Chapter 2A

FUEL SYSTEM

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LIST OF ILLUSTRATIONS

DESCRIPTION

Introduction

1. Details peculiar to the Mk.1A aircraft low pressure fuel system are contained in this chapter. For all other information on the fuel system reference must be made to Sect.4, Chap.2, of this book.

REFUELLING FLOW RESTRICTOR VALVES

2. Introduced by Mod.1143 (S.O.O.), flow restrictor valves are fitted in No.3,4, 5, 6 and 7 tanks port and starboard. The valves progressively restrict the flow from 115 ± 5 gallons per minute when they are fully open to 70 ± 5 gallons per minute as float switch level is reached. This reduction in flow rate ensures that the vent valves can dispose of an excessive pressure build up in the event of float switch failure.

3. The restrictor is mounted over the top of the refuelling valve and secured by mounting brackets to the fuel tank reservoir. Four slotted plates are sandwich mounted on each end of the cylindrical restrictor head. The inner plates are fixed, the outer plates, have a shaft running through their centre bosses and are movable. Each outer plate incorporates an arm, one having an attached balance weight, the other having a set length rod attached to it. The set length rod passes through the top of the reservoir and carries a float on its upper extremity.

4. A slotted stop, working on a stop bolt on the restrictor body, is cut into the base of one outer plate and governs the fully open and closed positions of the restrictor plates.

FUEL LEVEL SWITCHES

5. The Mk.10 double float fuel level switches are mounted on top of the internal transfer pump. Operated by the rising fuel level, during refuelling operations, the switches cut the electrical supply to the Mk.40 refuelling valves. It must be noted that, with the exception of No.2 port tank, float B is the lower, in No.2 port tank, float A is the lower. To prevent excessive flexibility of the column, a bracket mounted on the switch incorporates a spigot which locates in a plunger unit secured to the tank roof.

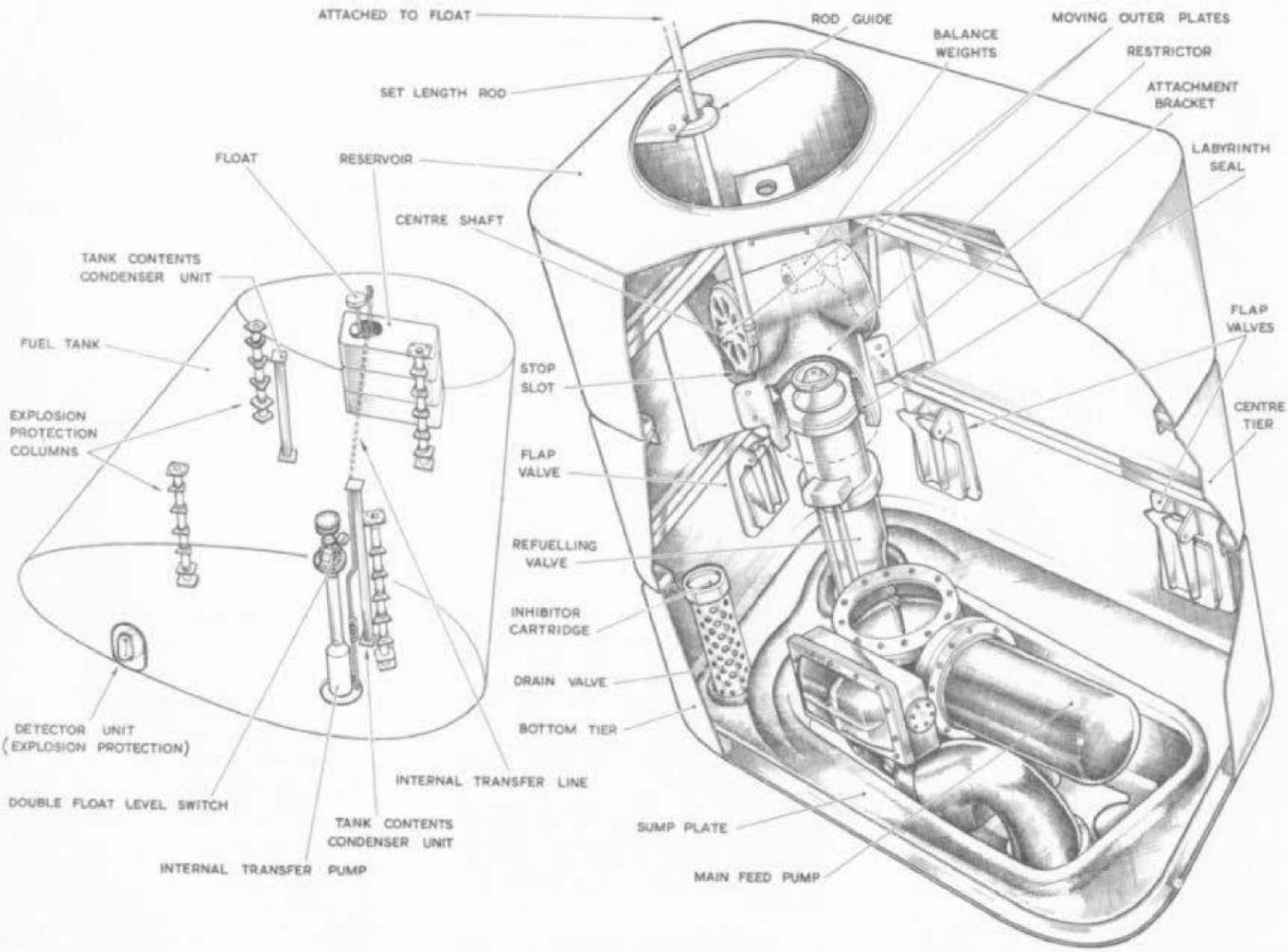

Fig. 1. Fuel tank equipment

RESTRICTED

RESTRICTOR VALVE ADJUSTMENT

6. Adjustment of the movable outer plate, prior to installation in the aircraft, is as follows:-

(1) Slacken the 4 B.A. set screws securing the plate, through its boss, to the centre shaft.

(2) Push the plate hard up to its shim.

(3) Using the nut on the threaded portion of the centre shaft, adjust to obtain an all round clearance of 0·008 to 0·009 in. between the inner and outer plates.

(4) With the slots of the inner and outer plates in line, tighten the 4 B.A. set screws.

(5) Check the movable outer plates for perfect freedom of rotation. Check that the stop limits the rotation so as to give fully open and fully closed conditions.

◀ After installing a restrictor in No.4 wing tank, check that full movement of the valve is not restricted by the float fouling on a stud in the top of the tank. If a foul does occur the stud must be cut back to give full movement of the valve. ▶

RESTRICTOR VALVE FLOW TEST

7. To check the flow rate through the restrictor valve after installation in a fuel tank proceed as follows:-

(1) Refuel each wing tank to 40 per cent capacity. To maintain aircraft weight balance the fuselage tanks must be refuelled to 50 per cent capacity.

(2) Disconnect the electric feed to the relief relay of the fuel tank group under test. To prevent selection to the next tank when float switch level is reached, disconnect the electric feed from the fuel level switches to the override relay.

(3) Connect a refuelling tanker to the flight refuelling probe using the adapter (Ref.No.27F/4819).

(4) Set the gallons gone meter on the tanker to zero. Select No.3 tank on the ground refuelling control panel. Commence refuelling.

(5) Check, by using the tanker flow rate indicator, the tank capacity at which the restrictor valve closes. If the tanker has no flow rate indicator, the fuel level, at which the restrictor closes, can be recognised, by a slight surge and rise in pressure reading on the probe pressure gauge. The tank capacities at which the restrictors close is as follows:-

Tank No.	Tank contents
3	472 - 520
4	495 - 540
5	317 - 362
6	605 - 650
7	395 - 440

(6) With the restrictor closed continue refuelling with the probe pressure as near to 50 p.s.i. as possible.

(7) Check the flow rate by recording the gallons refuelled in 30 seconds. At a probe pressure of 50 p.s.i. the flow rate must not exceed 75 gall. per minute.

NOTE...
Little time will be available for this check as float switch level is reached quickly after restrictor valve closing.

(8) If a probe pressure of 50 p.s.i. is unobtainable the following table gives the maximum flow rates for lower pressures.

Probe pressure (p.s.i.)	Max. flow rate (g.p.m.)
37	63
39	65
40	66
41	67
43	69
45	71
47·5	73

(9) Repeat the test on each tank of the group. Reduce the tank contents to 50 per cent after each test. Connect the electrics disconnected in op.2.

(10) Repeat the test on each tank group and on completion disconnect the tanker from the probe.

FLIGHT REFUELLING DISTRIBUTION TEST

8. Reference must be made to Chapter 2 of this section for information on the flight refuelling distribution test on aircraft fitted with refuelling restrictor valves.