Group 5

MISCELLANEOUS INSTRUMENTS

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LIST OF ILLUSTRATIONS

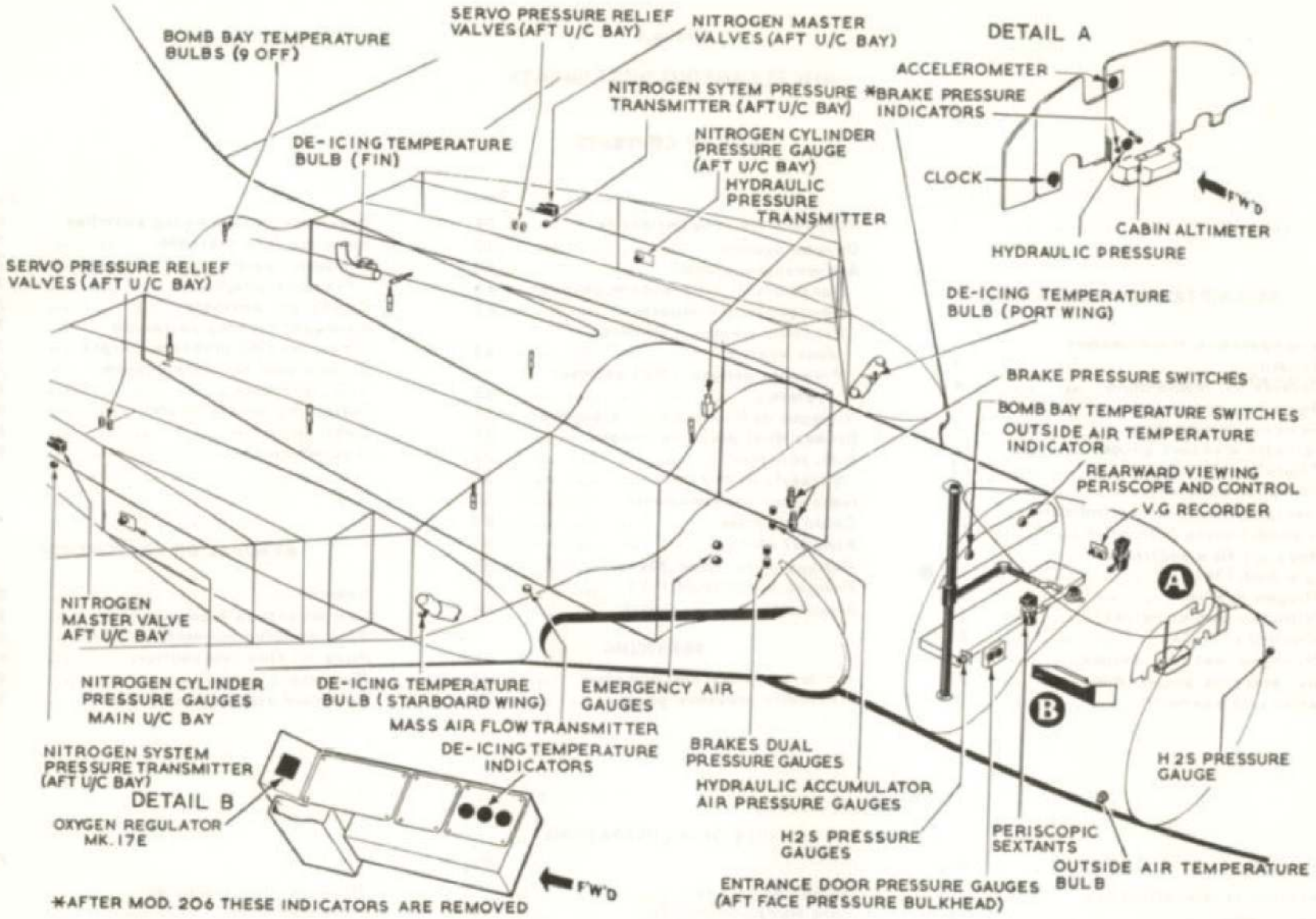

Fig. 1. Location of miscellaneous instruments

Mods. 176 and 909

RESTRICTED

Introduction

1. This group contains descriptive and servicing information for miscellaneous instruments which are additional to the main instrument services.

2. A location illustration for all miscellaneous instruments in contained in fig.1, and the necessary routing charts for the electrical instruments are supplied at the end of the text. Reference is made throughout the description to the relevant Air Publication where more detailed information on individual instruments will be found.

DESCRIPTION AND OPERATION

Air temperature thermometers

General

3. Sangamo Weston type air temperature thermometers are used to measure the temperature of the outside air, the bomb bay, and the leading edge de-icing ducts. This type of thermometer is designed for the accurate measurement of air temperatures over a wide range of speeds and varying atmospheric conditions, and consists of a temperature sensitive resistance bulb and connecting cable used in conjunction with a ratiometer indicator. A full description of the Sangamo Weston thermometers, including the principles of operation will be found in A.P.1275A, Vol.1, Sect.17.

Outside air temperature

4. The resistance bulb, Type S110G-14-93, for the outside air temperature is situated outside the cabin on the starboard side. It is attached to a round reinforcing plate which fits flush with the aircraft skin. The bulb is equipped with a small 2-pin plug which accommodates a socket on the associated duprensheath connecting cable. A coupling nut on the cable secures the electrical connection.

5. The indicator, Type S63-4-400, is installed on the plotter's instrument panel, and carries a scale calibrated in deg.C, -70 to +30. A 28-volt d.c. supply is connected to the indicator from fuse 179 in the starboard fuse and relay panel (4P). A routing chart of the circuit is contained in fig.2.

Bomb bay temperature

6. Nine resistance bulbs, Type S110G-4 are fitted to brackets mounted clear of the structure along the inner sides and roof of the bomb bay. The clamping nuts securing the bulbs are wirelocked to the brackets, and terminal blocks are provided near the bulbs for the associated connecting cables.

7. It will be seen from fig.3 that the resistance bulbs are connected in a series parallel arrangement. In this way the overall resistance value of the elements in the circuit is equivalent to that of one bulb. This arrangement permits the measurement of the average air temperature of the bomb bay. The location for the bulbs is given in fig.1.

8. The bomb bay temperature indicator is fitted on the navigator's radar panel. This indicator, Type S63-5-668, has a scale range from -50 to +50 deg.C, and the circuit is fed, from fuse 136 in 4P.

De-icing temperature

9. Three resistance bulbs, Type S110-3, are installed, one in each hot air duct for the port, starboard and fin leading edges. The wing temperature bulbs are located in the air duct immediately outboard of each air intake, the one for the fin is located in the duct as it passes from the bomb bay into the fin between bomb arches 225.227 and 243.127. The normal duprensheath connecting cables are provided and the bulbs are wirelocked in position.

10. The associated indicators, Type S63-4, are fitted on the anti-icing control panel on the starboard console (7P). These indicators show the temperature of the de-icing airflow to the aircraft leading edges, and are calibrated from 0 to 200 deg.C. The three circuits are individually fused from the starboard fuse and relay panel (4P). A routing chart is contained in fig.4.

11. The thermometers form part of the de-icing system controls described in Chap.1, Group 8 of this section.

Hydraulic pressure gauge

12. A Sangamo Weston type hydraulic pressure gauge is installed. This instrument combines the function of a pressure transmitter and a ratiometer indicator, and provides continuous indication of the aircraft hydraulic pressure during flight. A full description of the pressure gauge will be found in A.P.1275A, Vol.1, Sect.15. The hydraulic system is dealt with in Sect.3, Chap.6 of this publication.

Pilots' indicator

13. The hydraulic pressure indicator, Type S63-4, is fitted on the pilots' centre panel, and is calibrated up to 6,000 p.s.i. The circuit is fed from fuse 95 in the port fuse and relay panel 3P (fig.5). On the introduction of Mod.206, the indicator will

be replaced by one, Type S214-1-11. This later type instrument also incorporates two similar indicators for brake pressure (see fig.6 and 7).

Pressure transmitter

14. The pressure transmitter, Type S122-4, is mounted on the port side of the bomb bay near to the front spar. The electrical connection is made by a trip-rensheath cable supplied with the transmitter, and provided with a socket to accommodate the small 3-pin plug on the unit.

15. The transmitter is directly coupled to the hydraulic supply pipe. Any change of pressure in the hydraulic fluid will produce a variation in the resistance within the transmitter. A change in the circuit current is thus effected and the pilot's instrument will register accordingly.

Brake pressure warning indicators

16. Warning of low hydraulic pressure in the brake accumulators is given by two magentic indicators, operated by two pressure switches in the hydraulic circuit. The indicators (Ref.No.5CZ/5074) are fitted on the pilots' centre panel and will be energised as long as the pressure in each accumulator is within the normal operating limit.

17. The pressure switches, Dowty Type C1829Y, Mk.17, are mounted adjacent to the accumulators on the hydraulic panel in the nose wheel bay. These switches are designed to operate at a rising pressure of 3,000 lb. per sq.in. ± 50. Should the pressure in the accumulators fall below this figure, the switch contacts will open and the pilots' indicators will be de-energised to give warning of this condition. A routing chart of the circuit is provided in fig.8, and the hydraulic brake system is described in Sect.3, Chap.6 of this publication.

18. With the introduction of Mod.206 a triple gauge system will replace the present brake pressure warning indicators and the hydraulic pressure gauge (para.13).

Air conditioning indicators

19. Two Desynn indicators form part of the cabin air conditioning controls and are located on the panel labelled, CABIN HEAT AND PRESSURE CONTROL, on the starboard console. Information on the two indicators marked TEMP. CONTROL VALVE and RAM AIR VALVE is given in Chap.1, Group 8A of this section, which describes the air conditioning controls and includes the necessary circuit routing charts. A third indicator marked AIR FLOW, fitted pre Mod.176, is dealt with in the following paragraphs.

Mass air flow indicator (pre Mod.176)

20. Indication of the mass air flow to the cabin is given by a twin Desynn indicator, Smith Type 525 FL. Two position transmitters, Type C, control the indicator movements and are situated, one under each engine air intake. The transmitters are mechanically linked to the mass air flow modulators, which are operated by the associated switches on the control panel.

21. Movement of the modulator valves to the open or shut position is transmitted to the indicator, which registers this condition on two scales graduated from minimum to maximum air flow. Fuses for the circuit are contained in the 28 volt distribution panel (16P) in the nose wheel bay; the routing chart is provided in fig.9. For detailed information on the indicator and position transmitters, reference should be made to A.P.1275A, Vol.1, Sect.16.

Nitrogen system

22. The nitrogen system is installed to pressurise the aircraft fuel tanks, and comprises two separate installations, one for the fuel tanks on the port side of the aircraft, and one for the starboard tanks. Nitrogen pressure is used to lessen the fire hazard which always exists in a mixture of fuel and air.

23. The nitrogen system is fully described in Book 1, Sect.4, Chap.6 of this publication which also includes illustrated diagrams. The electrical controls for the nitrogen master valves, the servo pressure relief valves are described in Sect.5, Chap.1, Group 5A.

Nitrogen master valves

24. Two nitrogen master valves are fitted, one adjacent to each bank of nitrogen cylinders in the aft compartment of the main wheel bays. The valves are connected in the main nitrogen feed lines and each unit consists of a Dunlop valve, Type SK.25101, operated by a Plessey Panther actuator, Type CZ.54709. Selection of the valves to the open or close positions is made from the pilots' control switches. Further information on the Dunlop valves will be found in the appropriate volume of A.P.4303 series; the actuators are dealt with in A.P.4343D, Vol.1, Sect.16.

Control switches

25. Controls for the electrically operated valves are provided by three 2-position switches fitted on the nitrogen pressure panel on the starboard console. These switches are linked together for combined operation, and when placed to the OPEN (up) position will open the nitrogen master valves and close the servo pressure relief valves. A routing chart of the circuit is contained in Sect.5, Chap.1, Group 5A.

Nitrogen pressure gauges

26. Two Desynn indicators, Smith Type 379 PG, are fitted on the nitrogen pressure panel on the starboard console. The indicators provide the pilots with a reading of the pressure from each bank of nitrogen cylinders, and are calibrated from 0 to 2,000 lb. per sq. in.

27. Operation of the indicators is ef-

fected by two pressure transmitters, Smith Type 365PG. The transmitters are connected, one in the main pressure line of each nitrogen installation, and are attached to resilient mountings adjacent to the master valves in the aft main wheel bays. The circuit is fed from fuses in the 28-volt distribution panel (16P) in the nose wheel bay, and the indicators give continuous reading when the aircraft supply is switched on.

28. Further information on the nitrogen pressure gauges will be found in A.P. 1275A, Vol.1, Sect.16. A routing chart of the circuit is contained in fig.10.

Fuel pressure gauge (Mod.824)

29. With the introduction of Mod.824 a Sangamo Weston fuel pressure gauge (Ref. No.6A/6173) fitted on the starboard console gives indication of fuel pressure in the flight refuelling pipe line. A Sangamo Weston pressure transmitter (Ref.No.6A/3732) fitted to the starboard side of frame 470E (flight refuelling branch pipe H.S.A. Part No.60/P3180) operates the indicator. A routing chart is contained in Sect.5, Chap.1, Group 5A.

Periscopic sextants

30. Mountings are provided in the cabin for the installation of two Mk.2 periscopic sextants, one port and one starboard. These instruments, when fitted, are used to measure the altitude of astral bodies for navigational purposes.

31. Each mounting, Mk.1G, is fitted to a fairing on the upper skin and is secured from the outside by eight countersunk screws. A connector plate on each assembly makes the necessary electrical connections to the aircraft 28-volt d.c. supply, and also carries a control switch. These switches should be left in the ON position since additional control switches, which are more readily accessible, are provided, one on 3P and 4P respectively.

32. Supplies to the periscopic sextants are fed from a flat type plug adaptor on the connector plate of each mounting, and are taken via another plug positioned close to the mounting structure. When the appropriate aircraft control switch is ON, a heating element integral with each mounting is brought into circuit, and a supply is made to the periscopic sextant.

33. A routing chart of the electrical supplies is provided in Sect.5, Chap.1, Group 8, and a full description of the periscopic sextant Mk.2, along with mounting Mk.1G, will be found in A.P. 1275B, Vol.1, Sect.13.

Rearward viewing periscope

34. A Kelvin Hughes periscope, Type KPG 0401, is installed in the cabin, near the rear pressure bulkhead, for the use of the navigator. The periscope is designed for outside rearward viewing and is mounted vertically, the tube extending between the cabin floor and roof. A periscope head at each end of the tube enables viewing to be made from above or below the aircraft as required, and a rotatable reflecting mirror within each head provides a vision angle of 110 deg.

35. The eyepiece assembly projects from the centre section of the periscope to a suitable position on the navigator's table. The eyepiece holder is hinged to the main assembly and conveniently telescopes. In this manner, the eyepiece can be stowed in a recess provided in the table when the instrument is not in use.

36. Movement of the reflecting mirrors is effected by a teleflex control. The operating cables are connected from a control handle fitted on the underside of the navigator's table to each head and centre section of the instrument. To use the periscope by viewing from the top head or bottom head, the handle must be selected up or down accordingly; movement of the handle in a lateral direction gives sweep to the angle of vision in each case.

37. A 50-watt heating element is embodied within each head for demisting purposes. The heaters are connected in series and supply for these is fed from No.3 inverter at 115-volts, 1,600 c/s a.c. via a control switch on the navigator's panel. Fuse 740 in the a.c. supplies panel 11P supplies the circuit (fig.11). A complete description of the periscope will be found in A.P.1275B, Vol.1, Sect.17.

Oxygen system

38. Oxygen for the crew members is supplied from seven oxygen regulators, Mk.17D, fitted one at the five crew positions and one at the port sextant and prone bomber positions. When Mod.909 is embodied the regulators are changed to Mk.17E. A magnetic indicator on each regulator provides visual indication of the regulator's operation. Electrical supplies for the indicator circuits are shown in fig.13.

39. Descriptive and servicing information for the oxygen system is contained in Sect.3, Chap.10 of this publication. Detailed information on components is provided in A.P.1275G, Vol.1.

Air pressure gauges

40. The air pressure gauges described in the following paragraphs are integral with the hydraulic and pneumatic systems described in Sect.3. Reference is made to the appropriate chapters where information on the systems employing the gauges will be found.

Accumulator air pressure gauges

41. Two Mk.14 LL pressure gauges labelled, BRAKES ACCUMULATOR PNEUMATIC CHARGE, are fitted on the hydraulic panel in the nose wheel bay.

42. Each gauge is calibrated from 0 to

4,000 lb. per sq.in. and provides indication of the air pressure within its associated accumulator. The accumulators are charged with air at 2,550 lb. per sq.in. which is further increased to 4,000 lb. per sq.in. from the hydraulic pressure line. A description of the system is given in Sect.3, Chap.6. Information on the gauges is contained in A.P.1275A, Vol.1. Sect.15.

Emergency air gauges

43. Fitted on an air charging panel on the starboard side of the nose wheel bay, adjacent to the accumulator pressure gauges, are two other Mk.14 LL pressure gauges. These instruments register the pressures of two emergency air supplies for the alighting gear, one for the main wheel units and one for the nose wheel unit. The gauges are labelled accordingly.

44. The air supplies are obtained from two cylinders in the nose wheel bay which are charged at 3,000 lb. per sq.in. The system is described in Sect.3, Chap.6.

Pressure gauges - entrance door system

45. Two storage cylinders, mounted below the crew's floor on the port side of the cabin, provide the air supplies for the entrance door system. The cylinders are charged at 2,000 lb. per sq.in. and the pressures recorded on two gauges, Mk. 14 KK, fitted in an air charging panel at the rear pressure bulkhead on the nose wheel bay. This type of instrument carries a scale calibrated 0 to 3,000 lb. per sq.in.

46. A full description of the entrance door system is contained in Sect.3, Chap. 7. The gauges are dealt with in A.P. 1275A, Vol.1, Sect.15.

Pressure gauges - H2S scanner system

47. A Mk.14H pressure gauge is fitted to an air charging panel inside the nose of the aircraft. The charging panel can be seen when the access panel for the emergency equipment on the port side of the nose is removed, and it is used to charge a cylinder immediately above this position. Air is stored in the cylinder at 1,800 lb. per sq.in. and is used to supply the H2S scanner system. The gauge, which indicates the pressure of the air supply, is calibrated up to 2,000 lb. per sq.in.

48. The air passes through a pressure reducing valve, an electromatic tap, and a regulator, to be fed to the H2S equipment at a controlled pressure of 15 lb. per sq.in. absolute. This pressure is shown by a pressure gauge, Type K.B. 554/03, fitted at the starboard side of the navigation station. The scale on the gauge is calibrated from -10 to +20 lb. per sq.in.

49. The H2S scanner system is described in Sec.3, Chap.7. Information on the two pressure gauges will be found in A.P.1275A, Vol.1, Sect.15.

Nitrogen cylinder pressure gauges

50. Two pressure gauges, Mk.14H, provide indication of cylinder pressure for the port and starboard nitrogen installations. The gauges are fitted on the respective nitrogen charging panels which are installed one on the forward, outboard side of each main wheel bay. Nitrogen is stored in the cylinders for each installation at 1,800 lb. per sq.in.; the system is fully described in Sect.4, Chap. 6. Detailed information on the gauges will be found in A.P.1275A, Vol.1, Sect.15.

Brakes dual pressure gauges

51. Two dual pressure gauges, Dunlop Type AHO.29130, are mounted at the bottom of the hydraulic panel in the nose wheel bay. These gauges are connected, one in each hydraulic accumulator supply line, to the port and starboard main wheel brakes and are calibrated to read 0 to 3,000 lb. per sq.in.

52. The brakes have a normal working pressure of 2,500 lb. per sq.in., and are operated from the brake foot motors mounted one on each rudder pedal. Indication is given on the gauges of the applied brake pressures when the foot motors are operated. Information on the wheel brakes systems is contained in Sect.3, Chap.6. A description of the gauges will be found in A.P.1275A, Vol.1, Sect.15.

V.G. recorder

53. An attachment bracket on the port side of the cabin near the navigator's position provides for the installation of a V.G. recorder. When fitted, this instrument is fed from the pitot-static system, and during flight, automatically draws a graph of aircraft acceleration against air-speed.

54. The recorder consists of a moving-weight accelerometer and an air speed capsule. The resultant movement of these mechanisms is transmitted by a stylus on to a chalked glass slide carried within the slide cap on the face of the instrument. A complete description of the V.G. recorder is contained in an instruction leaflet No. I.T.2031 (issue 2) which bears the title, Routine Measurement of Flight Acceleration, and is published by the Ministry of Supply.

Vicker's 4-way cock

55. Mounted beside the V.G. recorder is a Vickers 4-way cock, Type D1885, which connects the instrument to the starboard pitot-static system. Flexible rubber tubing with clips, Type A.G.S. 606 Mk.D are used to link the pipe connections. When the recorder is required for use the cock should be turned to ON. Note that when the recorder is not fitted, the cock lever should be wirelocked in the OFF position to ensure that the pressure and static lines remain closed.

Indicating accelerometer

56. An indicating accelerometer, Type B6, is fitted on a bracket between the

pilot's centre and port instrument panels. This instrument is used to provide indication of the acceleration forces imposed on the aircraft during flight. These accelerations are measured in positive and negative G units which are recorded on the instrument dial over a range of -5G to +10G.

57. In addition to the normal indicating pointer, two auxiliary pointers on the face of the instrument measure maximum positive and negative accelerations respectively. A re-setting knob returns the auxiliary pointer in line with the indicating pointer as required. In level flight or when the aircraft is on the ground, the indicating pointer and the "plus" auxiliary pointer will register 1G.

58. A transit lock operated by a knob at the back of the accelerometer is provided to lock the mechanism lest the instrument suffer damage due to careless handling in transit. Prior to installation, the knob should be pulled out and turned to unlock, as instructed on the surface of the knob. Note that the accelerometer, unlike most instruments, is not shock mounted as this would have a damping effect on the operating mechanism.

59. Notes on aircraft indicating accelerometers including their fundamental principles are contained in A.P.1275A, Vol.1, Sect.1, Chap.18. The Type B6 accelerometer is fully described in Sect. 1, Chap.20 of the same publication.

Cabin altimeter

60. A cabin altimeter, Mk.21, is fitted in the well of the fuel contents gauge panel (2P). This instrument is used to indicate the cabin pressure in terms of altitude so that the crew may regulate oxygen supplies accordingly. The altimeter is designed on the aneroid principle and provides indication of altitudes between 8,000 ft. and 50,000 ft. For further information on the altimeter, reference should be made to A.P.1275B, Vol.1, Sect. 2, Chap.11.

Aircraft clock

61. A Mk.4 aircraft clock is mounted on the first pilot's instrument panel. The clock has a conventional 8-day movement and a centre seconds sweep hand. A knob for setting the hands is situated on the lower part of the case. A full description of the clock is given in A.P. 1275B, Vol.1, Sect.1, Chap.9.

Fatigue meter (Mod.374)

62. When Mod.374 is embodied on the aircraft a fatigue meter Mk.1B, Ref.No. 6A/5027, is installed at former 123.015. The instrument which is of the counting accelerometer type measures and records during flight the number and degree of vertical accelerations to which the aircraft has been subjected. More detailed information on the meter is contained in A.P.1275A, Vol.1, Sect.12, Chap.4.

Fatigue meter (Mod.912)

63. After the embodiment of Mod.912 the meter is replaced by a Mk.11, Ref. No.6A/6485. This meter provides more precise information for fatigue life calculations.

Airspeed pressure switch

64. To ensure that the fatigue meter operates only during actual flying time and not during take-off, landing and Taxying periods the electrical supply to the motor is controlled by an airspeed pressure switch, Type E12A-10A-276. The switch is mounted on the starboard side of the bomb bay adjacent to bomb arch 95.9 and is fed with a pressure and static supply from the starboard pitot-system as described in Group 1.

65. The switch is designed to close at airspeeds ranging from 130 to 150 knots ± 5 and will remain closed at all speeds greater than this range, thus completing the supply circuit to the meter. A complete description of the switch will be found in A.P.1275A, Vol.1, Sect.21, Chap.15

SERVICING

Air temperature thermometers

66. The thermometers used to measure the temperature of the outside air, the bomb bay, and the leading edge de-icing ducts require no minor servicing to be done apart from general inspection. The indicator glasses should be checked for soundness and the plug connections at the bulbs for security.

67. Items suspected of being defective should be tested according to the procedure outlined in A.P.1275A, Vol.1, Sect.4, Chap.6, Appendix 1. The Serviceability test contained therein also provides the tolerances laid down for calibration.

Hydraulic pressure gauge

68. The transmitter and indicator should examined for damage and security of connections and fixings during the normal inspection periods. Nothing more in the way of minor servicing can be done. Defective transmitters and indicators are to be removed and returned for repair, and new ones fitted. The gauge can be tested for correct functioning when a hydraulic test rig is being used to test the hydraulic system as described in Book 1, Sect.3, Chap.6 of this publication.

Brake pressure warning switches

69. The pressure switches, Dowty Type C1829Y, Mk.17, should be inspected periodically for security of connections and for leakage of hydraulic oil. Full instructions for the servicing and testing

of these switches will be found in the appropriate volume of A.P.1803 series.

Mass air flow indicator

70. The mass air flow indicators should be functioned to prove the operation of the air flow modulators as instructed in the servicing schedule. The procedure should be carried out as follows:-

(1) Close C.B.77 on the starboard fuse and relay panel (4P).

(2) Select the switch, labelled CABIN TEMP. CONTROL on the starboard console to the COLD position.

(3) Release the switch after a few seconds.

(4) Select the port manual switch marked INCREASE and DECREASE to each position in turn, and the associated pointer on the indicator should read MAS. and NORMAL accordingly.

(5) Repeat operation (4) using the starboard manual switch.

71. The circuit operation for the air conditioning system is outlined in Sect.5, Chap.1, Group 8 of this publication. Instructions for the testing of the Desynn indicators and transmitters is contained in A.P.1275A, Vol.1, Sect.1, Chap.12.

Nitrogen system

72. Servicing information for the nitrogen system, including functioning tests and a fault-finding chart, is contained in Sect.4, Chap.6 of Book 1. Bench testing details for the electrically operated valves will be found in volumes D and E of the A.P.4303 series.

Pressure gauges

73. The nitrogen pressure gauges will be operative when the 28-volt battery isolating switch is ON. In the event of an indication failure, the appropriate fuse in the distribution panel (16P) should be checked for serviceability. The Desynn indicators and transmitters should be examined periodically for any signs of damage. Calibration instructions for the gauges will be found in A.P.1275A, Vol.1, Sect.3, Chap.31.

Periscopic sextant

74. Servicing procedure for the periscopic sextants is confined to a visual check of the optical systems for cleanliness, and a functional check of the lighting switches and control gear. A sextant suspected of being faulty should be tested in accordance with the Standard Serviceability Test (S.G.94) contained in Appendix 1 to A.P.1275B, Vol.1, Sect.3, Chap.1. A test collimator required for the tests is described in Sect.3, Chap.8 of the same publication. Power supplies to the sextant head heaters are described in Book 2, Sect.5, Chap.1, Group 8.

Rearward viewing periscope

75. It is important that the window of each head is kept clean to ensure maximum viewing facilities in flight. The teleflex cables should be manipulated periodically to ascertain unrestricted operation of the rotatable mirrors and viewing change-over control.

76. The internal heaters are a necessary function of the periscope and the connections for these at each head assembly should always be tight and secure. Full servicing instructions for the periscope will be found in A.P.1275B, Vol.1. Sect 7

Direct reading pressure gauges

77. No repairs are permissible to the Mk.14 series pressure gauges employed in the hydraulic, pneumatic and nitrogen systems (para.41-50). Defective instruments should be returned to the appropriate Repair Depot and replaced by new items.

78. The tests to be applied to the pressure gauges during the normal inspection periods, and at any time when their serviceability is suspect, are outlined in the Standard Serviceability Test (S.G.53) contained in Appendix 1 to A.P.1275A, Vol.1, Sect.3, Chap.7. The pressure gauge calibrators required for the tests are described in A.P.1275T, Vol.1, Sect.3.

Brakes dual pressure gauges

79. The Standard Serviceability Test in A.P.1275A, Vol.1, Sect.3, Chap.16, Appendix 1, contains the necessary tests and tolerances for the Dunlop type brakes dual pressure gauges in the nose wheel bay. These tests are applicable to the gauges prior to installation, or when their serviceability is suspect. Instruments which prove to be faulty should to be replaced by serviceable ones.

V.G. recorder

80. Information on the care and handling of the V.G. recorder is provided in the Ministry of Supply leaflet 1.T.2031. Instructions for the calibration of the instruments are given on page 19 of the leaflet. It is important that the Vickers 4-way cock is wirelocked in the OFF position when the recorder is not fitted.

Indicating accelerometer

81. The accelerometer requires little servicing under normal operating conditions and must not be dismantled for cleaning or adjustment. Further servicing information, which includes a static test to be applied to the instrument prior to instaliation, is given in A.P. 1275A, Vol.1, Sect.1, Chap.20.

Cabin altimeter

82. No routine servicing is required on the Mk.21 cabin altimeter. Those suspected of being defective should be tested in accordance with the Standard Serviceability Test laid down in Appendix 1 to A.P.1275B, Vol.1, Sect.2, Chap. 11. This also applies to altimeters prior to installation.

Aircraft clock

83. The Mk.4 8-day clock should be wound regularly and occasionally checked for correct time keeping. The chronometer watch (Ref.No. 6B/60) is available for use when testing aircraft clocks and a serviceability test for clocks prior to their installation in aircraft is contained in A.P.1275B, Vol.1, Sect.1, Chap. 9. No other servicing is required. After a period of twelve months the clock should be returned to the appropriate depot for re-oiling.

Fatigue meter

84. At the appropriate inspection periods the meter should be checked for security of connections and signs of external damages. After a specified number of flying hours check that the counter readings have altered since the last reading although differencies may only be apparent on the counters nearest 1g. If no difference is apparent reference should be made to the standard serviceability tests contained in A.P.1275, Vol.1. Sect.12, Chap.4.

Airspeed pressure switch

85. The switch should be examined for security, external damage and signs of leakage. The switch may be tested by disconnecting from the fatigue meter the 2-pin supply plug, which is fed via the switch. A suitable test lamp should then be connected across the supply plug. By introducing an A.S.I. calibrator into the pressure line of the starboard pitot-static system pressure should be gradually applied to the switch and a note made of the airspeed at which the lamp lights. Pressure should be gradually increased until it approximately reaches the maximum speed of the aircraft. Reduce the pressure and note the airspeed at which the lamp goes out. The airspeeds noted should be within 130 to 150 knots ± 5. Further tests on the switch will be found in A.P.1275A, Vol.1, Sect.21, Chap.15, App.1.

REMOVAL OF COMPONENTS

General

86. The removal of most of the instruments in this group can be effected in the normal manner for which no detailed instructions are required. Indicators situated on the pilots' instrument panels and the plotter's instrument panel should be removed as instructed in Group 1 of this chapter. Removal of the indicators on the starboard console present no difficulty since their associated control panels can be easily unscrewed. The following paragraphs deal with those instances where removal information is considered necessary.

Components in pressure lines

87. A necessary measure of precaution applies in the removal of all components connected in pressure lines and must be observed at all times.

NOTE:
Prior to the removal of pressure gauges valves and transmitters, the pressure in the associated pipeline must be released in accordance with the instructions laid down in the appropriate section of Book 1 of this publication.

Wing de-icing temperature bulbs

88. Access panels for these resistance bulbs are provided, one on the underside of each wing leading edge, immediately outboard of the engine air intake. When it is necessary to replace a bulb, it is important that the new one is wirelocked to the tab provided on the air duct.

Mass air flow transmitters

89. Access to the mass air flow equipment, port and starboard, is gained from a panel located under each engine air intake forward of the air brakes. In order to facilitate removal of the transmitters, it is recommended that the air flow control actuator be removed first, in each case.

Periscopic sextant mountings

90. The removal and replacement of the mountings for the periscopic sextants affects the sealing of the pressurised cabin and instructions for this operation are contained in Book 1, Sect.3, Chap.1.

Rearward viewing periscope

91. The periscope tube must be dismantled and removed in sections. The removal and replacement of the viewing heads must be carried out in accordance with the instructions contained in Book 1, Sect.3, Chap.1.

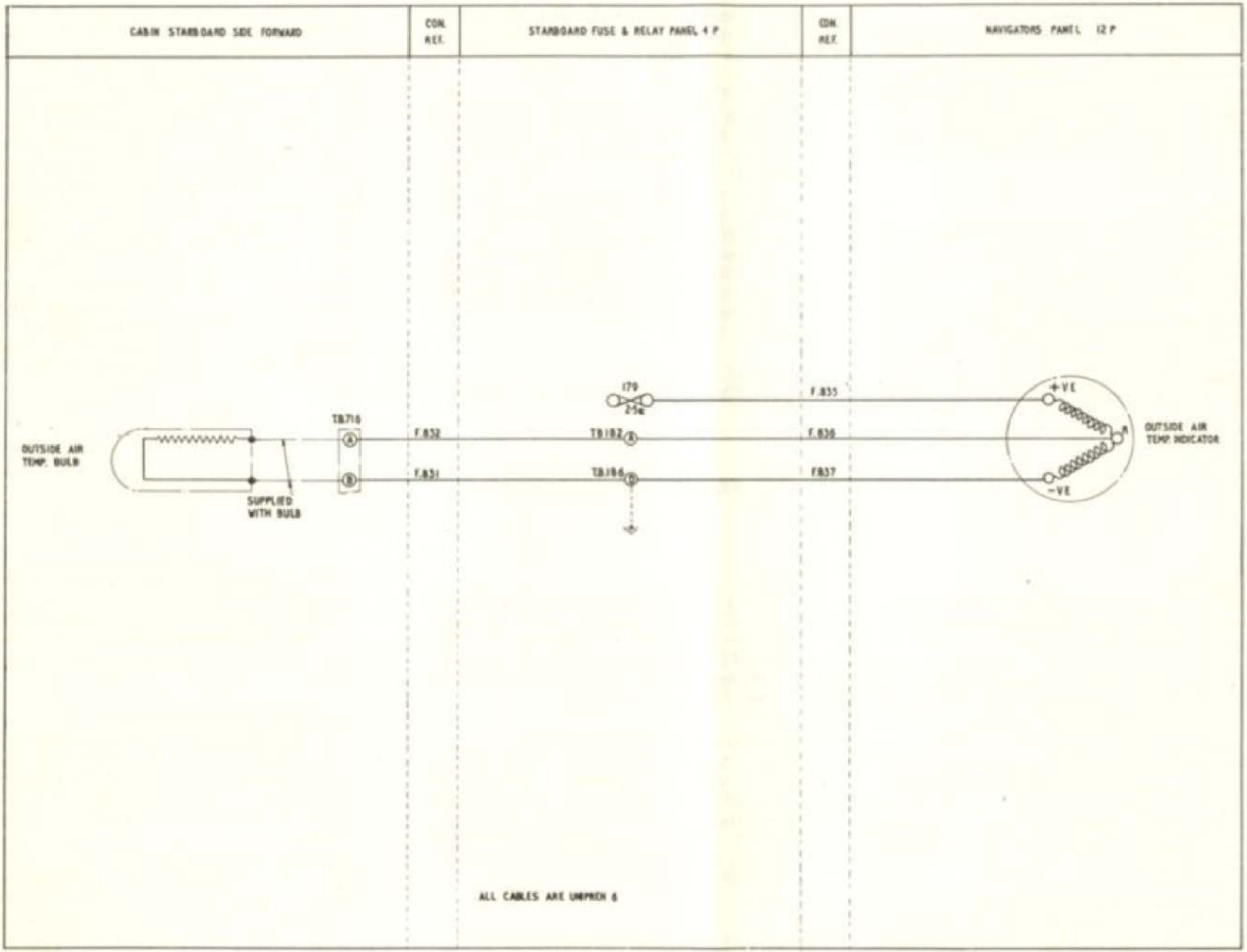

Fig. 2 Outside air temperature

RESTRICTED

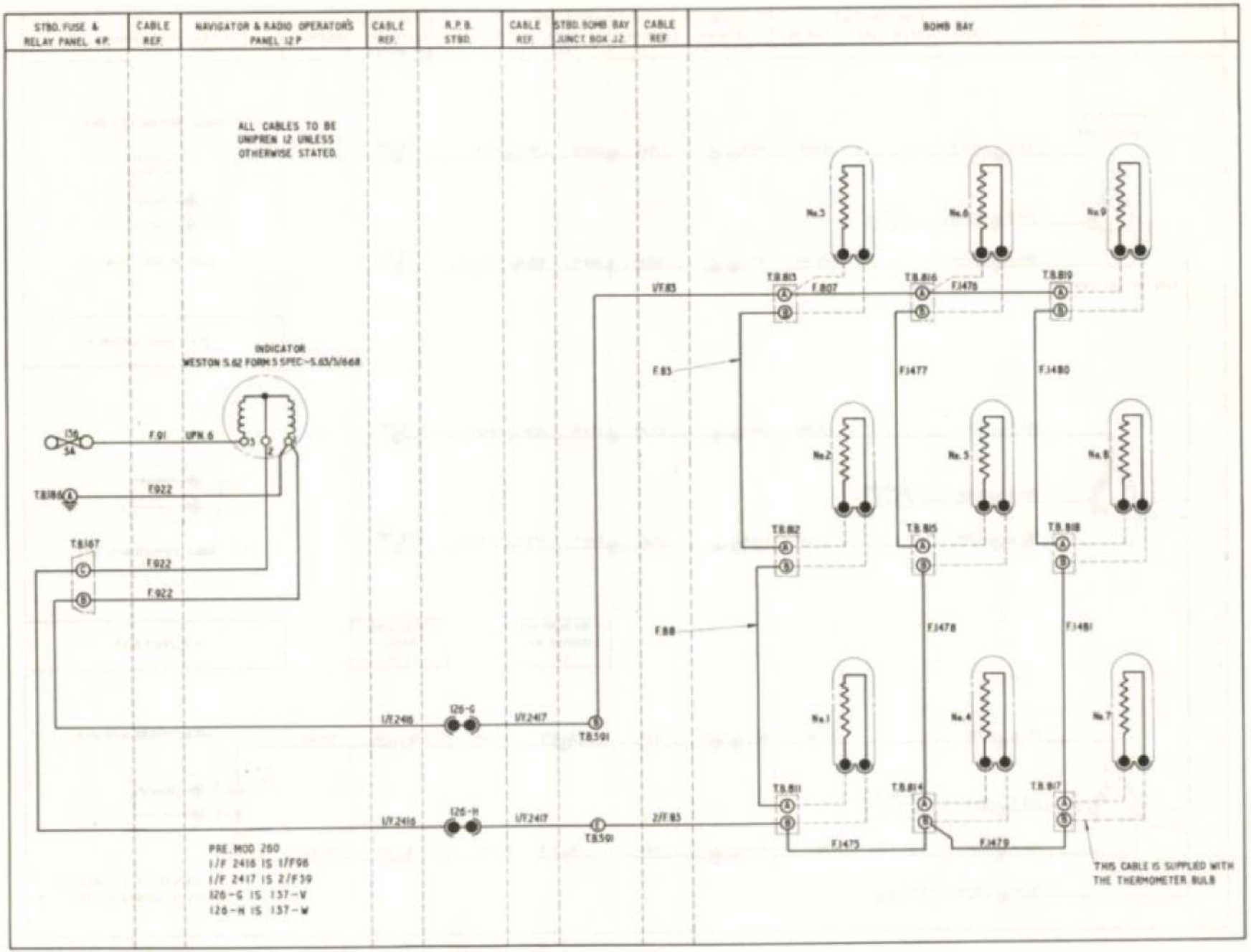

Fig. 3 Bomb bay temperature
◄Mod. 260►

RESTRICTED

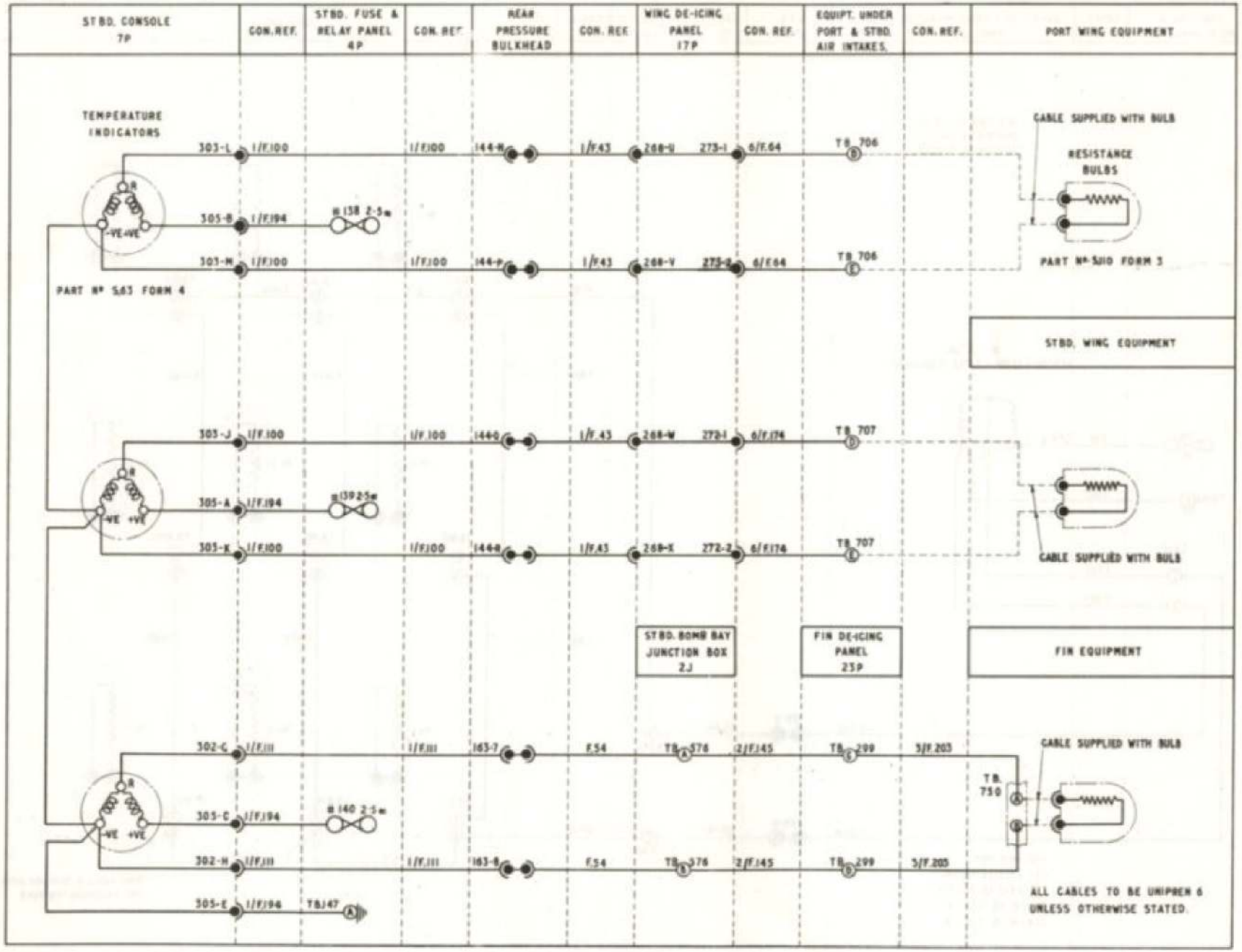

Fig.4 De-icing ducts temperature

RESTRICTED

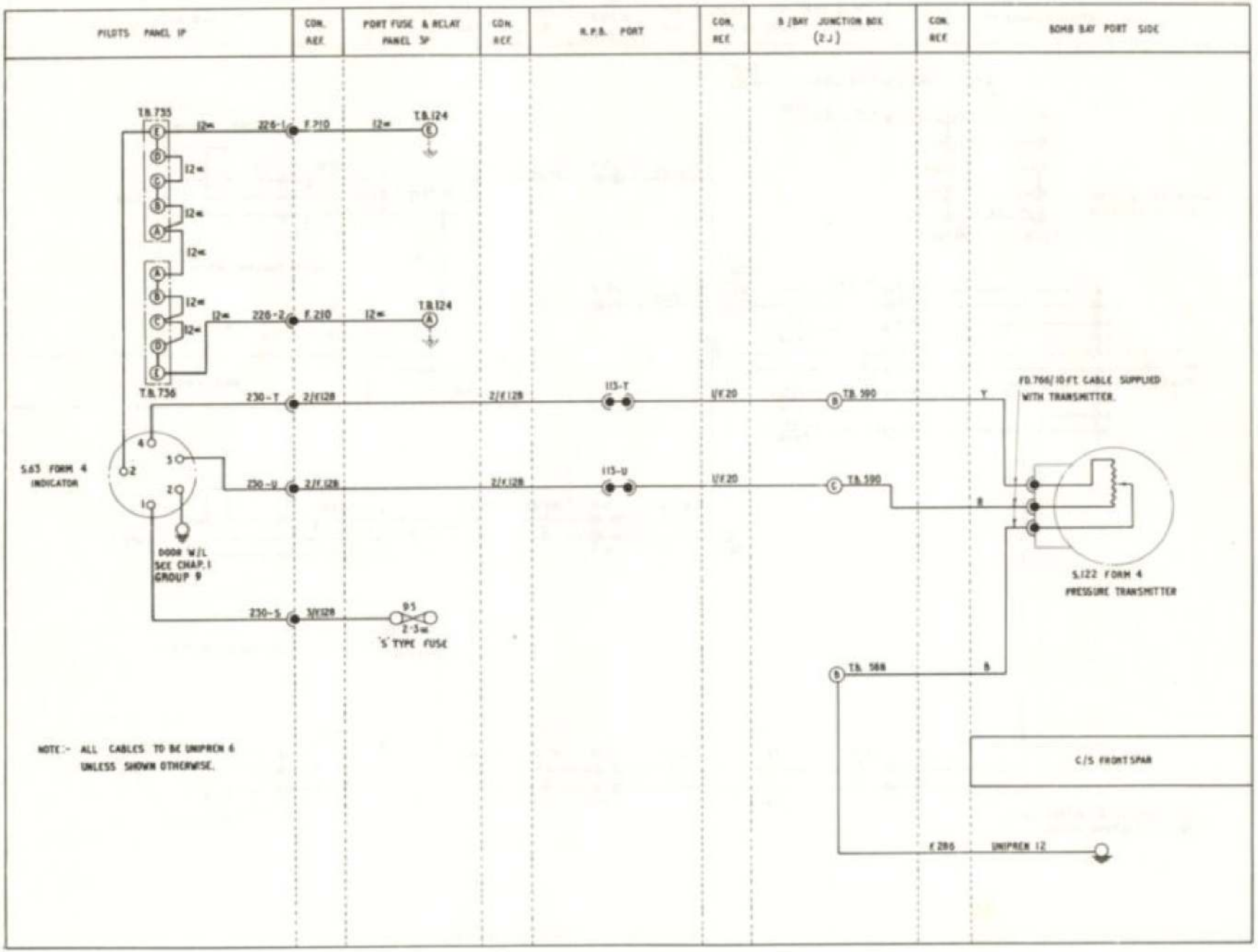

Fig. 5 Hydraulic pressure gauge (pre Mods. 206 and 260)

RESTRICTED

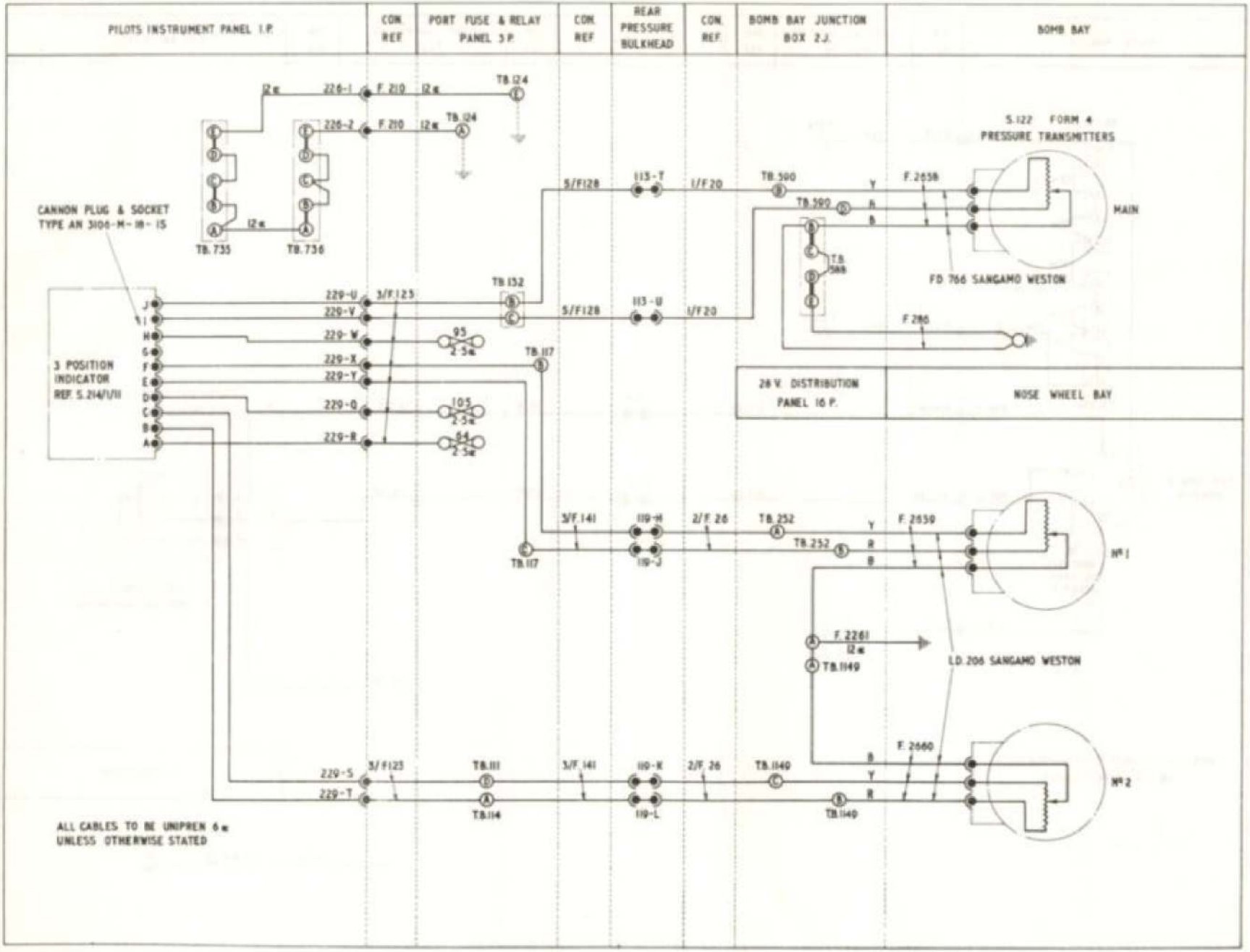

Fig 6 Hydraulic pressure gauge (post Mod.206, pre Mod.260)

◄ Correction to R.P.B. plugs ►

RESTRICTED

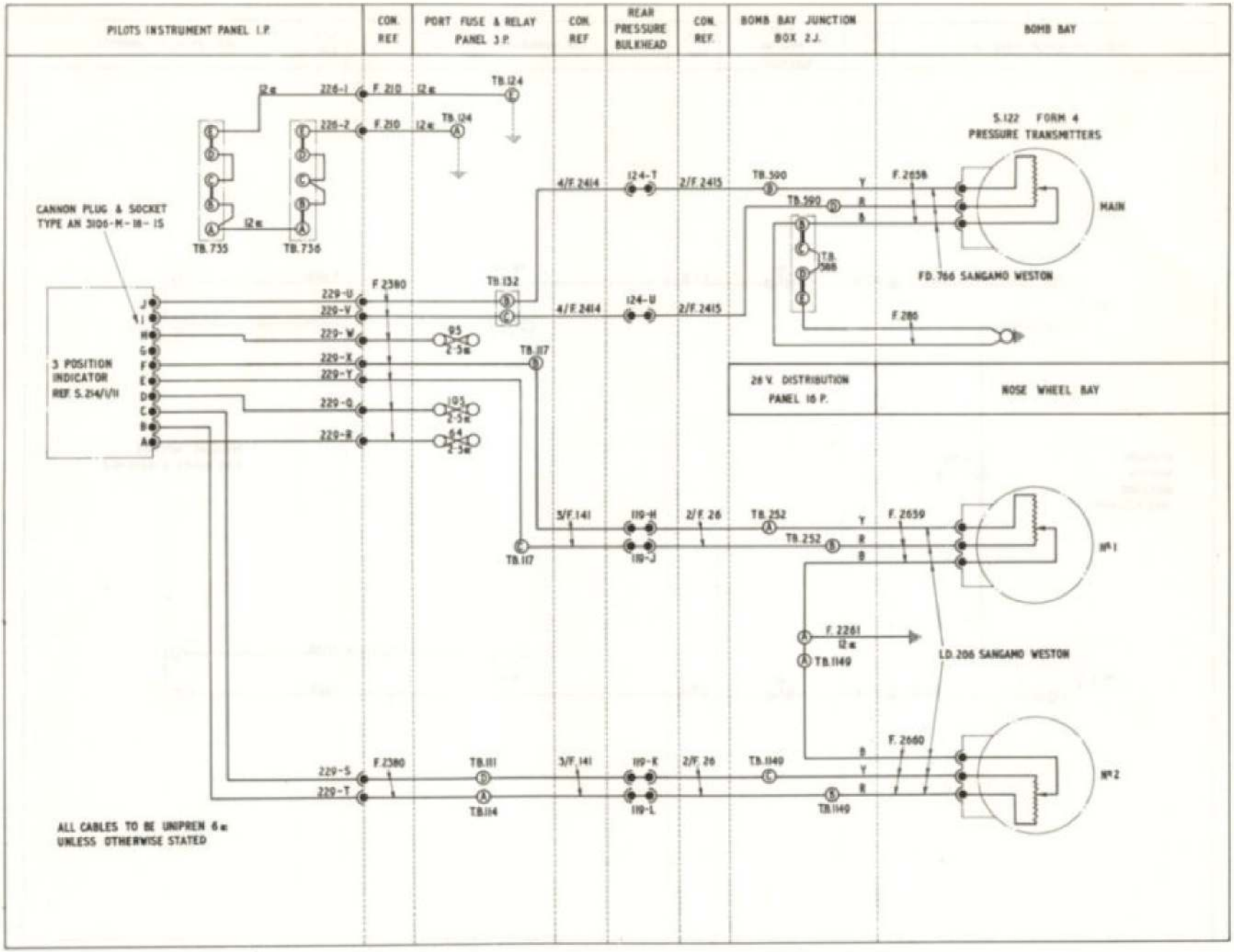

Fig. 7 Hydraulic pressure gauge (post Mods 206 and 260)

‹ Correction to plug 119 ›

RESTRICTED

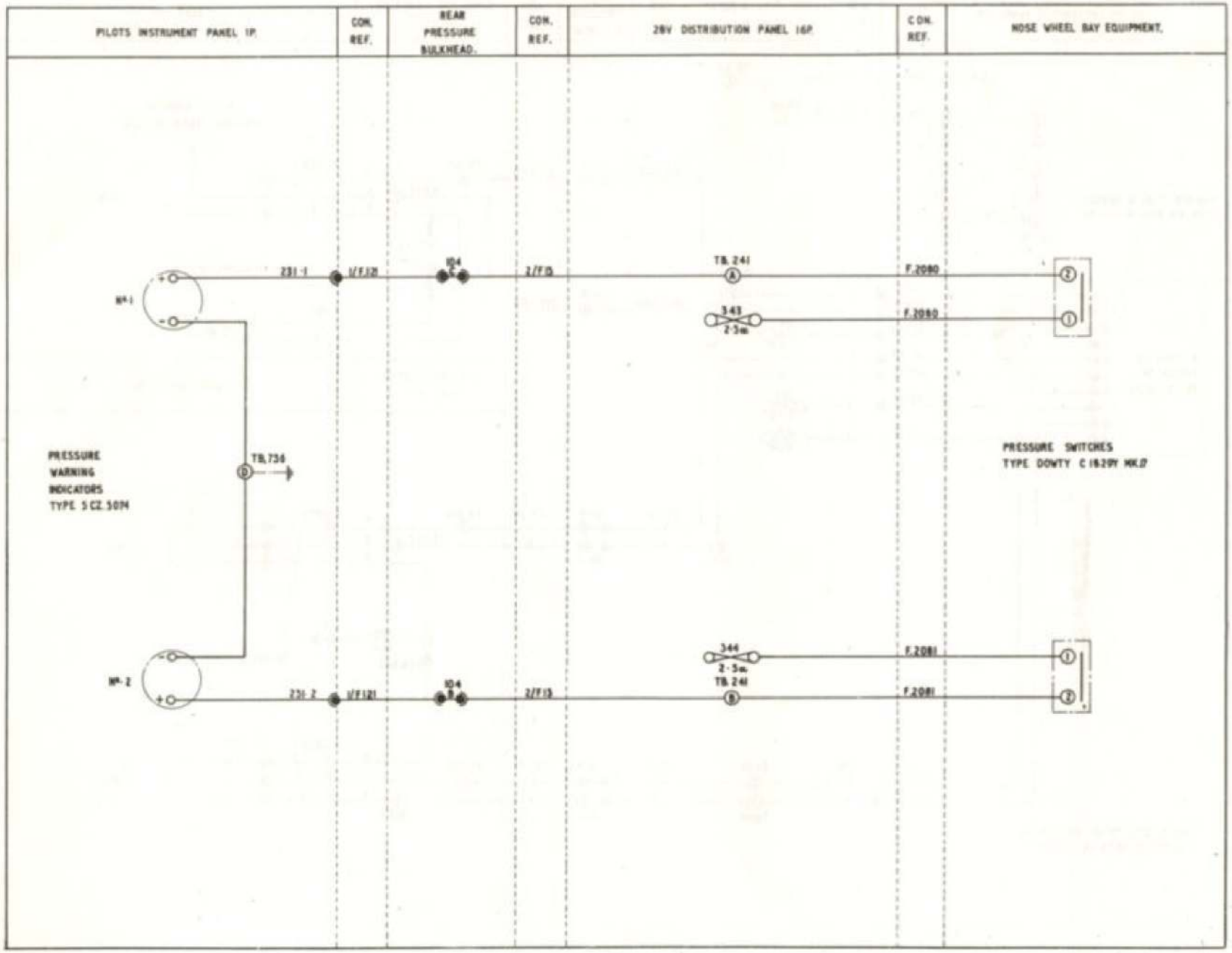

Fig.8 Brake pressure warning indicators (Pre. Mod 206)

RESTRICTED

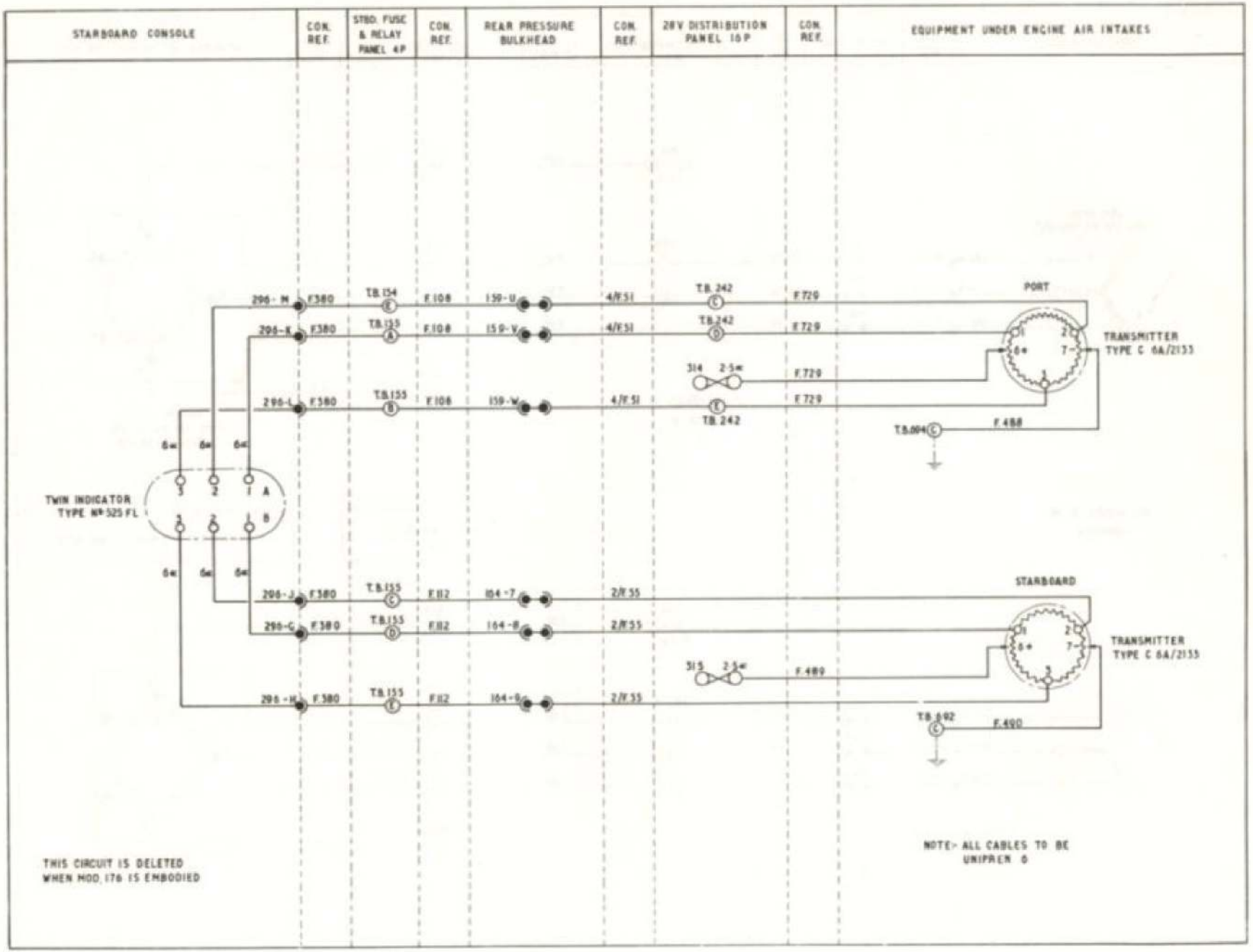

Fig. 9 Mass air flow indicator (pre Mod. 176)
(note added)

RESTRICTED

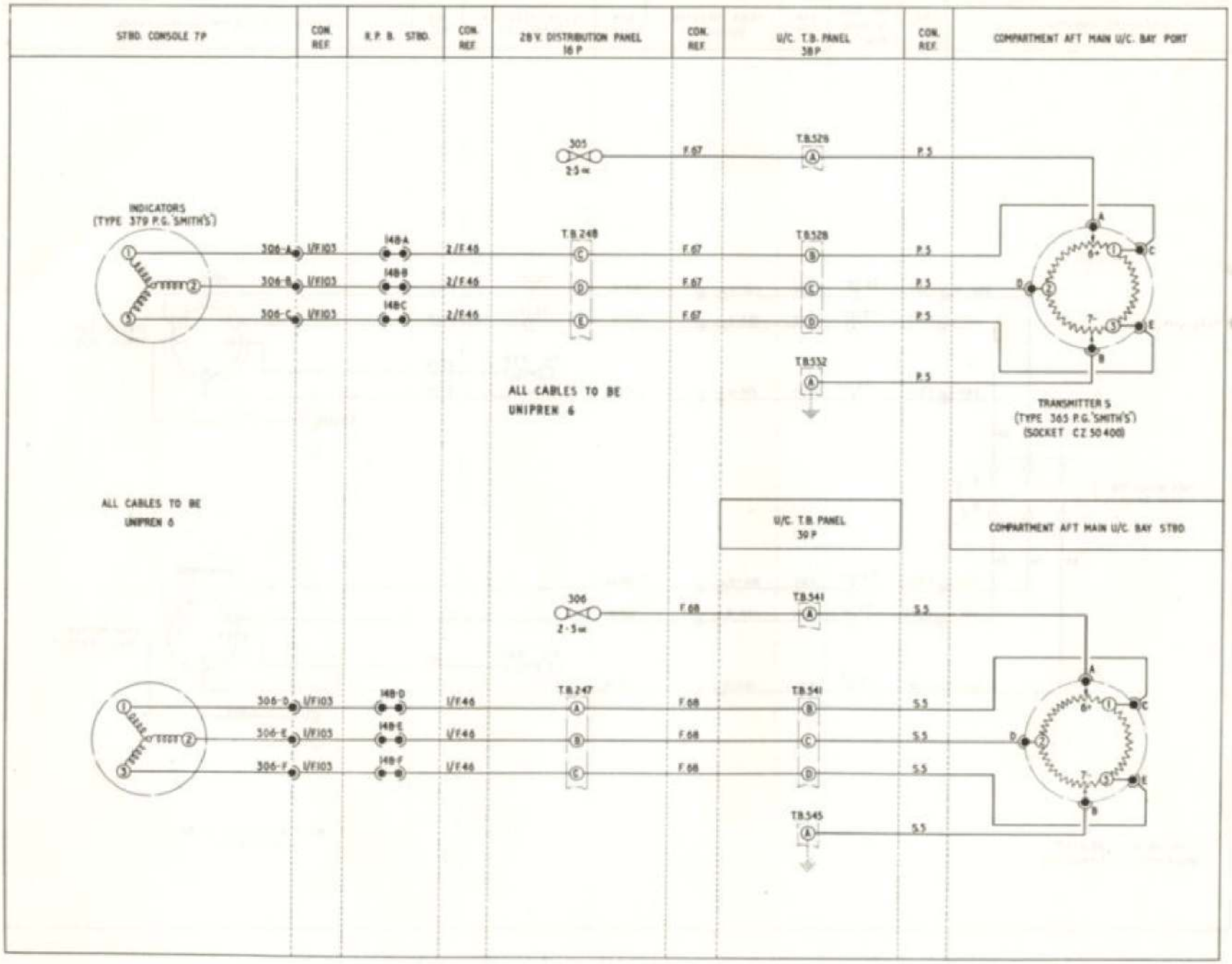

Fig. 10 Nitrogen pressure gauges (pre Mod. 171)

RESTRICTED

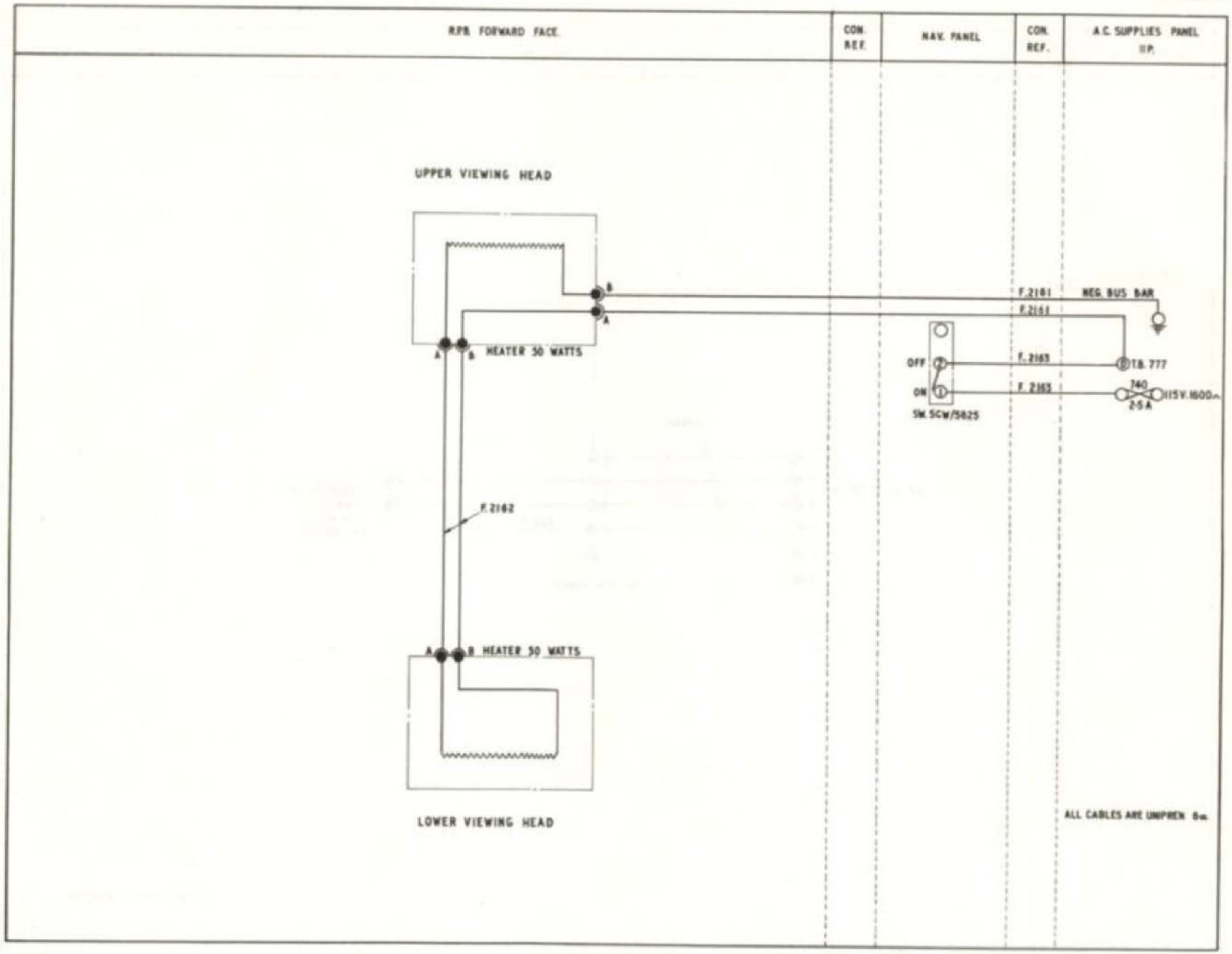

Fig.11 Heaters for rearward viewing periscope
◀ Switch added ▶

RESTRICTED

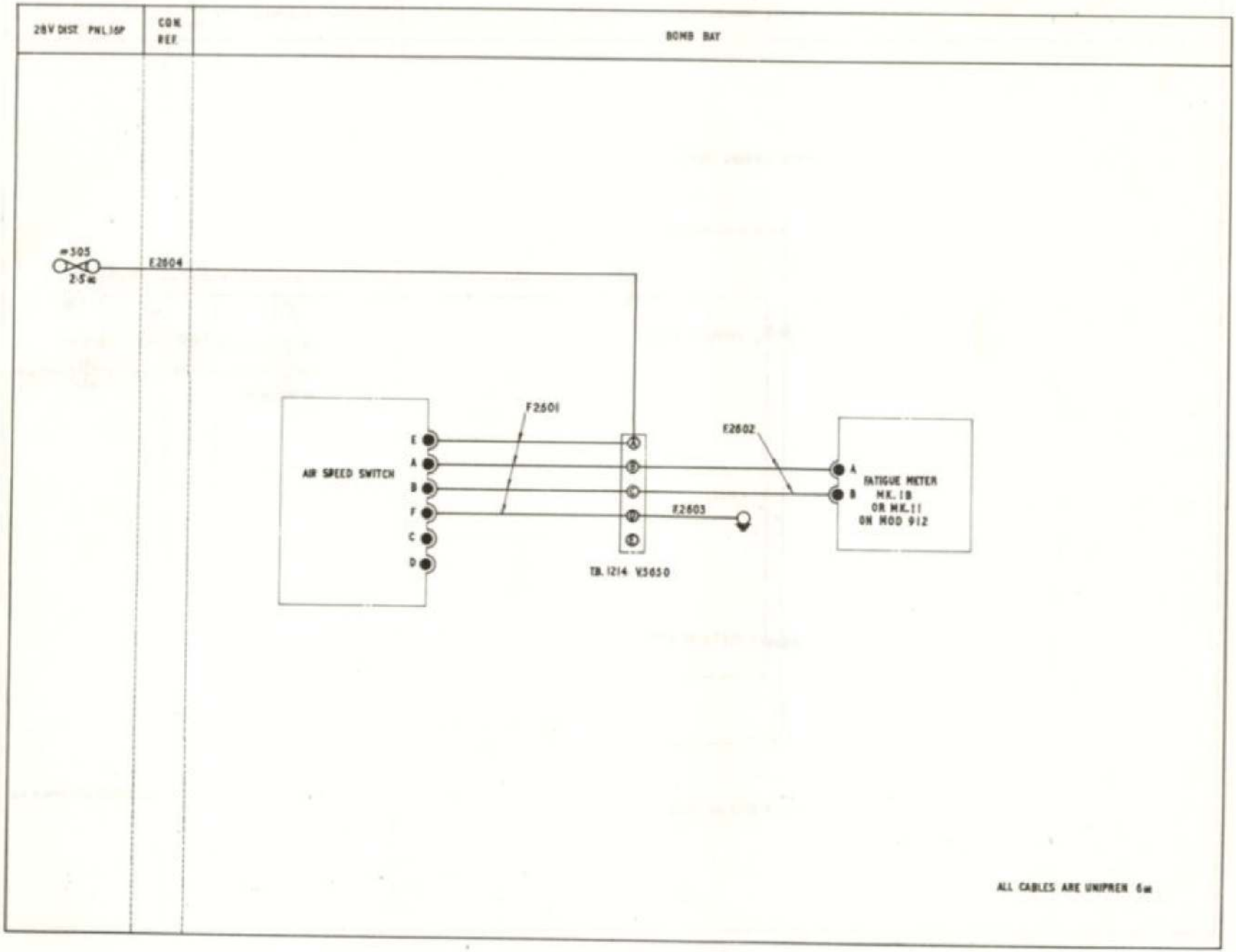

Fig. 12 Fatigue meter

RESTRICTED

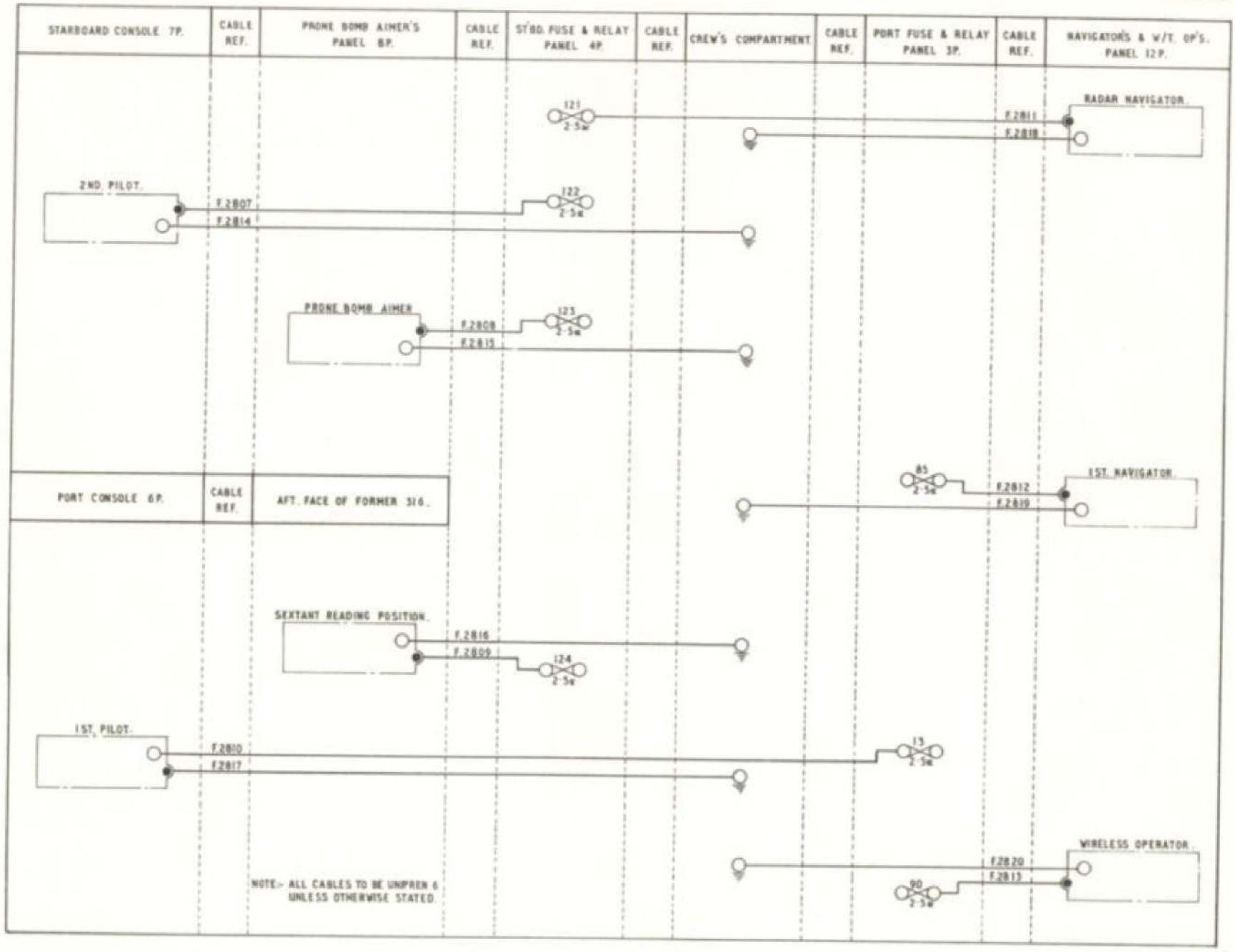

Fig. 13 Supply for oxygen regulators