

Chapter 13

WATER SYSTEMS

LIST OF CONTENTS

DESCRIPTION	Para.
Introduction	1
Galley water system	2
Drinking water tank	3
Rapid water boiler... ..	4
Galley sink	5
Waste water tank	6
Waste tank drain	7
▶▶	
Windscreen water spray system	
General	8
Water tank	9

Delivery piping	Para. 11
SERVICING	
Galley water system	
Draining the tank	15
Flushing the tank	16
Replenishing the tank	17
Draining the waste tank	18
Draining the rapid water boiler ...	19
Waste pipe	20
▶▶	

Windscreen water spray system	
Draining the tank	21
Tank examination	22

REMOVAL AND ASSEMBLY

Galley	
Removal of fresh water tank ...	24
Removal of waste water tank ...	25
Removal of rapid water boiler ...	26
▶▶	
Assembly	27

LIST OF ILLUSTRATIONS

Galley water system	Fig. 1
Windscreen water spray system ...	2

DESCRIPTION

Introduction

1. Two fresh water systems are used in the aircraft, each self-contained with its own storage tank and piping installation, as follows:-

(1) Galley water system.



(2) Windscreen water spray system.

GALLEY WATER SYSTEM

2. A drinking-water tank with a capa-

city of 15 gallons is provided and supplies water for use in the galley. A rapid water boiler is installed to provide hot water and a waste tank collects waste water drained from the galley sink (fig.1).

Drinking water tank

3. Constructed from aluminium alloy, the tank is secured to angle-section strips, which in turn are secured to brackets attached to the fuselage formers. A filler, located at the rear of the in-board face of the tank, is accessible from inside the fuselage. A water level

indicator is situated forward of the filler and a label, inscribed DRINKING WATER ONLY, is secured immediately below the filler. There are three connections in the base of the tank, two at the forward end and one at the rear. From the forward connection of the two, at the front of the tank, a lagged pipe leads to a drain cock mounted below and to the rear of the sink unit; access to the drain cock is through a detachable panel in the fuselage outer skin. A lagged pipe from the other forward connection leads directly to the sink unit cold water tap. From the connection at the rear of the tank, a pipe,

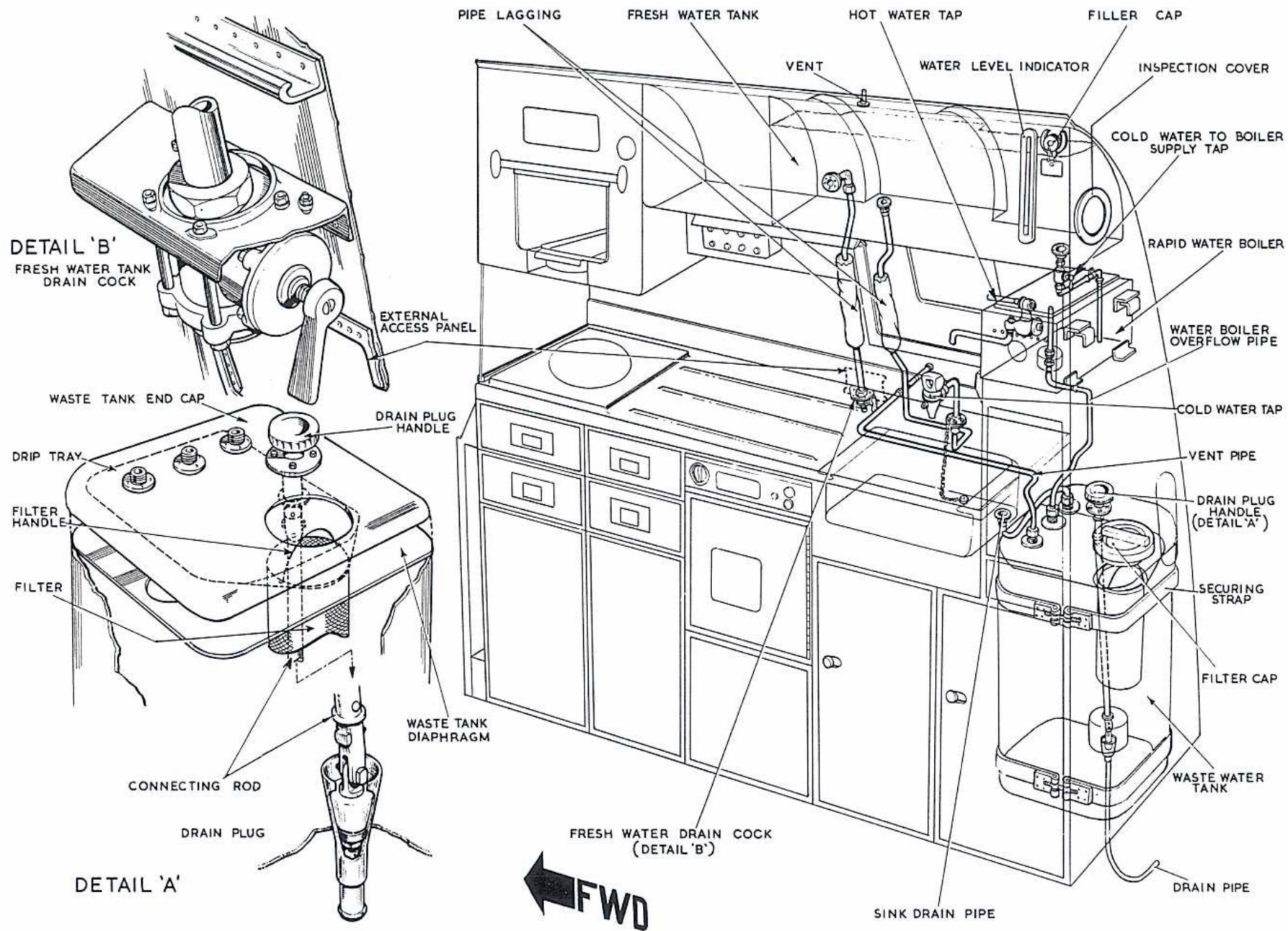


Fig. 1. Galley water system
RESTRICTED

incorporating an 'on-off' cock, supplies the water to the rapid water boiler. From a connection at the front of the top of the tank a pipe vents the tank to atmosphere through the fuselage top outer skin.

Rapid water boiler

4. The rapid water boiler, which is heated electrically by a 750 watt element, is mounted on a diaphragm bolted to the forward face of the bulkhead at former 22. Hot water is drawn from a tap fitted to the forward face of the water boiler, the tap has a swivel pipe attached which extends over the sink. An overflow pipe is led into the waste tank.

Galley sink

5. The sink forms part of the galley unit which is fully described in Chapter 15 of this Section.

Waste water tank

6. Waste water from the sink and the rapid water boiler overflow is drained through separate pipes into a fibreglass waste tank, of 8 gallons capacity, located in the galley unit below the sink and accessible through a door at the rear of the galley unit. The tank is housed in cradles attached to the fuselage formers and secured by straps and turnbuckles. All waste water passes through a removable filter housed in the tank, accessible after removing a threaded cap at the top of the tank, to which a slave cable is attached allowing the cap to rotate within it and securing it from loss. A waste pipe, attached to the sink drain, runs into the filter connection on the tank. A connection, inboard of the rapid water boiler overflow pipe, carries a pipe which vents to atmosphere through the fuselage skin on the starboard side of the aircraft.

Waste tank drain

7. A knurled handle, mounted on top of

the tank, is connected through a threaded housing to a push-pull rod running inside the tank shell to the tank base. The lower end of the rod is connected to a cone-shaped plug which seats in the bell-mouth of the drain pipe (fig.1). Anti-clockwise movement of the handle withdraws the plug from its seat allowing waste water to pass through the pipe to the drain outlet in the fuselage skin at the rear of the bomb doors.



WINDSCREEN WATER SPRAY SYSTEM

General

8. A 6-gallon tank, pressurized to 7 p.s.i. from the pneumatic system, supplies fresh water for spraying the pilot's air bomber's and front gunner's windcreens. Pre. Mod.1420 water is also supplied from this tank to the heaters for humidification of the air conditioning systems (Sect.3, Chap.8). The flow of water, from the tank to the spray nozzles, is controlled by manually-operated valves at the air bomber's and front gunner's positions and by an electromatic tap at the pilots' positions.

Water tank

9. This is located under the step, forward of the second pilot's floor in the starboard side of the front centre section. The tank is slung in two cradles bolted to the floorstep and secured in the cradles by straps and wing bolts. A dishing in the top of the tank accommodates a filler cap, a dipstick and a vent cock through which the tank is pressurized. Access to the filler cap, dipstick and vent cock is through a hinged panel in the floor step above the tank. The tank is capable of being re-filled in flight, operation of the vent cock will depressurize the tank so that the filler cap can be opened.

10. A sump at the bottom of the tank

carries a float-operated switch, which cuts off the supply to the heat exchanger in the event of the tank running dry, a drain connection and a two-way delivery connection. From the tank drain connection a pipe is led down to a drain cock on the starboard side of the nose section, access to which is through a hinged panel marked WATER TANK DRAIN COCK. An access panel, located on the inboard side of the tank, is provided for internal examination of the tank in situ. The tank is enclosed in a fibreglass blanket to insulate it against extreme temperature conditions.

Delivery piping

11. From the two-way connection in the tank sump, water is delivered to the heat exchangers on the No.1 and No.2 heater exhaust pipes (Sect.3, Chap.8) and to the windscreen water spray system.

12. The water spray system delivery pipe is taken forward to a filter adjacent to former E and thence to a tee-connection where the supply is divided, fore-and-aft, to supply the air bomber's, gunner's and pilots' windscreen spray nozzles.

13. The forward delivery pipe connects with a tee-connection which further divides the supply, one branch pipe being taken up to a push-button control valve (Dunlop Part No. A.C.M.17662), situated on the port side of the gunner's control panel. The remaining branch pipe connects with a further push button control valve on the starboard side of the air bomber's station. A pipe from the gunner's control valve is led to the rear connection of a manifold, externally mounted on the barrette fairing, thence to a spray assembly attached to the lower edge of the gunner's windscreen. Piping is led from the air bomber's control valve through the starboard gun beam where it is coupled to a spray assembly secured to the top edge of the air bomber's window.

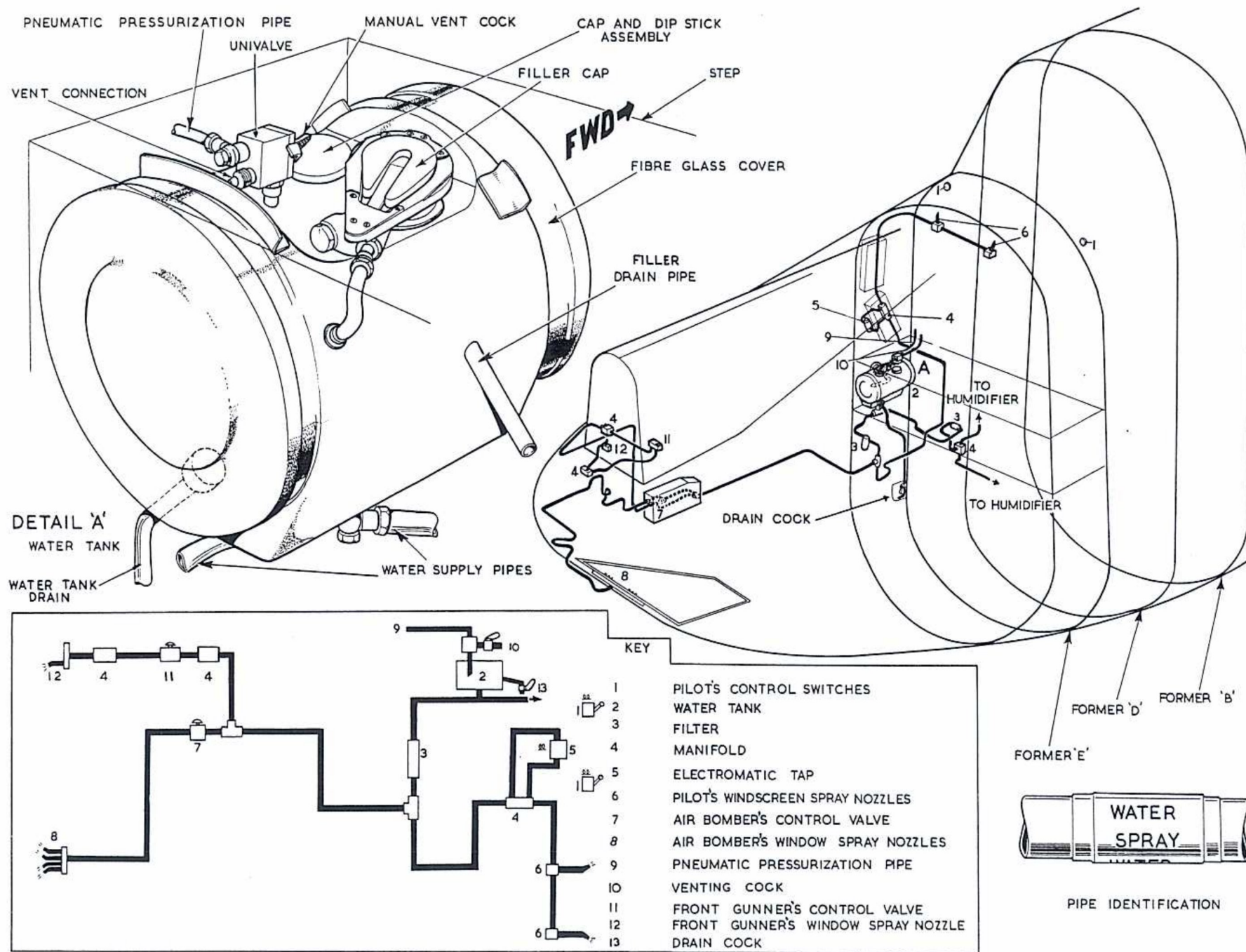


Fig 2 Windscreen water spray system

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14. The aft delivery pipe passes rearward and then upward to connect to a manifold mounted on the rear of the piping services trough on the starboard side of the aircraft between formers E and F. The manifold is connected by two pipes to an electromatic tap (Dunlop Part No. AC. 11326), mounted on the forward face of the

piping trough, one pipe is connected to the inlet and one to the outlet connections of the electromatic tap. A fourth pipe from the manifold passes upward in the trough to connect to a further manifold which is connected to the spray nozzle serving the second pilot's windscreen. A transverse pipe is led from the second pilot's mani-

fold to connect to a similar manifold on the port side, which is connected to the first pilot's windscreen. Both sprays are operated by the electromatic tap which is controlled by either one of two switches, one mounted on each auxiliary panel at the first and second pilot's station.

GALLEY WATER SYSTEM

Draining the tank

15. The drinking-water tank may be drained by removing the external access panel and, attaching a suitable length of hose to the drain cock outlet situated to the rear of the sink unit, opening the drain cock and allowing the contents to drain into a suitably positioned receptacle.

Flushing the tank

16. Ensure an adequate supply of clean water is available to be pumped into the tank by way of the filler (Sect.2, Chap.2), then proceed as in para.15).

Replenishing the tank

17. This operation is described in Sect.2, Chap.2. Since the water is used for drinking, ensure that the tank is replenished from scrupulously clean vessels.

Draining the waste tank

18. Place a suitable receptacle under the drain pipe outlet at the rear of the bomb doors. Unscrew the knurled drain handle to open the drain valve and allow the contents to drain away. The tank filter should be cleaned at the same time. To remove the filter, unscrew the cap and lift out the filter by the handle provided.

SERVICING

After cleaning, refit the filter and cap and finally, screw down the drain valve handle to close the valve.

Draining the rapid water boiler

19. Close the supply cock from the fresh water tank and open the rapid water boiler tap and drain into the waste water tank or a suitable receptacle.

Waste pipe

20. To completely drain and clear the waste pipe it must be removed. To remove the pipe, disconnect the hose joints at the sink drain and the tank and withdraw the pipe. The pipe may then be cleared, if necessary, by the use of a flexible rod or air blast.



WINDSCREEN WATER-SPRAY SYSTEM

Draining the tank

21. A drain connection is provided in the tank sump and the tank may be drained as follows:-

- (1) De-pressurize the tank by moving the vent cock handle to the off position.
- (2) Slacken the filler cap.

- (3) Release the external access panel to the drain cock on the starboard side of the nose section, remove the drain blanking cap, and sealing washer, open the drain cock and drain the tank.

- (4) On completion of draining, refit the sealing washer and cap, and lock with wire.

Tank examination

22. Internal examination of the tank may be carried out in situ, by removing an access panel on the inboard side of the tank. The panel is secured by bolts and spring washers and the joint is made with a soft aluminium gasket. The fibre-glass blanket covering the panel is attached by press-studs and easily removable. To examine the tank remove the blanket, access panel and seal taking care not to damage the seal.

23. To refit the access panel after examining the tank, proceed as follows:-

- (1) Clean the surfaces and remove all traces of old adhesive.
- (2) Apply a brush coat of Bostik 1752 (Ref.No. 33H/9405627) to the soft aluminium seal and to the tank and access panel mating surfaces.

- (3) Allow to dry for at least one hour.
- (4) Apply a minimum of Bostik 1790 (Ref.No. 33H/2202125) to above surfaces and bolt the panel in

GALLEY

Removal of fresh water tank

24. Drain the tank as described in para.15 and proceed as follows:-

- (1) Remove the trimming panels at the rear of the sink unit.
- (2) Disconnect the vent pipe at the top of the tank and the three connections at the bottom of the tank, turning the rapid water boiler supply cock off.
- (3) Support the tank and remove the screws securing it to the former brackets. Withdraw the tank.

Removal of waste water tank

25. Drain the tank as described in

position.

- (5) Pressurize the tank and check all joints for leaks.
- (6) If no leaks occur, de-pressurize

REMOVAL AND ASSEMBLY

para.18, access is gained through a door at the rear end of the galley unit, and proceed as follows:-

- (1) Disconnect the rubber hoses connecting the waste boiler overflow and vent pipes to the top of the tank.
- (2) Support the tank and release the securing strap turnbuckles. Raise the tank to gain access to, and disconnect the bottom drain connection, then lift the tank from its stowage.

Removal of rapid water boiler

26. Ensure that the electrical supply to the rapid water boiler is switched off before commencing the following operations:-

the tank, replenish with water refit the fibreglass blanket on its press-studs and tighten the filler cap. The tank may then be pressurized for use.

- (1) Drain the rapid water boiler (para. 19) and disconnect the electrical socket from the plug on the boiler.
- (2) Turn the delivery cock to off and disconnect the boiler from the fresh water tank delivery cock, disconnect the boiler overflow pipe to the waste tank.
- (3) Support the boiler and remove the bolts securing it to the diaphragm attached to the bulkhead.



ASSEMBLY

27. Assembly of the components in the reversal of the removal procedure: