Group 2 RECEIVER

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CROSS REFERENCES

Cockpit panel lamps (*post-Mod.* 1749 *or* 2071) ... ... *Book* 2, *Chap.* 2, *Group* 1

WARNING

Voltages in excess of 100v. a.c. or d.c. can be dangerous under certain circumstances. Personnel should therefore ensure that the electrical system is electrically safe before any servicing is attempted. Where it is essential that tests or adjustments are to be made with the electrical power switched on, the greatest care must be exercised.

Introduction

1. Information on the lay-out and interpretation of the schematic wiring diagrams can be obtained from the General Information Group contained in Book 2 immediately after Section 5 marker card. Also to be found in the General Information Group are all the general modifications applicable to all aircraft.

STARBOARD COAMING PANEL LAMPS (*fig.* 1)

2. In order to illuminate the engravings for the air-to-air refuelling switches at the rear end of the coaming panel, an extra lamp, Type C, is fitted and wired in parallel to the three lamps existing on the B. Mk. 1 and B/PR Mk. 1 aircraft. This lamp, fitted with a 2·8 watt filament, in parallel with the others, is supplied from a fuse on panel E and is controlled by the dimmer switch at the forward end of the coaming panel.

PROBE DE-ICING AND VENT VALVE CONTROL (*fig.* 2)

Note . . .

Mod. 2164 *introduces fluid pump Dunlop, Type* 13002 *in lieu of pump Dunlop, Type* 12302.

3. The probe is vented to atmosphere except prior to the refuelling operation. Immediately prior to refuelling, de-icing fluid is pumped into the probe via the vent tube. The vent valve actuator and the de-icing fluid pump are controlled simultaneously by a switch in the starboard coaming panel. The actuator, fluid pump and suppressor are mounted in the nose of the aircraft.

4. When the switch is selected ON, it connects a supply from panel D to the vent valve actuator *close* field, via the '*close*' limit switch, and thence to the armature and brake solenoid. At the same time, the supply is connected via a suppressor to the de-icing fluid pump.

5. On reaching the fully closed position, the actuator limit switch opens to break the supply to the actuator motor and to the brake-solenoid. The vent valve is thus closed and de-icing fluid is pumped into the vent tube.

6. When the switch is selected OFF, the supply is connected to the actuator *open* field, via the *open* limit switch, and then to the armature and brake solenoid. The actuator opens the valve and on attaining the fully open position, the limit switch operates to break the supply to its motor and brake solenoid.

REFUELLING VALVE CONTROL

Note . . .

1. *Mod.* 2652 *introduces refuelling valve* 1112639 *in lieu of* 1112000/3 *in the bomb bay tank and provides A.M.P. tags for the connections to this valve.*

2. *Mod.* 2653 *introduces refuelling valve* 1112634 *in lieu of* 1112610 *in the underwing stalk and provides A.M.P. tags for the connections to this valve.*

3. *Mod.* 2818 *introduces separate switching for the rear transfer and bomb bay tanks at both the starboard coaming panel and at the ground refuelling points. Pre-Mod.* 2818, *both tanks were controlled from a single switch.*

7. The control of the refuelling valves for ground refuelling is similar to the B. Mk. 1 and B/PR Mk. 1 aircraft, the only difference is that the wing refuelling points have been removed, and, in consequence, the wing tank refuelling switches are now at the fuselage refuelling points.

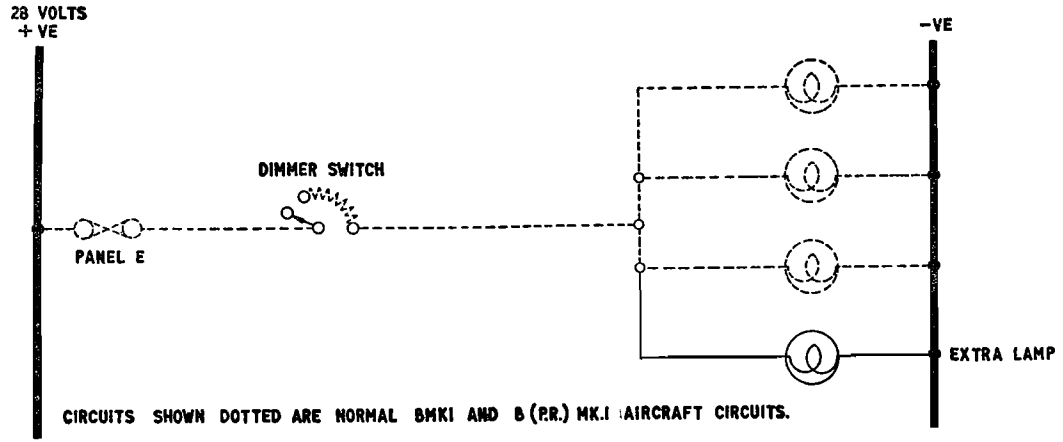

Fig. 1. Starboard coaming panel lamps

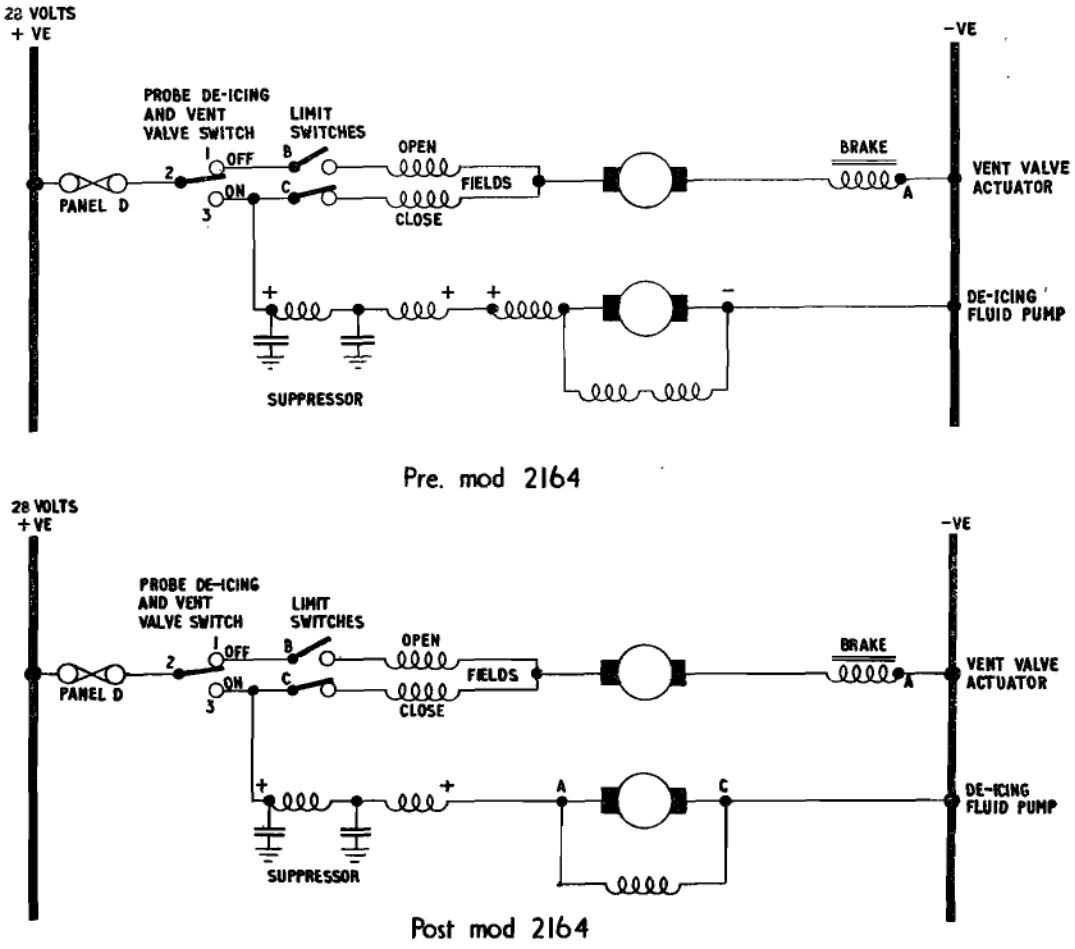

Fig. 2. Probe de-icing pump and vent valve control

AIR-TO-AIR REFUELLING

(*fig.* 3 *and* 4)

Note . . .

1. *Mod.* 2153 *introduces refuelling lamp indicator No.* 4507000/19 *in lieu of No.* 4507000/6.

2. *Mod.* 2616 *introduces refuelling lamp indicator No.* 4507000/24 *in lieu of No.* 4507000/19.

8. The air-to-air refuelling switches are all on the starboard coaming panel together with the tanks full lamp indicator. When any tank is full, its associated lamp on the indicator goes out.

9. The switches operate in parallel with the ground refuelling switches, but they are supplied from extra fuses on panel D. Three fuses are used, one for each set of wing switches and one for the fuselage switches.

Note . . .

1. *Mod.* 2066 *introduces float switch* 2103*FG/SB in lieu of* 1601*FG/SB in the bomb bay tank.*

2. *Mod.* 2511 *introduces float switches* 2136*FG/SB and* 2137*FG/SB incorporating sealed plugs in lieu of* 2103*FG/SB or* 1601*FG/SB and* 2104*FG/SB or* 1918*FG/SB respectively.*

10. When any switch is selected ON, its supply is connected to the float switch refuelling valve circuit for its relative tank. The float switch is 'made' at all times, unless the tank is full, so that the refuelling valve will be energized to let in fuel under pressure. When the tank is full, the float switches contact is broken to disconnect and close the refuelling valve.

11. The tank full lamp in the lamp indicator is in parallel with its relative refuelling valve, so that, if the refuelling valve is

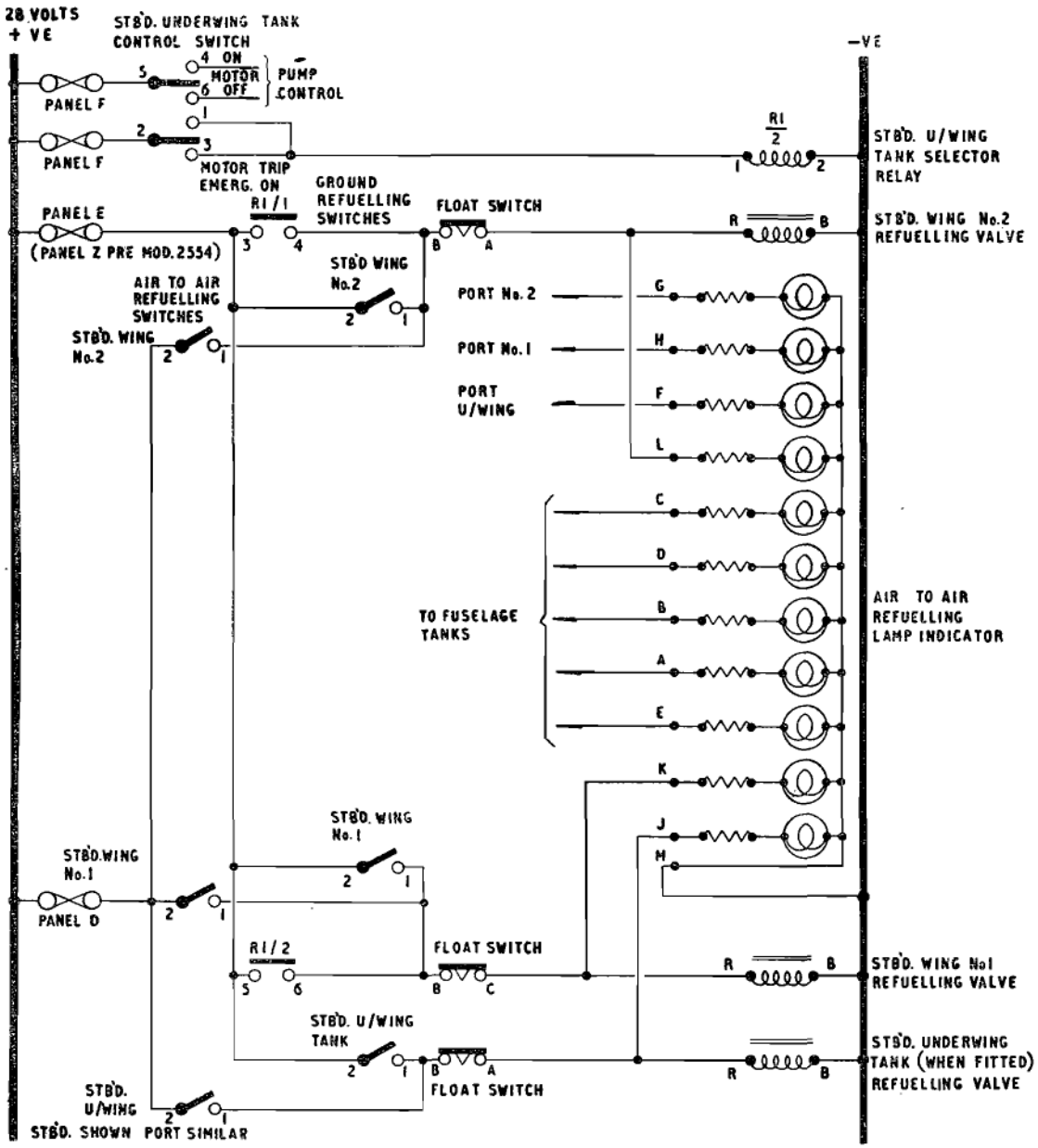

Fig. 3. Wing tanks refuelling valve control

energized, the lamp will be on. When the tank is full, the float switch breaks the supply to the lamp. There is only one lamp for the bomb bay and transfer tanks. In order to prevent feedback between the float switches for these tanks, rectifiers are connected in the circuits between the float switches and the lamp.

Note . . .

When the air-to-air refuelling operation is complete, the refuelling switches must be returned to OFF, *otherwise the refuelling valves will be energized as soon as the fuel level begins to fall.*

12. The underwing tanks, the bomb bay tank and the transfer tank can be used in the normal way to replenish fuel used from the wing tanks and No. 1 fuselage and reserve tanks during flight. The underwing tanks control differs slightly from that of the B. Mk. 1 and B/PR Mk. 1 aircraft although the switching remains the same (*Group* 3, *para.* 18).

Refuelling probe lighting (Mod. 2586) (*fig.* 5)

13. To facilitate contact, between the receiver aircraft refuelling probe and the tanker aircraft drogue during darkness, two lamps fitted with 24v, 3w filaments are mounted on the nose scanner bonnet to illuminate the refuelling probe. The lamps are controlled by separate dimmer switches, mounted on the starboard coaming panel. Each lamp is supplied from separate fuses in the starboard fuse panel D.

Probe fuel pressure gauge (Mod. 2684)

◀ **13A.** This modification introduces a pressure transmitter (Smiths 160P.G., 0-120 lb/in²) in the refuelling probe fuel pipe to the 'ring main' upstream of the non-return valve. Pressure readings are given on an indicator (Smiths 260 P.G., 0-120 lb/in²) mounted on the starboard quarter panel.

13B. The transmitter is flexibly mounted and is remote from the fuel pipe, the connec-

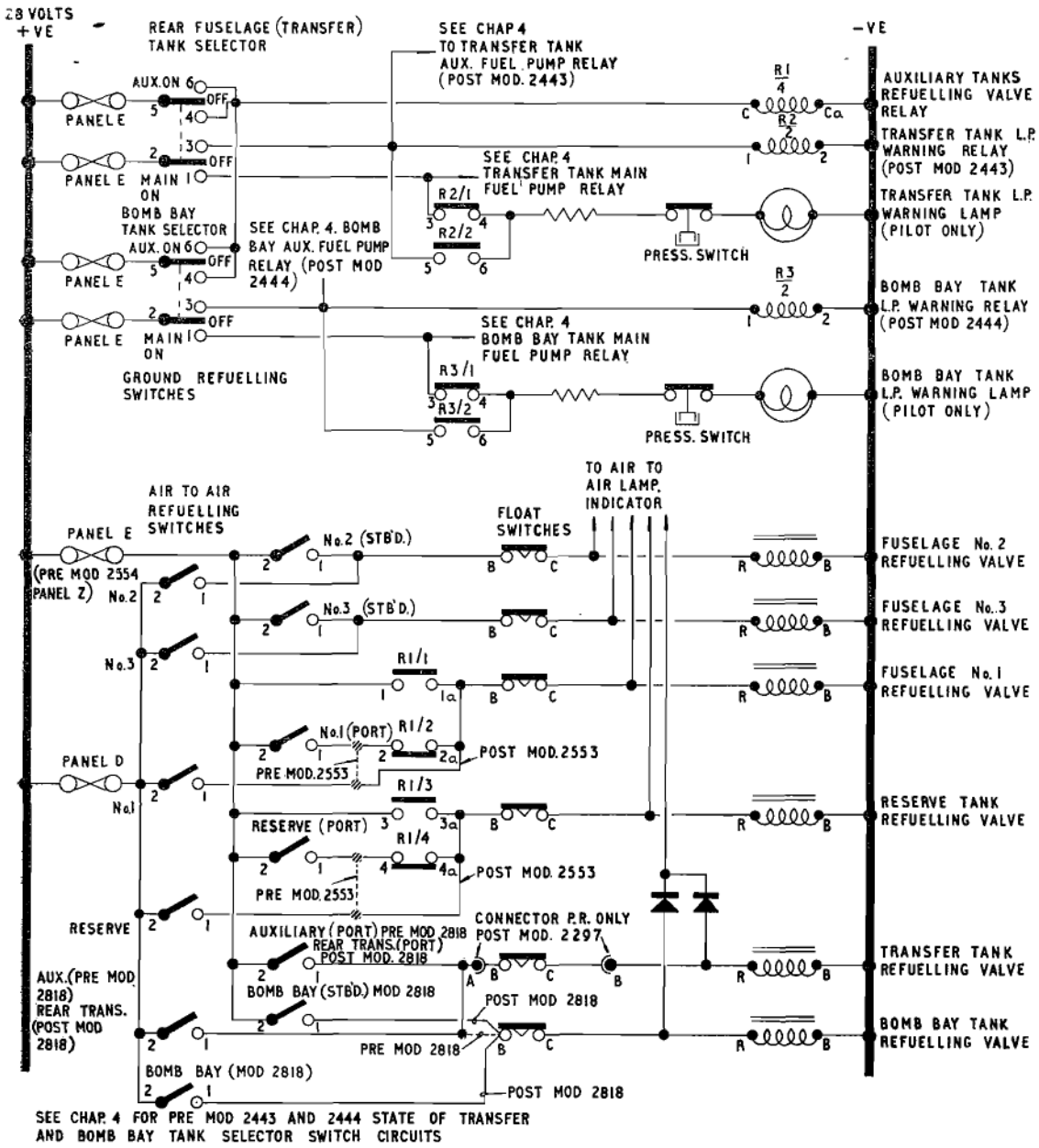

Fig. 4. Fuselage tanks refuelling valve control (post-Mod. 2443 and 2444)

F.S./3

tion being made by a short length of flexible pipe. The purpose of the system is to give indication to the receiver pilot that fuel is being received. Although indication is provided on the tanker aircraft by means of a flashing green light, this indicator on the receiver guards against failure or faulty operation of the tanker indication. During air-to-air refuelling, the pressure gauge should read 25 lb/in² approximately rising to a surge of 50–55 lb/in² as the tanks reach maximum capacity. Under ground refuelling conditions, the gauge should not read unless there is a failure of the non-return valve when the gauge will read in the region of 75 lb/in².

13C. The transmitter is fed at 28-volts from panel E and is earthed locally, signals from the transmitter are fed directly to the indicator. ▶

SERVICING

Introduction

14. Information on the testing of the fuel system circuits applicable to this aircraft, and not mentioned in this group, can be obtained from Chapter 4. The General Information group contained in Book 2 gives a detailed description of all the general tests to be applied to all aircraft circuits and the procedure to be adopted when servicing special circuits. The servicing procedure for the normal aircraft fuel system can be found in Chapter 4.

PROBE DE-ICING AND VENT VALVE CONTROL

15. (1) Check the circuit fuse and connect a 28-volt d.c. supply to the external connection.

(2) Select the 24-volt battery switch to ON.

(3) Select the probe de-icing switch to ON. Check that de-icing fluid is pumped out around the probe.

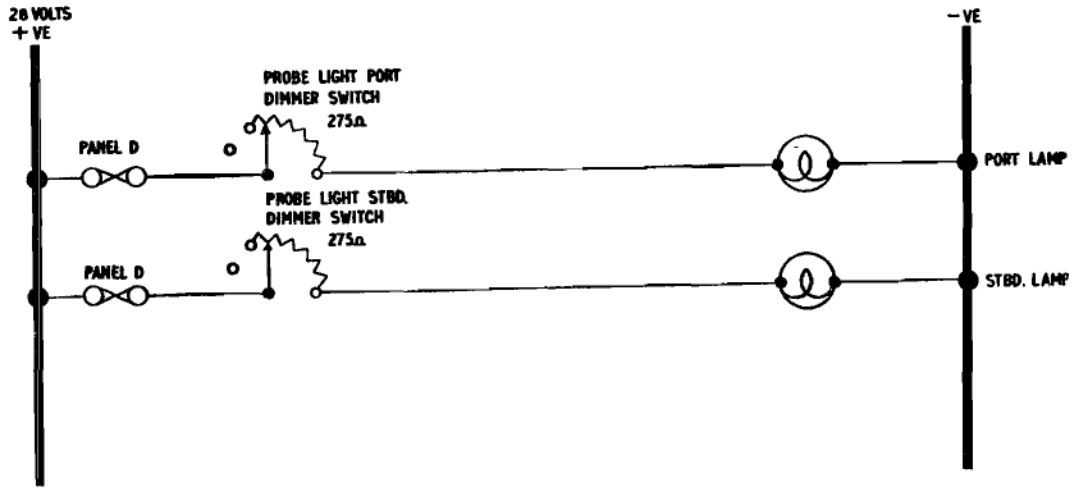

Fig. 5. Refuelling probe lighting

(4) Select the probe de-icing switch to OFF. Check that de-icing fluid flows out through the vent pipe on the starboard side of the scanner bonnet.

(5) Select the 24-volt battery switch to OFF.

REFUELLING VALVE CONTROL (AIR-TO-AIR)

Note . . .

Checks on these circuits depend upon whether access can be obtained to the inside of the fuel tanks and cells.

16. (1) Check the circuit fuses and connect a 28-volt d.c. supply to the external connection.

◄ (2) Select the 24-volt battery switch to ON. ►

(3) Using the AIR-TO-AIR REFUELLING SWITCHES select ON each tank or cell in turn.

(4) Enter the selected tank or cell and alternately raise and lower the float switch. Listen for the refuelling valve operating as the float switch is raised and lowered. Also check that the associated refuelling valve indicator lamp comes on and goes out as the float switch operates.

(5) Return all switches to OFF.

17. If access to the inside of the fuel tanks is not possible and the tanks are not full:—

(1) Select ON each tank refuelling valve switch in turn and check that the refuelling valve can be heard to operate.

(2) Select OFF each switch in turn and check that the refuelling valve can be heard to operate.

Note . . .

Pre-Mod. 2818, *the transfer and bomb bay tanks refuelling valves are operated by one switch. When selecting* ON *the transfer and bomb bay refuelling valve switch check that both valves can be heard to operate.*

Refuelling probe lighting (Mod. 2586)

18. (1) Check the circuit fuses and connect a 28-volt d.c. supply to the aircraft external supply socket.

(2) Select the 24-volt battery switch to ON.

(3) Operate both port and starboard probe lights dimmer switches over the whole range and check that the lamps light accordingly. Also check that each dimmer switch operates the appropriate lamp.

(4) Return the dimmer switch to OFF.

(5) Select the 24-volt battery switch to OFF.

◄ **Probe fuel pressure gauge (Mod. 2684)**

19. This can only be checked in conjunction with the fuel flow tests. During fuel flow checks through the refuelling probe, the pressure gauge should read the delivery pressure of the flow test, less 15 lb/in² approximately to allow for the pressure drop across the coupling. ►

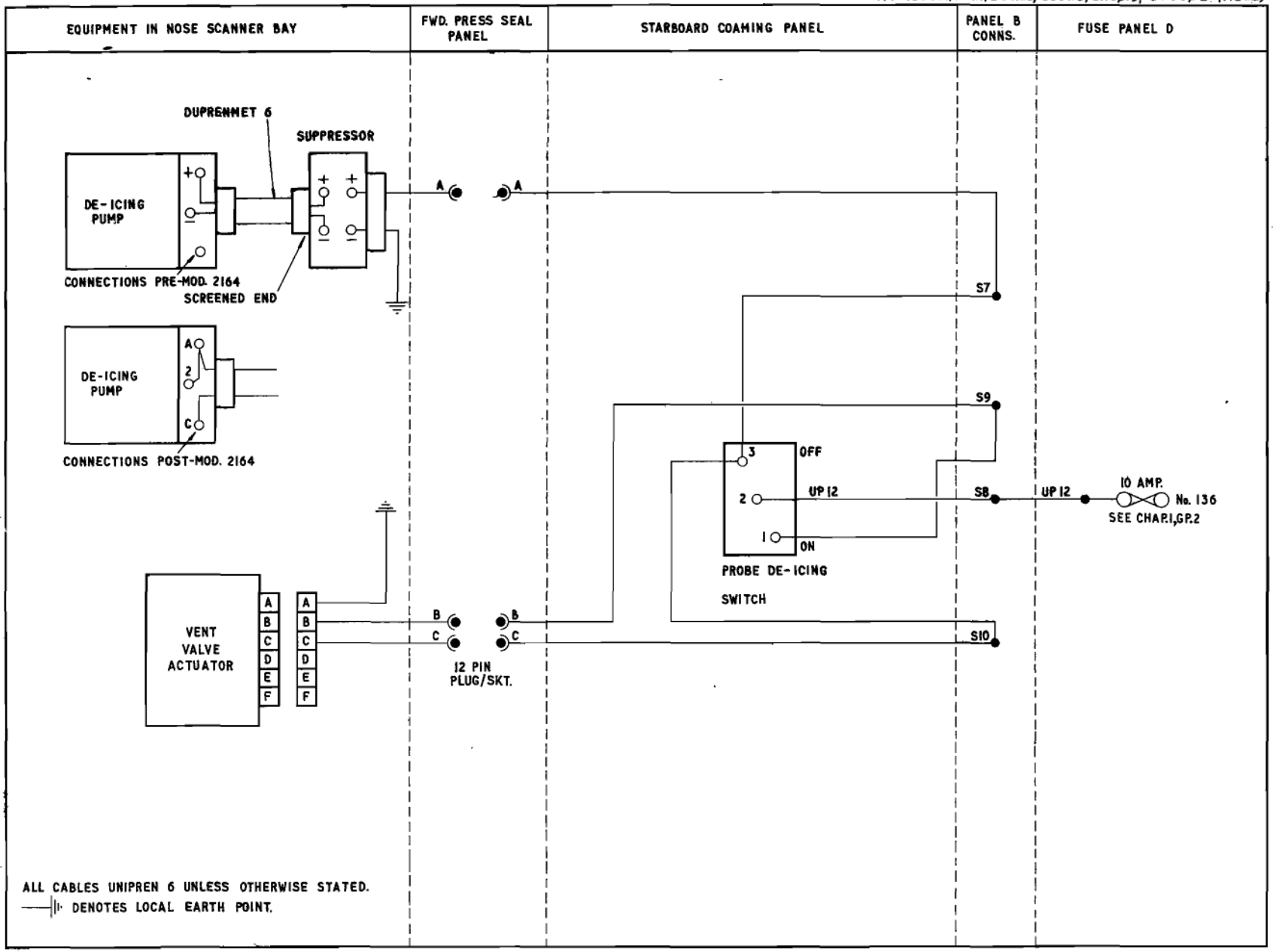

Fig. 6. Probe de-icing and vent valve

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PP8674 473781/6319 7/60 631 C & P Gp. 924 (4)

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73336 SHT. 420-D
75836 SHT. 420-D

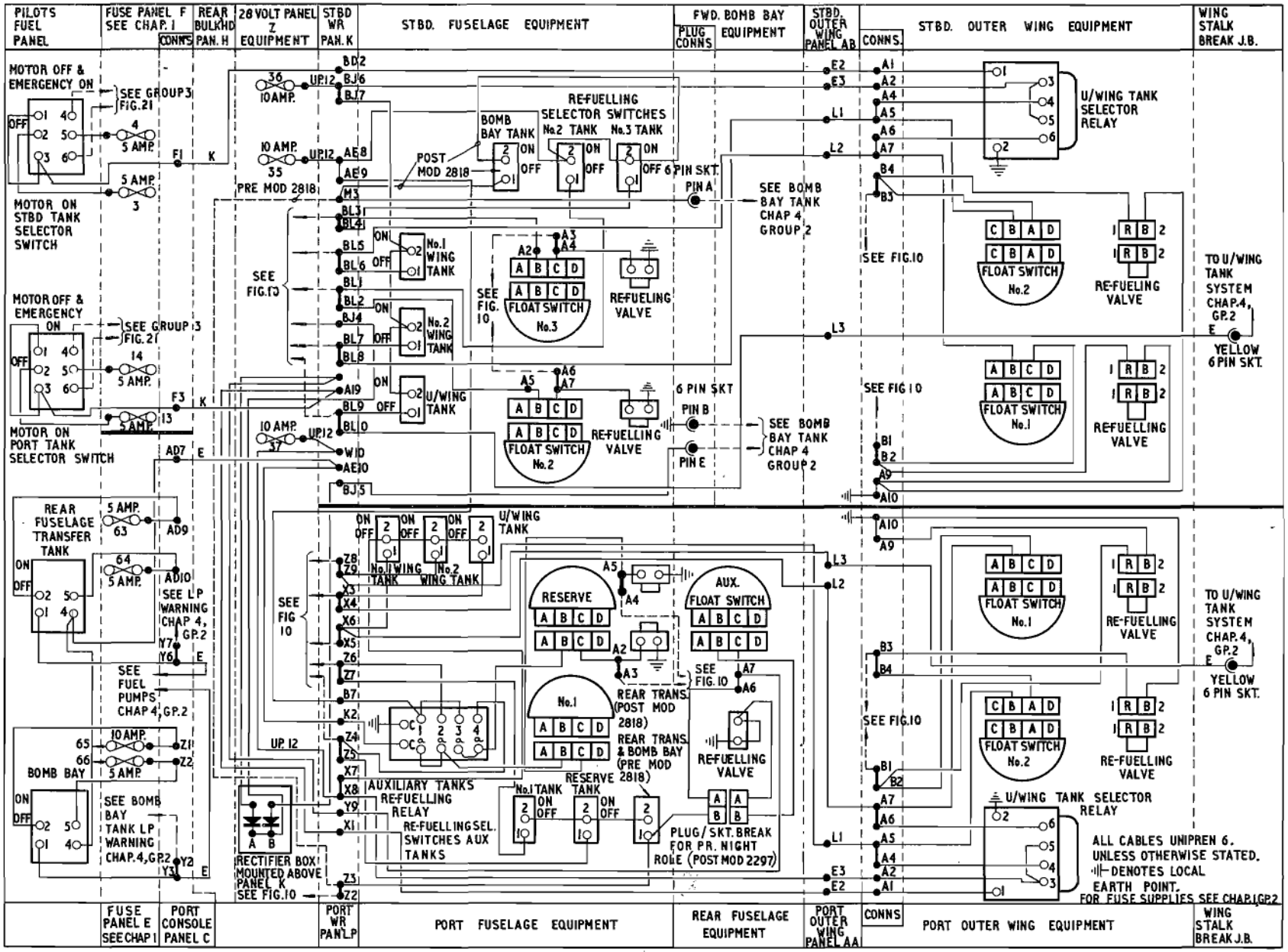

Fig. 7 Refuelling valve control (pre Mod. 2443)

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73336 SHT. 124-G
75836 SHT 124-C

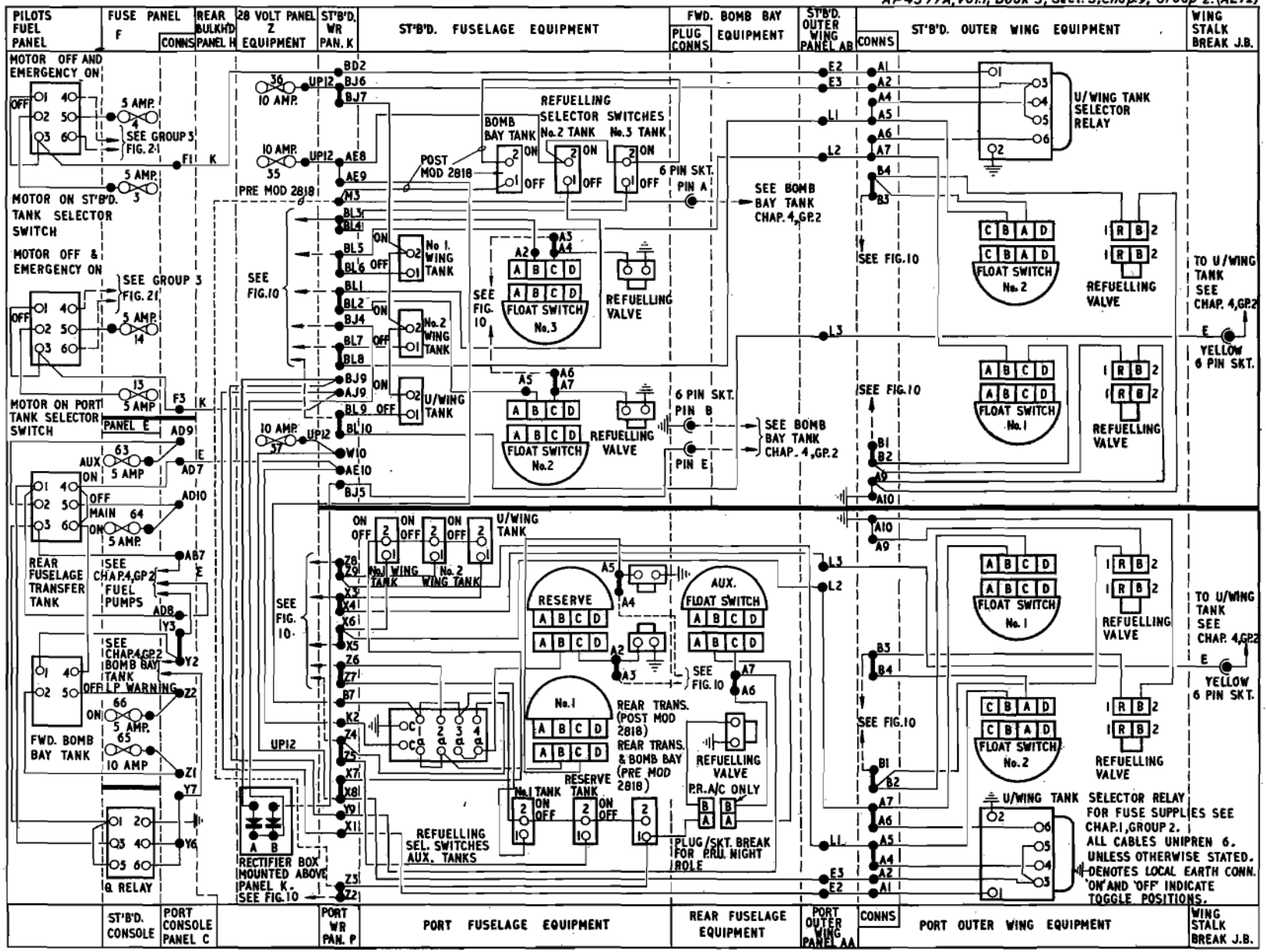

Fig.8. Refuelling valve control (post Mod. 2443. pre Mod. 2444)

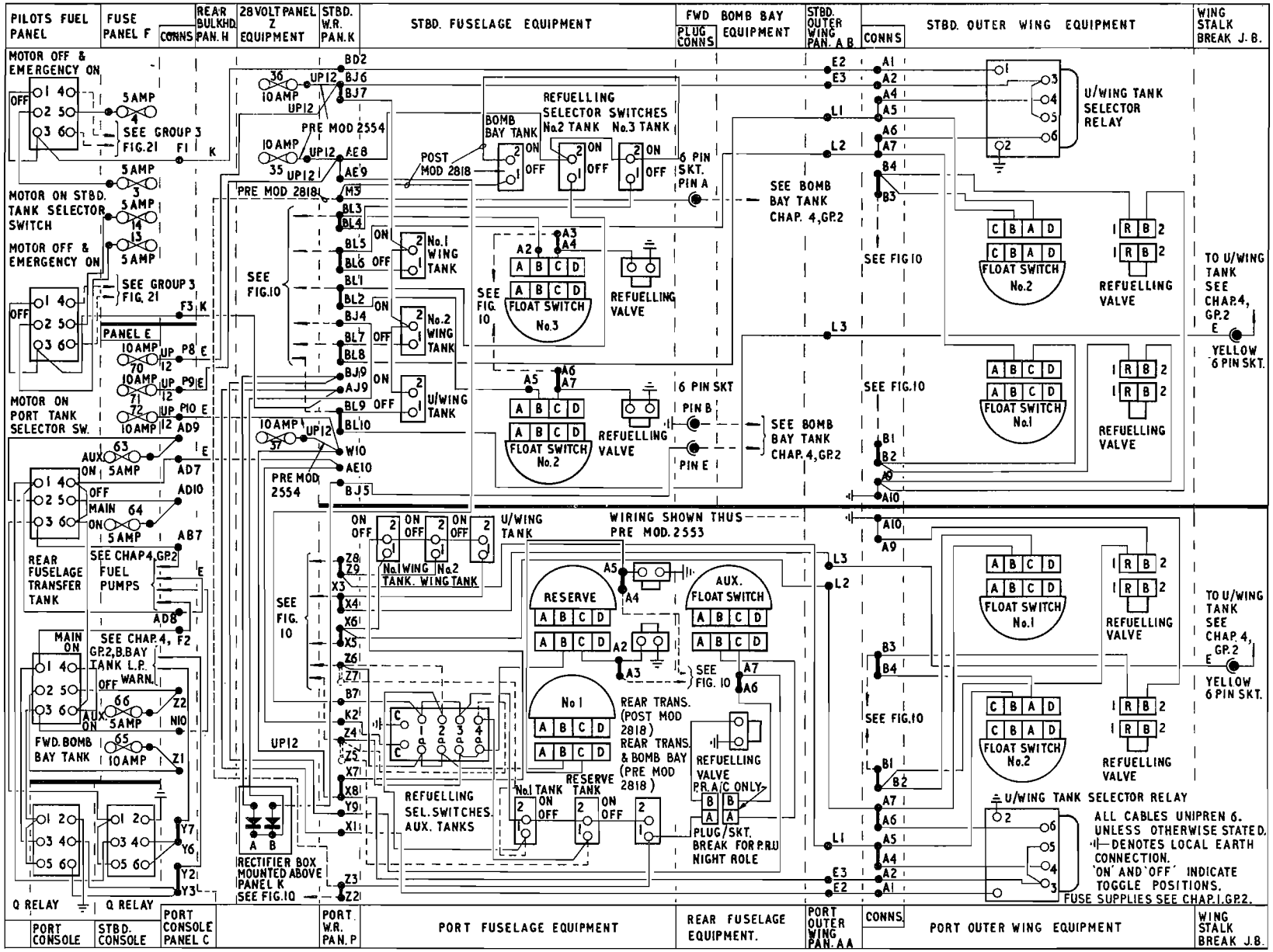

Fig. 9 Refuelling valve control (post Mod 2444)

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73336 SHT 124-S 75836 SHT 124-J

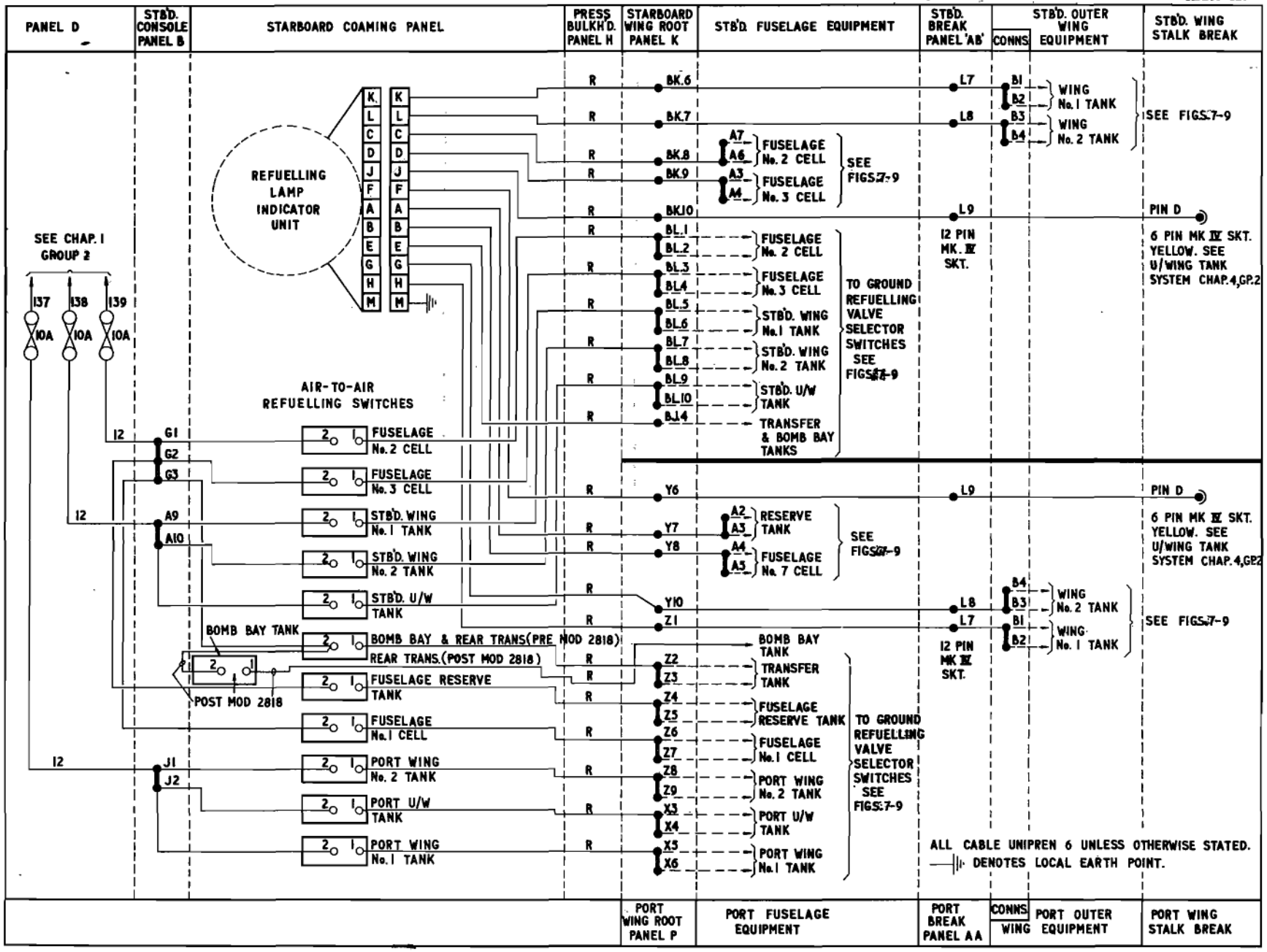

Fig.10 Air-to-air refuelling control

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73336 SHT. 418-J
75836 SHT. 418-G

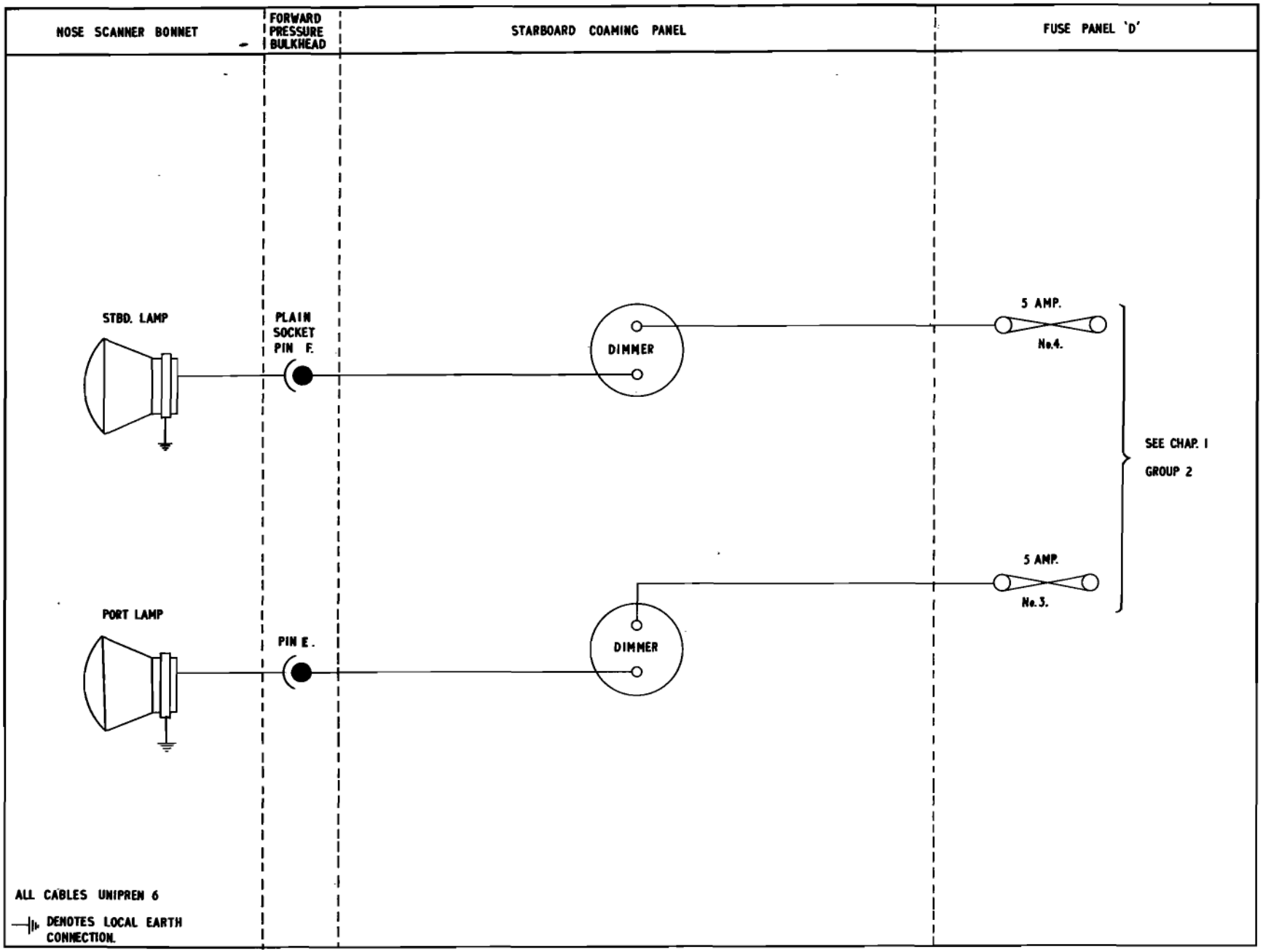

Fig. 11 Refuelling probe lighting (Mod. 2586 & 2909)

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75836 SHT. 502-D

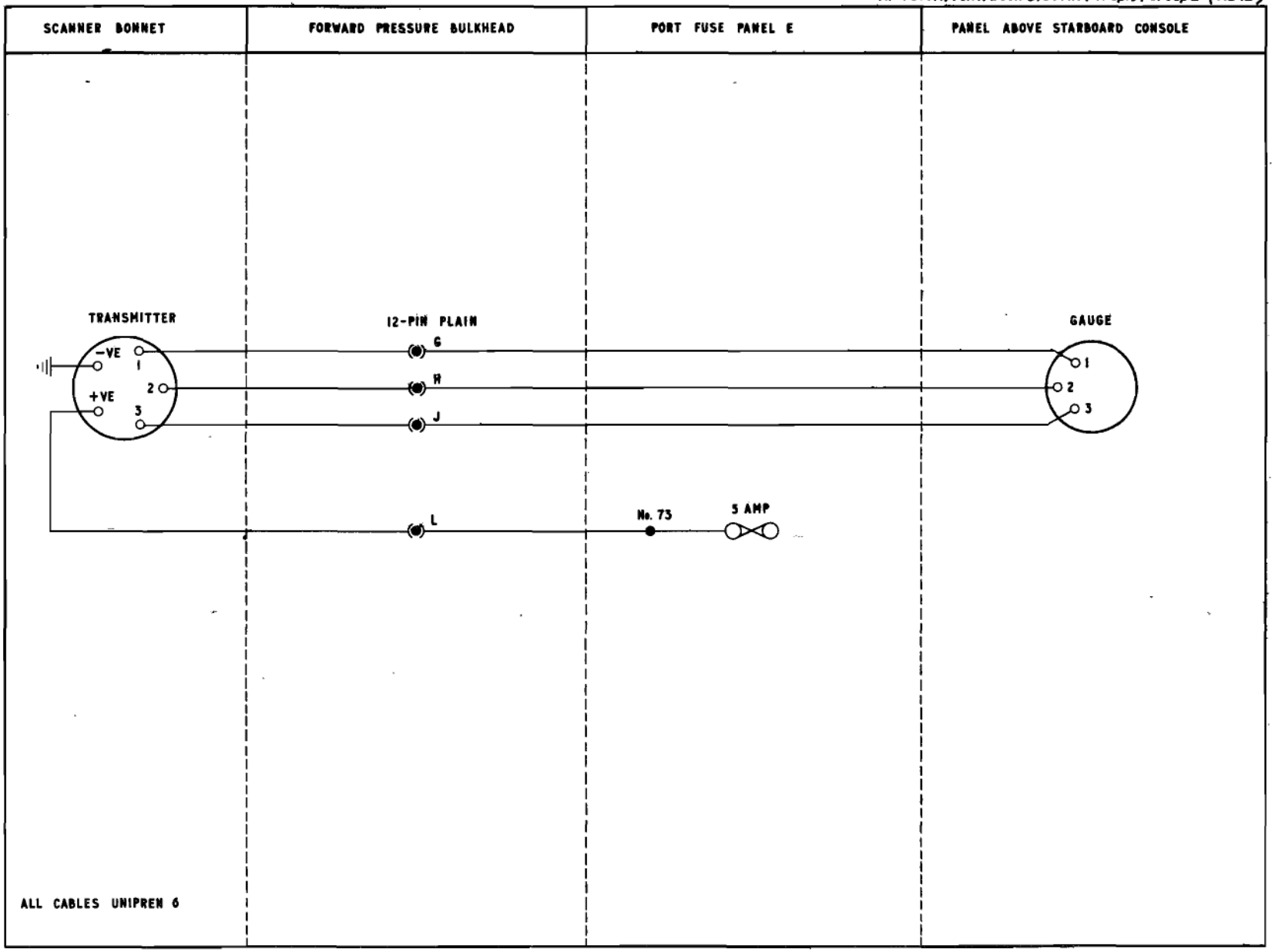

Fig. 12 Probe fuel pressure gauge (Mod. 2684)

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LIST OF APPENDICES

Appendix 1

PROBE DE-ICING AND VENT VALVE CONTROL (POST MOD. 2994)

1. Post Mod. 2994, the flight refuelling Mk. 6 probe nozzle and probe unit is replaced by a Mk. 8 nozzle and adaptor. Upon the introduction of this Mk. 8 nozzle the probe de-icing and vent valve control circuit (GROUP 2, FIG. 2 and 6) described in Group 2, para. 3 is deleted from the aircraft. The group 4 location diagrams show the components affected by the modification.

2. A description of the Mk. 8 nozzle and adaptor is contained in Book 1, Sect. 2, Chap. 6 of this publication.

Appendix 2

PROBE DE-ICING PUMP (Pre-Mod. 2994, Post-Amend. 3146)

Introduction

1. Amendment 3146 changes the probe de-icing pump type AC.13002 (introduced by Mod. 2164) to type AC.61272.

2. The circuit operation and servicing is unaffected by this amendment.