**ON A/C ALL

38–00–00–001

WATER/WASTE, GENERAL

Introduction

The potable water system supplies heated or unheated water to the galley. The water is used for drinking or washing purposes.

The wash water system supplies warm water to the lavatory sink for use by the passengers and crew.

The lavatory waste water system supplies the water for the passenger washroom facilities on board the aircraft. The system also stores the waste water after passenger use and allows it to be removed from the aircraft through a service panel.

General Description

Refer to Figures 1 and 2.

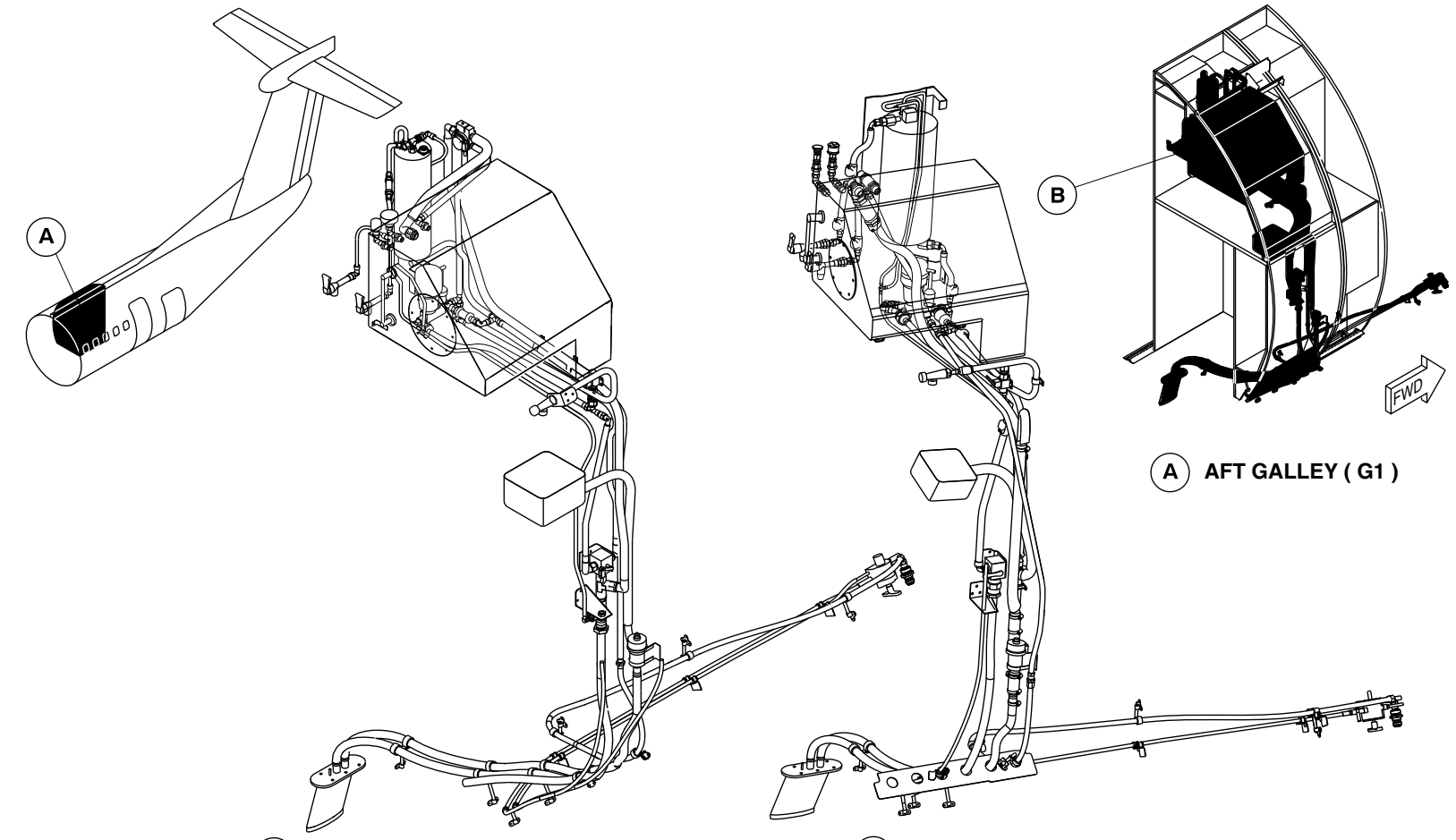
The potable water system is an optional system which can be installed in aircrafts with the G1 galley configuration. It supplies heated water to the galley for in–flight catering and unheated water for flight attendant sanitary purposes. All components are installed above the floor inside the galley enclosure. The system is remotely serviced from an external panel (refer to SDS 38–10–00).

Refer to Figures 3 , 4 and 5.

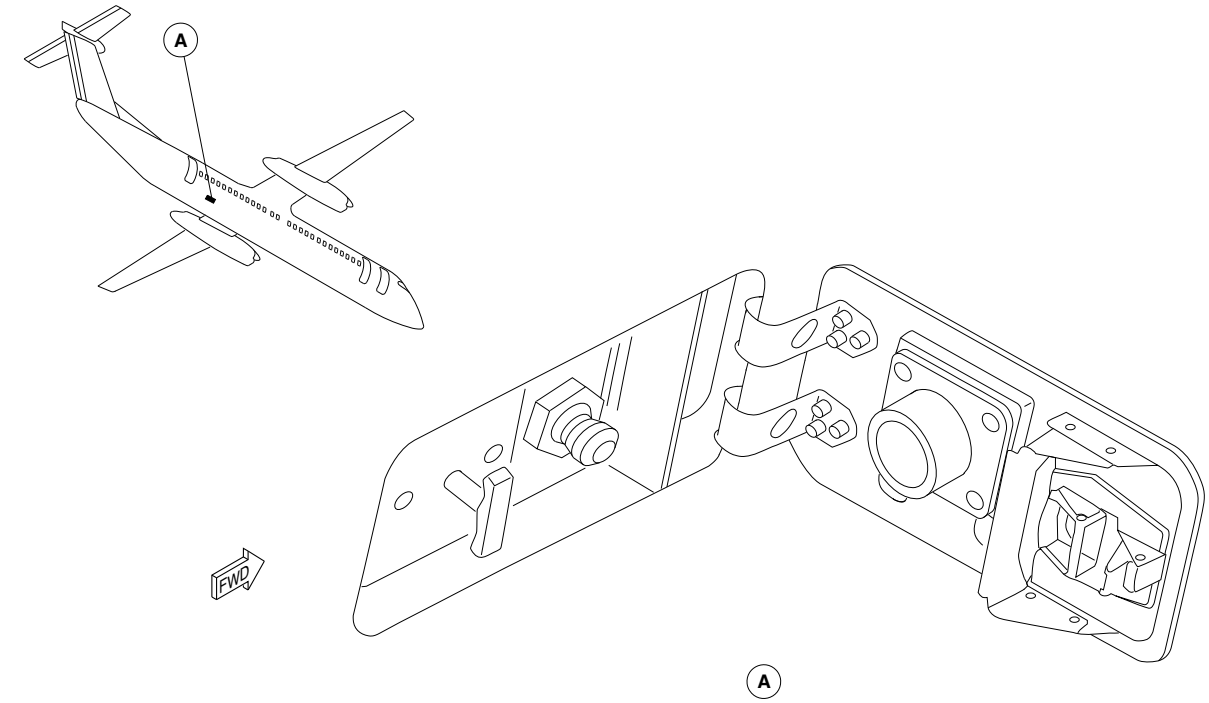
The lavatory water system allows passengers to wash their hands in the lavatory with warm water. All components are installed below the sink in the lavatory compartment. Servicing is done through a service panel installed on the exterior fuselage. The dc electrical system supplies power to the switches, valves and sensors which operate the lavatory water system. The ac electrical system supplies the power necessary to heat the system (refer to SDS 38–20–00).

Refer to Figures 4 , 5 and 6.

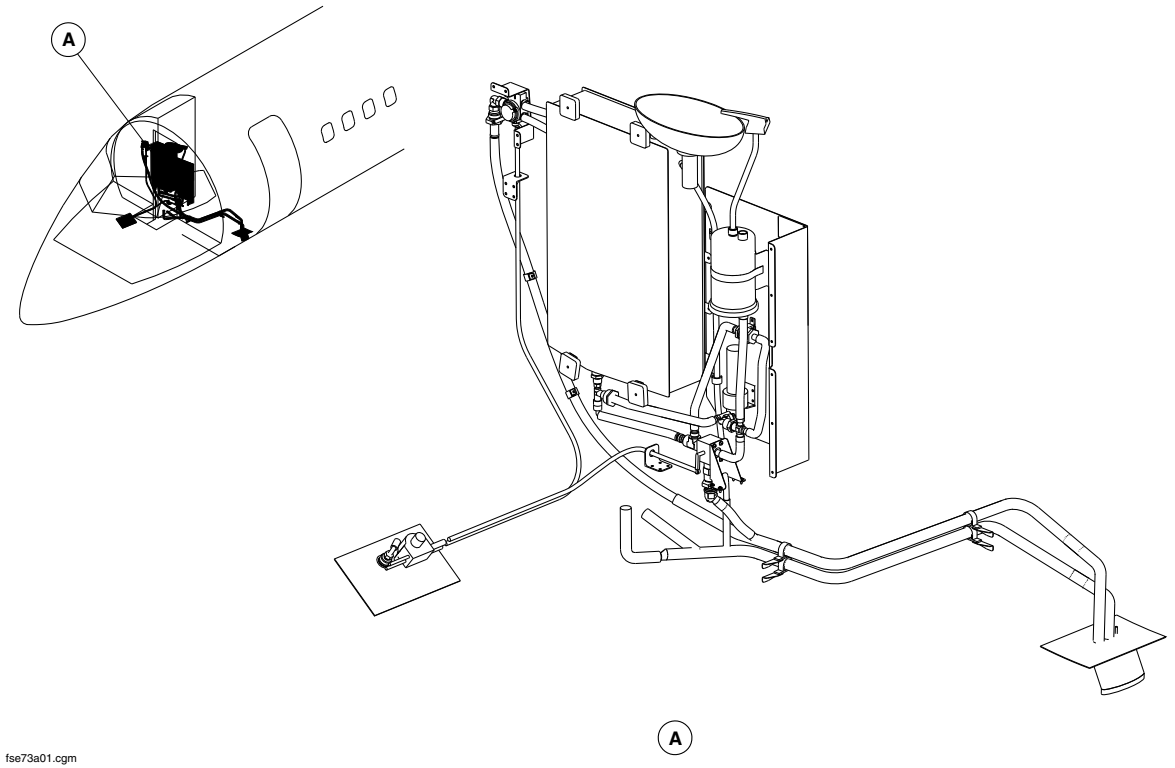
The lavatory waste system is an electronically operated, recirculating flush toilet installed in the lavatory compartment. The lavatory compartment is manufactured in one piece. Any fluids spilled on to the floor are contained within the compartment and then drained overboard through the floor drain. The toilet unit is filled with clean water and is drained of waste water through an exterior service panel (refer to SDS 38–30–00).



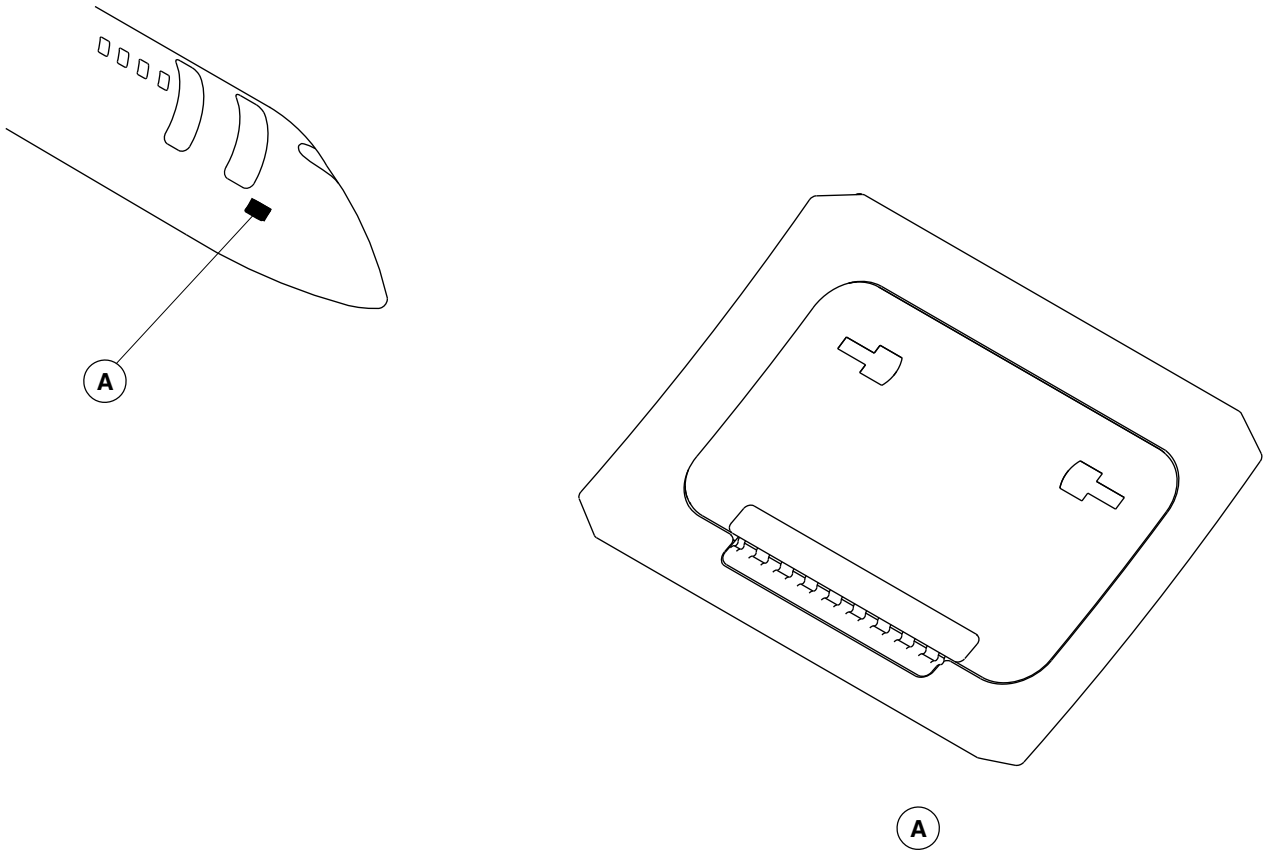
POTABLE WATER SYSTEM LOCATOR
Figure 1



POTABLE WATER SERVICE PANEL LOCATOR
Figure 2



LAVATORY WASH WATER SYSTEM LOCATOR
Figure 3



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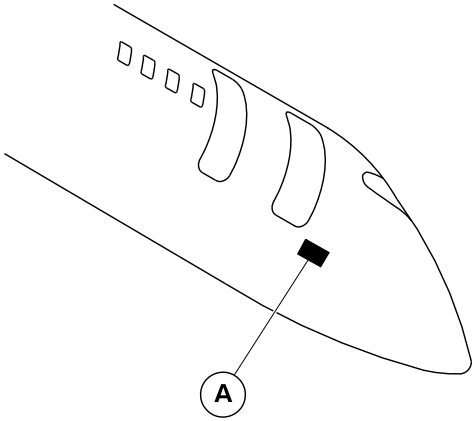
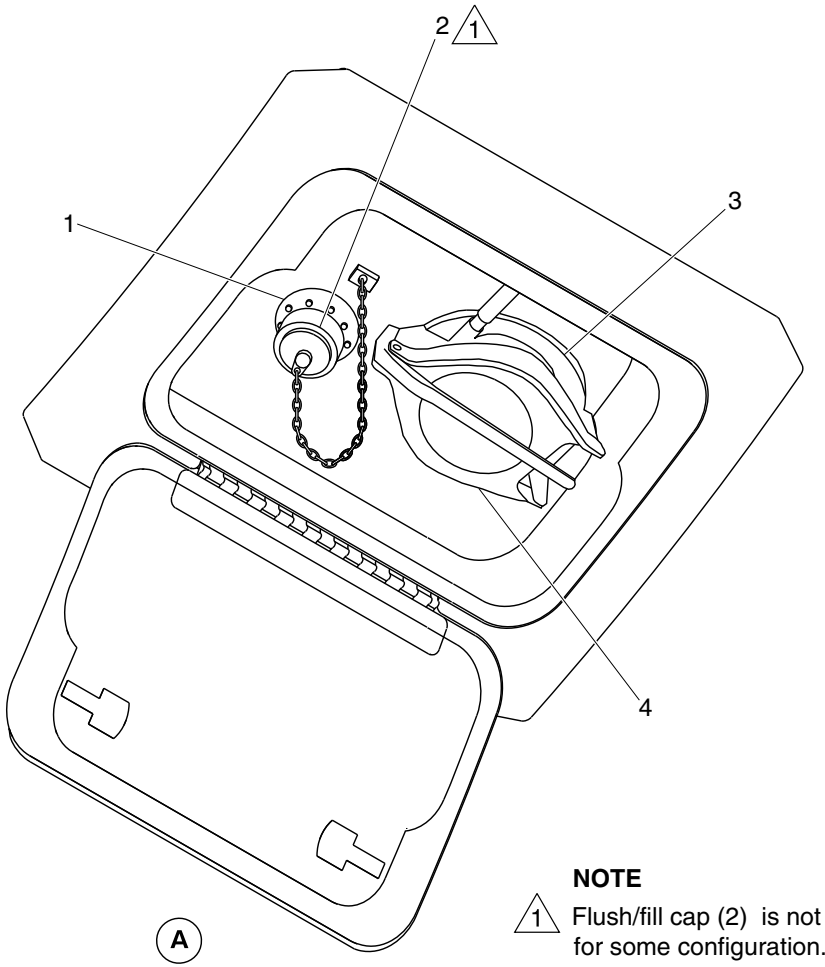
LAVATORY SERVICE DOOR LOCATOR
Figure 4





LEGEND

1. Flush/fill port.
2. Flush/fill cap.
3. Sewage drain.
4. Sewage drain cover.

NOTE

1 Flush/fill cap (2) is not applicable for some configuration.

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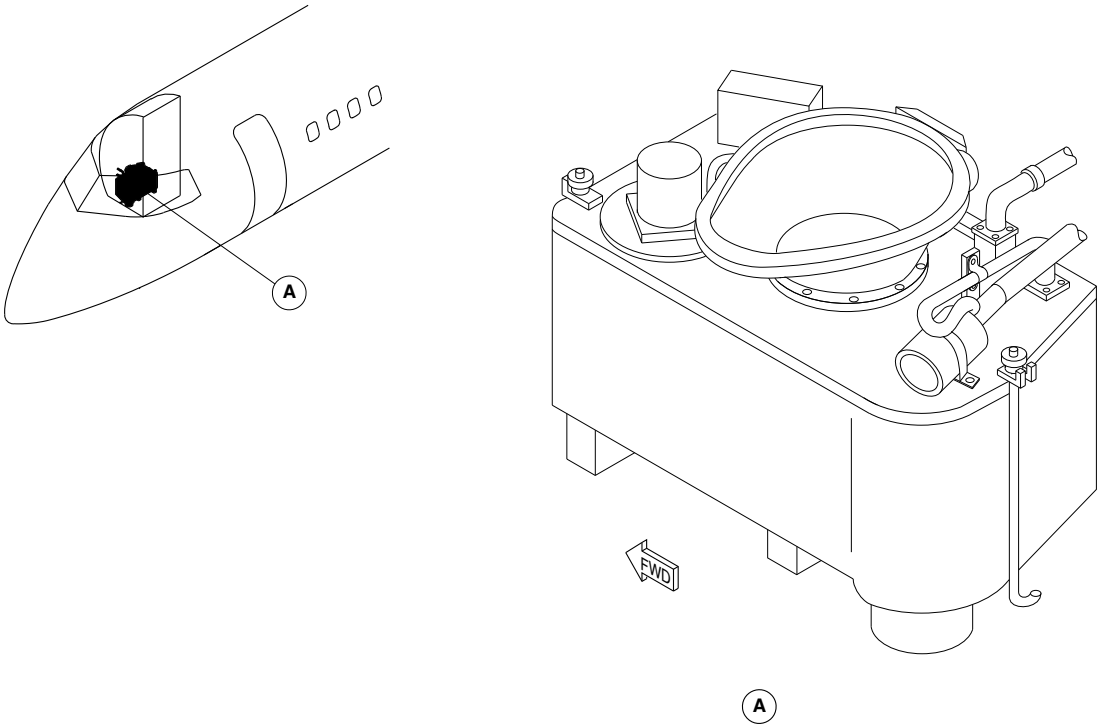
Lavatory Service Door Detail
Figure 5



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LAVATORY WASTE DISPOSAL UNIT LOCATOR
Figure 6

**ON A/C ALL

38–10–00–001

POTABLE WATER

Introduction

The potable water system supplies heated or unheated water to the galley. The water is used for drinking or washing purposes.

General Description

The potable water system is an optional system which can be installed in aircraft with the G1 galley configuration. It supplies heated water to the galley for in–flight catering and unheated water for flight attendant sanitary purposes. All components are installed above the floor inside the galley enclosure. The system is remotely serviced from an external panel.

Detailed Description

Refer to Figures 1 , 2 and 3.

The potable water system has an approximately 50 litre water storage tank and a 6 litre hot water (boiler) tank. An electric motor driven gear pump supplies system pressure. There are two hot water taps, a cold water tap and a sink. The temperature of the hot water is approximately 91 °C. All water lines and components are heated by either electric heating elements or heater cuffs.

There is an optional overnight freeze protection system. External AC power operates heaters installed around all the components and water lines. This allows the water to remain in the aircraft overnight during freezing conditions.

Refer to Figures 4 and 5.

On aircraft with the Option 825CH01386 or 825CH01386–01 incorporated and without the Modsum IS4Q3800003 or SB84–25–110 incorporated, a ground service cart is used to fill both tanks at the same time. The supply line from the cart is attached to the fill adapter on the external service panel. The T–handle on the panel is turned 90 degrees in a clockwise direction. The T–handle is connected to the valve control unit located just behind the service panel. The control unit changes the turning movement of the T–handle to the linear movement of a cable which opens the filler valve. Once the valve is opened, water flows into the fill line for the tank and boiler. A flow restrictor in the fill line to the tank makes sure there is no increase in pressure in the tank or boiler during the filling process. The tank and boiler both have pressure relief valves to prevent overpressure. A check valve in the fill line to the boiler prevents any reverse flow through the fill adapter at the ground service panel. Water pressure during filling opens the check valve which allows water to flow into the tank and boiler.

On aircraft with the Option 825CH01386–03 or Modsum IS4Q3800003 or SB84–25–110 incorporated, a ground service cart is used to fill both tanks at the same time. The supply line from the cart is attached to the fill adapter on the external service panel. Once the ground service cart supplies water, the water flows into the fill line for the tank and boiler. A flow restrictor in the fill line to the tank makes sure there is no increase in pressure in the tank or boiler during the filling process. The tank and boiler both have pressure relief valves to prevent overpressure. The check valves in the fill line to the tank and boiler prevents any reverse flow through the fill adapter at the ground service panel. Water pressure during filling

opens the check valves which allow the water to flow into the tank and boiler. A check valve in the tank drain line allows the water to overflow or drain from the tank.

Refer to Figure 6.

The face of the galley has a galley control panel and a boiler control panel. The galley control panel has a PUMP START switch. The boiler control panel has an illuminated switch (ON/OFF), LOW WATER advisory light and a green READY light. Selection of the PUMP START switch on the galley control panel primes the electric motor driven gear pump. The switch latches on a 5 second relay, which gives sufficient time for the pump to supply pressure. Selection of the illuminated switch (ON/OFF) on the boiler control panel energizes the heater in the boiler to get the water hot. The green READY light comes ON when the water temperature increases to 91 °C. Power is supplied from the R SECONDARY bus. When the pump is primed, flow control reverts to a pressure switch in the pump. This pressure switch will only operate if the pump is first pressurized by priming.

When the hand wash faucet or a hot water tap is opened, the pressure switch in the pump senses the drop in pressure. The pump then begins transferring water from the tank into the boiler. Pumping will continue until the tap is closed by the user. A low level switch in the pump senses low pressure and turns the pump off to prevent it from running dry. A filter installed upstream of the pump prevents foreign objects from entering the pump and contaminating the system.

Two thermistors monitor the water temperature in the boiler. Thermistor MZ1 controls heater operation between 0 and 91 °C. If the temperature is below 0 °C, MZ1 does not allow the heaters to operate. This prevents heater operation with ice in the tank. If the temperature is above 0 °C, MZ1 switches the heaters on. Once the water temperature reaches 91 °C, it shuts off the heaters and keeps the water temperature at this temperature.

A second thermistor, MZ2, controls the READY light on the control panel. Thermistor MZ2 turns the READY light on when the water temperature is 91°C. As the hot water is used, the READY light stays on until the water temperature falls to 83 °C, then MZ2 turns the light off. A thermal limiter switch supplies overtemperature protection, limiting the water temperature to 115 °C in case of failure of the MZ1 thermistor. A red reset button in the middle of the thermal limiter pops out during an overheat condition. Only maintenance personnel can reset this button.

A low level sensor shuts off the heater elements and illuminates the LOW WATER light when the water level is too low.

Waste water from the sink is dumped overboard through the drain mast installed in the underside of the aircraft. An airstop valve in the sink drain line is opened by the force of the waste water. The valve is normally closed to prevent cabin pressure from venting through the drain during flight.

On the aircraft with the Options 825CH01386 or 825CH01386–01 or Modsum IS4Q3800003 incorporated, pulling the T–handle and rotating it 90 degree counter clockwise drains the system. The drain valve opens allowing all water in the system to dump overboard through the drain mast. Once the system is drained, the T–handle is centered and pushed in.

On the aircraft with the SB84–25–110 incorporated, rotation the T–handle 90 degree counter clockwise drains the system. The drain valve opens allowing all water in the system to dump overboard through the drain mast. Once the system is drained, the T–handle is centered.

A ball valve is located in the line downstream of the tank. This valve allows the lines to be drained for maintenance purposes without having to drain the tank.

On aircraft with the Option 825CH01386 or 825CH01386–01 incorporated and without the Modsum IS4Q3800003 incorporated, heater cuffs protect the fill and drain valves, the pressure relief valve, the filter, the pump, the check valve and the tank from freezing during flight. The cuffs are either molded directly to these components or are fastened by bolts. The drain mast and water lines have built in heaters. All the heaters have thermostats which control the temperature in the individual components. The heater system is energized as soon as AC power is connected to the aircraft. This prepares the system for filling by preventing flash freezing of cold water coming into contact with cold components.

On aircrafts with SB84–24–59 incorporated and without SB84–24–61, the drain mast heater is deactivated.

On aircraft with the Option 825CH01386–03 or Modsum IS4Q3800003 incorporated, heater cuffs protect the drain valves, the pressure relief valve, the filter, the pump, the check valves and the tank from freezing during flight. The cuffs are either molded directly to these components or are fastened by bolts. The drain mast and water lines have built in heaters. All the heaters have thermostats which control the temperature in the individual components. The heater system is energized as soon as AC power is connected to the aircraft. This prepares the system for filling by preventing flash freezing of cold water coming into contact with cold components.

There is an option for a freeze protection system to be run using external AC power. This is so the wash water and galley water systems do not have to be drained if the aircraft sits for extended periods of time (overnight) in freezing conditions. The system is designed to work to a minimum temperature of –30 °C. Below this temperate, the system must be drained.

This optional system has an extra relay. When external AC power is connected, the relay is energized using dc power from either the battery bus or from a ground power unit. Once the relay is energized, the aircraft AC bus is bypassed and only the lavatory and galley heaters are energized.

The potable water system has the electrical interfaces that follow:

- The pump is powered from the R SECONDARY bus through a 5 A circuit breaker
- The start up 5 second time delay relay is powered from the R SECONDARY bus through a 5 A circuit breaker
- The boiler is powered from the right AC contactor box (3 phase 115 VAC)
- The freeze protection heaters are powered from the 115 VAC VARIABLE FREQUENCY RIGHT BUS through a 10 A circuit breaker.

Components

The water is stored in an approximately 50 litre welded stainless steel tank installed in the galley. The tank is filled through the fill port in the external service panel. An overflow line is located just below the fill port in the tank. The arrangement leaves 10% of the capacity unused to prevent structural damage if ice forms in the tank. A pressure relief valve on top of the tank protects the tank from overpressuring during refilling. A tank drain port is located at the low point of the tank to make sure there is no residual water in the tank after draining. There is an access cover which allows hand cleaning of the tank.

On aircraft with the Option 825CH01386 or 825CH01386–01 incorporated and without the Modsum IS4Q3800003 incorporated, the heated fill valve is a 4 way, 2 position valve. The valve is mechanically operated from the rotary control box located at the ground service panel. In the open position, the valve allows water to flow from the fill line to the tank. It also allows overflow water from the tank to flow through to the drain mast. In the closed position, the valve isolates the tank from outside ambient pressure. Two internal vents in the valve break the vacuum in the fill and overflow lines allowing water trapped within the valve to drain away. A heating element with a built in thermostat is molded directly on to the valve body. The heater uses 115 VAC variable frequency and the temperature is controlled between 10 and 30 °C.

On aircraft with the Option 825CH01386 or 825CH01386–01 incorporated and without the Modsum IS4Q3800003 incorporated, a check valve is installed in line between the tank and the boiler. The head of water in the tank forces the water through the check valve into the boiler during the filling process. The check valve prevents the water in the boiler from flowing back into the tank.

On aircraft with the Option 825CH01386–03 or Modsum IS4Q3800003 incorporated, 2 check valves are installed in the lines to the tank and the boiler. The head of water forces the water through the check valves into the tank and boiler during the filling process. The check valve in the tank line prevents the water in the tank from flowing back into the ground service cart during the filling process. The check valve in the boiler line prevents the water in the boiler from flowing back into the tank.

The pump is a constant displacement gear type driven by an electric dc motor. It supplies a constant pressure of 20 psig (138 kPag). at a flow rate of 1.5 gal/min (5.68 L/min). The pump has a built in pressure regulator, check valve, flow sensor, pressure relief valve and pressure switch. A magnetic clutch connects the motor to the gear drive. At a specified torque, the clutch disconnects and allows the motor to free spin. An external heating cuff installed on the gear housing keeps the pump from freezing.

The drain valve is a 2 position, 3 way ball valve, mechanically actuated from the rotary control box located at the ground service panel. The drain valve allows the entire system to be drained to prevent freezing in cold temperatures. A heating element is molded to the top of the valve. A built in thermostat controls the temperature of the heating element between 10 and 30° C. The heater element uses 115 VAC variable frequency power.

The filter is sintered stainless steel woven wire mesh inside a stainless steel case. It has a nominal rating of 40 microns, 75 microns absolute. It removes contamination from the water upstream from the pump. This prevents damage to the pump or clogging of other parts of the system. The filter is reusable and can be cleaned by backflushing or ultrasonic cleaning. The filter is heated by an external heater cuff.

The drain mast has two drain lines attached to it. One line drains the waste water from the sink while the other line drains the clean water from the system. A fibreglass/silicon blanket with a built in heater covers the two lines. A similar heater with a thermistor is attached to the drain mast. The two heating circuits are connected in parallel. The thermistor reduces the current to the heater as the temperature increases.

On aircrafts with SB84–24–59 incorporated and without SB84–24–61, the drain mast circuit breaker located on the 115 V AC variable frequency circuit breaker panel is removed.

The boiler assembly has a 6 litre tank, an electrical box, a control panel, interconnecting plumbing and electrical connections. It uses 115 VAC 3 phase power to heat the water.

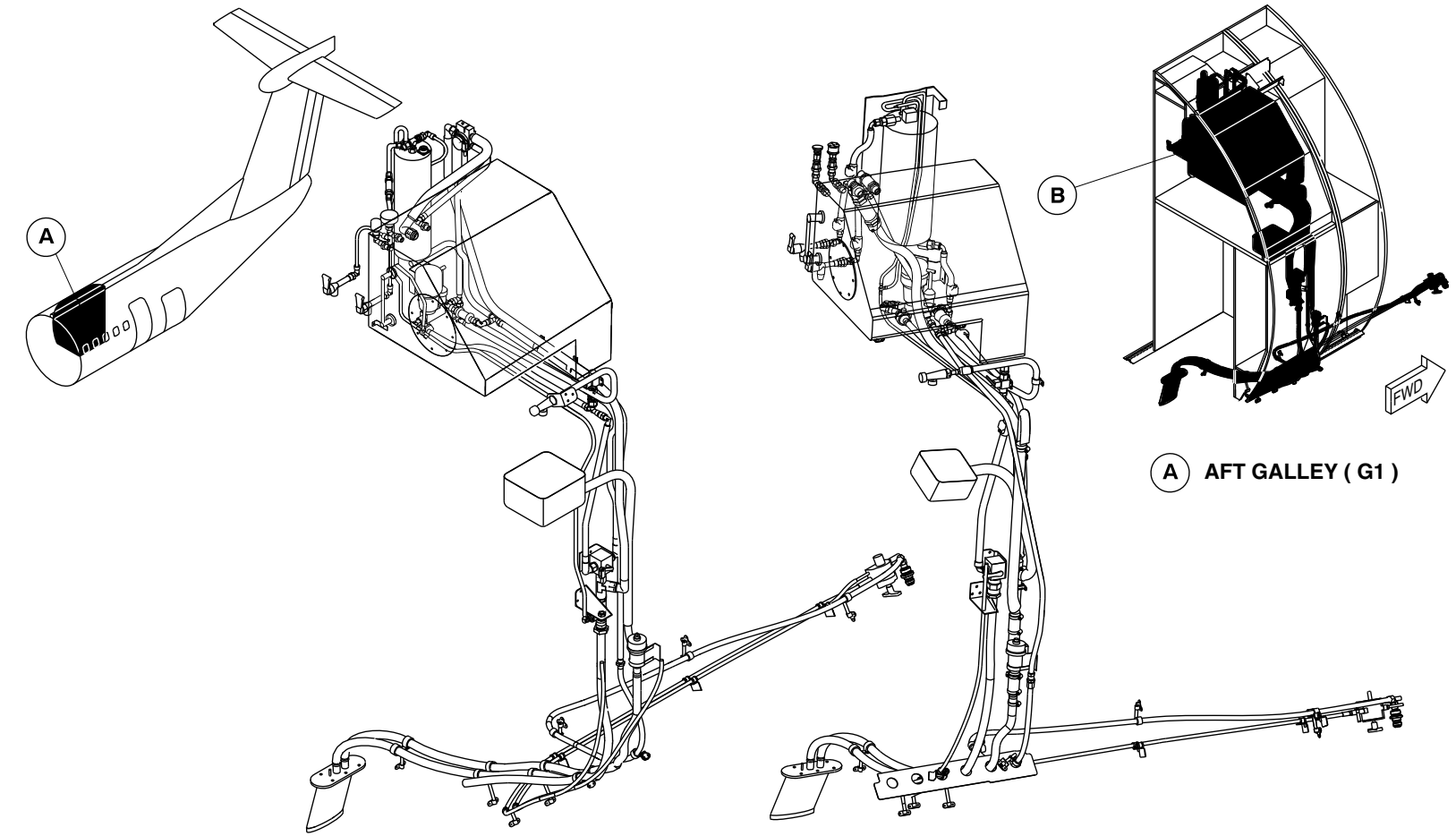
The tank has 6 heating elements, 2 thermistors, a level sensor, float valve, pressure relief valve and a thermal limiter. It is installed using quick release couplings and fittings. The electrical box has a relay, transformer, circuit breakers, circuit board with self diagnostics and an LED display. It is also installed using quick release fasteners.

The diagnostic LED's on the electrical box come on when the control relay and elements are energized to heat the water. They remain on until the correct temperature is reached. If an LED does not come on, there is a fault with that heating element or with the power supply. When the correct water temperature is reached, the control relay is de−energized shutting off the heating elements and the LED's. A PRESS TO TEST switch overrides the control thermistor, allowing the heating system to re−energize and the LED's to come on. If the low level light is illuminated, the PRESS TO TEST switch will not work. The diagnostic feature is for maintenance use only.

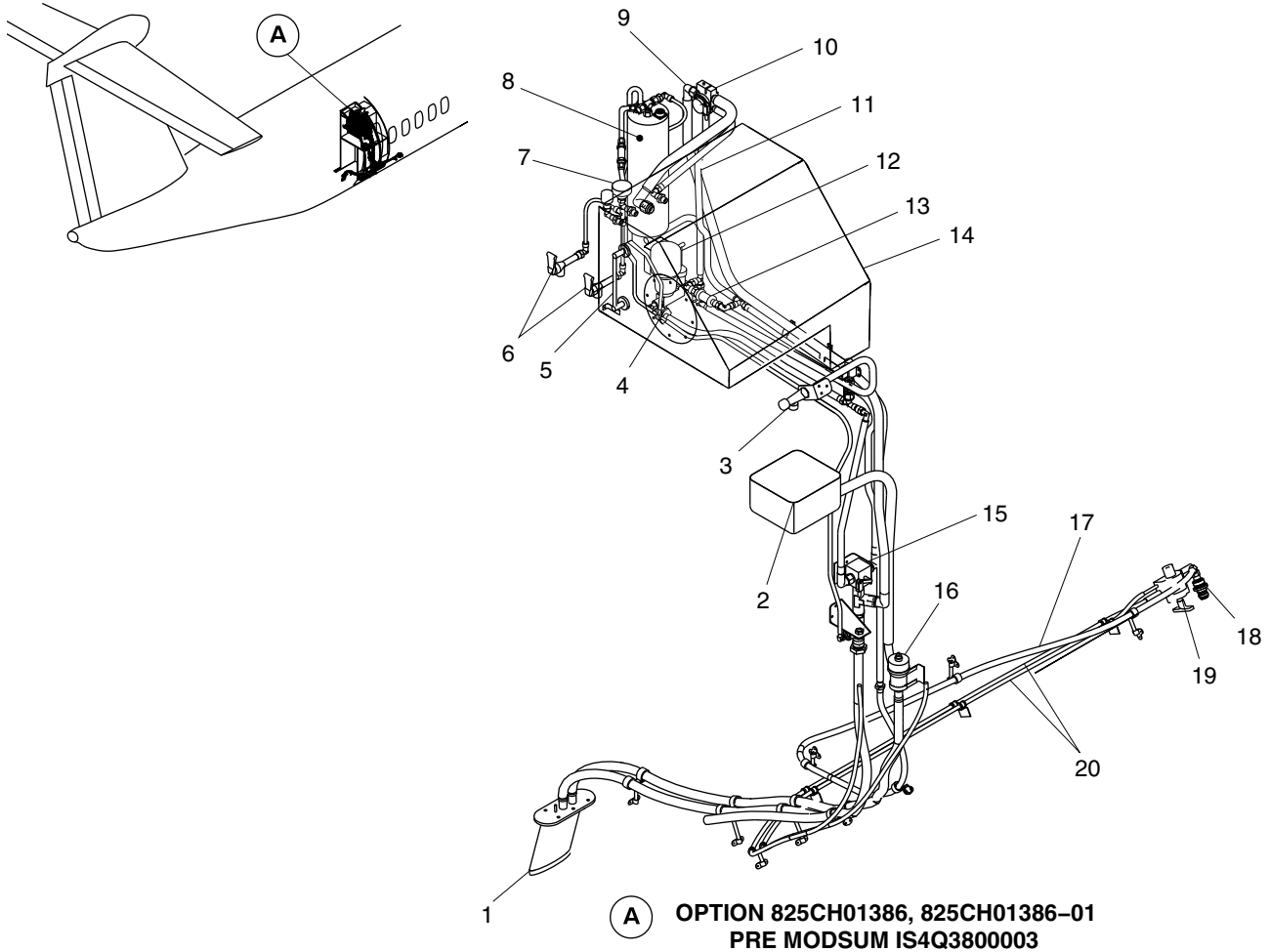
On aircraft with the Option 825CH01386 or 825CH01386−01 incorporated and without the Modsum IS4Q3800003 or SB84−25−110 incorporated, the ground service panel has a fill adapter, a T−handle and a cable control unit. The cable control unit has a control box installed behind the ground service panel with two cables coming out of it. One cable is connected to the fill valve and the other is connected to the drain valve. Rotating the handle causes an inner cog in the control box to engage the cable and move it in or out. This action operates the fill valve connected to the cable and allows the system to be filled with water. Pulling the handle out disengages the inner cog and allows the handle to engage an outer cog. Rotating the handle then operates the drain valve in a similar way.

On aircraft with the Option 825CH01386−03 or Modsum IS4Q3800003 and without the SB84−25−110 incorporated, the ground service panel has a fill adapter, a T−handle and a cable control unit. The cable control unit has a control box installed behind the ground service panel with one cable coming out of it. The cable is connected to the drain valve. Pulling the T−handle out allows the handle to engage an outer cog. Rotating the handle causes the outer cog in the control box to engage the cable and move it in or out. This action operates the drain valve connected to the cable and allows the system to be drained of water. Pushing the handle in disengages the outer cog.

On aircraft with the SB84−25−110 incorporated, the ground service panel has a fill adapter, a T−handle and a cable control box. The cable control box is installed behind the ground service panel. The cable control box consists of different components. One end of the drain valve cable is connected to the cable control box and other end to the drain valve. Rotating the T−handle counter clockwise causes the drain valve cable to extend. This action operates the drain valve connected to the drain valve cable and allows the system to be drained of water. Rotating the T−handle clockwise retracts the drain valve cable and moves the drain valve to the closed position.



POTABLE WATER SYSTEM LOCATOR
Figure 1



LEGEND

1. Drain mast.
2. Sink.
3. Cold water tap.
4. Filter.
5. Level indicator.
6. Hot water tap.
7. Vent.
8. Water boiler, 6L.
9. Drain line.
10. Fill valve.
11. Fill line.
12. Pump.
13. Check valve.
14. Tank, 50L.
15. Drain valve.
16. Air stop valve.
17. Fill line.
18. Fill adapter.
19. Control unit.
20. Control cable.

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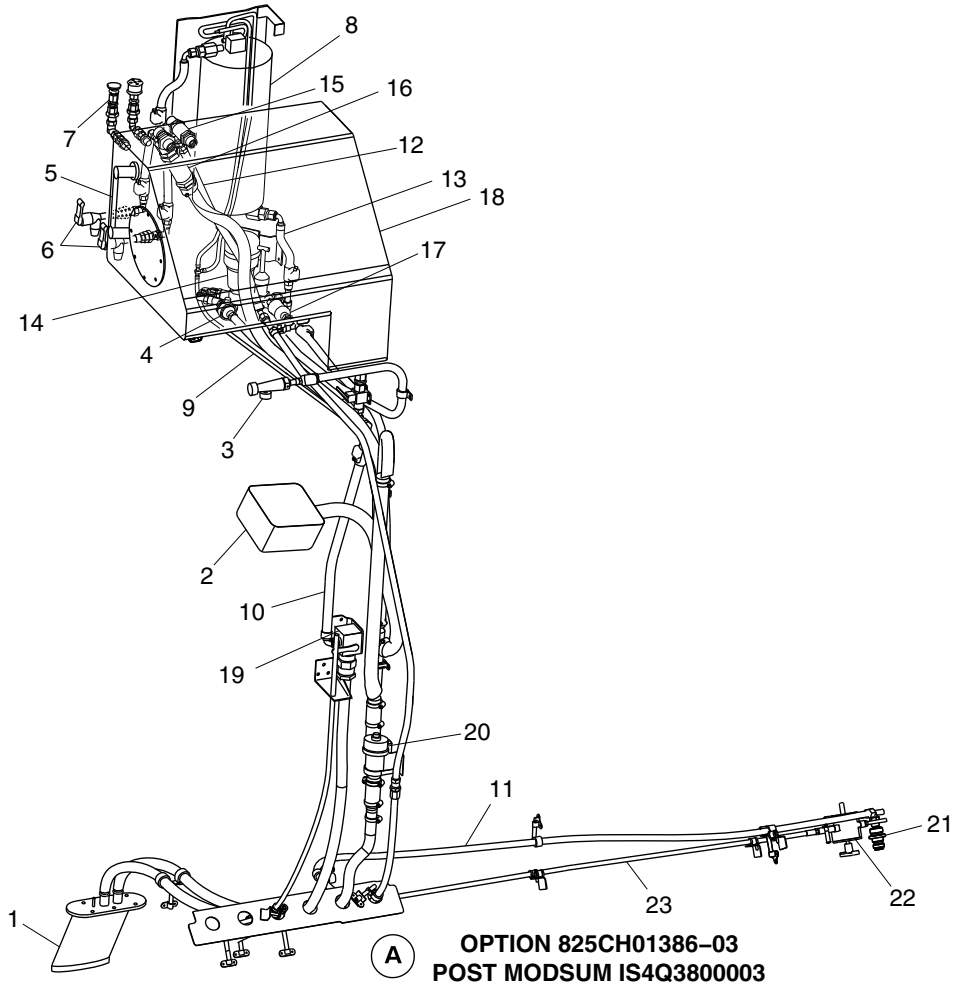
POTABLE WATER SYSTEM DETAIL
Figure 2 (Sheet 1 of 2)



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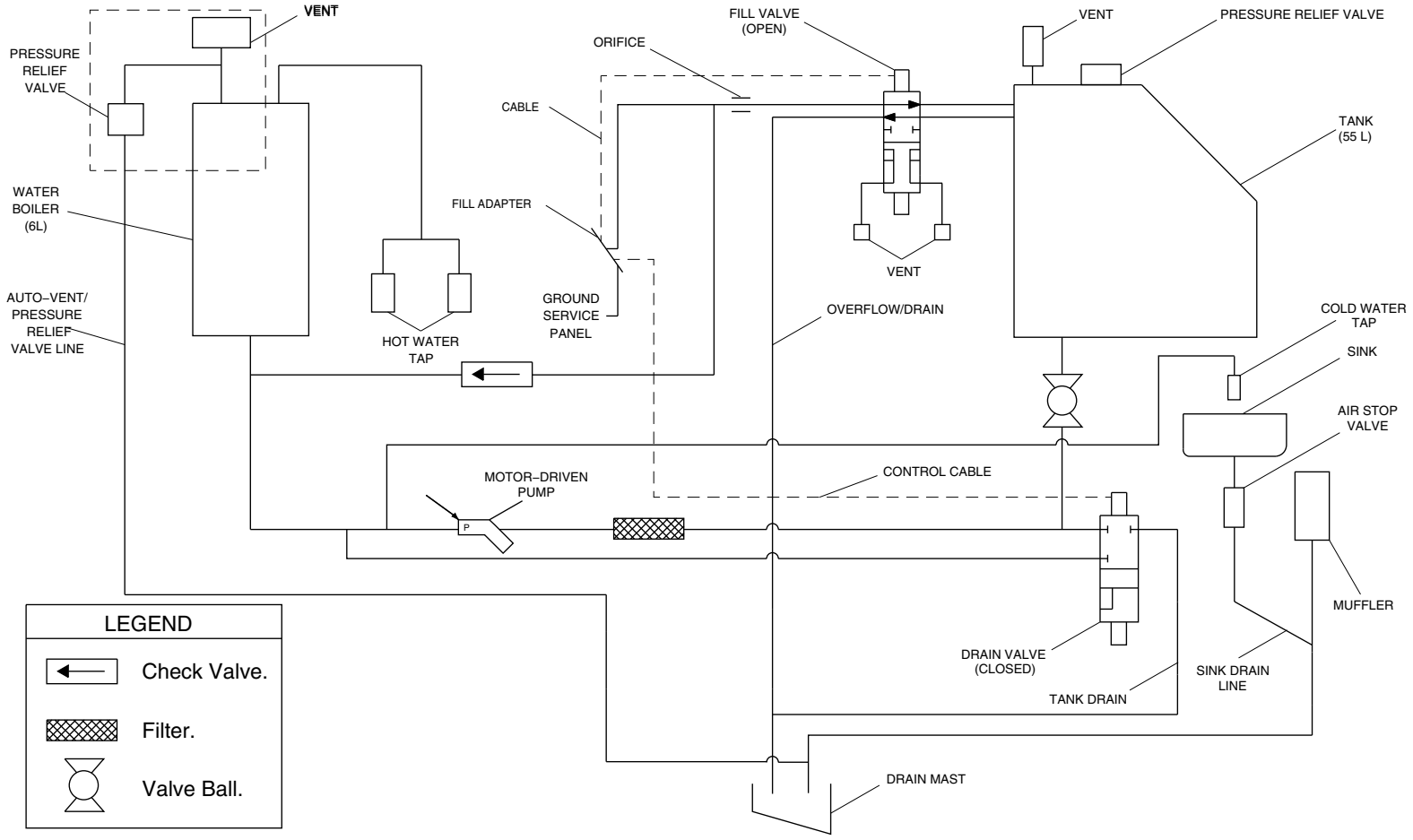
LEGEND

1. Drain mast.
2. Sink.
3. Cold water tap.
4. Filter.
5. Level indicator.
6. Hot water tap.
7. Vent.
8. Water boiler, 6L.
9. Boiler drain line.
10. Tank drain line.
11. Main fill line.
12. Tank fill line.
13. Boiler fill line.
14. Pump.
15. Tank fill line check valve.
16. Tank overflow line check valve.
17. Boiler fill line check valve.
18. Tank, 50L.
19. Drain valve.
20. Air stop valve.
21. Fill adapter.
22. Control unit.
23. Control cable.

POTABLE WATER SYSTEM DETAIL
Figure 2 (Sheet 2 of 2)



OPTION 825CH01386, 825CH01386–01
PRE MODSUM IS4Q3800003

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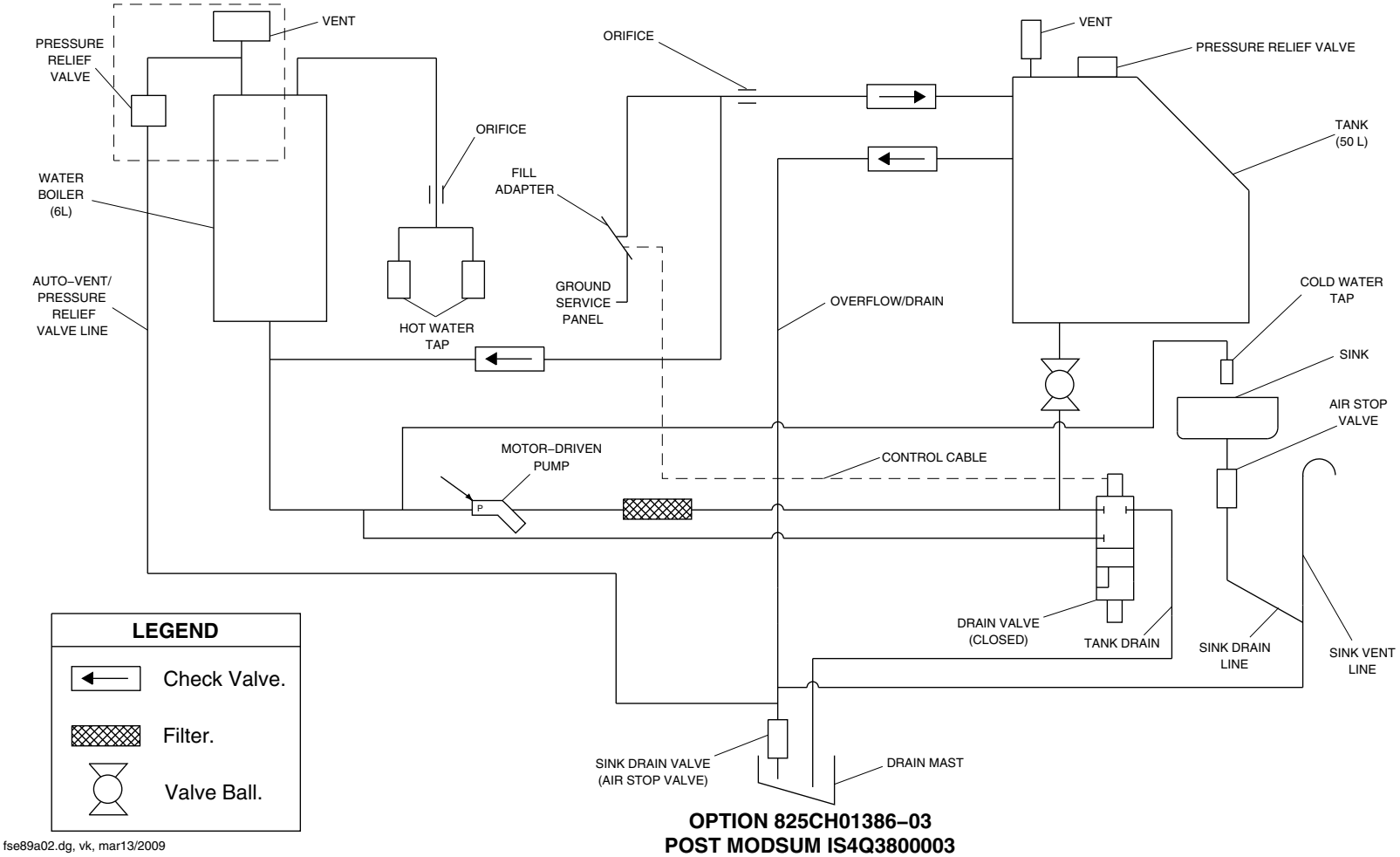
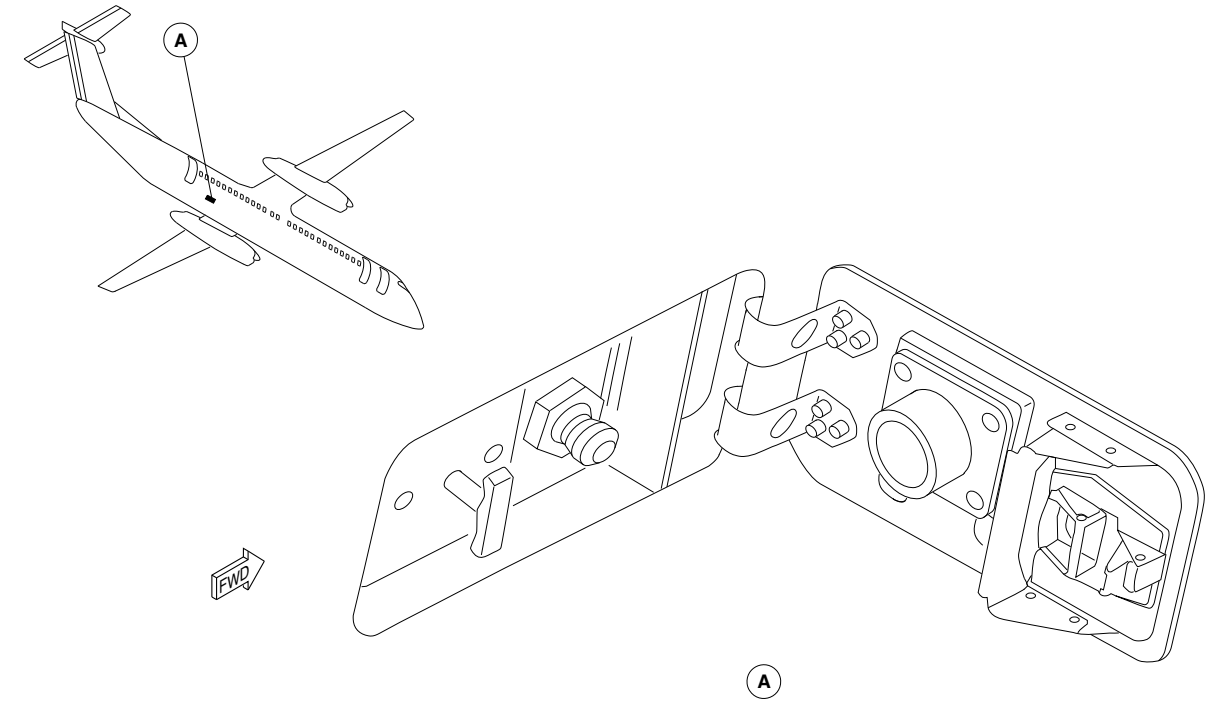
POTABLE WATER SYSTEM SCHEMATIC
Figure 3 (Sheet 1 of 2)



OPTION 825CH01386–03
POST MODSUM IS4Q3800003

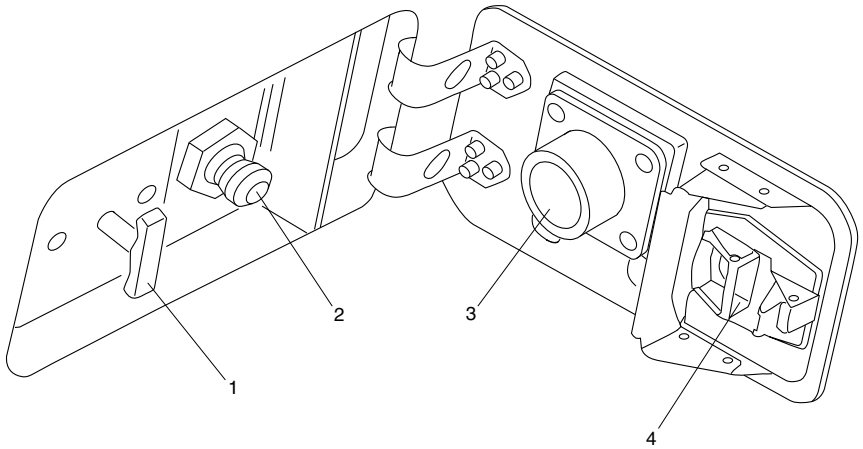
POTABLE WATER SYSTEM SCHEMATIC
Figure 3 (Sheet 2 of 2)



POTABLE WATER SERVICE PANEL LOCATOR
Figure 4

LEGEND

1. T Handle.
2. Fill Adapter.
3. Cover.
4. Latch.



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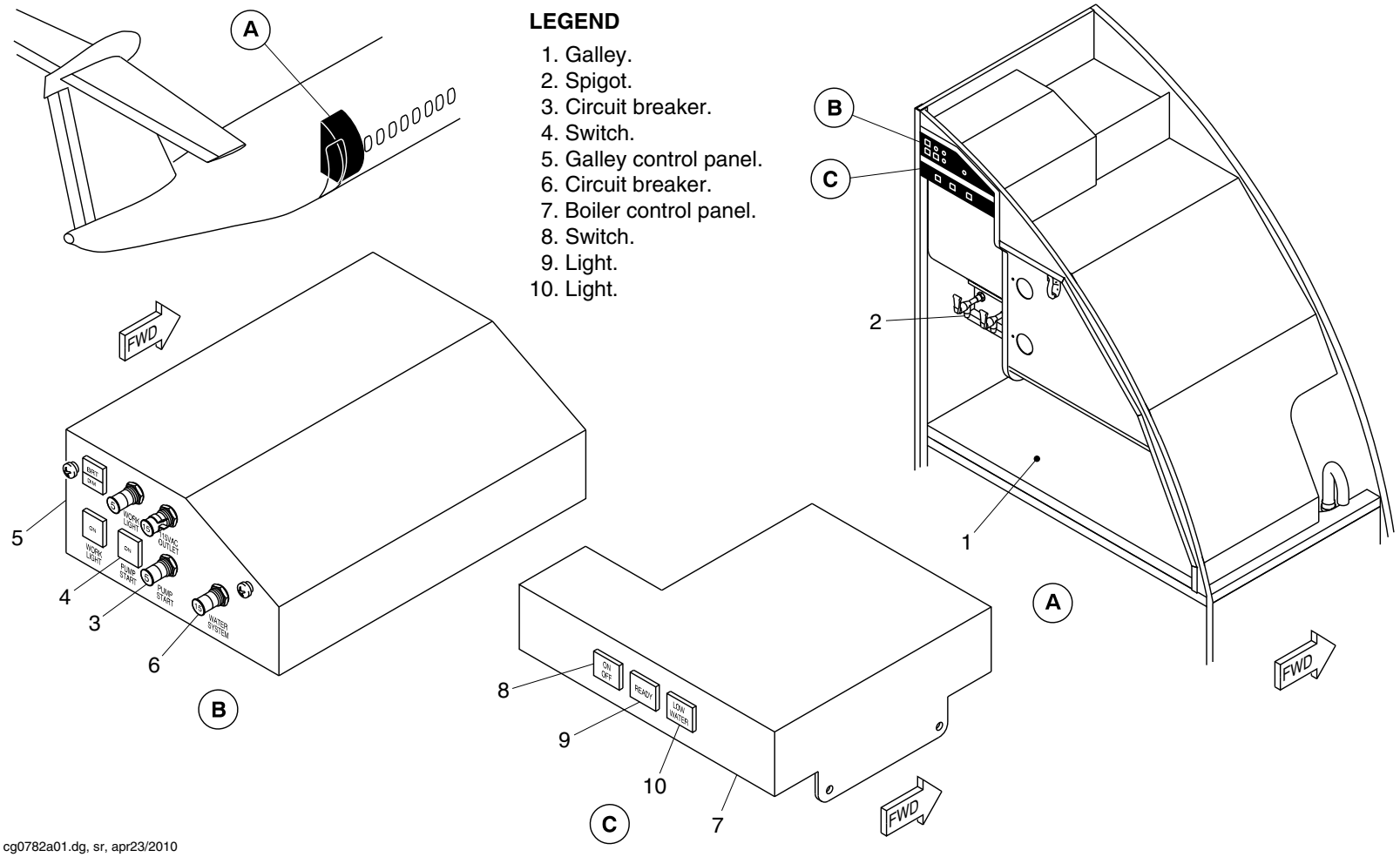
POTABLE WATER SERVICE PANEL DETAIL
Figure 5



LEGEND

1. Galley.
2. Spigot.
3. Circuit breaker.
4. Switch.
5. Galley control panel.
6. Circuit breaker.
7. Boiler control panel.
8. Switch.
9. Light.
10. Light.

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Galley Water System Control Panels
Figure 6

**ON A/C ALL

38–20–00–001

WASH WATER

Introduction

The wash water system supplies warm water to the lavatory sink for use by the passengers and crew.

General Description

The lavatory water system allows passengers to wash their hands in the lavatory with warm water. All components are installed below the sink in the lavatory compartment. Servicing is done through a service panel installed on the exterior fuselage.–

The DC electrical system supplies power to the switches, valves and sensors which operate the lavatory water system. The AC electrical system supplies the power necessary to heat the system.

On aircraft with SB84–25–159 incorporated and without SB84–25–160, the warm water wash system is deactivated.

On aircraft with SB84–25–165 incorporated, all the components related to the warm water wash system are removed.

On aircraft with SB84–24–59 incorporated and without SB84–24–61, the drain mast is deactivated

Detailed Description

Refer to Figures 1 , 2 and 3.

The lavatory water system has a 27 L water storage tank and a 1.7 L heater tank. An electric motor driven gear pump supplies system pressure. The system has one faucet with a built in switch which activates the pump. The temperature of the hot water is approximately 34 °C. All water lines and components are heated by electric heating elements.

Waste water is drained from the sink directly overboard through a drain mast installed in the underside of the aircraft. There is also a manual drain operated from the external service panel. This allows ground crews to drain the system for overnight storage in freezing conditions.

There is an optional overnight freeze protection system. External AC power operates heaters installed around all the components and water lines. This allows the water to remain in the aircraft overnight during freezing conditions.

A ground service cart is used to fill the 27 L storage tank. The supply line from the cart is attached to the fill adapter on the external service panel. The T–handle on the panel is turned 90 degrees in a clockwise direction. The T–handle is connected to the valve control unit located just behind the service panel. The control unit changes the turning movement of the T–handle to the linear movement of a cable which opens the filler valve.

Once the valve is opened, water flows into the fill line for the tank. A flow restrictor in the fill line to the tank makes sure there is no increase in pressure in the tank during the filling process. The tank has a pressure relief valve to prevent overpressure. A check valve in the fill line to the heater prevents any reverse flow from the heater to

the storage tank. As the tank fills, the water opens the check valve allowing water to fill the heater vessel. When the tank is approximately 90% full, water flows out the overflow line and drains through the drain mast. The overflow is visible to the servicing crew and indicates that the tank is full.

A switch and a control box are located near the faucet. After 8 minutes, push and hold the faucet switch. Make sure that warm water comes out of the faucet and the water pump operates while you push the faucet switch.

Waste water from the sink is dumped overboard through the drain mast installed in the underside of the aircraft. An airstop valve in the sink drain line is opened by the force of the waste water. When the water stops flowing, the airstop valve closes to prevent cabin pressure from venting through the drain during flight.

A filter installed upstream of the pump prevents foreign objects from entering the pump and contaminating the system.

The heater uses a thermostat controlled electric blanket to maintain the water temperature at approximately 34 °C. A thermal fuse limits the water temperature to a maximum of 60 °C, in the event of a control thermostat failure.

A solid state low level switch shuts off the heater blanket and the pump when the water level is too low. The low level switch also turns on the LOW LEVEL POWER CUT–OFF light located on the lavatory control panel below the sink.

Heater cuffs protect the fill and drain valves, the pressure relief valve, the filter, the pump, the check valve and the tank from freezing during flight. The cuffs are either molded directly to these components or are fastened by bolts. The drain mast and water lines have built in heaters. All the heaters have thermostats which control the temperature in the individual components. The heater system is energized as soon as AC power is connected to the aircraft. This prepares the system for filling by preventing flash freezing of cold water coming into contact with cold components.

There is an option for a freeze protection system to be run using external AC power. This is so the wash water and galley water systems do not have to be drained if the aircraft sits for extended periods of time (overnight) in freezing conditions. The system is designed to work to a minimum temperature of –30 °C. Below this temperature, the system must be drained.

The optional system has an extra relay. When external AC power is connected, the relay is energized using DC power from either the battery bus or from a ground power unit. Once the relay is energized, the aircraft AC bus is bypassed and only the lavatory and galley heaters are energized.

The pump and control relay are powered from the 28 V AC RIGHT SECONDARY BUS through a 5 A LAV SYSTEM circuit breaker. The heaters are powered from the 115 V AC VARIABLE FREQUENCY RIGHT BUS through a 10 A LAV HTRS circuit breaker.

On aircraft with SB84–25–159 incorporated and without SB84–25–160, the LAV SYSTEM (D3) circuit breaker located on the 28 V DC right circuit breaker panel and the LAV HTRS circuit breaker located on the 115 V AC variable frequency circuit breaker panel are removed.

Components

The tank is installed above the floor, in a compartment under the lavatory sink. It is made from welded stainless steel. On the face of the tank, there is an access hole to allow for cleaning by hand. A cover and gasket is attached with 8 fasteners, sealing the hole.

The heated fill valve is a 4 way, 2 position valve. The valve is mechanically operated from the rotary control box located at the ground service panel. In the open position, the valve allows water to flow from the fill line to the tank. It also allows overflow water from the tank to flow through to the drain mast. In the closed position, the valve isolates the tank from outside ambient pressure. Two internal vents in the valve break the vacuum in the fill and overflow lines allowing water trapped within the valve to drain away.

A heating element with a built in thermostat is molded directly on to the valve body. The heater uses 115 V AC variable frequency and the temperature is controlled between 10 and 30 °C.

A check valve is installed in line between the tank and the heater. The head of water in the tank forces the water through the check valve into the heater during the filling process. The check valve prevents the water in the heater from flowing back into the tank.

The pump is a 28 V DC geared motor pump, with overtemperature protection. A magnetic clutch connects the motor to the gear drive. At a specified torque, the clutch disconnects and allows the motor to free spin. The overtemperature protection is a self resetting thermostat located in the motor housing. The thermostat switch turns off the electrical power supply if the motor overheats. The pump is protected from freezing by an external heating cuff installed on the pump housing.

The pump has an internal bypass valve which prevents the system from overpressurizing during operation. The bypass valve allows water to recirculate from the valve outlet back to the inlet. The bypass pressure is set at 38 psi (262 kPa), but is adjustable.

The drain valve is a 2 position, 3 way ball valve, mechanically actuated from the rotary control box located at the ground service panel. The drain valve allows the entire system to be drained to prevent freezing in cold temperatures. A heating element is molded to the top of the valve. A built in thermostat controls the temperature of the heating element between 10 and 30 °C. The heater element uses 115 V AC variable frequency power.

The filter is sintered stainless steel woven wire mesh inside a stainless steel case. It has a nominal rating of 40 microns, 75 microns absolute. It removes contamination from the water upstream from the pump. This prevents damage to the pump or clogging of other parts of the system. The filter is reusable and can be cleaned by backflushing or ultrasonic cleaning. The filter is heated by an external heater cuff.

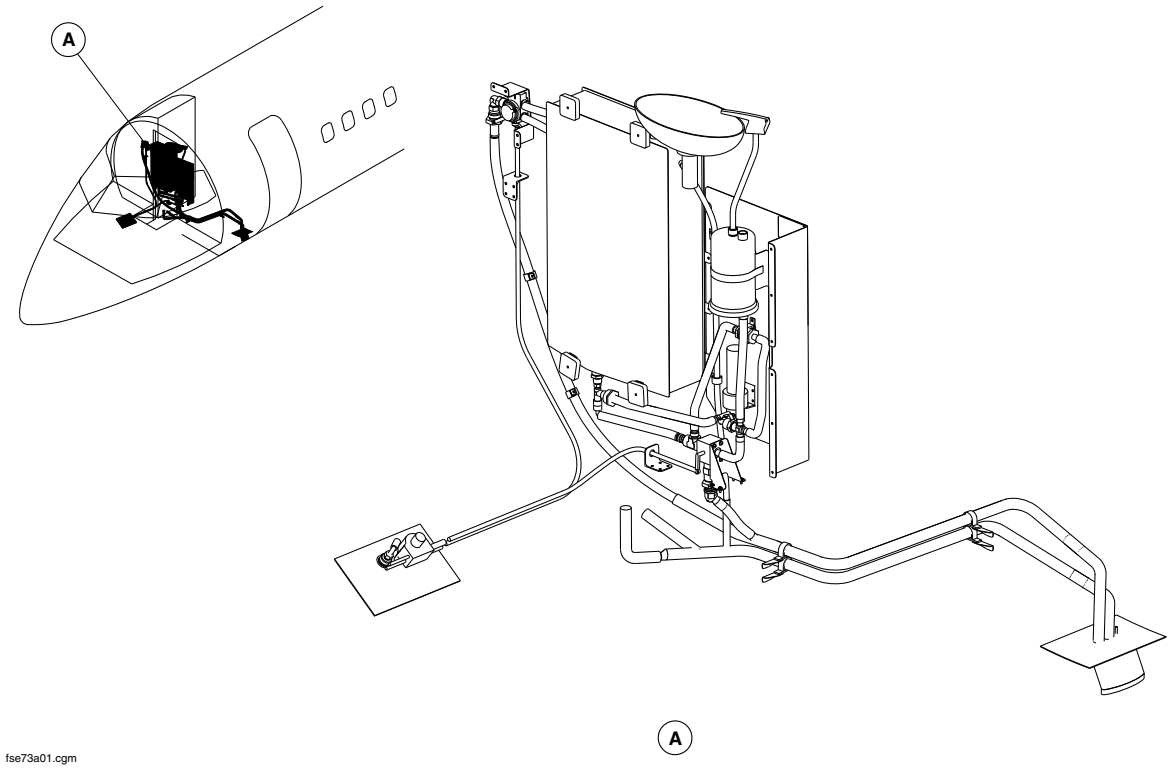
The heater is a 1.7 L stainless steel tank. A 450 W heating blanket molded to the heater supplies heating for the water in the tank. A built in thermostat maintains the water temperature at about 34 °C. If the thermostat fails, a thermal fuse will melt and turn off the heater when the water temperature reaches 60 °C. This protects the passengers against scalding water.

When the faucet lever is pushed down, a cartridge in the faucet opens and a microswitch is activated. This sends a signal to the five second timer relay to operate the pump. The flowing water holds open the cartridge. When the water stops flowing the cartridge is held in the closed position to prevent water from spilling out during flight maneuvres. The cartridge self–vents when the system is drained.

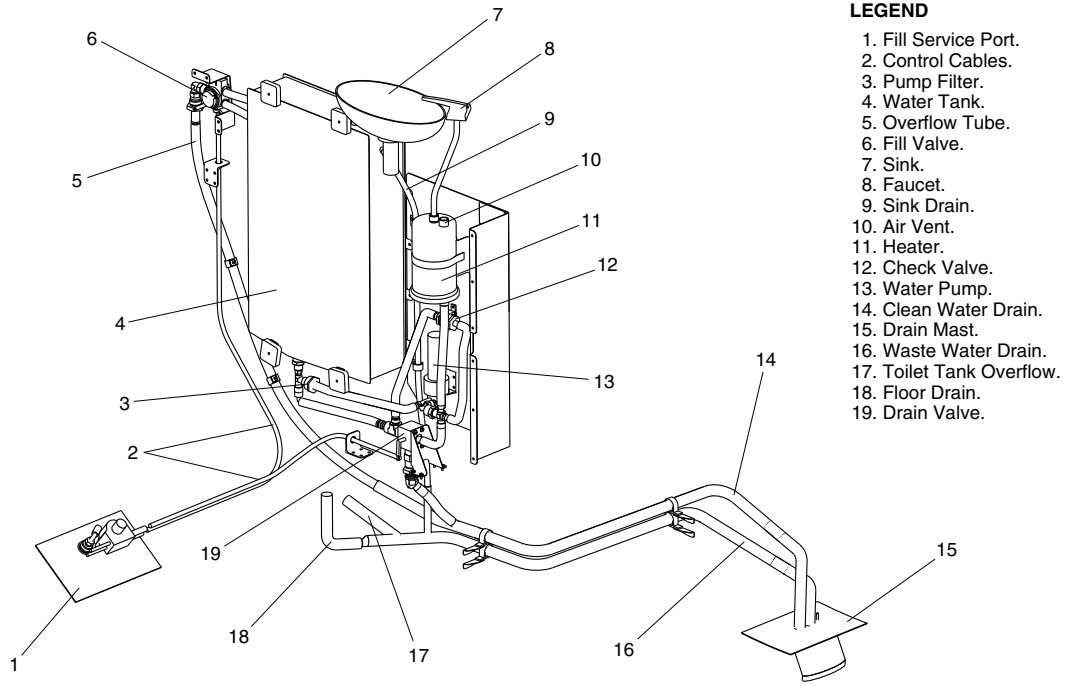
The drain mast has two drain lines attached to it. One line drains the waste water from the sink while the other line drains the clean water from the system. A fibreglass/silicon blanket with a built in heater covers the two lines. A similar heater with a thermistor is attached to the drain mast. The two heating circuits are connected in parallel. The thermistor reduces the current to the heater as the temperature increases.

On aircraft with SB84–24–59 incorporated and without SB84–24–61, the drain mast circuit breaker located on the 115 V AC variable frequency circuit breaker panel is removed.

The ground service panel has a fill adapter, a T–handle and a cable control unit. The cable control unit has a control box installed behind the ground service panel with two cables coming out of it. One cable is connected to the fill valve and the other is connected to the drain valve. Rotating the handle causes an inner cog in the control box to engage the cable and move it in or out. This action operates the fill valve connected to the cable and allows the system to be filled with water. Pulling the handle out disengages the inner cog and allows the handle to engage an outer cog. Rotating the handle then operates the drain valve in a similar way.



LAVATORY WASH WATER SYSTEM LOCATOR
Figure 1



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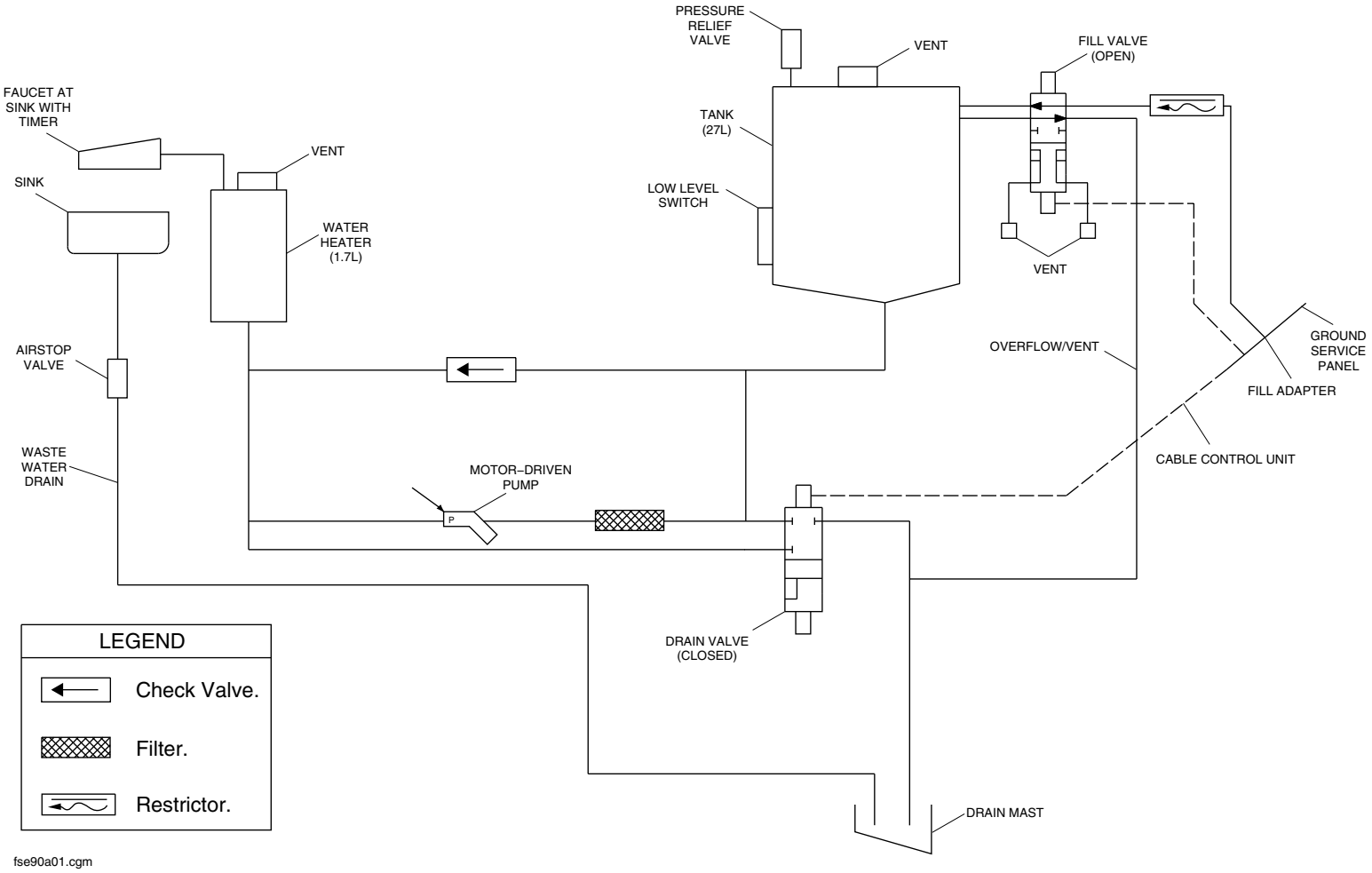
LEGEND

1. Fill Service Port.
2. Control Cables.
3. Pump Filter.
4. Water Tank.
5. Overflow Tube.
6. Fill Valve.
7. Sink.
8. Faucet.
9. Sink Drain.
10. Air Vent.
11. Heater.
12. Check Valve.
13. Water Pump.
14. Clean Water Drain.
15. Drain Mast.
16. Waste Water Drain.
17. Toilet Tank Overflow.
18. Floor Drain.
19. Drain Valve.

LAVATORY WASH WATER SYSTEM DETAIL
Figure 2



LAVATORY WASH WATER SYSTEM SCHEMATIC
Figure 3

**ON A/C ALL

38–30–00–001

WASTE WATER

Introduction

The lavatory waste water system supplies the water for the passenger washroom facilities on board the aircraft. The system also stores the waste water after passenger use and allows it to be removed from the aircraft through a service panel.

General Description

Refer to Figures 1 and 2.

The toilet unit is an electronically operated, recirculating flush toilet installed in the lavatory compartment. The lavatory compartment is manufactured in one piece. Any fluids spilled on to the floor are contained within the compartment and then drained overboard through the floor drain. The toilet unit is filled with clean water and is drained of waste water through an exterior service panel.

Detailed Description

Refer to Figures 3 and 4.

The toilet unit has a reservoir tank which holds the fluid used for flushing as well as the waste fluid. The unit also has a motor pump cartridge with a built in filter basket, a timer unit, toilet bowl, flush/fill line with a check valve and a vent line with a muffler. The toilet unit is attached to the lavatory compartment floor by hold down rods and is covered around the base by a decorative shroud.

The toilet bowl is made from polished stainless steel and is installed on top of the fluid/waste reservoir. A flush channel allows a flow of fluid to cleanse the bowl during flushing. The unit is drained by dumping fluid and waste into a sewage drain which is directed to a service panel on the exterior of the aircraft.

Pushing the flush switch installed on the lavatory wall starts the flush cycle. When the flush switch is pushed, a timer unit installed on top of the toilet unit activates the 28 Vdc motor driven pump for 5 seconds. The pump causes the flushing fluid to flow through the filter basket to the flush channel at the upper rim of the toilet bowl. The flushing fluid flows down the inner side of the toilet bowl rinsing waste material directly into the reservoir. A one–way hinged flapper valve prevents the waste material and fluid from flowing back into the bowl.

Refer to Figures 5 , 6 and 7.

On aircraft with the Modsum 4–459505 incorporated, flush/fill cap is not installed.

The lavatory waste water system is drained and filled through the lavatory service panel on the exterior of the aircraft. The sewage drain cover is opened and flush/fill cap removed. The coupling connector and flush/fill hoses from the ground cart are connected to the appropriate connectors. The sewage drain plug is removed by operating the plug extractor handle, which is part of the connector. The waste fluid and material drains into the ground service cart.

Once the tank has drained, the system is flushed with 10 gallons (37.85 liters) of pressurized water. The water enters the tank through the check valve to the pump inlet and a rotating spray nozzle. The pressurized fluid sprays through the nozzle and cleans the inside of the filter basket and tank sidewalls. Then the drain plug is re–installed, and the unit is filled with 9.5 L of water and deodorant

solution. The drain connector and flush/fill line are then disconnected and the sewage drain cover and flush/fill cap are replaced.

The toilet flush electric motor is powered from the L MAIN bus through a 5 A circuit breaker. The electrical connector is attached to the timer unit.

Components

Refer to Figure 4.

The toilet bowl assembly is a polished stainless steel bowl installed on the top of the tank assembly. The shape of the bowl forces the water and waste flow into the tank. A flapper valve at the bottom of the bowl prevents waste and water from re–entering the bowl from the tank.

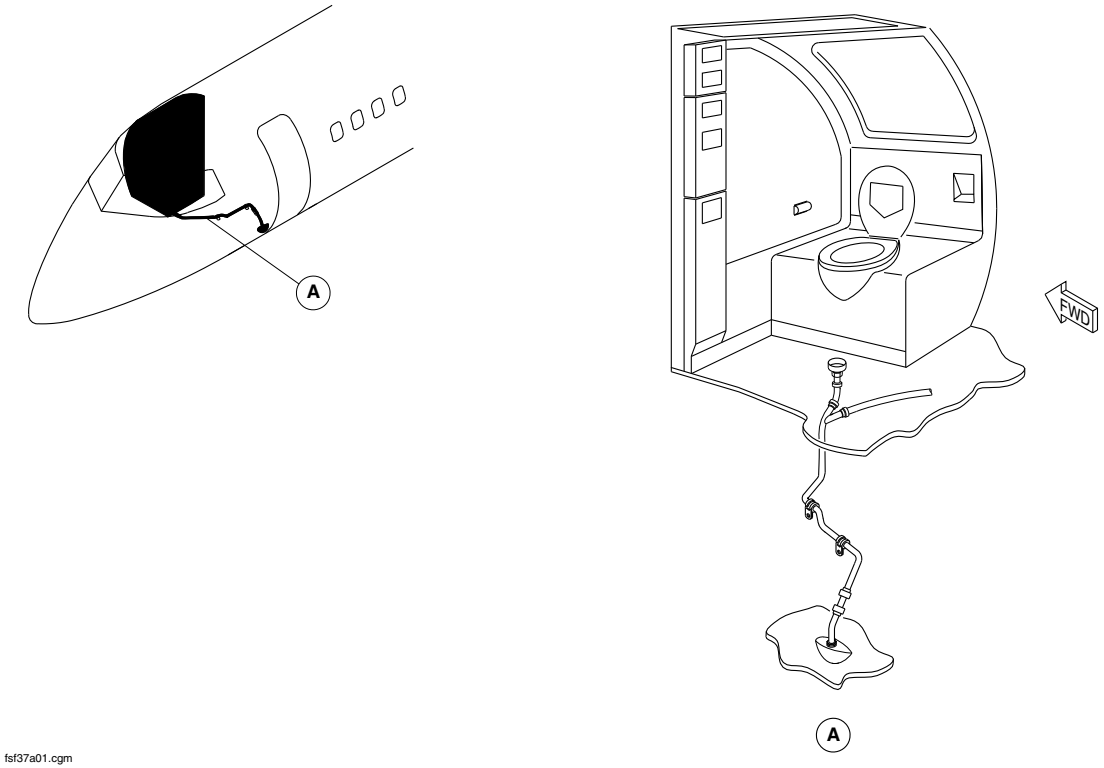
The tank and top assembly are made from fiberglass, with a built in structural reinforcement. The top has provisions for the installation of the bowl assembly, the motor, pump and filter assembly, the timer, the flush/fill check valve and the vent line elbow.

The motor pump and filter is an electric pump/filter assembly installed in the top of the tank assembly. The filter is a TEF coated basket type filter that sits in the flush fluid. The motor has a built in thermostat which disconnects power when the temperature reaches a preset level. This protects against overheating of the motor if it runs continuously.

The timer assembly is an electronic unit that is installed on top of the tank assembly. When the toilet flush timer switch is pushed, the timer unit will operate the pump for 5 seconds.

The flush/fill check valve is a mechanical valve installed in the top of the tank assembly. It allows water from the ground cart into the tank for cleaning and refilling, but does not allow water to flow back out through the fill tube.

The tank is vented to the atmosphere through a vent line attached to the top of the tank assembly. This keeps toilet odors from entering the lavatory compartment. The vent line is open to the atmosphere and makes a constant noise while the aircraft is in operation. A muffler assembly is installed in the vent line to reduce the noise.



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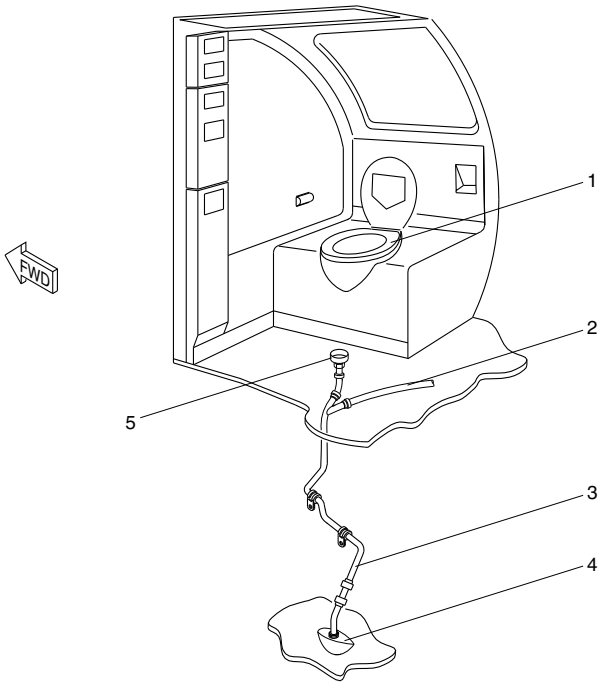
LAVATORY LOCATOR
Figure 1



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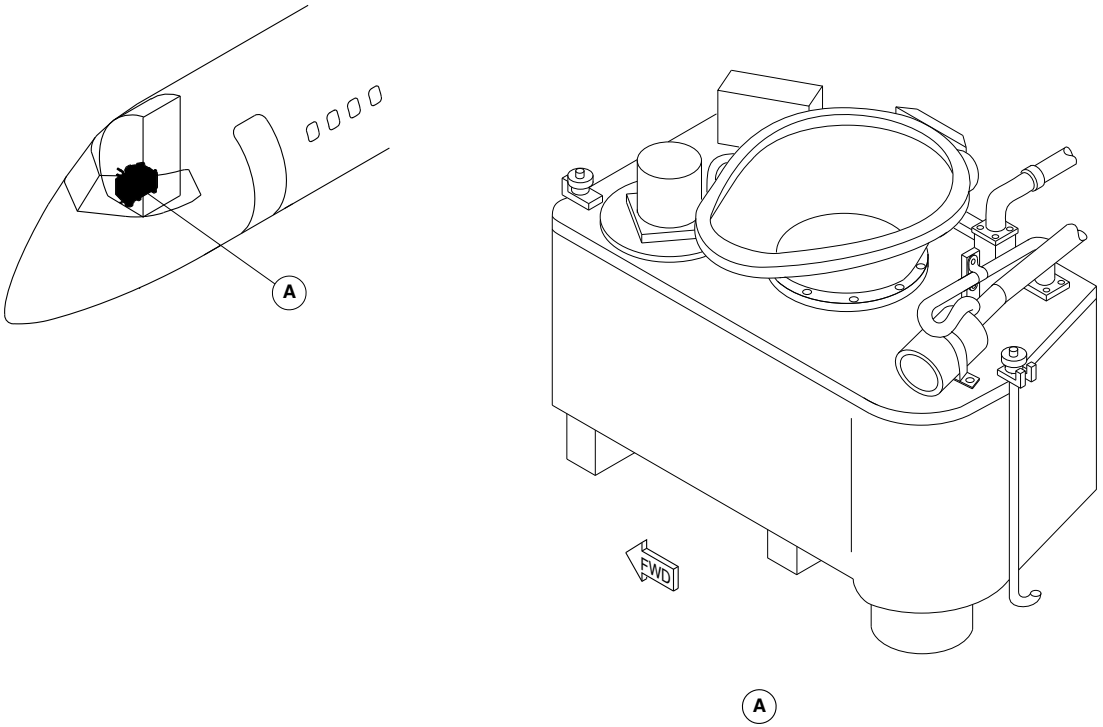
LEGEND

1. Toilet Unit.
2. Toilet Vent Line.
3. Waste Water Drain Pipe.
4. External Drain.
5. Lavatory Floor Drain.

LAVATORY DETAIL
Figure 2



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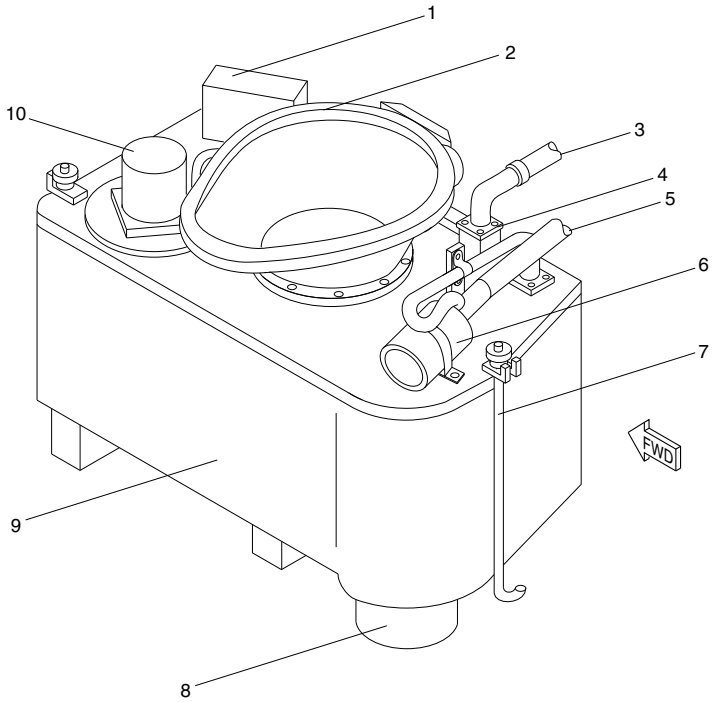
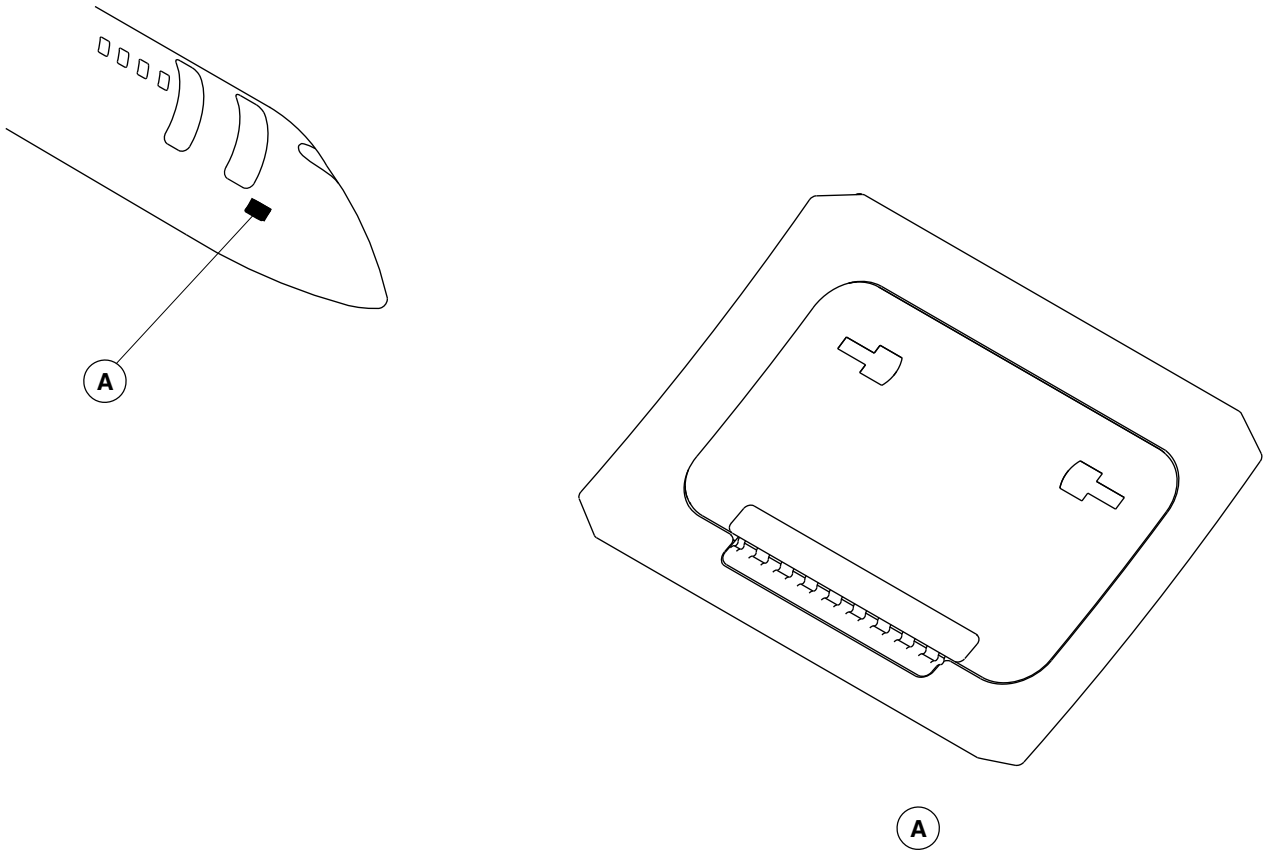
LAVATORY WASTE DISPOSAL LOCATOR
Figure 3



LEGEND

1. Timer Assembly.
2. Toilet Bowl Assembly.
3. Flush/Fill Line.
4. Check Valve.
5. Vent.
6. Muffler Assembly.
7. Hold Down Rods.
8. Waste Drain.
9. Tank Assembly.
10. Motor Pump and Filter.

LAVATORY WASTE DISPOSAL DETAIL
Figure 4



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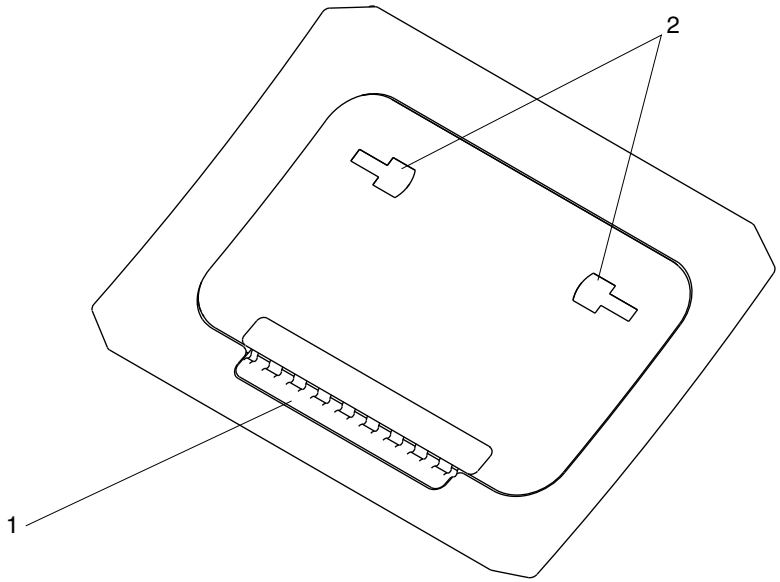
LAVATORY SERVICE DOOR LOCATOR
Figure 5



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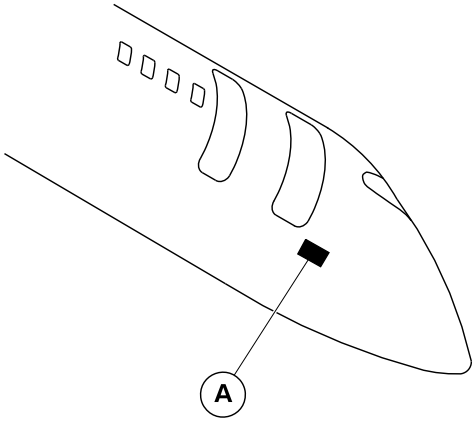
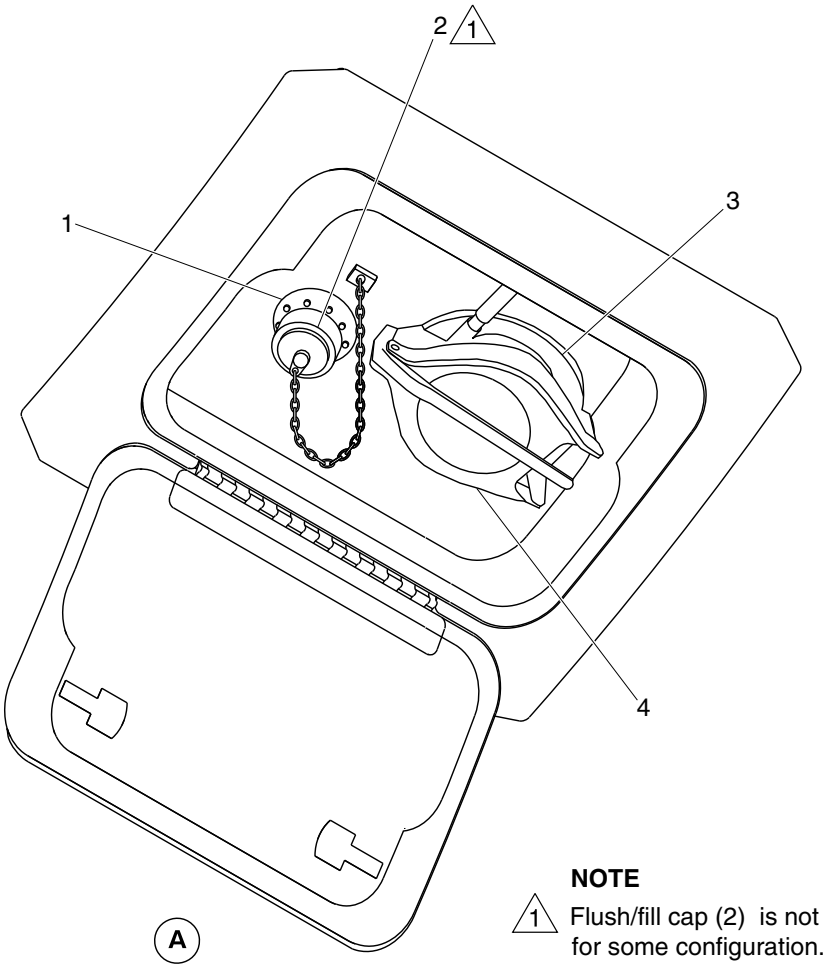
LEGEND

1. Hinge.
2. Latch.

WASTE WATER, LAVATORY SERVICE DOOR DETAIL
Figure 6





LEGEND

1. Flush/fill port.
2. Flush/fill cap.
3. Sewage drain.
4. Sewage drain cover.

NOTE

1 Flush/fill cap (2) is not applicable for some configuration.

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Lavatory Service Panel Detail
Figure 7