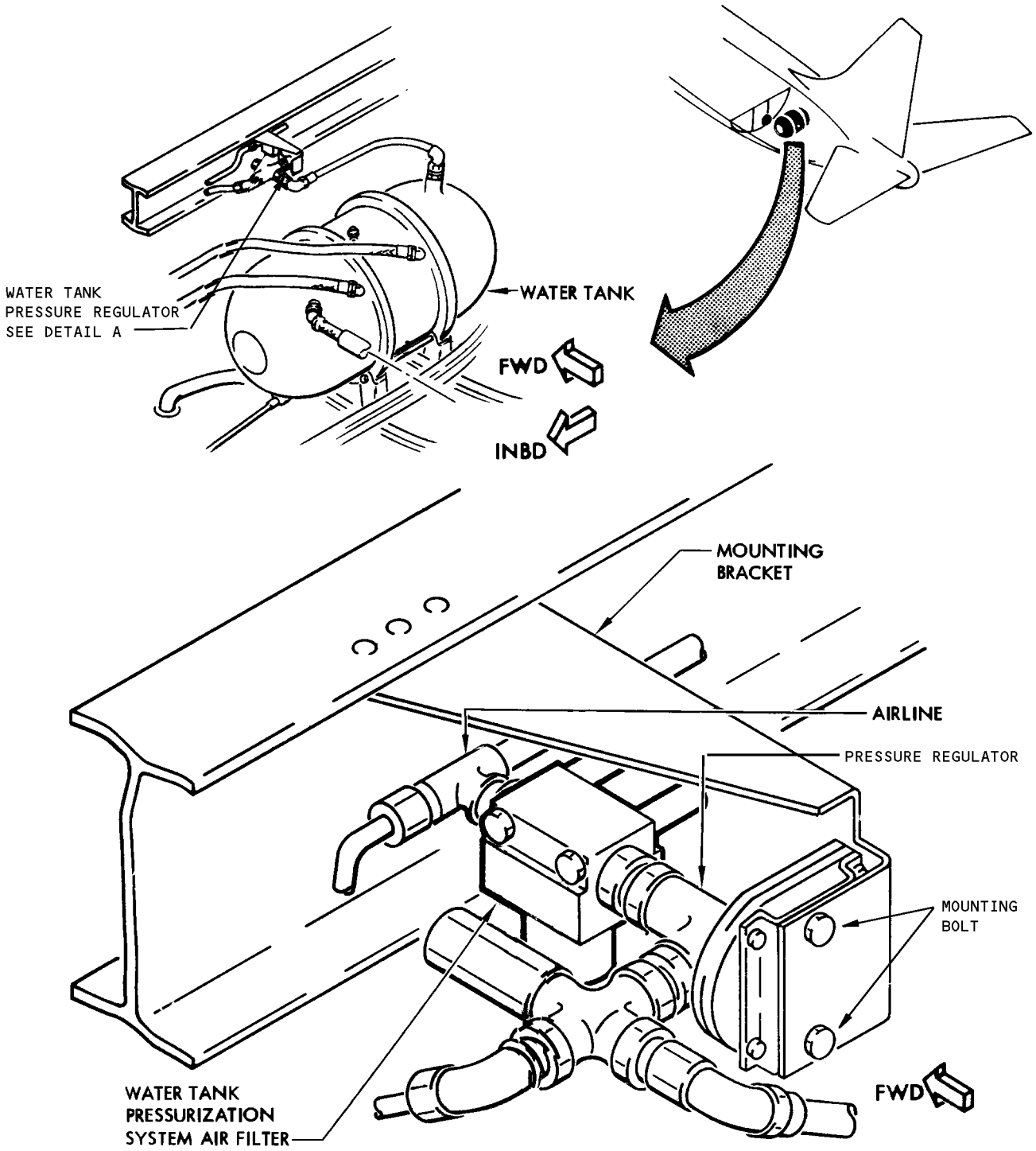

DETAIL A

Pressure Regulator Installation
Figure 401

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WATER TANK PRESSURE REGULATOR - ADJUSTMENT/TEST

1. General
   A. The purpose of this test is to verify that the water tank pressure regulator reduces engine bleed air within correct range.
2. Equipment and Materials
   A. Two pressure gages (0-80 psig ±0.5 psig)
   B. Control valve (pressure rating 150 psig minimum, 3/8 inch minimum globe type, 15 scfm minimum flow at 50 psid)
   C. Pressure regulator (pressure rated for air source, outlet pressure adjustable, zero to 100 psig, 3/8 inch minimum)
   D. Air filter (in-line type)
   E. Compressed air source (regulated 80 psig, 15 scfm minimum)
3. Water Tank Pressure Regulator Test (Fig. 501)
   A. Remove pressure regulator (AMM 38-41-52/401).
   B. Using schematic in figure 501 as a guide, connect equipment and pressure regulator to a regulated clean oil-free source of compressed air.
   C. Close control valve.
   D. Verify zero psig reading on pressure gages.
   E. Gradually open pressure regulator, monitor gages as pressure increases.
   F. Increase upstream pressure to 60 to 65 psig the downstream pressure should be:
      (1) 25 ±2.5 psig for the 1552-002-9 pressure regulator.
      (2) 35 ±2.5 psig for the 1552-002-19 pressure regulator.
   G. If the downstream pressure is not in the pressure range noted above, replace pressure regulator.
   H. Reduce pressure to zero.
   I. Install pressure regulator on airplane (AMM 38-41-52/401).

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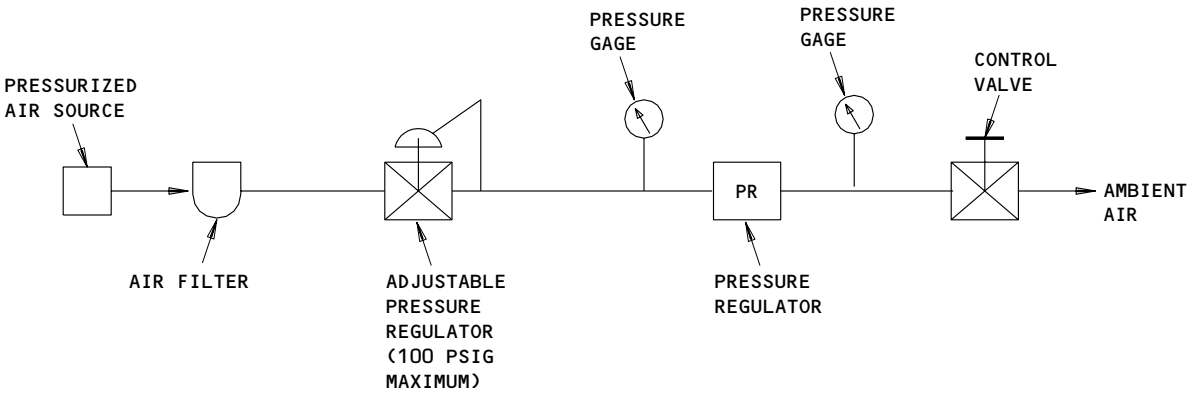

Pressure Regulator Test
Figure 501

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