Chapter 7 PNEUMATIC SYSTEM

(Completely revised)

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DESCRIPTION AND OPERATION

General

1. The pneumatic installation consists of high and low-pressure systems. The high-pressure is supplied by air cylinders charged on the ground from an external supply. The low-pressure systems are supplied by tappings at four different points on the engine compressors. The systems and the services they operate are as follows :-

(1) High pressure - supplied by three air cylinders :-
(a) Pilot's hood and observer's hatch seals.
(b) Radar wave guide and transmitter/receiver pressurization.
(c) Firestreak pylon installation cooling.
(d) Air conditioning shut-off valve ram.

(2) High pressure - supplied by one air bottle - operates the observer's hatch jettison mechanism.

(3) Low pressure - supplied by a tapping on the 8th stage of each engine compressor - operates the pylon tank fuel transfer system.

(4) Low pressure - supplied by a tapping on the 15th stage of each engine compressor - operates :-
(a) Firestreak pylon installation heating.
(b) Windscreen de-icing.
(c) Pilot's and observer's anti-g system.
(d) Fuel recuperators.
(e) Fuel system main vent valve.
(f) Methanol recuperator.

(5) Low pressure - supplied from a second tapping on the 15th stage of each engine compressor - operates the windscreen rain-shedding system.

(6) Low pressure - supplied by a third tapping on the 15th stage of each engine compressor - pressurizes the hydraulic reservoir.

HIGH PRESSURE SYSTEMS (Fig. 3 and 5)

2. The main high pressure system (post mod. 1078) receives a supply of air from three air cylinders, charged to 3000 p. s. i. (post mod. 419). The air cylinders are installed in the air brake bay between Stn. No. 131·1 and 176, and are accessible when the air brake is lowered. The cylinders are connected in parallel at their forward ends by a pipe assembly incorporating a charging valve and pressure gauge. The pressure gauge (0 to 4000 p. s. i.) is mounted on the charging valve block, and the assembly is bolted to the rear face of the beam at Stn. No. 131·1.

3. An isolating cock, attached to the centre of the beam serves to isolate the cylinders for ground servicing when a lever on the cock is moved to the OFF position.

4. A relief valve, ACM 19502, which relieves at 3500 p. s. i., is bolted to the beam adjacent to the port air cylinder. It is connected to a T-joint in the pipeline connecting the port and centre cylinders and protects the cylinders if they are charged with the isolation cock OFF.

5. From the isolating cock, the air supply is taken to a dehydrator, the element of which is an activated alumina charge. The supply then enters a selector/reducing valve which reduces the pressure to 300 p. s. i. The supply can be turned off at the selector/reducing valve for ground servicing, by rotating a screwdriver slot (Fig. 4) which operates a tap in the valve. A relief valve, set at 3500 p. s. i. is connected to the inlet connection of the selector/reducing valve, and a ground test point is situated on the outlet connection.

6. From the selector/reducing valve the supply passes through a filter, and is then distributed two ways. One line supplies the pilot's hood and observer's hatch seals (para. 8), and the second line supplies the radar waveguide and transmitter/receiver (para. 9), the Firestreak pylon installations (para. 10), and the air conditioning shut-off valve ram (para. 11).

7. On pre mod. 1078 aircraft, the relief valve and isolation cock, on the beam at station No. 131·1, are not fitted. The air supply is taken from the air cylinders directly to the

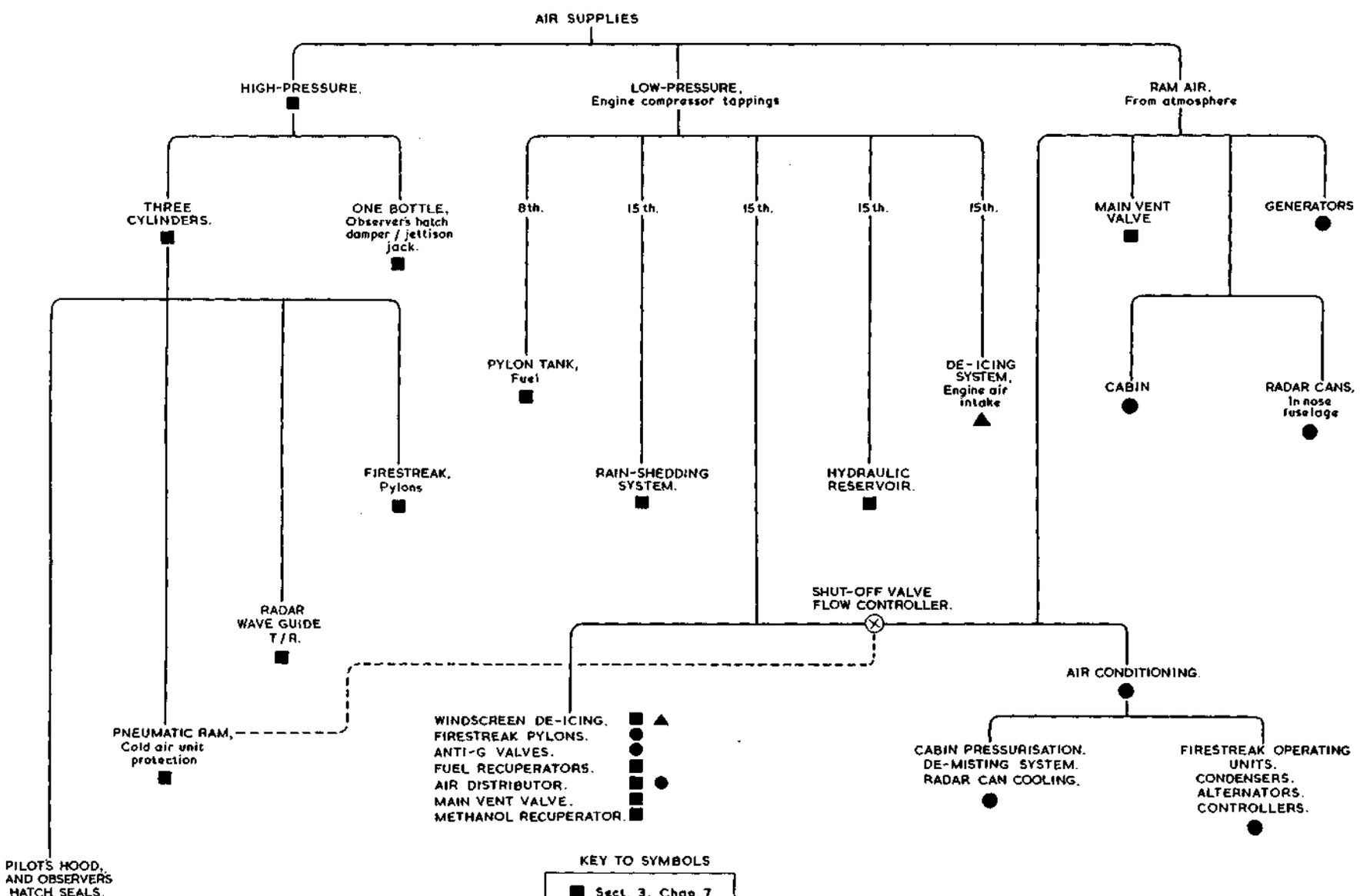

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Fig.1 Guide to the aircraft air supplies

selector/reducing valve and then to a low pressure dehydrator. The supply then passes through a filter and is distributed as described for post mod. 1078 aircraft (Fig. 2 and 4).

Pilot's hood and observer's hatch seals

8. The pressurizing air supply for the hood and hatch seals is taken from the main supply line after passing through the filter (Fig. 8). The supply then passes through a non-return valve, mounted on the forward face of the beam at Stn. No. 148. The pipeline is then routed aft to a reducing valve, mounted aft of Stn. No. 167 under the fuselage top skin, and which reduces the pressure to 9 p. s. i. The reduced supply is then taken to a four-way connection and is distributed to the hood seal via a solenoid valve. The solenoid valve is controlled by hood-operated microswitches to provide automatic inflation or deflation when the hood is fully closed or being opened respectively (refer to Book 2, Cover 1, Sect. 5, Chap. 1, Group H3 for details of electrical control system). The second connection supplies the hatch seal via a stop valve, which releases the seal pressure mechanically when the hatch is opened. A third connection on the four-way joint is coupled to a ground test point, located under a panel in the port boundary layer bleed.

Radar wave guide and transmitter/receiver pressurization

9. The wave guide and transmitter/receiver are pressurized by air supplied from the air cylinders. From the air filter in the main supply line the supply is taken to a reducing valve, which reduces the pressure to 219 p. s. i. The supply is then connected to a T-joint; from one connection a pipeline is routed through the beam at Stn. No. 131. 1 (Fig. 8), forward below the cabin floor, through the forward pressure bulkhead to an electromatic tap fitted in the nose bay (Fig. 5). The air, when released by the tap is taken to a pressure reducing valve, which reduces the pressure to 22 p. s. i. absolute. The supply is then routed inboard to a T-joint. One line supplies the wave guide unit via a pressure relief valve, set at 26 p. s. i. absolute; the other line from the T-joint is routed forward to a three-way connection incorporating a non-return valve. One connection supplies the transmitter/receiver, and the other, through the non-return valve, is connected to two desiccator units, which are open to atmosphere and permit inward venting.

Firestreak pylon installation cooling

10. Air is supplied to the light store pylons to cool the Firestreak missiles when fitted. The supply is taken from the filter in the main supply line to a pressure reducing valve, which reduces the pressure from 300 p. s. i. to 219 p. s. i. The supply is then taken to a T-joint (Fig. 8), one connection of which feeds the pylons through a pressure maintaining valve located below the front spar on the port side. The P. M. V. retains 100 p. s. i. in the pipelines past the valve. A vertical pipeline, on the forward face of the front spar, carries the supply to a four-way joint. Two pipelines take the supply to the port and starboard twin electromatic taps, installed on the leading edge diaphragm, inboard of rib No. 3A (Fig. 6, detail 'C'). The taps each supply an inboard and outboard pylon.

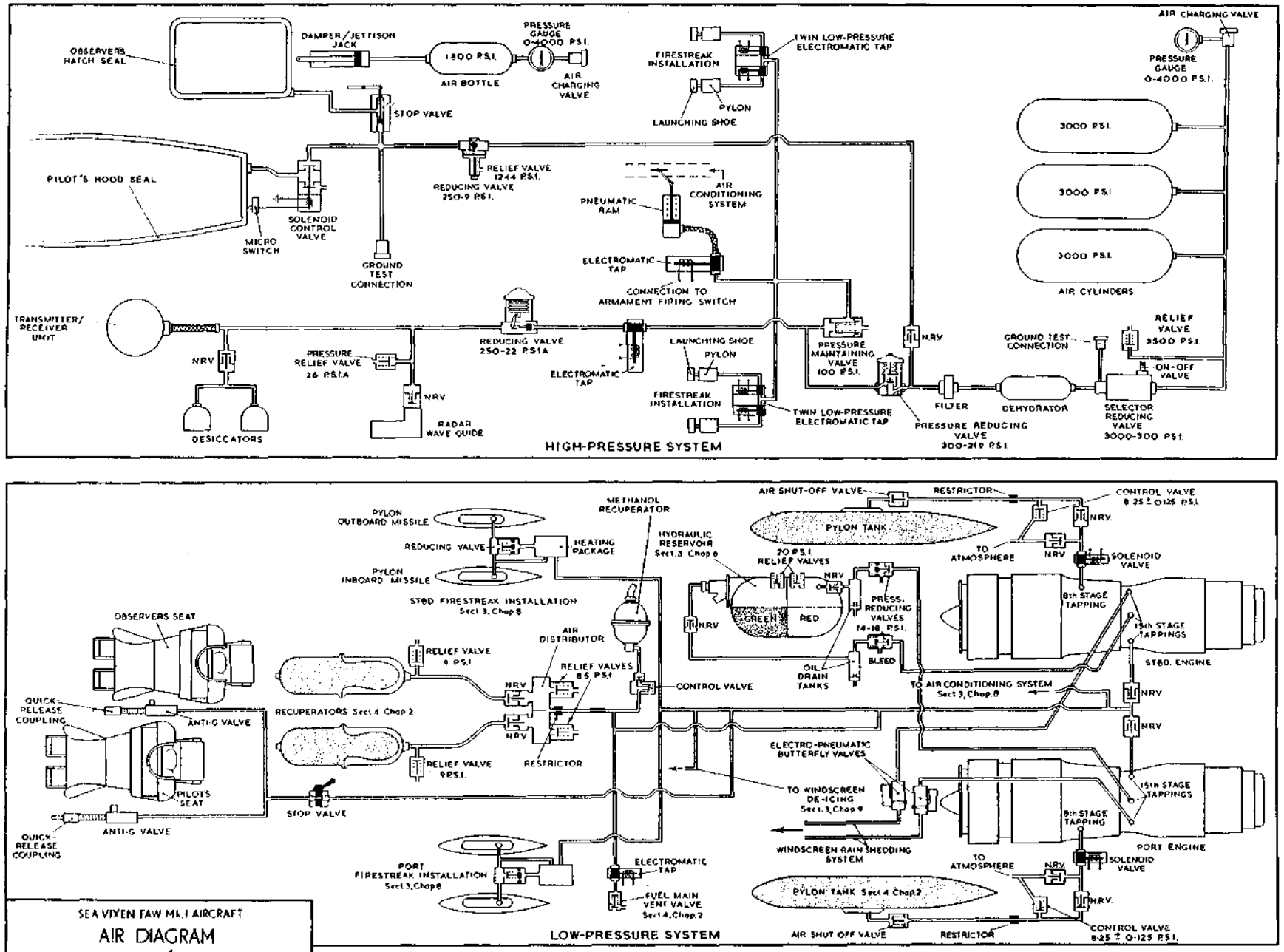
Air conditioning shut-off valve ram

11. The air conditioning system (Sect. 3, Chap. 8) incorporates a cold air unit protection system which requires that the cabin air shut-off valve be partially closed during armament firing. This is achieved by a pneumatic ram which operates when an air supply is released by an electromatic tap, actuated by the operation of the armament firing switch. For further information on the electrical operation of the protection system refer to Book 2, Cover 1, Sect. 5, Chap. 1, Group F.

12. The air supply is taken from the four-way joint on the front spar (para. 9), and is routed aft along the top of rib No. OA, and then inboard to rib O, to the electromatic tap fitted on the port side of the rib (Fig. 6, detail 'B') and then to the pneumatic ram.

Observer's hatch jettison system

13. The observer's hatch is jettisoned by the release of air from an air bottle installed aft of the observer's seat (Figs. 5, and 6, detail 'A'). The air



SEA VIXEN FAW Mk.1 AIRCRAFT

AIR DIAGRAM

7614/MIN.

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Fig. 2 Pneumatic system diagrams (pre mod. 1078 applies to 'Y' tank reservoir removed)

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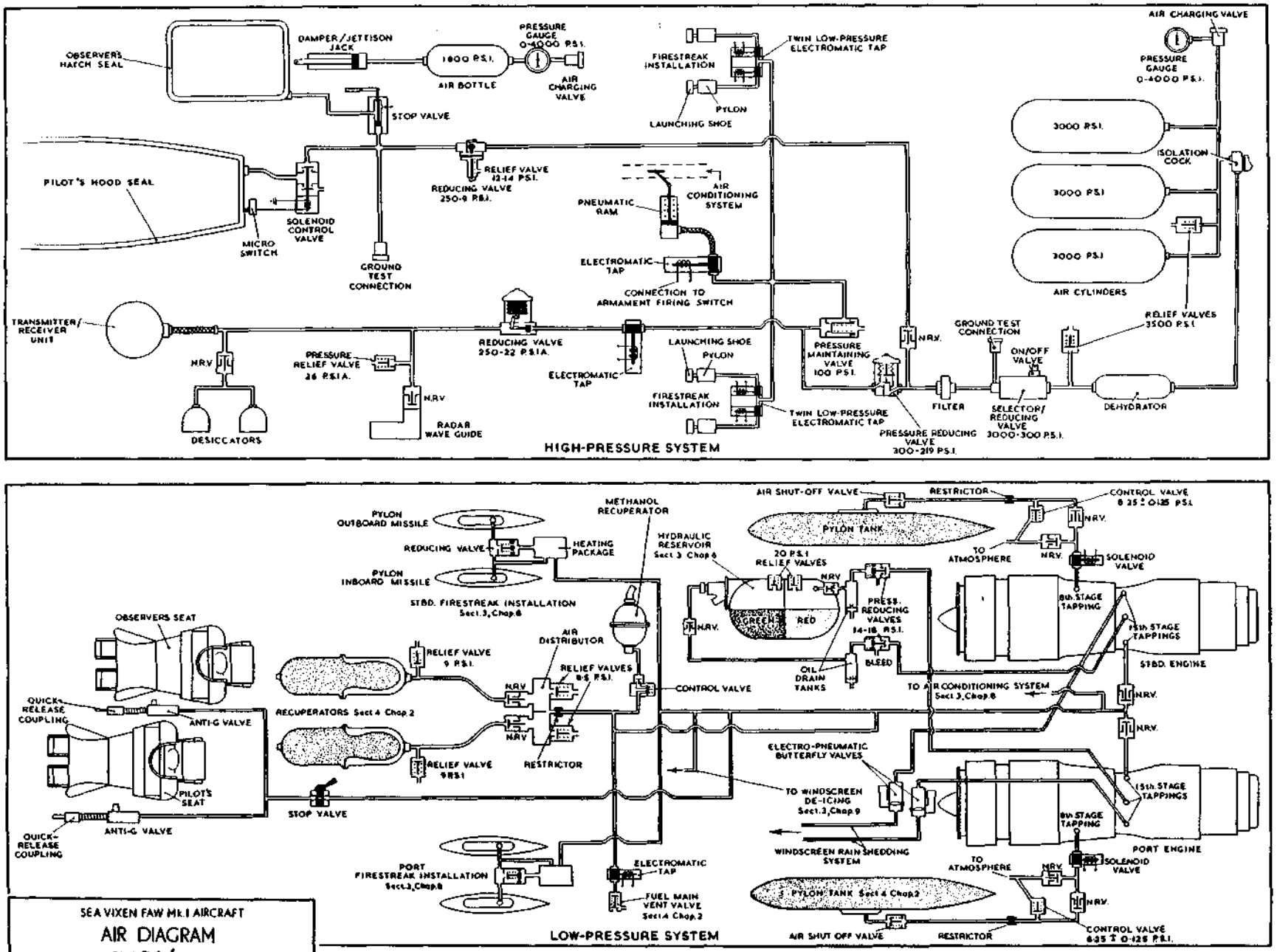

SEA VIXEN FAW Mk.1 AIRCRAFT

AIR DIAGRAM

7681/MIN.

ISSUE 2

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Fig. 3 Pneumatic system diagrams (post mod. 1078)

*Supplies to hydraulic reservoir corrected.

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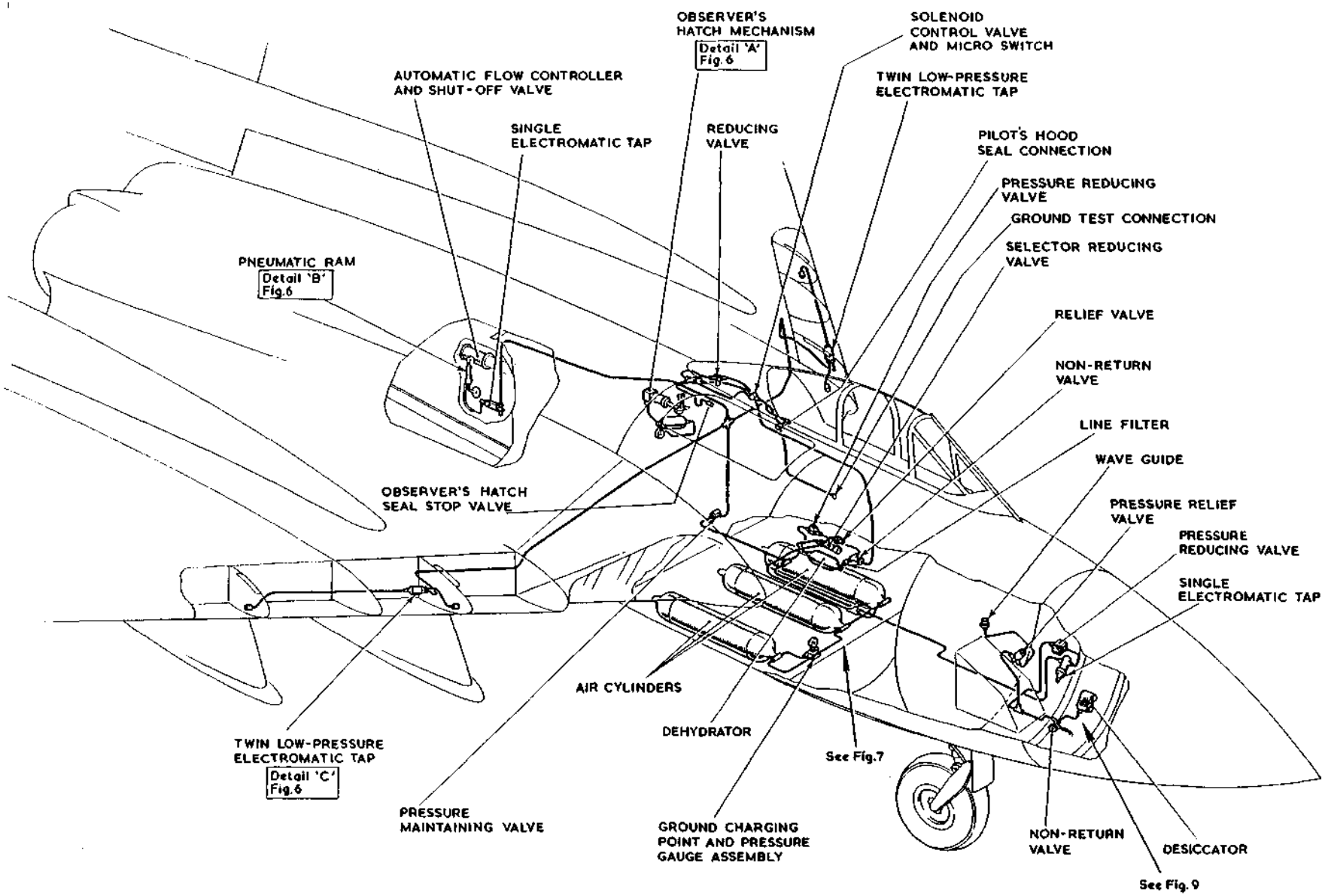

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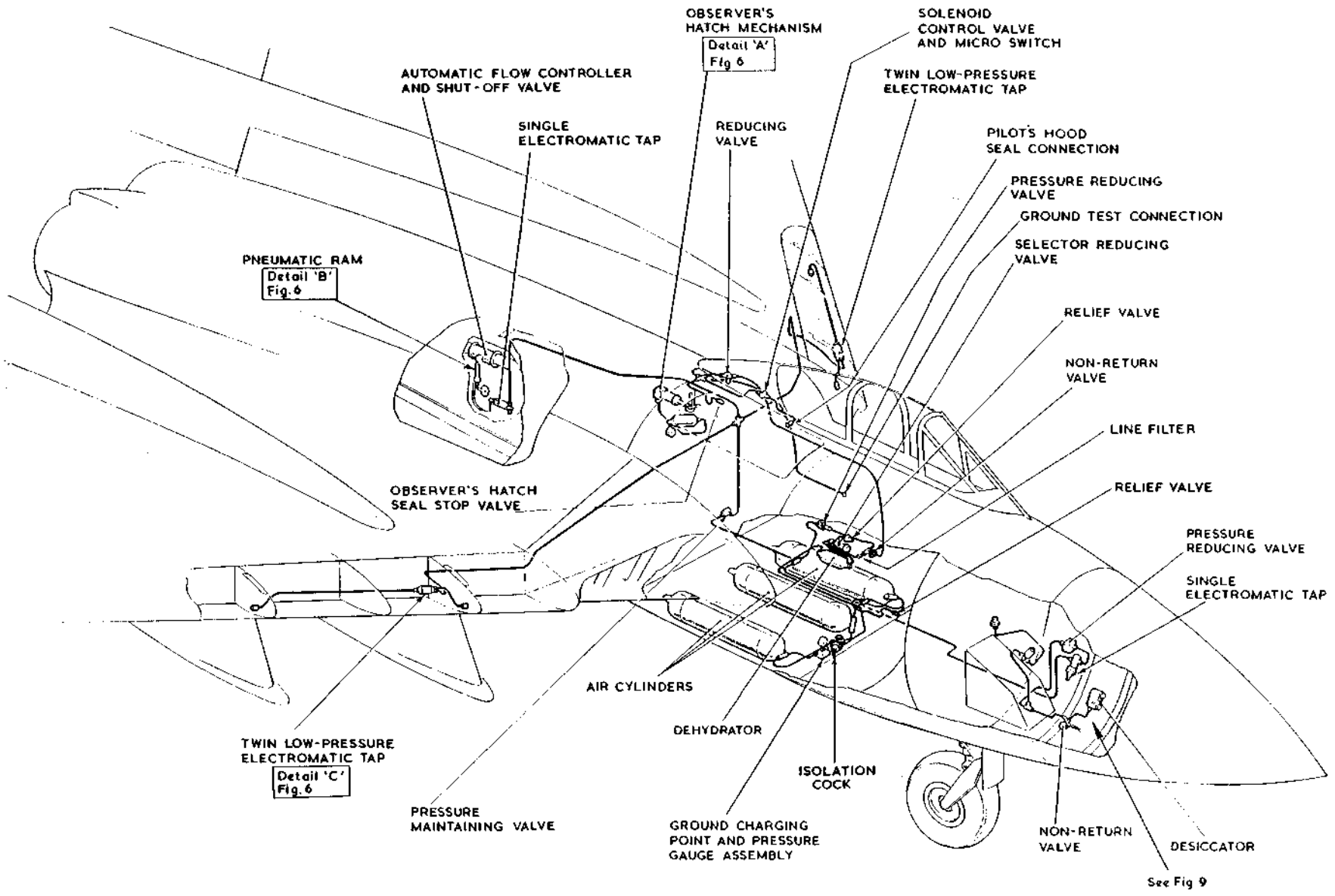
Fig. 4 Disposition of pneumatic high-pressure system components (pre mod. 1078)



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SEA VIXEN FAW Mk.1 AIRCRAFT
AIR DIAGRAM
7682/MIN.
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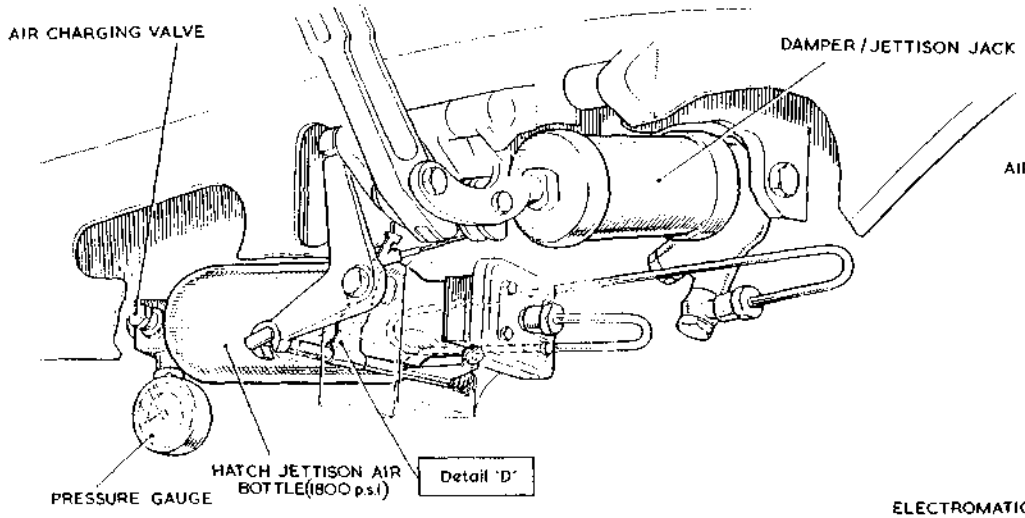
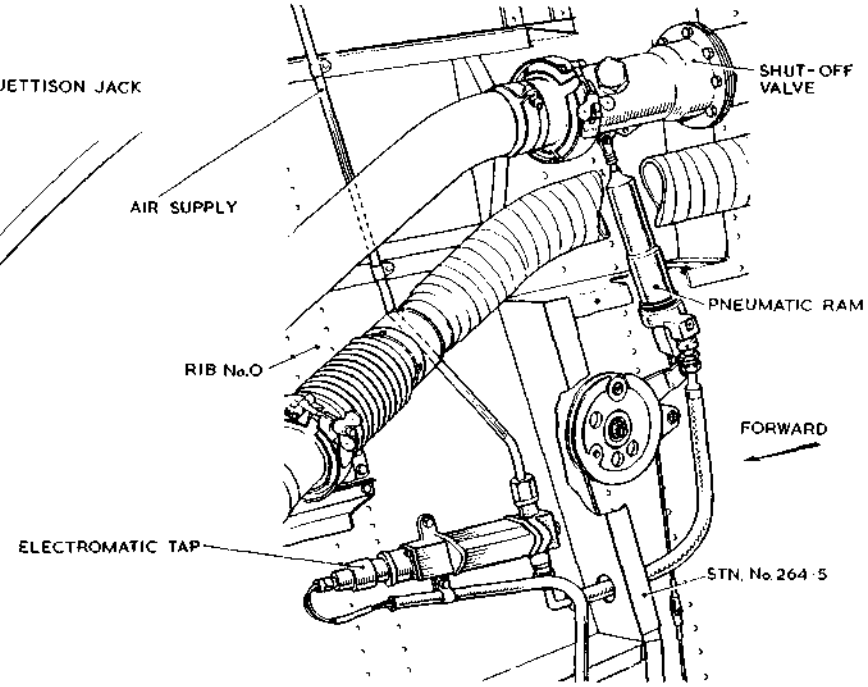
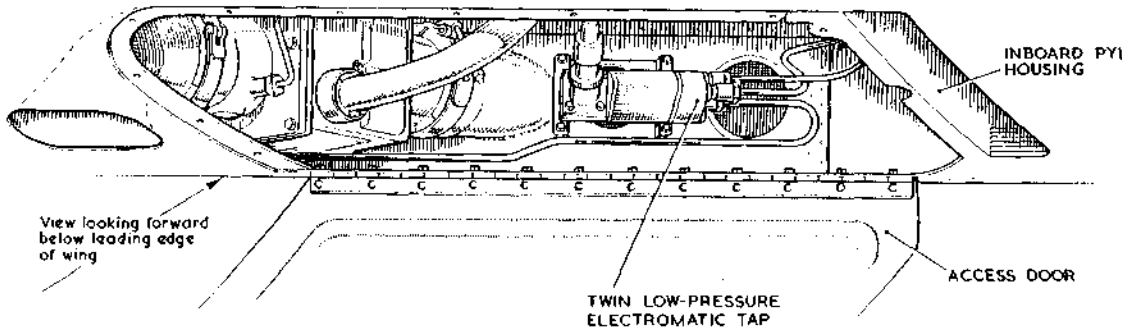
Fig. 5 Disposition of pneumatic high-pressure system components (post mod. 1078)



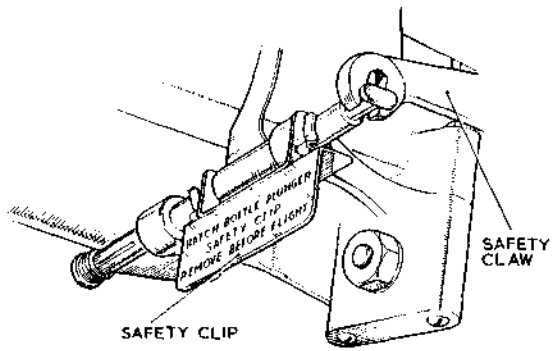
DETAIL 'A'



DETAIL 'B'



DETAIL 'C'
Port shown, starboard similar



DETAIL 'D'

SEA VIXEN FAW ME1 AIRCRAFT	
AIR DIAGRAM	
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Fig. 6 Details of pneumatic high-pressure components

bottle assembly, incorporates an air charging valve and pressure gauges and is charged to a pressure of 1800 p. s. i. When the air is released, as described in Sect. 3, Chap. 11, the air is piped to a damper/jettison jack which operates the jettison mechanism.

WARNING...
When the aircraft is on the ground, a safety clip must be fitted to the push rod and firing arm assembly to prevent inadvertant discharge of the air bottle. The clip is stowed in the observer's cockpit with the ejector seat safety pins.

LOW PRESSURE SYSTEM (8th STAGE)

Pylon tank fuel transfer system

14. Fuel is transferred from the pylon tanks to the wing tanks by air pressure supplied from a tapping on the 8th stage of the engine compressors. The port and starboard installations are separate; the port engine supplies the port tank, and starboard the starboard tank.

15. From the 8th stage tapping, an Avica flexible metal hose takes the supply to a union bolted to the gearbox beam, the pipeline is then routed forward and inboard to an adapter which passes through the front firewall. From a banjo bolt connection, the pipeline is taken forward and up to the aft face of the main spar where it is routed outboard and then forward to the forward face of the front spar just inboard of rib No. 1.

16. The pipeline continues outboard along the front spar to a reducing union inboard of rib No. 4. A flexible hose carries the air supply from the reducing union across the wing-fold line to an adapter in the outer wing. The supply is taken to the pylon via a solenoid valve, and a non-return valve. A control valve, regulates the air pressure to 8. 25 p. s. i. , spilling excess pressure to atmosphere. An additional non-return valve connects the spill pipe to the main supply, between the solenoid valve and non-return valve (Fig. 15), and allows inward venting should the pylon tank internal pressure drop below atmospheric. On pre mod. 2 aircraft the starboard solenoid and non-return valves are identical to those on the port side. For further information see Sect. 4, Chap. 2.

LOW PRESSURE SYSTEMS (15th STAGE)

General

17. A supply of hot air for the low-pressure systems is obtained from a tapping of the 15th stage compressor on each engine. The supply is taken by flexible braided hoses, via non-return valves, to an elbow with a two-way outlet. One pipeline supplies the air conditioning system, and the other the following low pressure systems :-

(1) Firestreak pylon installation heating.
(2) Windscreen de-icing.
(3) Pilot's and observer's anti-g system.
(4) Fuel recuperators.
(5) Fuel system main vent valve.
(6) Methanol recuperator.

18. Two separate tappings, also at the 15th stage, supply air for the windscreen rain-shedding system, and for pressurization of the hydraulic reservoir.

Firestreak pylon installation heating

19. Hot air supply for the Firestreak pylon installation heating (Fig. 11) is taken from the elbow referred to in para. 17. The pipeline is routed through the front firewall, across the fuel bay and through the semi-bulkhead to the forward face of the front spar. A T-joint then delivers the supply to the heating packages in the leading edges. Refer to Sect. 3, Chap. 8 for further information.

Windscreen de-icing

20. Air supply for windscreen de-icing (Fig. 11) is taken from the Firestreak supply line forward of the semi-bulkhead, and is routed under the cabin floor to the windscreen temperature control valve mounted on the front pressure bulkhead. Refer to Sect. 3, Chap. 9 for further information.

Pilot's and observer's anti-g system

21. The supply for the pilot's and observer's anti-g valves is taken from the Firestreak pylon supply line forward of the semi-bulkhead, adjacent to the tapping for the windscreen de-icing. Further information is given in Sect. 3, Chap. 8.

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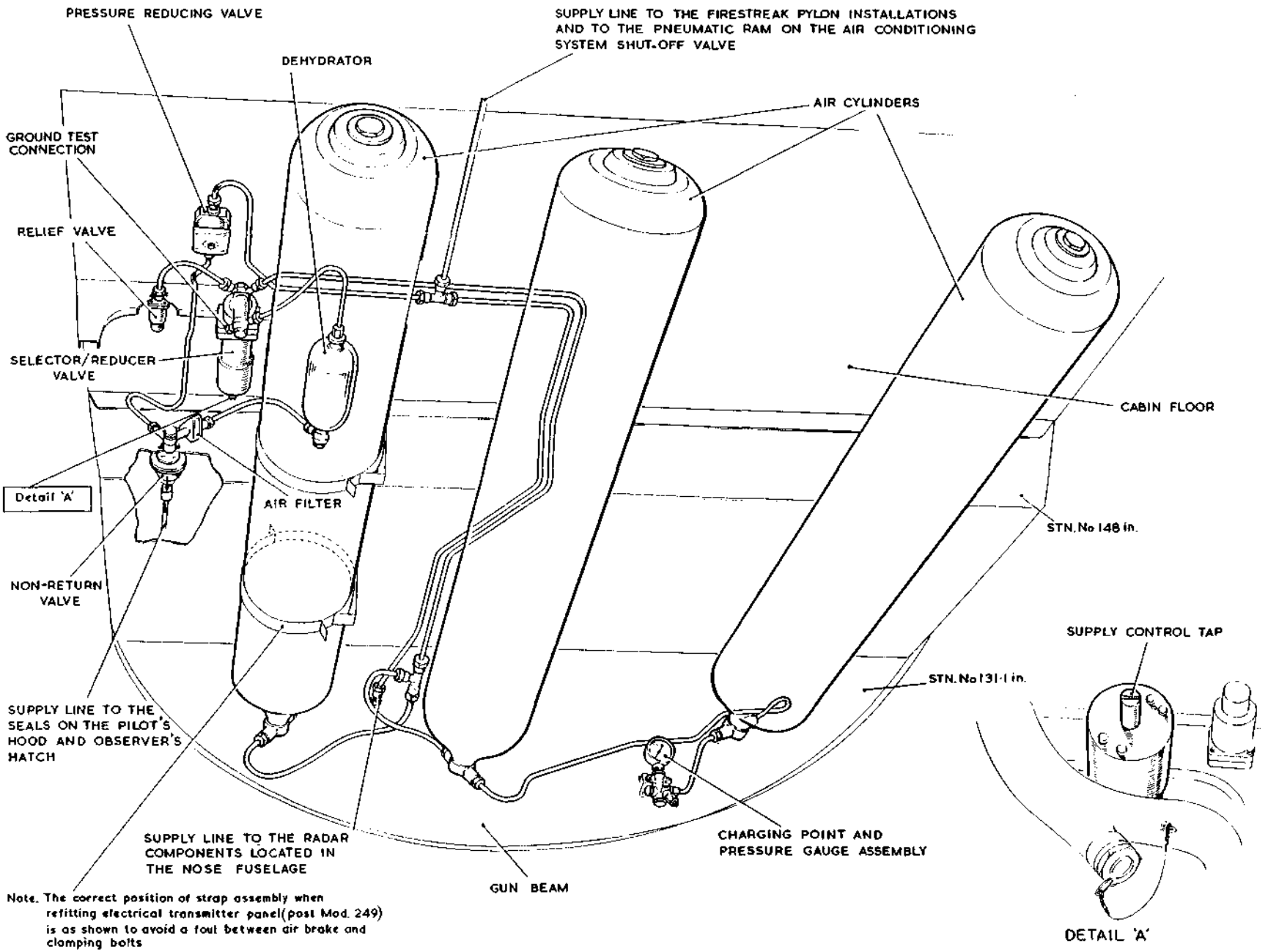

Fig. 7 Pneumatic high-pressure system below cabin floor (pre mod. 1078)

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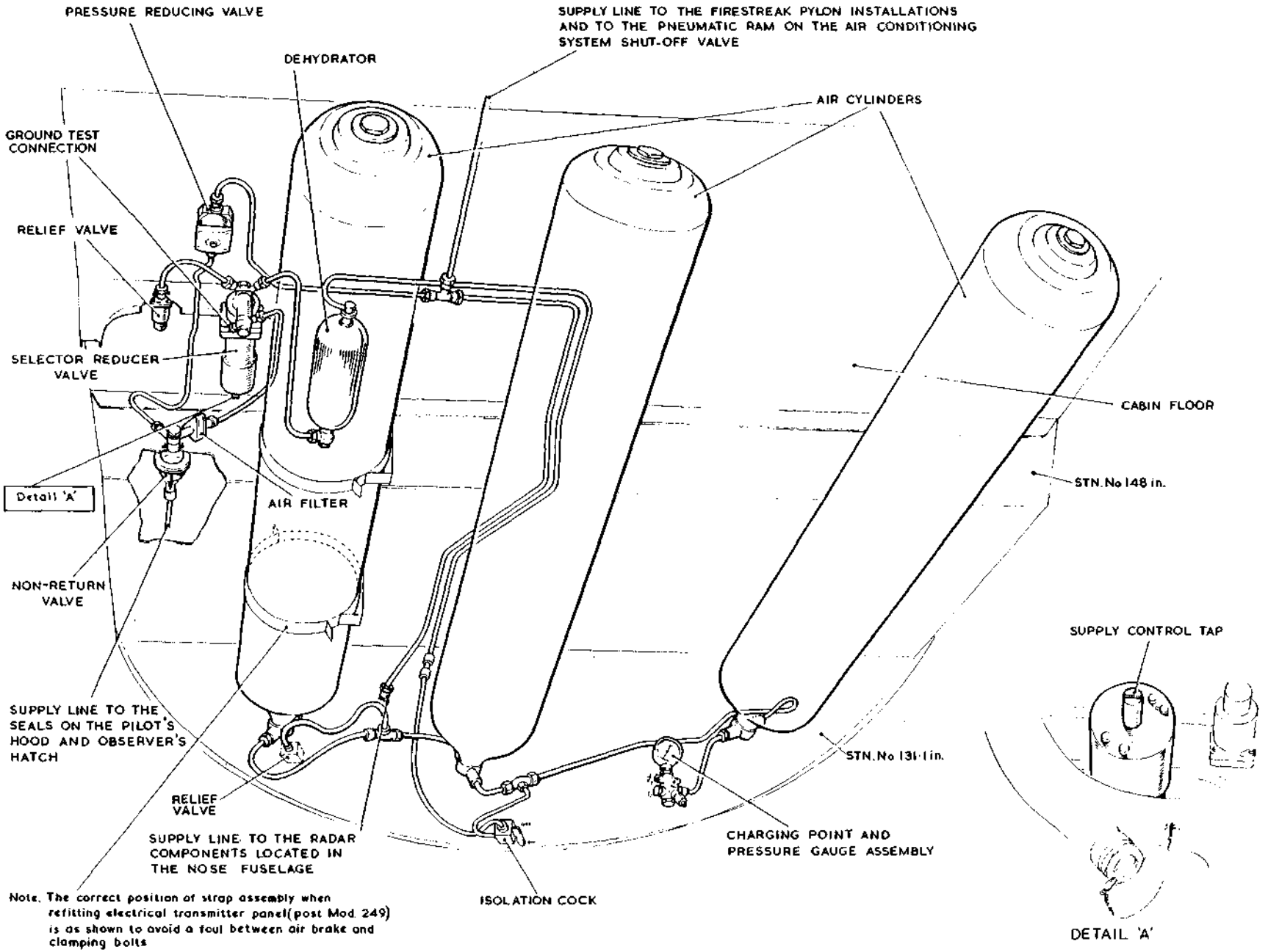

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8 Pneumatic high-pressure system below cabin floor (post mod. 1078)

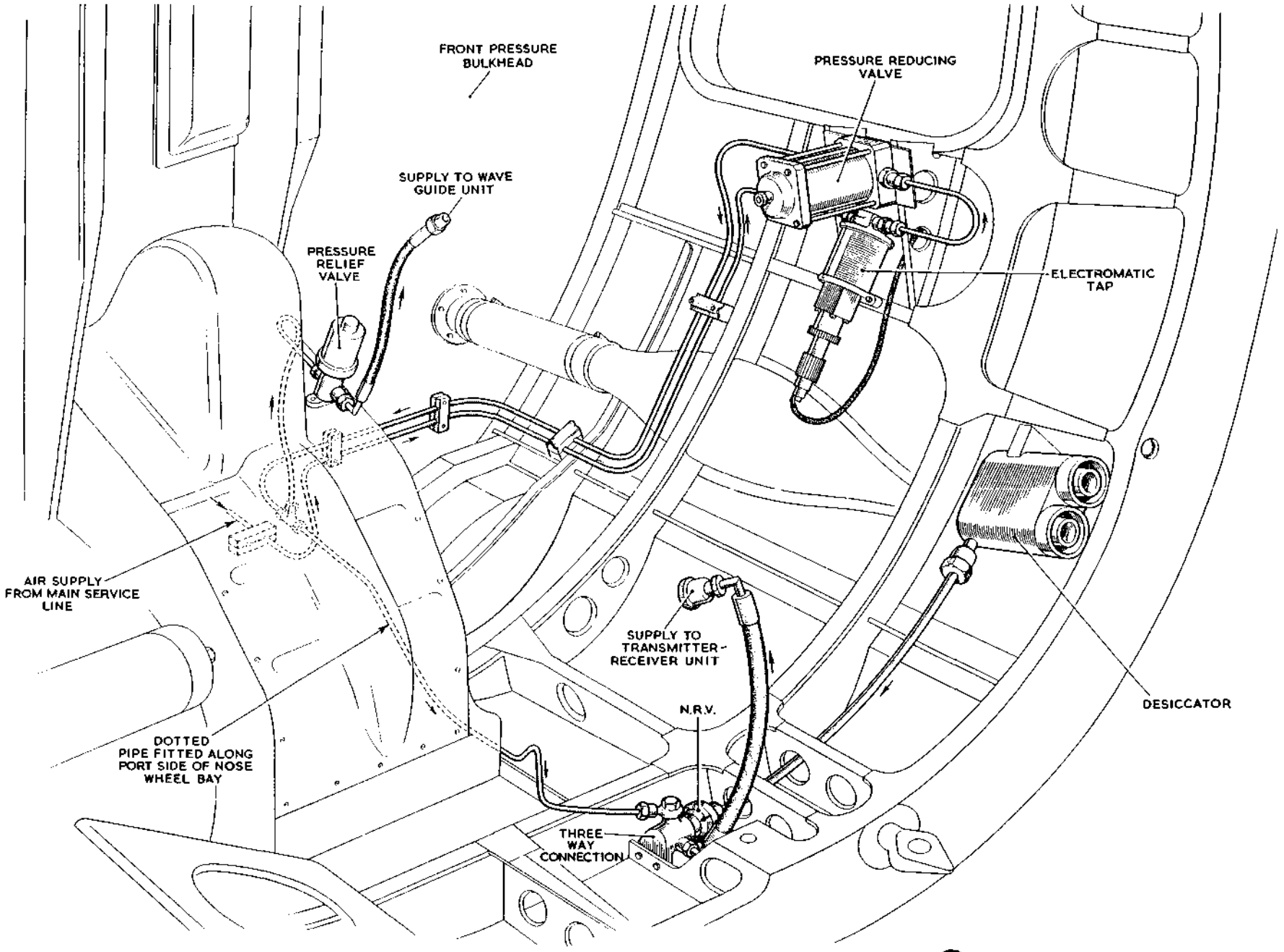

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Fig.9 Pneum[redacted] high-pressure system in nose fuselage [redacted]

Fuel recuperators

22. The fuel recuperator installed in each No. 1 fuel tank is pressurized from a tapping on the Firestreak pylon supply pipeline just forward of the front firewall. The supply is taken to an air distributor (Fig. 12), which comprises a light alloy block incorporating two non-return valves and two relief valves set at 8.5 p.s.i. The air enters the block via a reducing union, and is directed to two outlets which are fitted with the non-return valves. The two supplies then pass forward along Zone 'A' to the fuel recuperators. Further information is given in Sect. 4, Chap. 2.

Main vent valve

23. The fuel system main vent valve (Sect. 4, Chap. 2) is operated by air taken from a tapping on the pipeline that supplies the air distributor on the front firewall (Fig. 12). The supply is routed outboard to an adapter on the port rib No. 1, and is then taken aft to an adapter on the port rear wheel well wall. The supply line then runs to the main vent valve via an electromatic tap bolted to a mounting bracket on the bottom skin outboard of rib No. 1.

Methanol recuperator

24. The methanol recuperator is pressurized by a supply from a tapping of the pipeline to the air distributor (Fig. 12). The supply is then routed forward to the rear face of the main spar where a control valve is bolted to the recuperator mounting plate (Fig. 13). The supply passes through the control valve and is delivered to a solenoid valve screwed on to the base of the recuperator. Further information is given in Sect. 4, Chap. 2.

Windscreen rain-shedding system

25. A hot air blast, supplied by the engine compressors, is used to clear the port front windscreen panel of rain. The supply is taken from a tapping on the 15th stage of each engine compressor, through a flexible metal hose to electrically operated butterfly valves, mounted on the inboard face of each rib No. 1 (Fig. 17).

26. The supply is taken forward and inboard to a coupling on the front firewall (Fig. 17, detail 'A'). The pipe assemblies are secured by a clip and quick-release pin on rib No. 1 (Fig. 17, detail 'C') and a clamp assembly with two Dzus fasteners on the engine casing (Fig. 17, detail 'B').

27. V-clamp assemblies connect the pipelines to the tapping point adapter, the butterfly valve, and the firewall coupling.

28. From the front firewall, a single pipe assembly carries the supply from the port engine, and a two-piece pipe assembly the supply from the starboard engine to the port upper engine cowling. Both pipe assemblies are lagged with fibreglass casings.

29. The supplies are taken through the cowling door by special pipe couplings which connect the internal and external pipes. The engagement is effected by a bolt which passes through the external pipe and enters a tapped hole in a boss in the internal pipe. The bolt draws the pipes together and the cowling door is sandwiched between the pipe flanges which seat on sealing washers. The bolt is wirelocked with 22 s.w.g. non-corrodible steel wire (Fig. 16, detail 'C').

30. The external pipe consists of a twin pipe and fixed fairing assembly which is routed forward to the fuselage/centre section joint at approximately station No. 174. The pipe assembly is attached to the stub wing at station No. 200·75 by a bracket and cross-bolt assembly. The cross-bolt is locked by a cover plate secured by two countersunk screws (Fig. 16, detail 'B').

31. The joint at station No. 174 is made by the aft pipe assembly sliding over the two forward pipes, which are fitted with 'O' seals in annular grooves (Fig. 16, detail 'D'). The fairing at this position has a detachable cover plate fitted.

32. The forward pipe assembly is carried forward alongside the canopy port guide rail, and at station No. 100 the cylindrical pipes flatten and merge into the ducting which terminates in the nozzle at the base of the windscreen panel.

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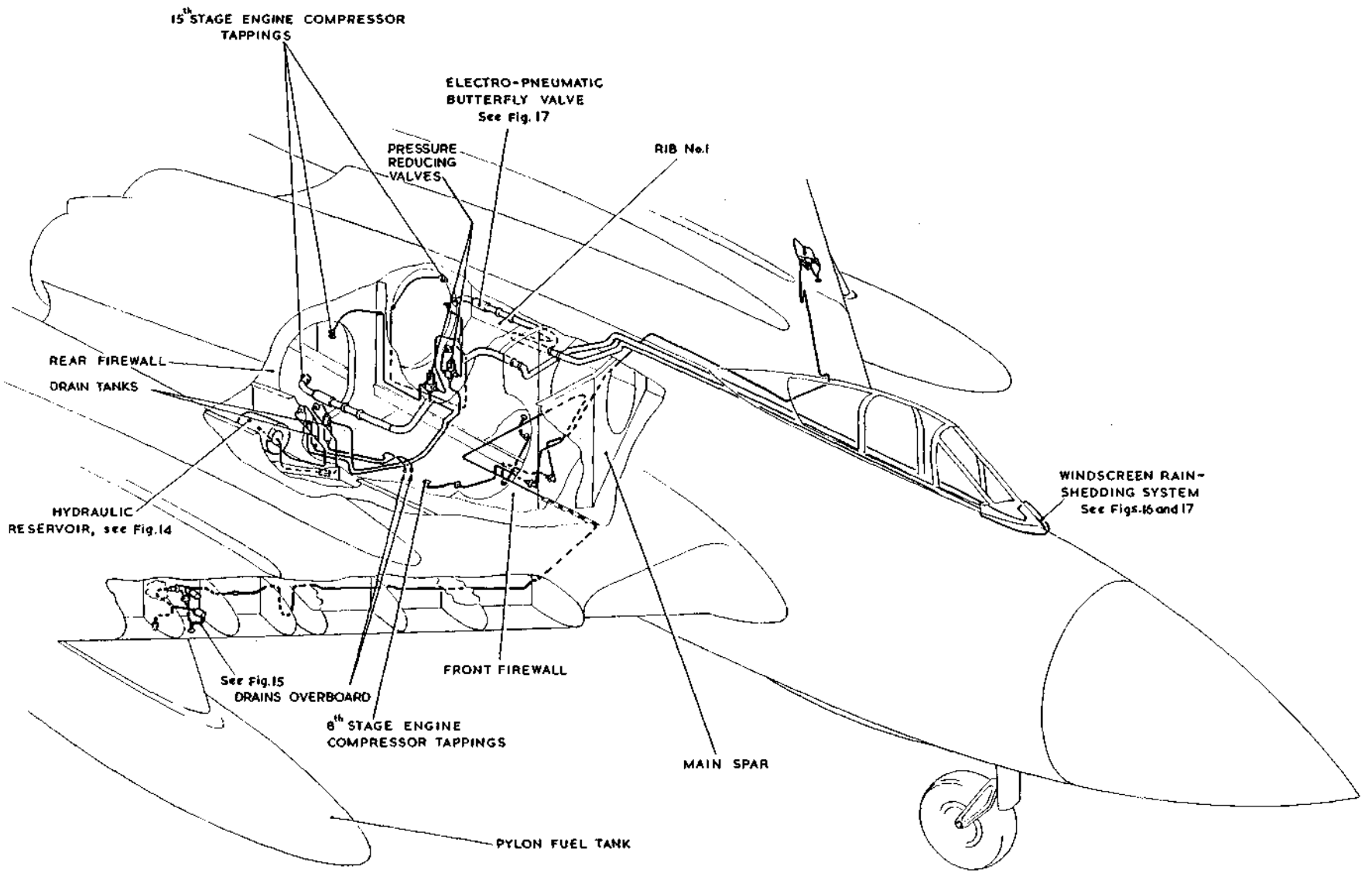

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Fig.10 Disposition of pneumatic low-pressure system components (1)

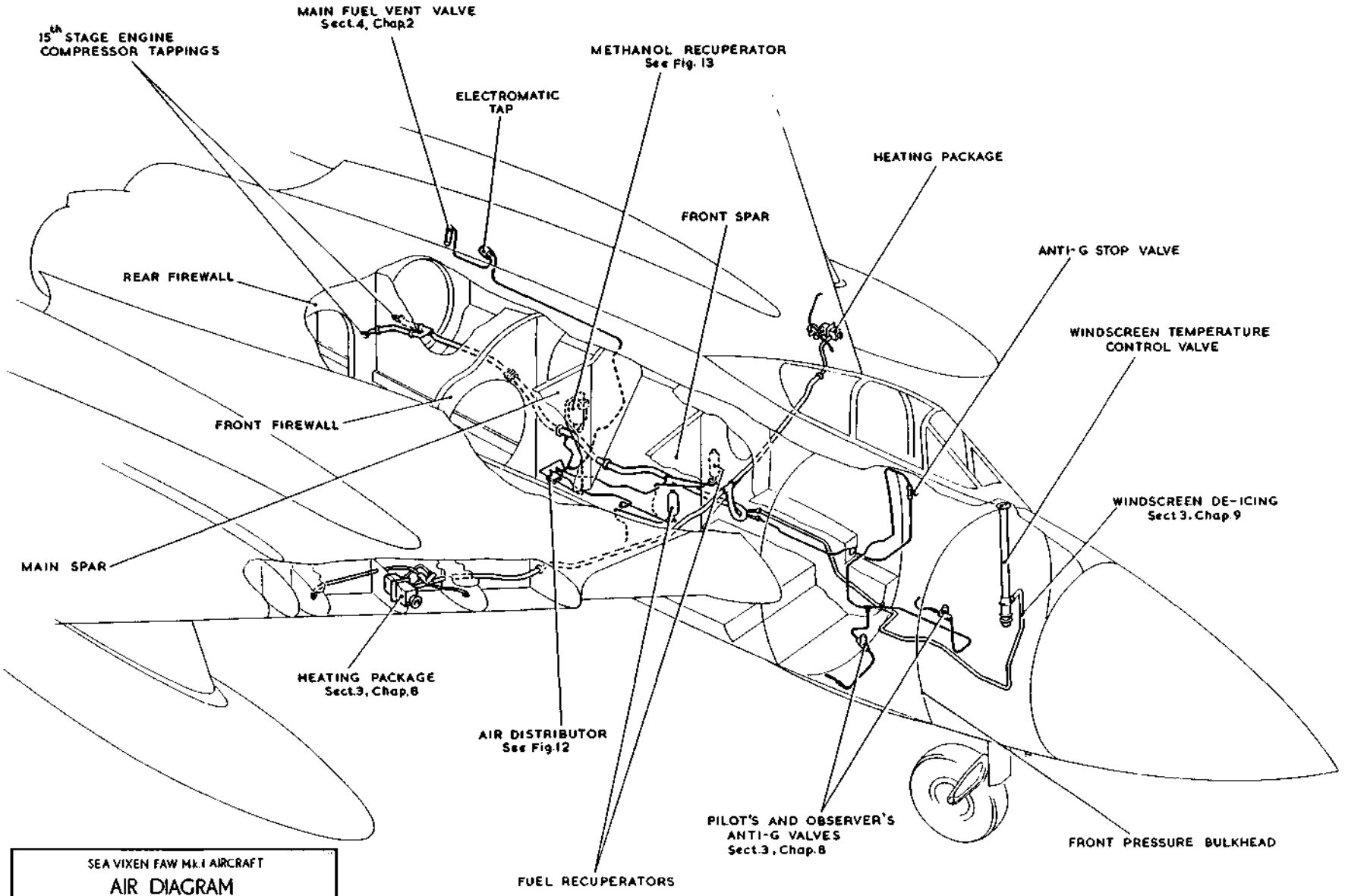

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Fig. 11 Disposition of pneumatic low-pressure system components (2)

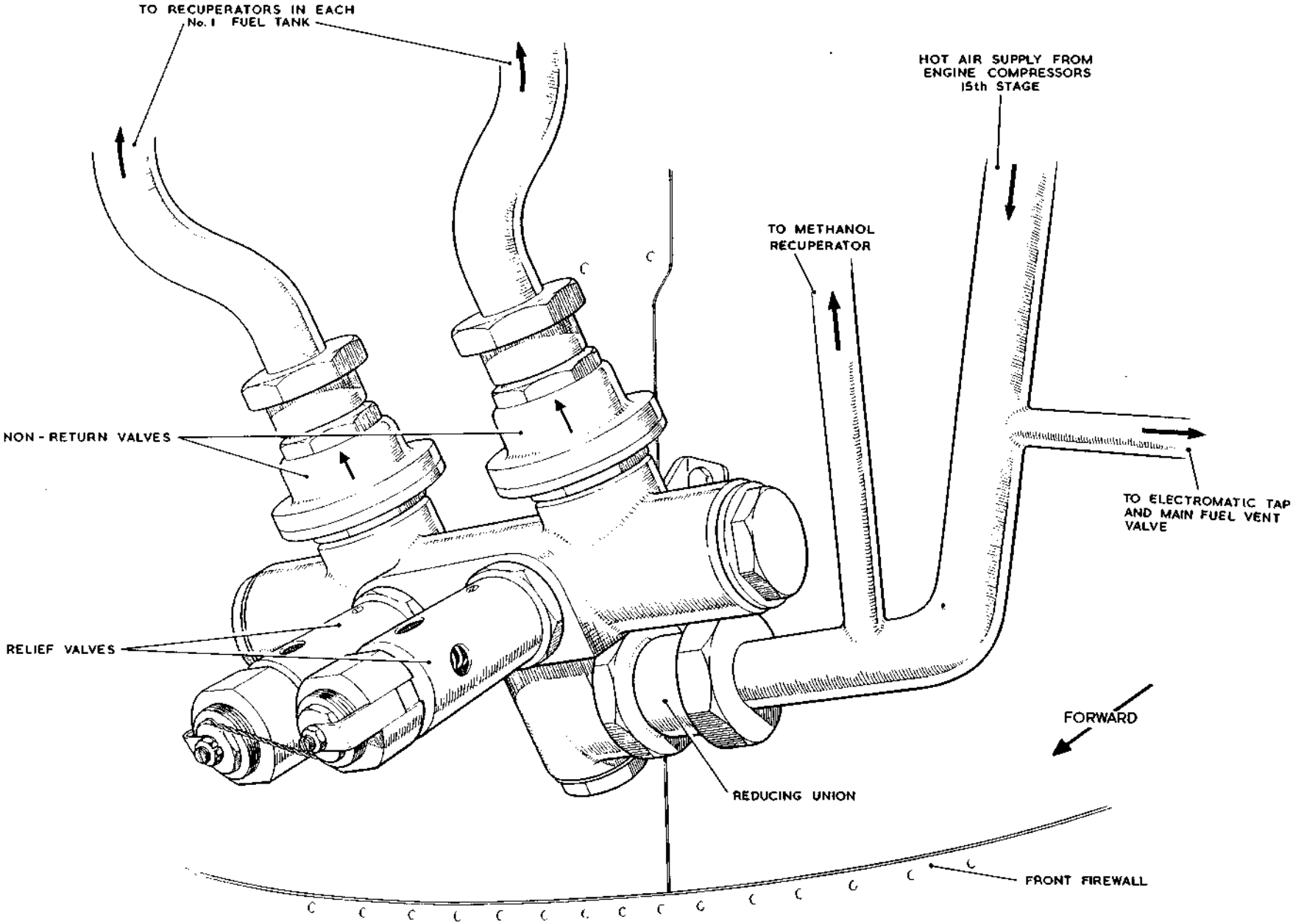

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Fig. 2 Air distributor

33. The forward pipe assembly and duct is secured to the aircraft by lugs welded to the duct, a cross-bolt assembly at station No. 135·8 and two brackets at station No. 174 (Fig. 16, details 'A' and 'D').

34. The twin pipes are lagged with close-woven light asbestos cloth 1/16 in. thick, and the fairings over the pipes consist of an inner and outer skin riveted along the upper and lower edges. Tubular sealing strips are attached to the edges of the fairings to form a seal with the aircraft skin.

35. The system is operated by two ON/OFF switches, marked RAIN CLEARANCE, located forward of the throttle levers on the pilot's port console. For information on the electrical system refer to Book 2, Cover 1, Sect. 5, Chap. 1, Group H.

Hydraulic reservoir (Fig. 14)

36. The hydraulic reservoir is pressurized by air tapped from the 15th stage of each engine compressor. The port engine pressurizes the RED compartment of the reservoir, and the starboard engine the GREEN compartment as described in Sect. 3, Chap. 6.

37. From an adapter on the top of the engines, forward of the rear firewall, the supplies are taken inboard to rib No. 0 by flexible metal hoses. The port supply passes through rib No. 0 via a coupling and the two pipelines run along the starboard side of the rib to two reducing valves between station Nos. 282 and 273.

38. The reducing valves, limit the pressure to 15 p. s. i. The vent connection on each valve is connected to a single pipeline which bleeds excess pressure overboard through an aperture in the upper skin.

39. The outlet pipes from the reducing valves are routed together along the forward mounting of the starboard engine to two drain tank assemblies mounted on the inboard face of the starboard rib No. 1 between station Nos. 284 and 294.

40. The tanks are drained continually through restrictor holes in the base of each tank from which pipelines run down to two drain outlet elbows which pass through the forward engine mounting to atmosphere.

41. The outlet pipes from the drain tanks are routed through the starboard rib No. 1 via angled couplings to the RED and GREEN compartments of the hydraulic reservoir fitted between the starboard ribs No. 1 and 2.

42. An air charging valve on the wheel well rear wall is connected to a T-joint in the GREEN compartment pressurizing line. A non-return valve is fitted between the T-joint and the rib No. 1 coupling to prevent air losses when using the air charging valve for ground test purposes.

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SERVICING

HIGH PRESSURE SYSTEMS

Charging the three air cylinders

43. The charging valve and pressure gauge are fitted to the rear face of the beam at station No. 131·1, and are accessible through the fuselage centre access door situated forward of the air brake.

44. The system must be charged, to the pressure given in the Leading Particulars, with air to a standard not lower than that required in N.A.T.O. specification S.T.A.N.A.G. 3054.

Charging the air bottle

45. The charging valve and pressure gauge for the hatch jettison air bottle are fitted to the end of the bottle, and is accessible when the observer's hatch is open (Fig. 6, detail 'A').

WARNING ...

The safety clip, which is stowed with the ejector seat safety pins, must be fitted to the push rod of the hatch jettison air bottle when the aircraft is not flying (Fig.6, detail 'D').

PRESSURE AND LEAK TESTS

Preparation

46. Prepare the aircraft as follows :-

(1) Ensure that the system is complete.

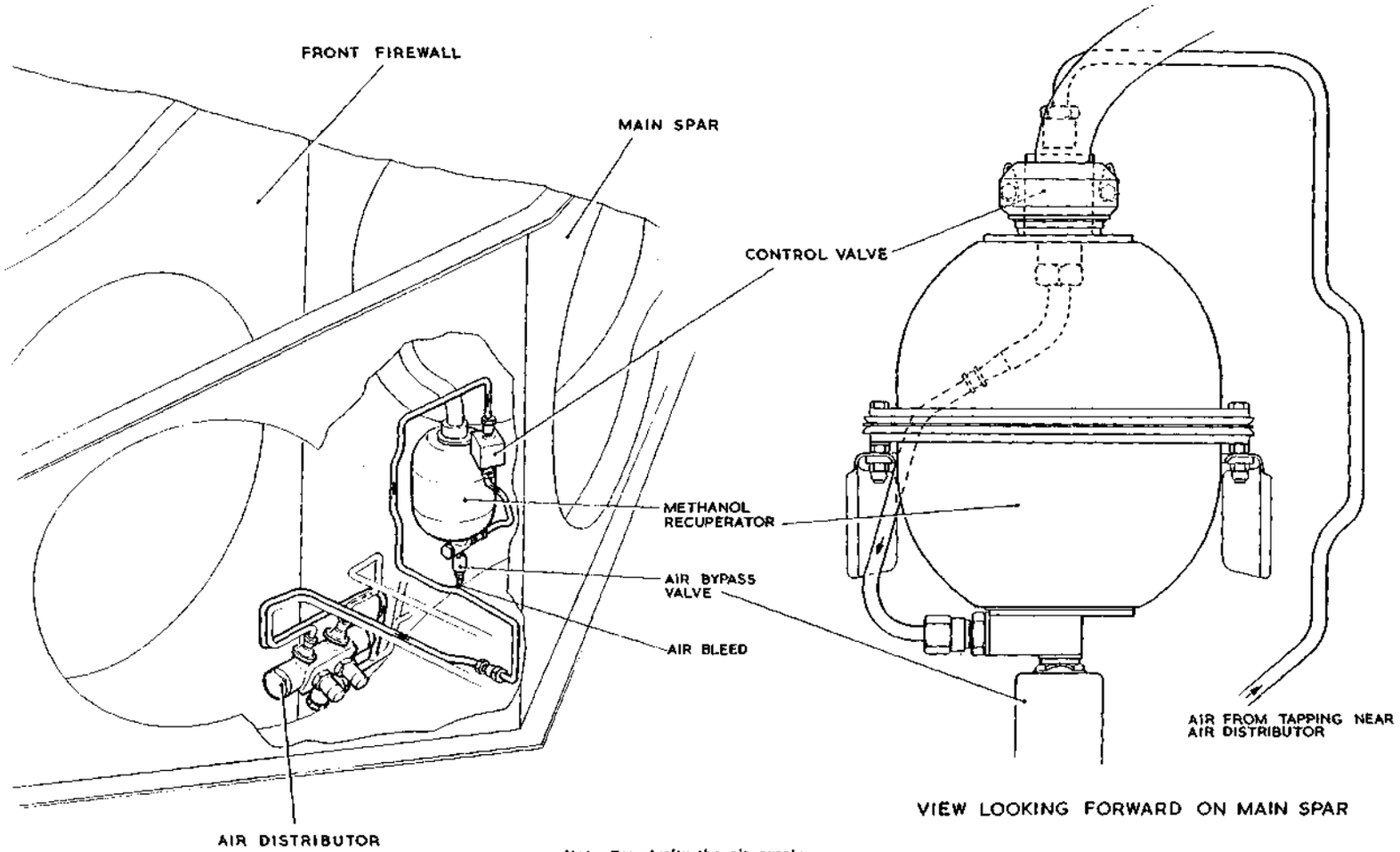
(2) Select the selector/reducing valve to the OFF position.

TABLE I - PNEUMATIC SYSTEM COMPONENTS

Nomenclature	Part Number	System	Access	A.P. reference
Air cylinders	Dunlop AC 11846	Main supply	Air brake bay	A.P.4303B, Vol.1, Bk.1
Relief valve	" ACM 19502	Main supply	Air brake bay (2 off post mod.1078)	A.P.4303B, Vol.1, Bk.1
Isolation cock (post mod. 1078)	" ACM 16738	Main supply	Air brake bay	A.P.4303B, Vol.1, Bk.2
Dehydrator (pre mod.1078)	" ACM 18534	Main supply	Air brake bay	A.P.4303B, Vol.1, Bk.1
" (post mod.1078)	" ACM 21752			
Selector/reducing valve	" AC 60598	Main supply	Air brake bay	A.P.4303B, Vol.1, Bk.1 for similar type
Filter	" ACM 18302	Main supply	Air brake bay	A.P.4303B, Vol.1, Bk.1
Pressure reducing valve	" ACM 20188	Firestreak pylons, shut-off ram and radar units	Air brake bay	
Pressure maintaining valve	" ACO 27020	Firestreak pylons and shut-off ram	Panel Q	A.P.4303B, Vol.1, Bk.1
Electromatic tap	" ACM 20906	Firestreak pylons	Panel No.150	A.P.4303B, Vol.1, Bk.1 for similar type
Electromatic tap	" AC 60322	Shut-off valve ram	Port engine bay (panel M)	A.P.4303B, Vol.1, Bk.1
Electromatic tap	" AC 13492	Radar units	Nose bay	A.P.4303B, Vol.1, Bk.1
Pressure reducing valve	" ACM 17504	Radar units	Nose bay	A.P.4303B, Vol.1, Bk.1
Pressure relief valve	" ACM 18560	Radar units	Nose bay	A.P.4303B, Vol.1, Bk.1
Air bottle	Hymatic RES 20/1	Observer's hatch jettison	Observer's cockpit	A.P.4303C, Vol.1
Pressure reducing valve	" PS 29/60	Hood and hatch seals	Aft of pilot's seat	A.P.4303C, Vol.1
Stop valve	" SV 19/2	Hatch seal	Aft of pilot's seat	A.P.4303C, Vol.1
Relief valves (air distributor)	" RV 56	Fuel recuperators	Fuel bay doors (panel Q)	
Pressure reducing valve	" PS 60/25 Mk.2	Reservoir pressurization	Starboard engine bay	A.P.4303C, Vol.1
Pressure control valve	Hymatic RV 32	Pylon tank pressurization	Panel No.89	A.P.4303C, Vol.1

TABLE 1 - PNEUMATIC SYSTEM COMPONENTS continued

Nomenclature	Part Number	System	Access	A.P. reference
Pressure control valve	Hymatic RV 67/1	Methanol recuperator	Starboard engine (panel G)	
Solenoid valve	Teddington ES/A/502	Canopy seal	Aft of pilot's seat	A.P.4303E, Vol.1
Butterfly valve	" FMP/A/211	Rain-shedding	Port and starboard engine bays (panel H)	
Solenoid valve	" FGB/A/4	Pylon tank pressurization	Panel No.89 (port)	
Solenoid valve	" FRU/A/1	" " "	Panel No.89 (starboard)	
Solenoid valve	" FAW/A/507	Methanol recuperator	Starboard engine (panel G)	
Non-return valve	S.P.E.29A, Mk.2	Hood and hatch seals	Aft of pilot's seat	
Non-return valve	S.P.E.28A	Radar units	Nose bay	
Non-return valves (air distributor)	S.P.E.2197	Fuel recuperators	Fuel bay doors	
Desiccator units	Ref. No.10AQ/585	Radar units	Nose bay	
Ram assembly	10.20.S 15195A	Shut-off valve ram	Port engine bay (panels D and M)	



Note. For clarity the air supply only is shown

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SEA VIXEN FAW Mk.1 AIRCRAFT AIR DIAGRAM *7621 / MIN.*	
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Fig.13 Air supply to methanol recuperator

(3) Remove the blanking cap from the ground test point on the selector/reducing valve, and connect a 0 to 500 p. s. i. pressure gauge.

(4) Disconnect the inlet hose from the transmitter/receiver unit in the nose compartment (Fig. 9) and connect a 0 to 20 p. s. i. pressure gauge. If radar is not fitted, connect the gauge to the three-way connection.

(5) Connect a 0 to 20 p. s. i. pressure gauge to the pilot's hood seal test connection in the port boundary layer bleed.

(6) Disconnect the electrical connections to the Firestreak system electromatic taps in the port and starboard leading edges (Fig. 6, detail 'C'), and connect a 24 Volt d. c. auxiliary power supply.

(7) Disconnect the electrical connection to the electromatic tap supplying the radar units (Fig. 9), and connect a 24 Volt d. c. auxiliary power supply.

Pressure maintaining valve test

47. Test the operation of the pressure maintaining valve as follows :-

(1) Charge the air cylinders to 450 p. s. i. using N.A. T.O. standard air.

(2) Check that the isolation cock is wirelocked ON and turn selector/reducing valve ON.

(3) Select the port electromatic tap ON for both pylons.

(4) Allow air to exhaust until the pressure maintaining valve operates. The high-pressure test gauge must then read 100-130 p. s. i.

(5) Select the port Firestreak electromatic tap OFF.

Radar units and hood seal pressure test

48. Test the operation of the radar units and seal pressurization as follows :-

(1) Charge the air cylinders to 2000 p. s. i. (pre mod. 419) or to 3000 p. s. i. (post mod. 419).

(2) Select the radar units electromatic tap to the ON position.

(3) Check that the high-pressure gauge reading does not exceed 260 p. s. i. (pre mod. 849), or 350 p. s. i. (post mod. 849).

(4) Check that the gauge in the nose compartment is reading 7·3 p. s. i. ± 0·5 p. s. i. at a barometric pressure of 14·7 p. s. i. (i. e. 22 p. s. i. absolute). Make allowance for the barometric pressure of the day.

(5) Check that the gauge on the pilot's hood seal test connection is reading 9 p. s. i. ± 1·0 p. s. i.

(6) Check for obvious external leakage from pipes and couplings.

Note...
A recommended solution for leak detection is 5% Lensodel A and 95% distilled water. Remove all traces of the solution after use, using distilled water, and dry thoroughly.

(7) Select the radar units electromatic tap to OFF.

FIRESTREAK COOLING SYSTEM FLOW TEST

Preparation

49. Prepare the aircraft as follows :-

(1) Fit AITS Mk. 2 test units to each pylon.

(2) Clamp the test button on the units to give a full flow to the 0·025 in. dia. restrictor.

Test procedure

50. Complete the flow test as follows :-

(1) Fully charge the air cylinders.

(2) Select all pylons ON simultaneously, and check that the pressures at the test units are between 185 and 230 p. s. i. with an initial surge pressure not exceeding 245 p. s. i. The duration of the surge above 230 p. s. i. must not exceed 30 secs. During a steady run, the pressure may rise and fall to a maximum of 10 p. s. i. provided it remains within the limits stated above.

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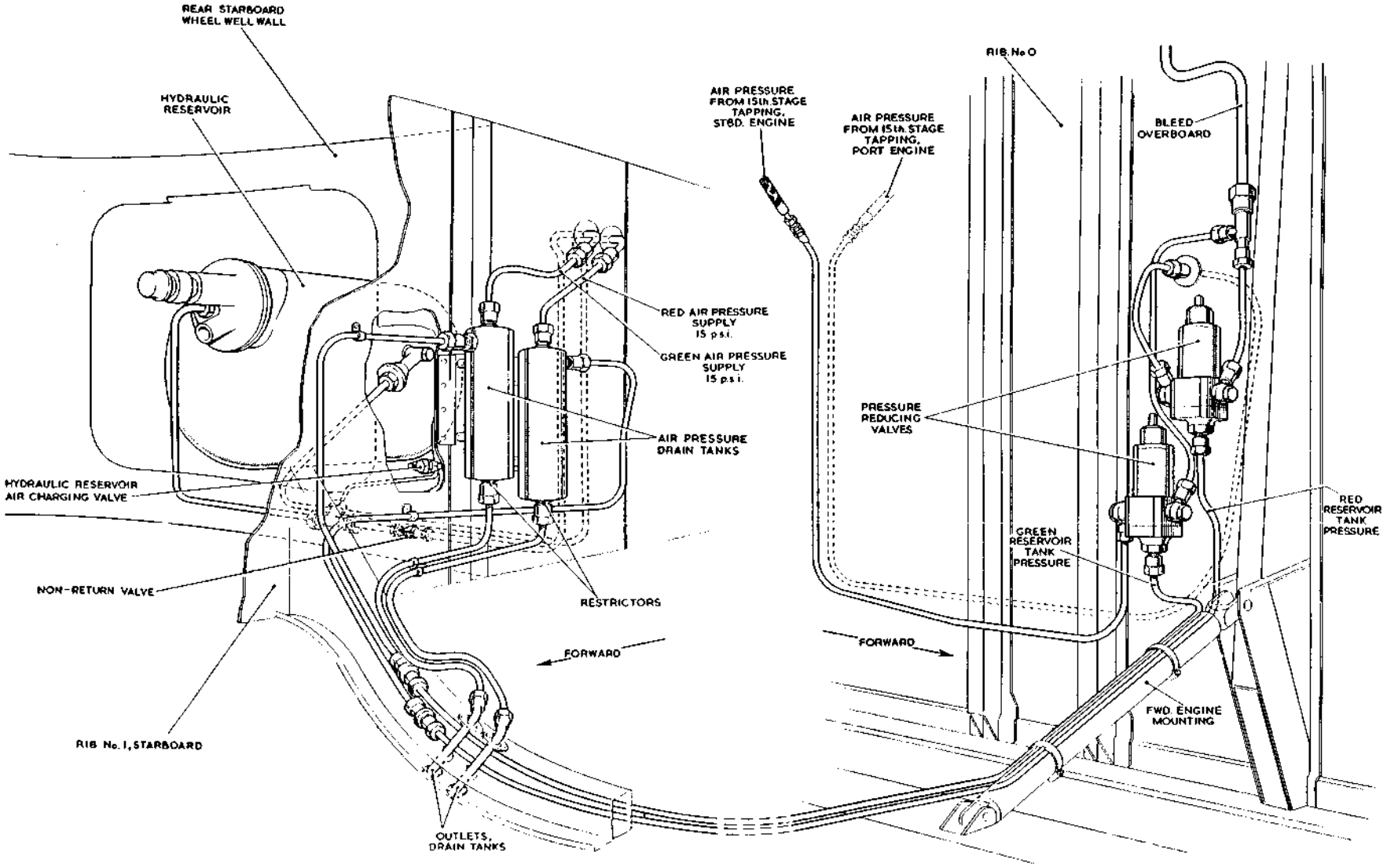

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SEA VIXEN FAW Mk 1 AIRCRAFT	
AIR DIAGRAM	
7622/MIN.	
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Fig.14 Air supply to hydraulic reservoir

(3) Select the electromatic taps as follows, and check that the surge and steady pressures do not exceed the limits given in para. 50 (2) :-

(a) Any one tap (i. e. one pylon) OFF.

(b) The inner pylon taps OFF simultaneously.

(c) The outer pylon taps OFF simultaneously.

(d) Any three pylon taps OFF simultaneously.

(4) Repeat the test detailed in para. 50(2) with the air cylinders charged to 1500 p. s. i. , and then at 400 p. s. i.

(5) Recharge the cylinders to the pressures given in para. 48(1).

(6) Select all pylon taps ON; when all pressures are steady, switch OFF all taps, and check that the high-pressure test gauge reading does not creep above 380 p. s. i. within 15 min.

51. Restore the aircraft to normal as follows :-

(1) Disconnect the auxiliary electrical power supplies from the electromatic taps and refit the normal connections.

(2) Remove the test units and gauges, and refit all blanking caps and access panels.

SHUT-OFF VALVE RAM FUNCTIONAL CHECK

52. Check the operation of the shut-off valve ram as follows :-

(1) Disconnect the electrical connection to the electromatic tap on rib No. 0 in the port engine bay (Fig. 6, detail 'B'), and connect a 24 Volt d. c. auxiliary power supply.

(2) Select the cabin air conditioning control lever, on the pilot's port console, to ON.

(3) Check that the air cylinders are charged to 400 p. s. i.

(4) Ensure that the isolation cock and the selector/reducing valve are ON.

(5) Select the electromatic tap ON, and check that the ram extends in less than 0. 5 sec. , and 90% closes the air conditioning shut-off valve.

(6) Select the electromatic tap OFF, and check that the ram retracts, from the closed to 20 deg. from the fully open position of the shut-off valve, in not more than 4 secs.

(7) Repeat sub-para. (5) and (6) three times.

(8) Disconnect the auxiliary electrical power supply, and restore the aircraft to normal.

PURGING

53. When the system has been partially dismantled, or when air of a lower standard than that required in N.A. T.O. specification S. T.A. N.A. G. 3054 has been used for charging the system, the system must be purged to eliminate all moisture.

54. The purging operation can be divided into three stages; the purging of the air cylinders, the recharging of the dehydrator, and the flushing of the complete system with dry air.

55. The purging procedure is as follows :-

(1) Shut the selector/reducing valve (pre and post mod. 1078) and turn OFF the isolation cock (post mod. 1078) to isolate the air cylinders.

(2) Connect an external supply of N. A. T. O. standard air to the air charging point at station No. 131· 1.

(3) Lower the pressure in the aircraft air cylinders to 200 p. s. i.

(4) Charge the aircraft air cylinders to 600 p. s. i. and then reduce the pressure to 200 p. s. i. Repeat this cycle five times.

(5) Remove the dehydrator from the air brake bay, blank off the pipelines, and recharge the dehydrator with desiccant.

(6) Refit the dehydrator.

(7) Charge the system to 3000 p. s. i. (2000 p. s. i. pre mod. 419).

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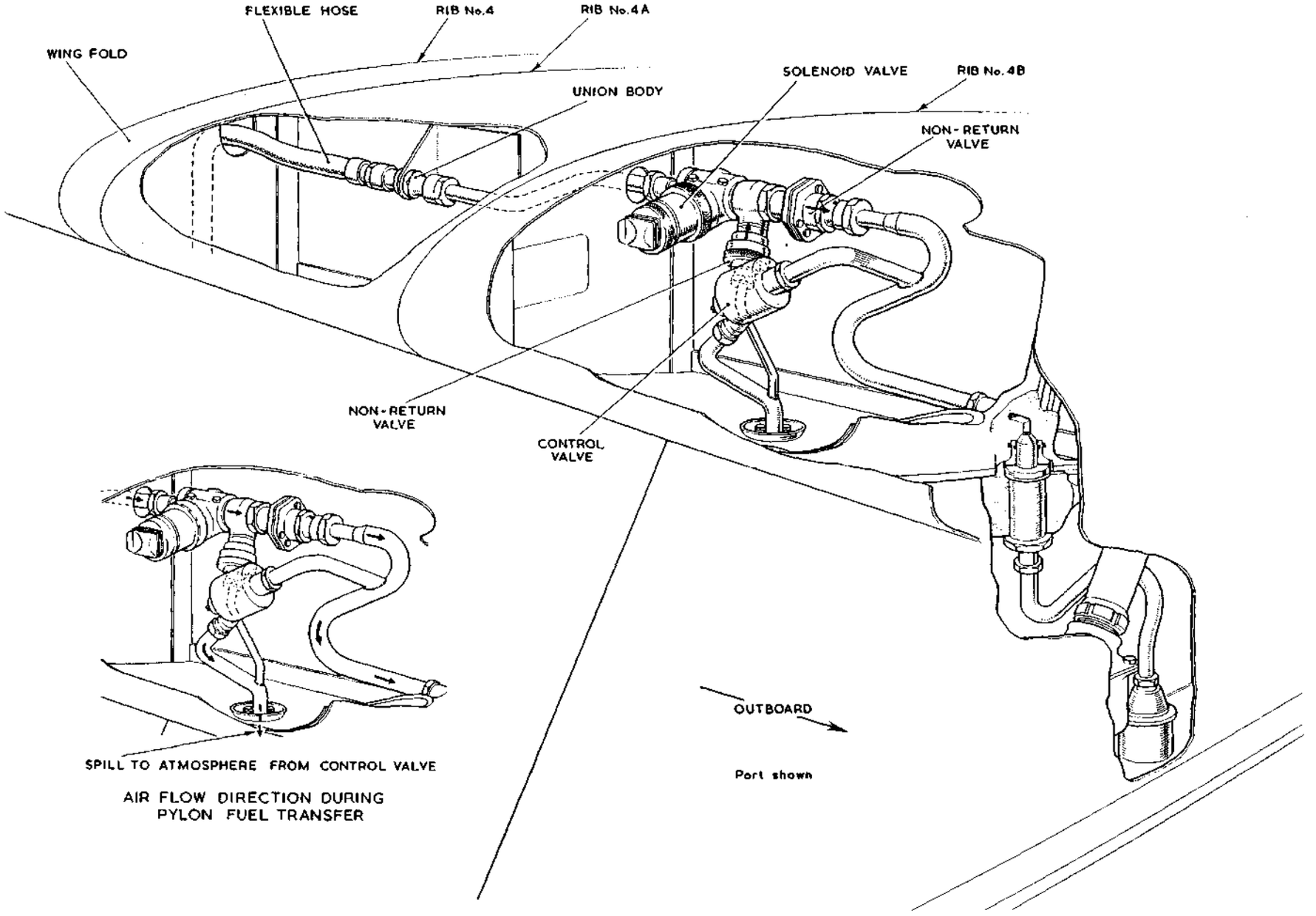

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Fig.15 Air supply to pylon tank

(8) Open the twin electromatic taps associated with the Firestreak pylon installation by applying a 24 Volt d. c. supply to the electromatic tap Breeze plugs.

(9) Open the selector/reducing valve, and the isolation cock (post mod. 1078), and allow the pressure to fall to 2500 p. s. i. (1500 p. s. i. pre mod. 419).

(10) Close the electromatic taps and then the selector/reducing valve. Leave the isolation cock ON.

(11) Recharge aircraft cylinders to 3000 p. s. i. (2000 p. s. i. pre mod. 419), leave the selector/reducing valve ON, and wirelock the isolation cock in the ON position.

LOW PRESSURE SYSTEMS
Rain-shedding system test

WARNING...
The air blast from the nozzle is dangerous. Do not use hands to check the flow from the nozzle, and do not raise head above windscreen unless nozzle is switched OFF. It is advisable to close the sliding hood when testing the air blast.

56. Check the rain-shedding system when the engines are running, as follows :-

(1) Switch ON the port and starboard rain clearance switches one at a time, and check the supply at the nozzle from the port and starboard engines separately.

(2) Check the system for obvious leakage with both switches ON.

(3) Switch the rain clearance switches OFF, and check that the air flow at the nozzle ceases.

Note...
The control valves will not respond to the selection of the ON/OFF switches at low engine speeds; this is acceptable if the flow is satisfactory at higher engine speeds.

HYDRAULIC RESERVOIR
Pressurizing
57. The hydraulic reservoir can be pressurized, using items H19 and H20, Sect. 2, Chap. 4, at the charging valve fitted on the starboard wheel well rear wall.

REMOVAL AND INSTALLATION

GENERAL
58. The procedure for the removal and installation of most of the pneumatic components will be readily apparent when the components are viewed on the aircraft.

59. When components are removed, the pipelines must be blanked off with approved blanking caps, and extreme care must be taken to prevent the entry of foreign matter into the systems. Full use must be made of the cocks in the high-pressure system to limit the extent of contamination when the system is broken down, and the system must be purged when restored to normal.

Band type V-clamp assemblies
60. The inside of the segments of the assemblies must be smeared with grease, ZX-28, to ensure even tightening up. The wing nut must be tightened by hand only. Pliers or any other tool must not be used, or overtightening and deformation of the clamp band will result. Lock the wing nut with 22 s.w.g. non-corrodible steel wire.

PORT AIR CYLINDER
Installation
61. Installation is the reverse of removal, but it should be noted that the transmitter panel (post mod. 249) must be fitted with the clamp bolts set, as shown in Fig. 8, at the 11 o'clock and 5 o'clock position looking forward, and with the transmitter mounting panel vertical.

RAIN-SHEDDING SYSTEM
Removal
62. The windscreen rain-shedding system is removed as follows :-

(1) Remove the fairing joint cover plate, the cowl door coupling bolts and then the cross-bolt (Fig. 16).

(2) Withdraw the aft twin pipe and fairing assembly from the forward pipe assembly.

(3) Remove the cowl door.

(4) Remove the two pipe assemblies from the couplings on the front firewall (Fig. 17, detail 'A').

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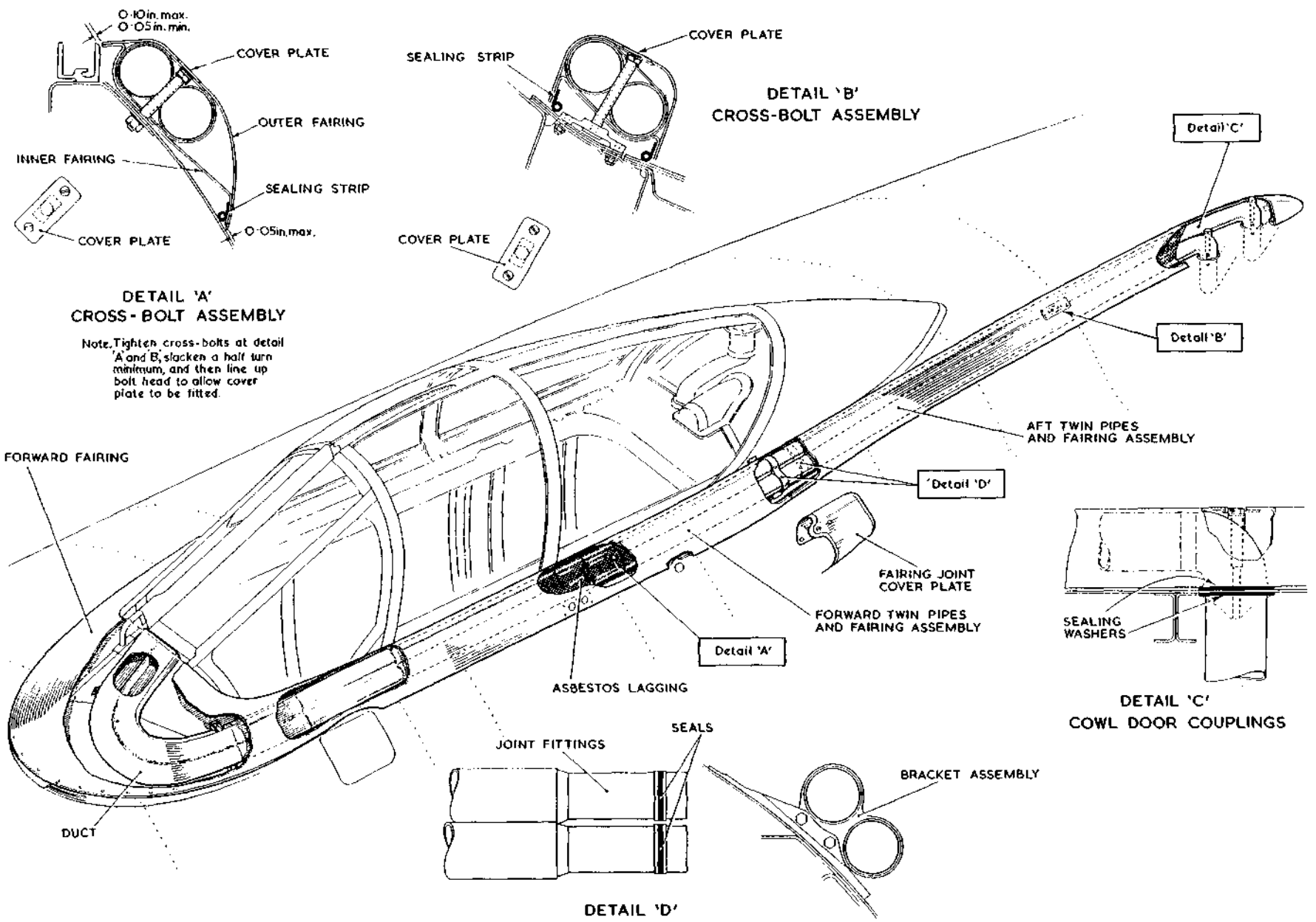

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SEA VIXEN FAW Mk.1 AIRCRAFT	
AIR DIAGRAM 7619/MIN.	
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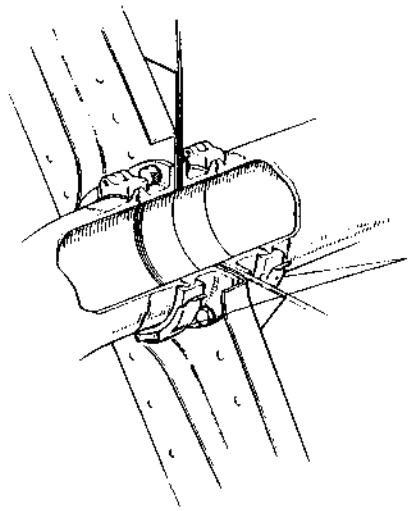
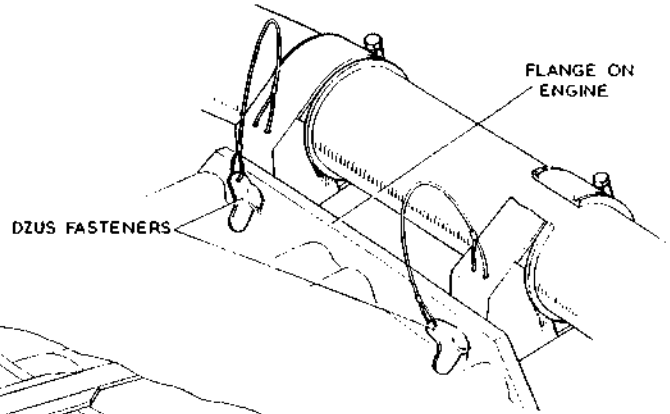
Fig.16 Assembly of windscreen rain-shedding system, forward

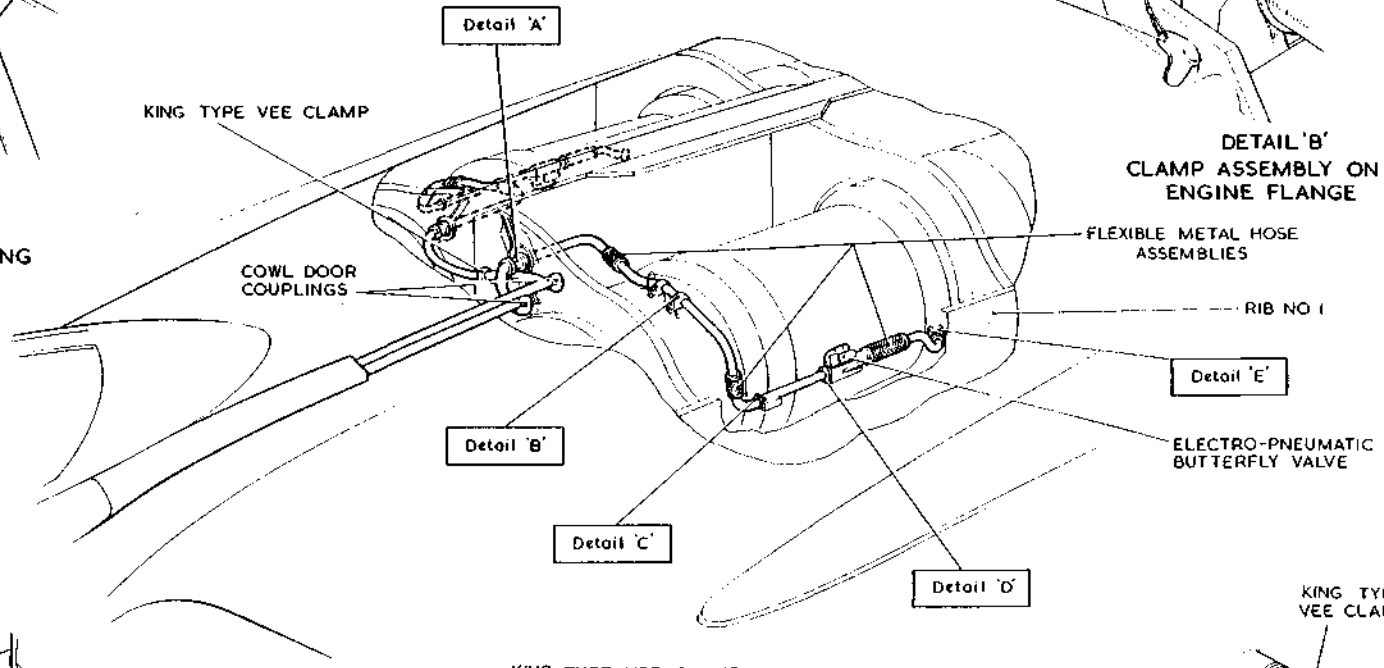
VEE CLAMPS
When assembling smear inside of segments with grease, ZX-28

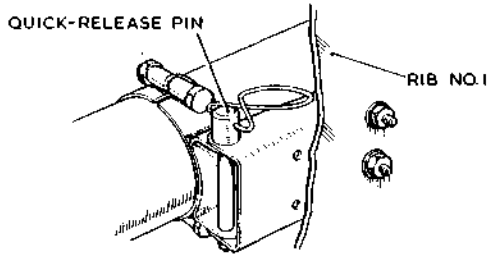


DETAIL 'A'
FRONT FIREWALL COUPLING

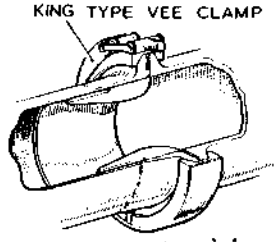


DETAIL 'B'
CLAMP ASSEMBLY ON ENGINE FLANGE

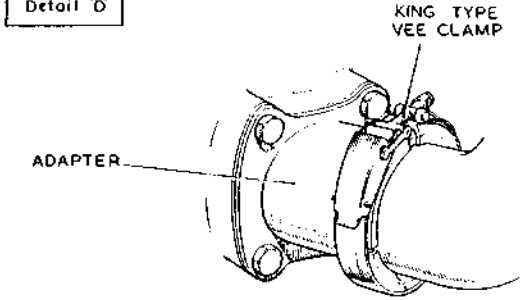




DETAIL 'C'
ATTACHMENT CLIP ON RIB NO. 1



DETAIL 'D'
COUPLING TO ELECTRO-PNEUMATIC BUTTERFLY VALVE



DETAIL 'E'
15TH STAGE ENGINE COMPRESSOR TAPPING CONNECTION

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AIR DIAGRAM 7620/MIN.	
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Fig.17 Assembly of windscreen rain-shedding system, aft

(5) Remove the clamp assemblies at the front firewall and at the butterfly valves (Fig. 17, detail 'D').

(6) Undo the Dzus fasteners securing the pipes to the engine flanges (Fig. 17, detail 'B').

(7) Withdraw the quick release pins securing the pipes to the No. 1 ribs (Fig. 17, detail 'C').

(8) Remove the pipe assemblies.

(9) Remove the butterfly valves, after the electrical connection has been removed, by releasing the hose clips.

(10) Remove the clamp assemblies from the engine adapters and remove the flexible hoses.

Installation

63. The installation procedure is the reverse to that of removal but the following points must be noted :-

(1) The port butterfly valve is fitted with the electrical connection facing aft and uppermost. The starboard valve has the connection also facing aft but is under the valve.

(2) The cross-bolt securing the twin pipe assembly must be tightened and then turned back a minimum of half a turn. The bolt head must be lined up to allow the cover plate to be fitted and lock the bolt.

(3) The forward fairing must clear the hood guide rail by 0·05 in. to 0·10 in., but the clearance between the fairing and the fuselage must not exceed 0·05 in.

(4) The aft fairing, at approximately station No. 178 - 185, must not project into the slipstream from the air bleed duct.

(5) The clearance between the aft fairing and the aircraft skin must not exceed 0·05 in.