

## Chapter 6

## CONVERSION TO REFUELLING-IN-FLIGHT TANKER ROLE

## TANKER ROLE

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## DESCRIPTION

**Basic aircraft** (*fig. 1*)

1. Two basic Valiant aircraft, the B/K Mk. 1 and B/K/PR Mk. 1, incorporate, on construction, all the necessary equipment (less probe) to receive fuel in flight irrespective of the operational role of the aircraft. The probe (Mod. 2012) is fitted when required and is normally to be removed from the air-

craft when not required. In addition, they are provided with fixed equipment which enables the aircraft to accept the removable packages enumerated in para. 11 and with this equipment installed they have an air-to-air tanker role. A full description of the air-to-air refuelling equipment is contained in A.P.4611, Vol. 1 and 6.

2. A number of conversions or adaptations of receiver aircraft are possible, and these are shown in Table 1. The relevant information on the electrical installation is contained in Book 3, Sect. 5, Chap. 9.

**The probe-and-drogue system**

3. The probe-and-drogue system of re-

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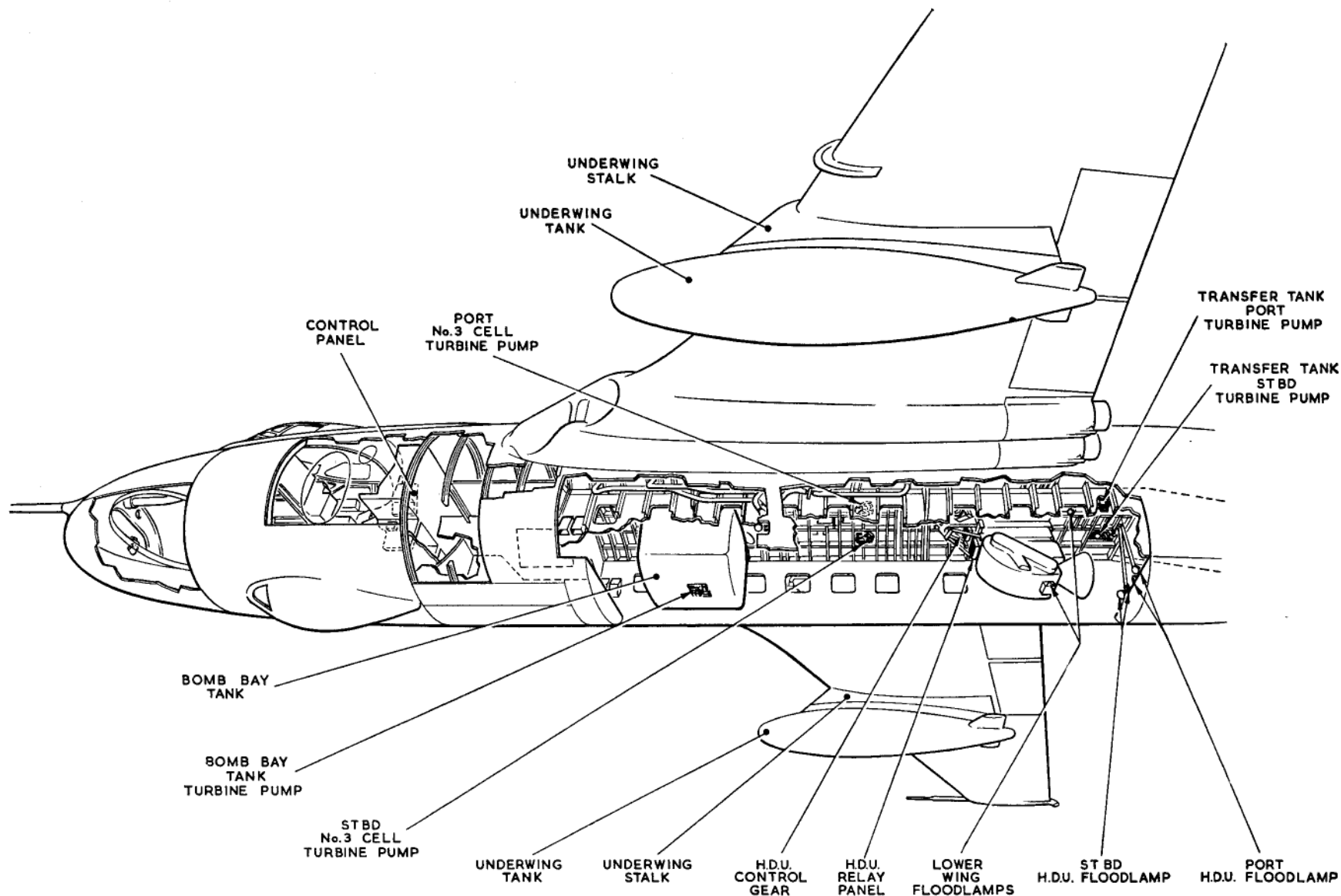


Fig. 1. B/K Mk. 1 aircraft

fuelling in flight is used. The probe consists of a suitable length of fuel pipe encased in a support shroud and mounted on the scanner bonnet in such a position that it is clearly visible to the pilot. The tanker aircraft,

from which fuel is obtained during flight, carries a length of cotton-covered and armoured rubber hose wound on a rotatable hose drum. One end of the hose is connected to the air-to-air transfer fuel

system and the other end is fitted with a reception coupling terminating in a conical metal drogue. ◀Post-Mod. 3053, a Mk. 8A reception coupling replaces the Mk. 6. ▶Prior to contact being made by

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the receiver aircraft, the tanker trails the hose and the drogue then acts as an aiming point for the probe.

4. The drag imparted to the hose and drogue is so great at normal aircraft speeds that, if the hose were permitted to run out freely, damage to both hose and drum would be unavoidable. For this reason the driving mechanism, which incorporates a variable-torque fluid drive coupling the motor to the drum, is designed not only to rotate the drum during winding-in but also to restrain the hose during a trailing operation. The direction of rotation of the motor is such that it always attempts to rotate the drum in the winding-in direction, but an electrically-actuated scoop controlled by the operator enables him to vary the amount of fluid circulating in the fluid drive coupling and in consequence, the amount of torque transmitted to the drum, until the drag load slightly exceeds the winding-in load and the hose then trails to its full length at a reasonable speed. Safety devices incorporated in the mechanism ensure that if the hose run-out speed becomes excessive a brake is immediately and automatically applied.

#### Air-to-air fuel receiving equipment

5. The refuelling probe is fitted, when required, to a faired mounting provided on the scanner bonnet nose and is visible to both pilots. The probe has an independent de-icing and vent system, the fluid tank, pump and vent valve for which are permanently mounted in the aircraft. ◀On aircraft post-Mod. 2994 a Mk. 8 nozzle, without the de-icing facility, replaces the Mk. 6 nozzle and the probe de-icing installation is removed. ▶ The probe feeds the aircraft refuelling circuits via a trifurcated pipe covered by a fairing ducted along the top of the scanner bonnet on the port side, past the pressure cabin. On passing into the service loft, the system again merges into a single pipe. From the service loft the pipe bifurcates into the port and starboard servicing bays, joining the fuselage refuelling circuits. From the servicing bays, pipes run into the main

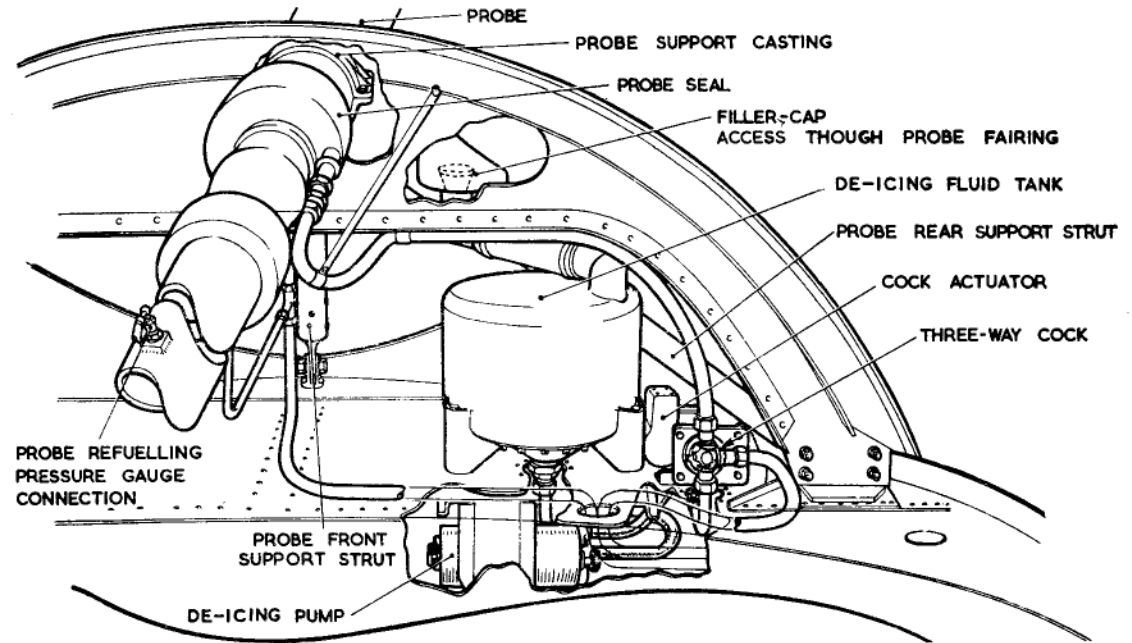


Fig. 2. Refuelling probe de-icing system (pre-Mod. 2994 only)

planes aft of the rear spar where they are ducted under the jet pipes and continue outboard to join the wing defuelling selector valve; the ducts under the jet pipes are fire-proof and drain to the atmosphere. Mod. 2684 introduced a fuel pressure gauge in the probe fuel pipe so that independent indication is given to the receiver pilot that fuel is being received.

6. The controls for air-to-air fuel reception are mounted on the starboard coaming panel and consist of a combined probe de-icing and vent valve switch ◀(pre-Mod. 2994 only), ▶ a refuelling valve selector switch for each tank, and an eleven-lamp TANKS FULL indicator. When ON is selected at a refuelling selector switch, the refuelling valve circuit in the tank selected is energized and the relevant lamp lights in the TANKS FULL indicator. When the tank is full the float switch breaks the circuit to the tank refuelling

valve solenoid, the valve automatically closes and the lamp in the TANKS FULL indicator goes out. When all the tanks have been filled, the selector switches must all be set to OFF; this ensures that when one tank subsequently becomes partially empty the float switch will not complete the circuit to the refuelling valve, and thus prevents feed back of fuel during transfer operations. The bomb-bay and rear fuselage transfer tanks are represented by the same lamp on the indicator, the float switches being wired in parallel. For further details of the fuel system see Sect. 4, Chap. 2.

#### Tanker role fuel tanks

7. In normal conditions, the contents of the four wing tanks, No. 1 and 2 fuselage cells and the reserve tanks, are available for use by the tanker aircraft, the contents of the two underwing, fuselage No. 3, transfer, and bomb bay tanks being reserved for air-to-air

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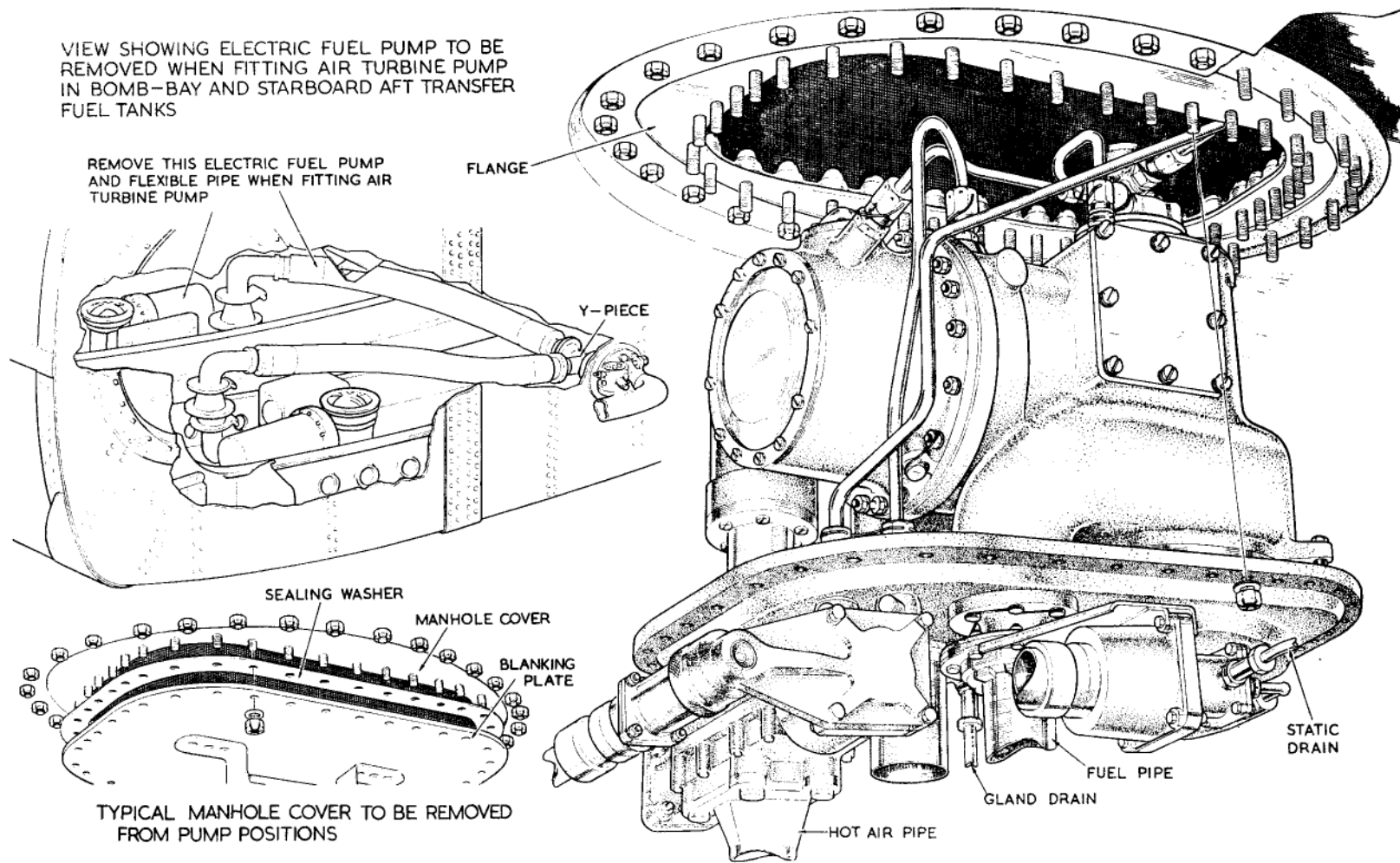


Fig. 3. Fitting the air turbine pumps

refuelling purposes. When transferring fuel from the underwing tanks to a receiver aircraft, the tank pumps, in conjunction with the high-pressure stage of a nitrogen system, will transfer fuel to the collector manifold. If required, the pilot of the tanker aircraft may, by setting the underwing tank switches to MOTOR ON or MOTOR TRIP EMERGENCY ON transfer the fuel in the underwing tanks to his own use.

**Note . . .**

*In the event of the pilot using his underwing tank fuel for operating the tanker aircraft, selection to MOTOR ON switches on the tank pump and supplies fuel to No. 1 and 2 wing tanks. Selection to MOTOR TRIP EMERGENCY ON uses the high-pressure stage of the two-stage nitrogen system to transfer the fuel. THE MOTORS MUST ALWAYS BE*

*TRIPPED AND THE SWITCHES RETURNED TO OFF ON COMPLETION OF THE OPERATION.*

8. Since the fuel in No. 3 fuselage cells is part of the air-to-air transfer fuel in the tanker role, a safety electrical circuit is incorporated which prevents the shut-off valve which stops that fuel being used by the tanker aircraft, being left in the CLOSED posi-

tion after removal of the tanker control panel.

#### Ground refuelling

9. Ground refuelling of both tanker and receiver aircraft is carried out entirely through the port and starboard fuselage connections only, there being no wing refuelling connections. Before commencing ground refuelling operations ensure that the air-to-air refuelling switches on the starboard coaming panel are at OFF. To ensure that the ground refuelling selector switches cannot be left ON an obstruction bar prevents the refuelling access panel from being replaced unless the switches are at OFF. A full descrip-

#### Note . . .

*Mod. 2105, introducing fixing points in the bomb-bay roof, must be incorporated before beginning the conversion.*

11. The conversion to tanker role is effected by the incorporation of the following items:—

- (1) A Mk. 16 hose drum unit package (H.D.U.), which is suspended at the bomb-bay rear end from No. 5 and 6 bomb slips. This unit comprises an air turbine-operated fuel pump, a hose drum operated by an electric motor through a variable-torque coupling and 100 ft. of 3 in. dia. cotton-covered armoured rubber fuel hose terminating with a drogue. The H.D.U. is capable of supplying fuel at up to 500 gallons per minute at 50 lb/in<sup>2</sup>.
- (2) The Operator's control panel (Book 3, Sect. 5, Chap. 9), is mounted on the pressure cabin starboard side, in the same position as that occupied by the camera control panel in P.R. aircraft. This panel has pictorial representations of the aircraft showing fuel gauges for the tanks containing air-to-air transfer fuel, contents gauge change-over switches, fuel pump stop and start push-buttons and indicator lights, to-

gether with the hose drum controls, fuel flowmeter and pressure indicator, and hose footage indicator.

#### Probe de-icing and vent system (fig. 2) ◀pre-Mod. 2994 only▶

10. The refuelling probe de-icing and vent system is self-contained and consists of a one-gallon capacity fluid tank, electrically actuated de-icing pump, electrically actuated three-way cock and suitable pipelines terminating in a jet in the probe nozzle valve assembly. The tank, pump and three-way cock are mounted on the starboard side of the shelf in the radome nose. An access

### CONVERSION TO TANKER

gether with the hose drum controls, fuel flowmeter and pressure indicator, and hose footage indicator.

(3) Four tank packages which are fitted to No. 3 fuselage cell tank doors and the rear fuselage transfer tank. These packages each consist of an air-turbine-operated fuel pump which will supply fuel to the hose drum unit, an air shut-off valve and low-pressure switch.

(4) Removable piping for air, fuel and vent systems.

(5) Two underwing stalks for supporting underwing tanks.

(6) Suspension links for attaching underwing tanks to the underwing stalks.

(7) Two underwing tanks, each containing an electrically-driven fuel pump and a self-contained nitrogen system.

(8) One bomb-bay tank fitted with an air turbine fuel pump, air shut-off valve and low-pressure switch. This tank is suspended in the bomb-bay forward end from lugs in the bomb-bay roof.

#### Preparing the aircraft

12. The basic B/K Mk. 1 aircraft requires no special preparation before installation

panel to the de-icing fluid tank filler neck is provided in the probe fairing. When the probe de-icing switch on the starboard coaming panel is switched ON it starts the pump and operates the cock actuator so that fluid passes to the probe nozzle, emerges from a ball-controlled valve and is spread by air flow over the contact face of the probe. On switching OFF, the pump is stopped and the three-way cock vents the probe system to atmosphere via a vent in the starboard side of the radome. A full description of the de-icing and vent system is contained in Sect. 3, Chap. 9.

of the tanker role packages, other than fitting the underwing stalks (Sect. 3, Chap. 2, Appendix 1) and the underwing fuel tanks (Sect. 4, Chap. 2) On B/K/PR Mk. 1 aircraft equipped for any of the P.R. roles, the following procedure must first be carried out:—

(1) Remove the camera crate, fuselage rear fairing or night flash crate; this is a reversal of the installation operations for these items (Sect. 2, Chap. 5, and its appendices).

(2) Remove the port and starboard oblique cameras and mountings.

(3) Remove the P.R. type deflector, following the procedure for removing the bomber type deflector (Sect. 2, Chap. 5) after first ensuring that the DOOR SAFE and ISOLATION switches are at TRIP and ISOLATE respectively.

(4) Remove the P.R. type bomb doors and ancillary telescopic rods, reversing the procedure detailed in Sect. 2, Chap. 5, ensuring that the special distance pieces fitted on each side of the centre motorized bogies are attached to and remain with the P.R. bomb doors.

(5) Remove the P.R. type rear radius rods and radius-rods fitting from the

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**TABLE 1**  
**Refuelling-in-flight roles**

|     |  |                             |   |   |
|-----|--|-----------------------------|---|---|
| (1) | VALIANT B/K Mk. 1<br>(Receiver)                              | =Basic B Mk. 1              | + Mod. 1161   | Structural alterations and fixed fittings for refuelling in flight (less probe)   |
| (2) | VALIANT B/K Mk. 1<br>(Tanker)                                | =B/K Mk. 1<br>(Receiver)    | + Mod. 2012<br>+ Mod. 527<br>+ Mod. 1345<br>+ Mod. 1512<br>+ Mod. 1513  | Probe.<br>Removable equipment for Tanker role.<br>Standard underwing stalks.<br>Standard underwing tanks.<br>Suspension links for underwing tanks.  |
| (3) | VALIANT B/K/PR Mk. 1<br>(Receiver)<br>Day role<br>Night role | =B/PR Mk. 1                 | + Mod. 1514<br>+ Mod. 197<br>+ Mod. 2012  | Standard bomb-bay tank.<br>Fixed fittings for refuelling in flight (less probe).<br>Probe.  |
| (4) | VALIANT B/K/PR Mk. 1<br>(Tanker)                             | =B/K/PR Mk. 1<br>(Receiver) | + Mod. 527<br>+ Mod. 1345<br>+ Mod. 1512<br>+ Mod. 1513<br>+ Mod. 1514<br>Mod. 1345<br>Mod. 1512<br>Mod. 1513 | Removable equipment for tanker role.<br>Standard underwing stalks.<br>Standard underwing tanks.<br>Suspension links.<br>Standard bomb-bay tank.<br>Standard underwing stalks.<br>Standard underwing tanks.<br>Suspension links. |

The aircraft shown at (1) and (3) can be equipped with underwing fuel tanks for long-range purposes by the addition of:—

rear drag link of No. 6 bomb hoist at Stn: 738·18.

(6) Remove the port and starboard oblique camera windows. Remove the shutter actuators and optical flats and fit the locking bars and blank cover plates, reversing the operations detailed in Sect. 2, Chap. 5.

(7) Store in suitable racks the P.R. type deflector, bomb doors, ancillary telescopic rods, rear radius rods and fitting, and the oblique camera window shutter actuators and optical flats, ensuring that the optical flats are protected from damage or abrasion.

(8) Fit the bomb door rack supports to the port and starboard oblique camera window apertures.

(9) To the supports fitted in operation (8), fit the port and starboard bomb door racks complete with motorized bogies, ensuring that the rack packing shims are replaced in the positions from which they were removed on changing

from bomber to P.R. role (*Sect. 2, Chap. 5*).

(10) Fit the bomber type bomb-bay doors, reversing the procedure described in Sect. 3, Chap. 1.

(11) Fit the bomber type deflector (*Sect. 3, Chap. 1*).

The aircraft is then ready to accept the tanker role packages.

#### **Bomb door and deflector sequence**

**13.** The action of the bomb doors and deflector on B/K Mk. 1 and B/K/PR Mk. 1 aircraft in the tanker role differs from the bomber role in that the doors are interlocked with the H.D.U.; the refuelling hose cannot be trailed until the bomb doors are opened. A MASTER CLOSE relay is brought into circuit automatically on fitting and connecting the operator's control panel; this relay ensures that the bomb doors cannot close until the refuelling hose is in the fully-stowed position on the hose drum unit. Refer to Book 3, Sect. 5, Chap. 9.

#### **FITTING THE TANKER PACKAGES**

**14.** The following packages must be fitted:—

(1) Air turbine pumps in No. 3 and transfer tank cells, H-beam and hose drum unit, bomb-bay fairing, bomb-bay fuel tank, control panel, deflector assembly and removable piping in the bomb bay.

(2) When fitting the brackets, supports and removable piping on the bomb-bay roof, refer to fig. 6 and 7 for location and list of items.

#### **Bomb-bay tank and vent system piping**

**15.** The installation of this tank and vent system is described in Sect. 4, Chap. 2.

#### **Air turbine pumps (fig. 3)**

**16.** Air turbine pumps must be fitted to the bomb bay, transfer and No. 3 fuselage tanks, referring to Table 2 for the various items.

#### **Bomb-bay tank**

**17.** To fit the air turbine pump proceed as follows:—

(1) Drain the unusable fuel from the bomb-bay tank.

(2) Remove the tank manhole cover to gain access to the forward fuel pump and piping.

(3) Uncouple the flexible fuel pipe at the Y-piece at the tank rear wall and fit a blanking plate (*item 3*).

(4) Remove the bolts securing the adapter plate, the sealing washer and the pump to the structure (*items 1, 2 and 4*).

(5) Carefully withdraw the pump from its mounting.

(6) (*Pre-Mod. 2473 aircraft only*). Remove the blanking plate (*item 6*) and the sealing washer (*item 2*) from the forward fuel pump position.

(7) Position the air turbine pump (*item 7*) to the mounting flange, ensuring that the RED ARROWS on the pump and pump surround are in alignment. Ensure that the pump seal is seated in the groove before securing the assembly with the bolts removed in operation (4).

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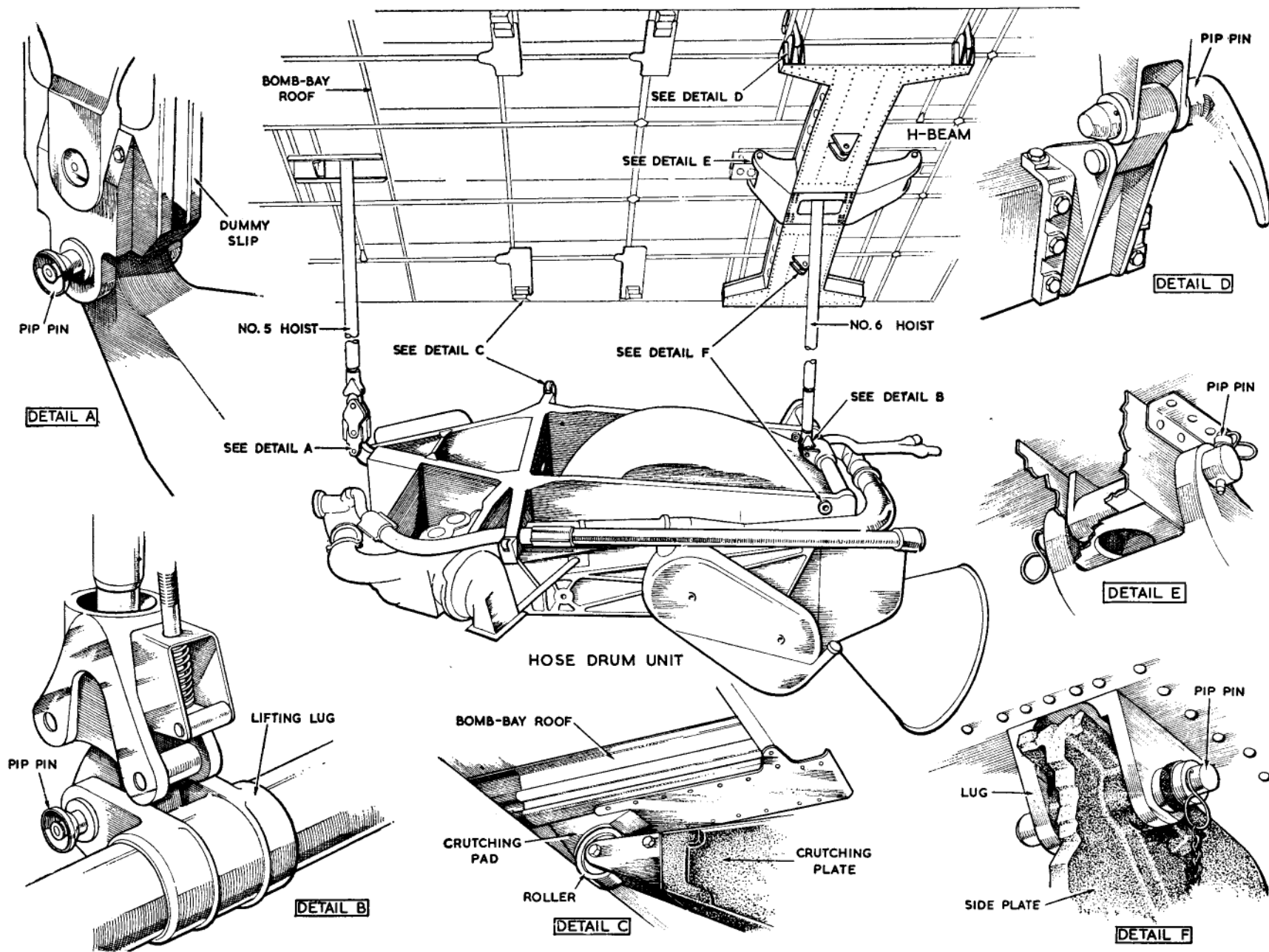


Fig. 4. Fitting the H-beam and hose drum unit  
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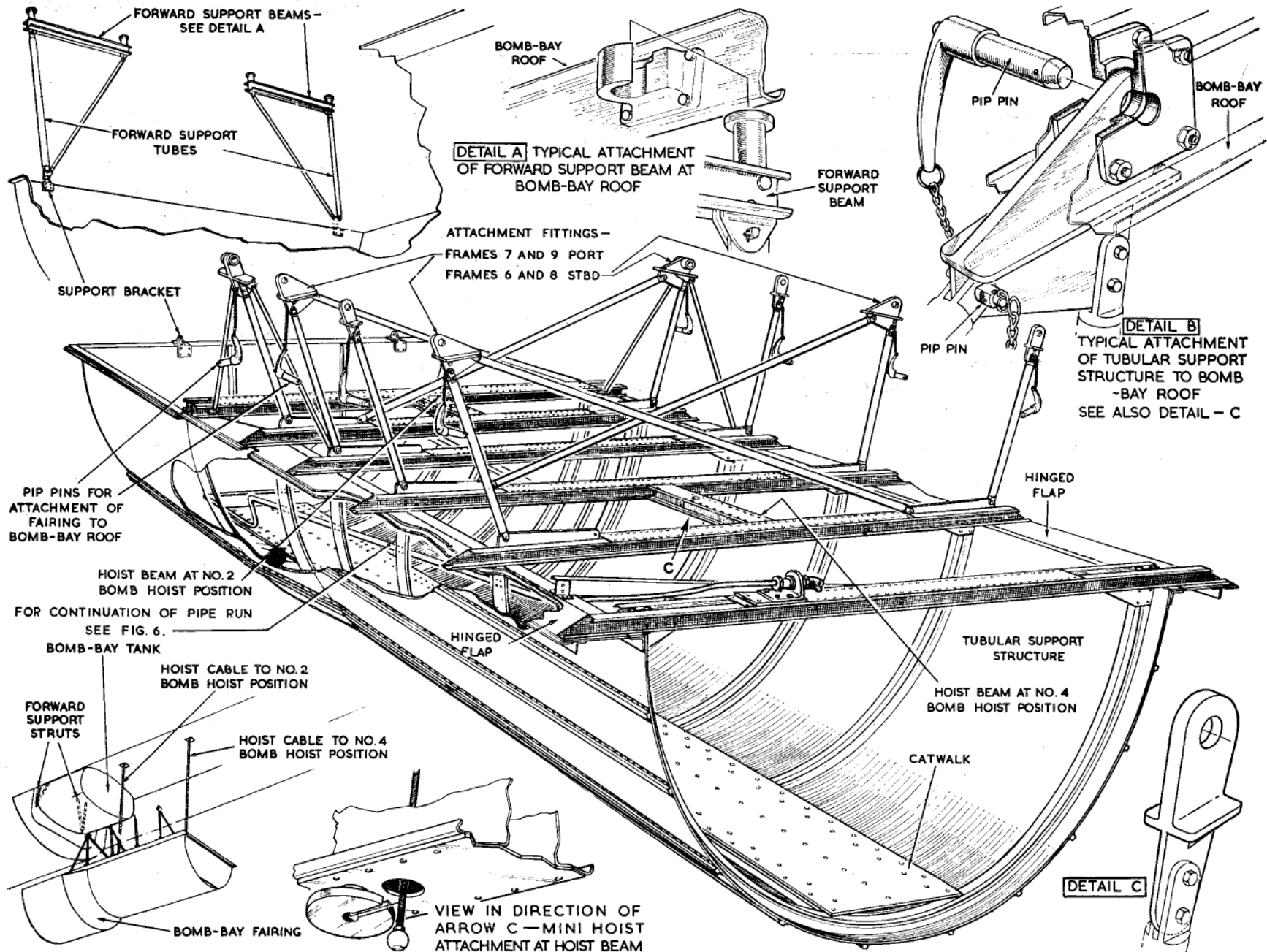


Fig. 5. Bomb-bay fairing

(Pipe run continuation has been added)

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- (8) When fitting the air turbine pump refit the bracket (item 5).

*No. 3 fuselage tank cells*

**18.** To fit the air turbine pumps proceed as follows :—

- (1) Ensure that all fuel is drained from the tank cells.
- (2) Remove the blanking plate (item 6) and the sealing washer (item 2) from the pump position, and store.
- (3) Position the air turbine pump (item 8) to the mounting flange so that the RED ARROWS on the pump and pump surround are in alignment.
- (4) Secure the pump to the mounting flange, using the stiffnuts and washers removed in operation (2).

*Transfer tank*

**19.** To fit the air turbine pumps proceed as follows :—

**Note . . .**

*The method of installing the air turbine pump (item 9) in the starboard transfer tank cell (pre-Mod. 2443) and in the port transfer tank cell is the same as that for No. 3 fuselage tank cells (para. 18). On aircraft post-Mod. 2443, remove the pump mounting plate 73344 Sht. 9 and use the mounting plate 73344 Sht. 7 and stud ring 73344-9.*

- (1) Remove the stiffnuts securing the electric pump (item 4) and carefully lower the pump until access can be gained to the flexible pipe coupling on the pump.
- (2) Disconnect the flexible pipe (item 10) and remove the pump.
- (3) Remove the manhole cover and enter the tank (see Sect. 4, Chap. 2, Appendix 2 for notes on precautions to be taken when working in a fuel tank).
- (4) Disconnect the flexible pipe (item 10) from the T-piece (item 11).

- (5) Fit a blanking-plate (item 3) to the T-piece.

(6) Fit the air turbine pump, adopting the same procedure as for No. 3 fuselage tank cells (para. 18).

**Hose drum unit and H-beam (fig. 4)**

**20.** Remove the H-beam from the hose drum unit and fit the two components to the aircraft in the following sequence :—

*H-beam*

- 21.** (1) Remove No. 5 and No. 6 bomb hoist covers.
- (2) Remove the H-beam from the hose drum unit by withdrawing the pip-pins from the hose drum unit side plates (detail F).
- (3) Manhandle the hoist beam into the bomb-bay under No. 6 hoist, ensuring that the arrow on the hoist beam faces forward.
- (4) Lift the hoist beam, one side at a time, to the bomb-bay roof, and attach to the roof structure with the six pip-pins provided (details D and E). When assembling the four pip-pins (detail D), a fore-and-aft float of 0.3 in. is permissible in the beam attachments.
- (5) Check that the conduits in the bomb-bay roof are cut back 22 in. to clear the hose drum unit.

*Hose drum unit*

- 22.** (1) Lower the load-retaining mechanism complete with the long lifting eye assembly into No. 6 hoist tunnel. Ensure that the assembly rests on the spigots in the hoist beam, this being determined from the underside of the hoist beam.
- (2) Lower the load-retaining mechanism short lifting eye assembly, short eye piece and dummy slip into No. 5 hoist tunnel. Ensure that the assembly rests on the spigots in the bomb slip housing.

(3) Fit the lifting rod, torque tube and compression tube to both hoist tunnels as detailed in A.P. 1664D, Vol. 1, Part 1, Sect. 2, Chap. 9.

(4) Couple the above items (1) and (2) to two hoisting cranes (Ref. No. 16A/1931 or 16A/2303).

(5) With the hose drum unit mounted on its servicing trolley, operate the lowering mechanism to position the hose drum unit as low as possible.

(6) Wheel the trolley into the bomb bay and position the forward lifting lug under No. 5 hoist.

(7) Operate the gantries, lowering the dummy slip at hoist No. 5 and the eye-bolt at hoist No. 6, down to the hose drum unit.

(8) Attach the dummy slip at hoist No. 5 to the lifting eye on the hose drum unit with the pip-pin provided (detail A).

(9) Attach the eye-bolt at hoist No. 6 to the lifting lug on the rear of the hose drum unit.

(10) Remove the pip-pins from the lugs on the underside of the H-beam (detail F).

(11) Decrease pressure on the gantry to zero, then increase until sufficient pressure is reached to lift the hose drum unit.

(12) Operate both the gantries, hoisting the hose drum unit into position with the rear end slightly higher than the forward end. Decrease the hoisting speed as the rear end approaches the H-beam, guide the hose drum unit side plates into the lugs on the underside of the H-beam (detail F).

(13) Fit the pip-pins securing the side plates to the H-beam lugs (detail F).

(14) Slacken off and disengage the gantry at No. 6 hoist.

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(15) Remove the lifting rod, torque tube and compression tube from the aircraft and replace the hoist cover.

(16) Continue hoisting with the forward gantry until the crutching plate rollers engage the crutching pads on the bomb bay roof (detail C).

(17) Pre-set the pressure to  $600 \pm 30$  lb/in<sup>2</sup> on the gantry pressure gauge on crane 16A/1931 or 456 lb/in<sup>2</sup> on crane 16A/2303.

(18) Pre-tension the hose drum unit to the figure given in operation (17).

**Note . . .**

*When a new hose drum unit is first fitted to an aircraft it must be again pre-tensioned after 12 hours.*

(19) Tighten the securing nut on to the pawls then remove the gantry and replace the hoist covers.

#### **Bomb bay fairing (fig. 5)**

**Note . . .**

*Post-Mod. 3065B, this fairing (Sect. 2, Chap. 7, para. 42) is modified to serve also as a 1000 lb pannier for the carriage of spares and equipment ◀ or, post-Mod. 3065A, replaced by a 4000 lb pannier and separate bomb-bay fuel tank fairing. ▶*

**23.** The bomb-bay fairing straightens out the airflow when the bomb-bay doors are open, smoothing the flow around the hose drum unit and eliminating turbulence and vibration.

**24.** It is a semi-cylindrical light alloy structure extending from the bomb-bay forward end to mid-way between No. 4 and 5 bomb hoist positions, suitably shaped at its forward end to enclose the bomb-bay fuel tank. Built around ten semicircular frames the forward end is closed by a bulkhead, the rear end being open. Frames No. 5 to 10 are bridged by transverse beams which carry the fittings for the tubular support struts. Attachment at the forward end is provided by special support tubes, the lower ends being attached by pip-pins to brackets at the bulk-

head frame and the upper ends secured by special fittings to a beam in the roof. All struts supporting the fairing are attached by pip-pins to the fairing and the bomb rack attachment points for ease of assembly and removal, the holes in the upper attachment plates at frames No. 6 and 8, port, and No. 7 and 9, starboard, being slightly elongated to facilitate assembly and alignment. The pip-pins are secured to the support structure by lengths of chandelier chain. Hoist beams are fitted centrally between No. 5 and 6, and No. 8 and 9 transverse beams, and in conjunction with Mini-hoists used at No. 2 and 4 bomb hoist positions, provide an alternative means of raising or lowering the fairing.

**25.** A catwalk is fitted at the base and throughout the length of the fairing to provide servicing access to those components that would be inaccessible with the fairing assembled. A drain hole is provided in each panel along the fairing centre line, below the catwalk.

**26.** To fit the fairing to the aircraft, proceed as follows:—

(1) Assemble the front support struts to the roof beam.

(2) Assemble the rear tubular support struts to the bomb rack attachment points and secure by pip-pins.

(3) Lift the fairing into position either manually or by means of the Mini-hoists, and attach it to the lower ends of the support struts by means of pip-pins.

**Note . . .**

*When using Mini-hoists they are positioned above No. 2 and 4 bomb-hoists; pay out the hoist cables through the aircraft centre beam and down through the hoist beam fairing positioned below them. Assemble the slotted hoisting discs over the cables, ensuring that the nipples bed securely and hoist evenly.*

(4) Assemble the side braces at frame No. 6, the lower ends of the braces be-

ing secured at frame No. 5 and 7 to give longitudinal rigidity. All joints are made by pip-pins.

(5) Assemble the diagonal bracing struts at frames No. 6 to 9 and secure with pip-pins. These are fitted at the top port and bottom starboard at frames No. 7 and 9, and the reverse at frames No. 6 and 8.

#### **Hose drum unit deflector**

**27.** (1) Bolt the deflector support struts to the deflector side members.

(2) Position the deflector so that attachment by pip-pins can be made to the hose drum unit side plates.

(3) Raise the deflector until the support struts can be located in the roof fittings and secured by pip-pins.

#### **External lightning (Mod. 2590 and 2588, tanker aircraft only)**

**28.** To assist the pilot of the receiver aircraft to refuel at night the following system of external lighting is installed on the tanker aircraft. During the refuelling operation the tail navigation lamps are switched OFF. The tail navigation lamps ON/OFF switch is on the starboard coaming panel (Mod. 2638).

(1) A flood lamp attached to adjustable brackets bolted to each bomb-bay door rear radius rod is directed forward on to the drum of the hose drum unit.

(2) Two flood lamps, one each side of the rear fuselage, are directed on to the underside of each main plane.

(3) A flashing beacon is secured by three anti-vibration mountings to the tail cone aft of the rudder.

(4) Two forward-facing flood lamps are immediately aft of the probe on the scanner bonnet. These flood lamps are directed on to the tip of the probe. Each lamp is faired by a cowling.

**Note . . .**

*For the disposition of these lamps, see Book 3, Sect. 5, Chap. 9, Group 4, fig. 1 and 2.*

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**TABLE 2**  
**Pump Components**

| <i>Item</i> | <i>Ref. No.</i> | <i>Part No.</i>   | <i>Description</i> | <i>Location</i>  |
|-------------|-----------------|-------------------|--------------------|--|
| 1           | 26SR/—          | 71079-3881        | Adapter plate      | Electric fuel pump   |
| 2           | 26SR/11006      | 73344-5           | Sealing washer     | Electric fuel pump   |
| 3           | 26SR/8466       | 71079-755         | Blanking plate     | Y-piece  |
| 4           | —               | S.P.E. 1207 Mk. 1 | Electric fuel pump | Forward pump in the bomb-bay tank<br>and in the stbd. transfer tank cell |
| 5           | 26SR/—          | 71079-3571        | Bracket            | Forward pump position  |
| 6           | 26SR/11631      | 73344-3           | Blanking plate     |  |
| 7           | 27F/—           | E.4004007         | Air turbine pump   | Bomb-bay tank  |
| 8           | 27F/—           | E.4004006         | Air turbine pump   | No. 3 tank cells   |
| 9           | 27F/—           | E.4004004         | Air turbine pump   | Transfer tank cells  |
| 10          | 26SR/12745      | 73345 Sht. 33     | Flexible pipe      | } Starboard transfer tank cell   |
| 11          | 26SR/12746      | 73345 Sht. 31     | T-piece            |  |

**TABLE 3**  
**Test equipment**

| <i>Item</i> | <i>Part No.</i> | <i>Description</i>    | <i>Remarks</i>             |
|-------------|-----------------|-----------------------|----------------------------|
| 1           | 73379 Sht. 411  | Blast cooling adapter | U/W tank cooling air inlet |

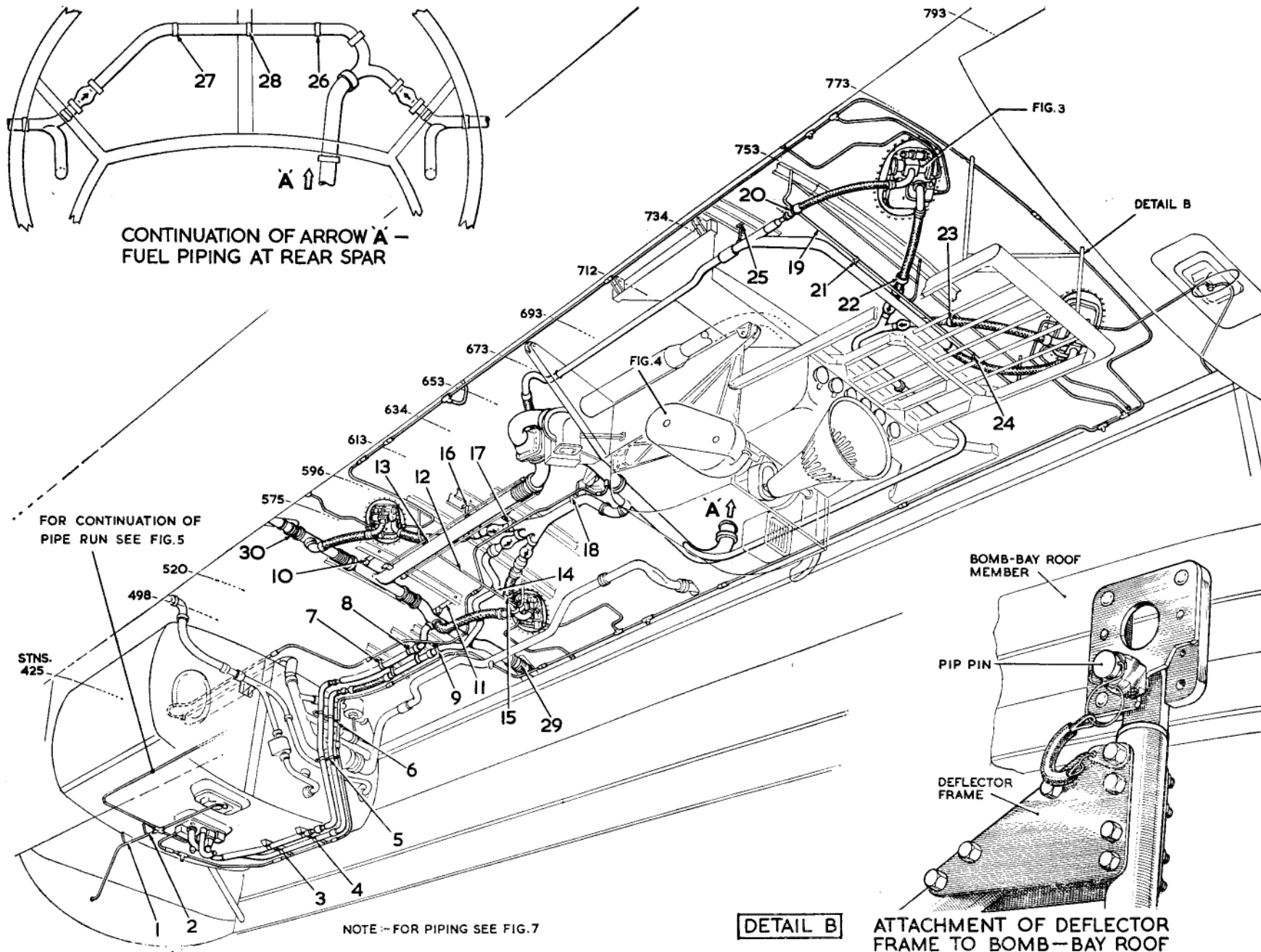


Fig. 6. Location of pipe brackets and supports on bomb-bay roof

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## KEY TO FIG. 6. Location of pipe brackets and supports

| Item | Part No.    | Description     | No. off | Item | Part No.      | Description      | No. off |
|------|-------------|-----------------|---------|------|---------------|------------------|---------|
| 1    | 71079-3495  | Bracket         | 1       | 10   | 73382 Sht. 13 | Air duct support | 2       |
| 2    | 71079-3497  | Bracket         | 1       |      | A25 8E        | Bolt             | 2       |
| 3    | 71079-3139  | Half clamp      | 1       |      | A24 EP        | Nut              | 2       |
|      | A25-1C      | Bolt            | 3       |      | SP47E         | Spring washer    | 2       |
| 4    | 71079-3139  | Half clamp      | 1       | 11   | 73382 Sht. 13 | Air duct support | 2       |
|      | A25-1C      | Bolt            | 3       |      | A25 8E        | Bolt             | 2       |
| 5    | 71079-3139  | Half clamp      | 1       |      | A24 EP        | Nut              | 2       |
|      | 71079-3329  | Half clamp      | 1       |      | SP 47E        | Spring washer    | 2       |
|      | 71079-3331  | Support bracket | 1       | 12   | 73379-215     | Support          | 1       |
|      | AS487 12    | Half clamp      | 1       |      | A25-8C        | Bolt             | 4       |
|      | A25 6C      | Bolt            | 2       | 13   | 73379-221     | Clip             | 1       |
|      | A25 14C     | Bolt            | 3       |      | A25 10B       | Bolt             | 2       |
|      | AGS.2001 C2 | Stiffnut        | 5       |      | SP 15B        | Washer           | 2       |
| 6    | 71079-3139  | Half clamp      | 1       |      | AGS.2001 B2   | Nut              | 2       |
|      | 71079-3329  | Half clamp      | 1       |      | A27 EP        | Nut              | 2       |
|      | 71079-3333  | Support bracket | 1       |      | SP 47E        | Spring washer    | 2       |
|      | AS.487 18   | Half clamp      | 1       | 14   | 73379-265     | Clip             | 1       |
|      | A25 6C      | Bolt            | 2       |      | AS490 12      | Half clamp       | 1       |
|      | A25 14C     | Bolt            | 3       |      | A25 8C        | Bolt             | 2       |
|      | A25 5C      | Bolt            | 2       |      | SP 15C        | Washer           | 2       |
|      | AGS.2001 C2 | Stiffnuts       | 7       |      | AGS.2001 C2   | Nut              | 2       |
| 7    | 73379-241   | Bracket         | 1       |      | A27 EP        | Nut              | 2       |
|      | A25 1C      | Bolt            | 4       |      | SP47E         | Spring washer    | 2       |
|      | 71079-3329  | Half clamp      | 1       | 15   | 73379-221     | Clip             | 1       |
|      | 71079-3139  | Half clamp      | 1       |      | A25 10B       | Bolt             | 2       |
|      | A25 15C     | Bolt            | 3       |      | SP 15B        | Washer           | 2       |
|      | A25 6C      | Bolt            | 4       |      | AGS.2001 B2   | Nut              | 2       |
|      | A24 CP      | Nut             | 7       |      | A27 EP        | Nut              | 2       |
|      | SP47C       | Spring washer   | 7       |      | SP47E         | Spring washer    | 2       |
| 8    | 73379-243   | Bracket         | 1       | 16   | 73327-73      | Brace            | 1       |
|      | A25 1C      | Bolt            | 4       |      | A25 1C        | Bolt             | 2       |
|      | 71079-3329  | Half clamp      | 1       |      | SP47C         | Spring washer    | 2       |
|      | 71079-3139  | Half clamp      | 1       |      | 73382 Sht. 15 | Duct support     | 1       |
|      | A25 15C     | Bolt            | 3       |      | A25 5C        | Bolt             | 1       |
|      | A25 6C      | Bolt            | 4       |      | A24 CP        | Nut              | 1       |
|      | A24 CP      | Nut             | 7       |      | SP 47C        | Spring washer    | 1       |
|      | SP 47C      | Spring washer   | 7       |      | A25 8E        | Bolt             | 1       |
| 9    | 73379-261   | Bracket         | 1       |      | A24 EP        | Nut              | 1       |
|      | AS490 12    | Half clamp      | 1       |      | SP 47E        | Spring washer    | 1       |
|      | AGS.2001 C2 | Stiffnuts       | 2       |      |               |                  |         |
|      | A25 8C      | Bolt            | 2       |      |               |                  |         |
|      | A25 1C      | Bolt            | 4       |      |               |                  |         |
|      | SP13C       | Plain washer    | 4       |      |               |                  |         |

KEY TO FIG. 6. Location of pipe brackets and supports—continued

| Item      | Part No.      | Description   | No. off       | Item        | Part No.      | Description   | No. off       |               |         |   |
|-----------|---------------|---------------|---------------|-------------|---------------|---------------|---------------|---------------|---------|---|
| 17        | 73379-211     | Bracket       | 1             | 24          | 73379-219     | Clip          | 2             |               |         |   |
|           | A25 1C        | Bolt          | 6             |             | 73379-217     | Special clip  | 2             |               |         |   |
|           | SP 47C        | Spring washer | 6             |             | A25 7C        | Bolt          | 2             |               |         |   |
|           | 73379-212     | Bracket       | 1             |             | SP 13C        | Washer        | 2             |               |         |   |
|           | A25 1C        | Bolt          | 6             |             | AGS.2001 C2   | Stiffnut      | 2             |               |         |   |
|           | SP 47C        | Spring washer | 6             |             | A24 EP        | Nut           | 2             |               |         |   |
|           | 73379-201     | Clip          | 3             |             | SP 47E        | Spring washer | 2             |               |         |   |
|           | A25 9C        | Bolt          | 6             |             | 73379-221     | Clip bracket  | 1             |               |         |   |
|           | SP47C         | Spring washer | 6             |             | A25 10B       | Bolt          | 2             |               |         |   |
|           | 73379-203     | Saddle        | 3             |             | SP 47B        | Spring washer | 2             |               |         |   |
|           | 18            | 73379-207     | Bracket       |             | 1             | A24 BP        | Nut           | 2             |         |   |
|           |               | 73379-213     | Fixing plate  |             | 1             | 73379-233     | Clip          | 1             |         |   |
|           |               | A25 1C        | Bolt          |             | 3             | 73379-227     | Special clip  | 1             |         |   |
| SP47C     |               | Spring washer | 3             | A25 7C      | Bolt          | 2             |               |               |         |   |
| 73379-205 |               | Saddle        | 1             | SP 13C      | Washer        | 2             |               |               |         |   |
| AS489 20  |               | Clip          | 1             | AGS.2001 CZ | Stiffnut      | 2             |               |               |         |   |
| A25 9C    |               | Bolt          | 2             | A24 EP      | Nut           | 2             |               |               |         |   |
| SP47C     |               | Spring washer | 2             | SP47E       | Spring washer | 2             |               |               |         |   |
| 19        |               | 73379-231     | Support       | 1           | 25            | 73379-239     | Support       | 1             |         |   |
|           |               | A25 8E        | Bolt          | 6           |               | A25 1C        | Bolt          | 4             |         |   |
| 20        | 73379-221     | Bracket       | 1             | 26          | A24 CP        | Nut           | 1             |               |         |   |
|           | A25 10B       | Bolt          | 2             |             | SP 47C        | Spring washer | 1             |               |         |   |
|           | SP47B         | Spring washer | 2             |             | A25 10C       | Bolt          | 1             |               |         |   |
|           | A24 BP        | Nut           | 2             |             | 27            | 73345-175     | Bracket       | 1             |         |   |
|           | 73379-233     | Clip          | 1             |             |               | 73345-317     | Bracket       | 1             |         |   |
|           | 73379-227     | Special clip  | 1             |             |               | A25 1C        | Bolt          | 2             |         |   |
|           | A25 7C        | Bolt          | 2             |             |               | A25 8C        | Bolt          | 2             |         |   |
|           | SP13C         | Washer        | 2             |             |               | AS 490/24     | Half clamp    | 1             |         |   |
|           | AGS.2001 C2   | Stiffnut      | 2             |             |               | AGS.2001/C2   | Stiffnut      | 2             |         |   |
|           | A24 EP        | Nut           | 2             |             |               | SP 47C        | Spring washer | 2             |         |   |
|           | SP47E         | Spring washer | 2             |             |               | A24 CP        | Nut           | 2             |         |   |
|           | 21            | 73379-221     | Clip bracket  |             |               | 1             | 28            | 73345-177     | Bracket | 1 |
|           |               | A25 10B       | Bolt          |             |               | 2             |               | A25 1C        | Bolt    | 2 |
|           |               | SP47B         | Spring washer |             | 2             | SP47C         |               | Spring washer | 2       |   |
| A24 BP    |               | Nut           | 2             | A24 CP      | Nut           | 2             |               |               |         |   |
| 22        | 73379-221     | Clip bracket  | 1             | 73345-317   | Bracket       | 1             |               |               |         |   |
|           | A25 10B       | Bolt          | 2             | AS 490/24   | Half clamp    | 1             |               |               |         |   |
|           | SP 47B        | Spring washer | 2             | A25 8C      | Bolt          | 2             |               |               |         |   |
|           | A24 BP        | Nut           | 2             | AGS.2001 C2 | Stiffnut      | 2             |               |               |         |   |
|           | 73379-219     | Clip          | 1             | 29          | 73345-195     | Bracket       | 1             |               |         |   |
|           | 73379-217     | Special clip  | 1             |             | 73345-317     | Bracket       | 1             |               |         |   |
|           | A25 7C        | Bolt          | 2             |             | A25 1C        | Bolt          | 2             |               |         |   |
|           | SP 13C        | Washer        | 2             |             | A25 8C        | Bolt          | 2             |               |         |   |
|           | AGS.2001 C2   | Stiffnut      | 2             |             | A24 CP        | Nut           | 2             |               |         |   |
|           | A24 EP        | Nut           | 2             |             | AS490/24      | Half clamp    | 1             |               |         |   |
| SP 47E    | Spring washer | 2             | AGS.2001 C2   |             | Stiffnut      | 2             |               |               |         |   |
| 23        | 73379-221     | Clip bracket  | 1             |             | 30            | SP 47C        | Spring washer | 2             |         |   |
|           | A25 10B       | Bolt          | 2             |             |               | VGS6318/12    | Pipe clamp    | 2             |         |   |
|           | SP 47B        | Spring washer | 2             |             |               | VGS6318/12    | Pipe clamp    | 2             |         |   |
|           | A24 BP        | Nut           | 2             |             |               |               |               |               |         |   |

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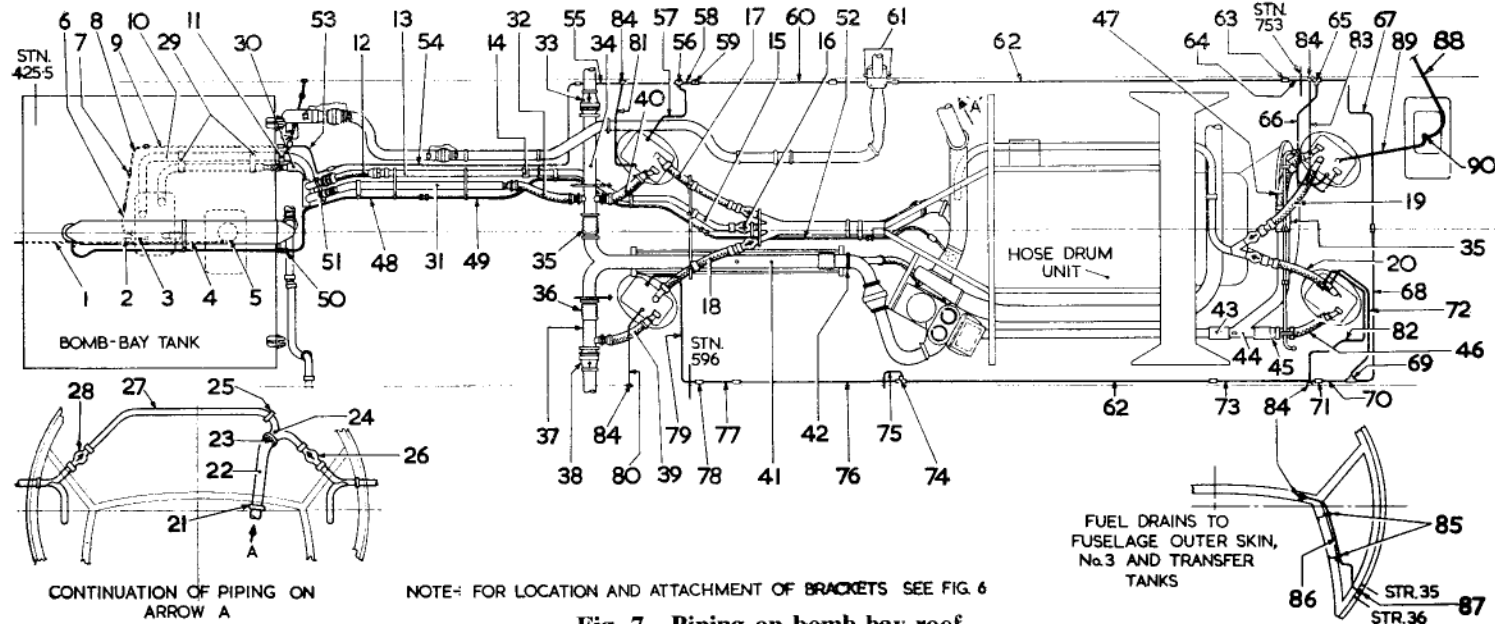


Fig. 7. Piping on bomb-bay roof

KEY TO FIG. 7. Piping on bomb-bay roof

| Item | Part No.               | Description      | No. off | Item | Part No.      | Description   | No. off |
|------|------------------------|------------------|---------|------|---------------|---------------|---------|
| 1    | 71079-Sht. 519         | Gland drain pipe | 1       | 5    | AGS.1135-A    | Banjo bolt    | 1       |
| 2    | ◀ 21250-101            | 4-way piece ▶    | 1       |      | AGS.1186-A    | Washer        | 2       |
|      | AGS.1140B              | Blanking nipple  | 1       | 6    | 73387-34/1    | Pipe          | 1       |
|      | AGS.904B               | Outer sleeve     | 1       |      | AGS.1142-B    | Nipple        | 1       |
|      | SP9-C6                 | Split pin        | 1       |      | AGS.1107-A    | Coupling      | 1       |
| 3    | Remove the following:— |                  |         | 7    | A5680-Sht. 1  | Static drain  | 1       |
|      | AGS.1140B              | Nipple plug      | 1       |      | 73387-34/3    | Pipe          | 1       |
|      | AGS.904B               | Nut              | 1       | 8    | 73387-34/5    | Pipe          | 1       |
|      | SP9-C6                 | Split pin        | 1       |      | AGS.1142-B    | Nipple        | 1       |
|      | Fit the following:—    |                  |         |      | AGS.1170-B    | Nipple        | 1       |
|      | 73387-45/5             | Pipe             | 1       | 9    | 73387-34/5    | Pipe          | 1       |
|      | AGS.1186B              | Washer           | 2       |      | AGS.1170-B    | Nipple        | 3       |
|      | AGS.1135B              | Banjo bolt       | 1       | 10   | 71079-335     | Fuel pipe     | 1       |
|      | AGS.1142B              | Nipple           | 1       | 11   | FRS.110K      | Coupling      | 1       |
|      | VGS.1418/2             | Elbow            | 1       |      | 71079-337     | Pipe          | 1       |
| 4    | 73387-45/7             | Pipe             | 1       | 12   | FRS.110K      | Coupling      | 2       |
|      | AGS.1142B              | Nipple           | 1       |      | 73379-Sht. 53 | Flexible pipe | 1       |

**KEY TO FIG. 7. Piping on bomb-bay roof—continued**

| <i>Item</i>   | <i>Part No.</i> | <i>Description</i>              | <i>No. off</i> | <i>Item</i>   | <i>Part No.</i>    | <i>Description</i>               | <i>No. off</i> |
|---|-----------------|---------------------------------|----------------|---|--------------------|----------------------------------|----------------|
| 13  | 73379-259       | Pipe                            | 1              | <i>Before fitting items 33, remove and store blanking cap 73382-9</i> |                    |                                  |                |
|   | FRS.110K        | Coupling                        | 1              | 33  | 73379-103          | Coupling                         | 1              |
| 14  | 73379-257       | Pipe                            | 1              |   | A.5520-Sht. 5      | Non-return valve                 | 1              |
|   | FRS.110K        | Coupling                        | 1              |   | VGS.6286-Sht. 3/12 | Sealing ring                     | 2              |
| 15  | 73379-257       | Pipe                            | 1              | 34  | 73379-105          | Air duct                         | 1              |
|   | FRS.110K        | Coupling                        | 1              | 35  | 73379-Sht. 93      | Expansion joint                  | 1              |
| 16  | F.R.501008      | 3-way non-return valve assembly | 1              |   | VGS.6318/12        | Clamp                            | 2              |
|   | FRS.325P        | Coupling                        | 1              |   | VGS.6286-Sht. 3/12 | Sealing ring                     | 2              |
| 17  | 73379-Sht. 47   | Flexible pipe                   | 1              | 36  | VGS.6318/12        | Clamp                            | 1              |
|   | FRS.110K        | Coupling                        | 1              |   | VGS.6286-Sht. 3/12 | Sealing ring                     | 1              |
| 18  | 73379-Sht. 47   | Flexible pipe                   | 1              | 37  | 73379-Sht. 13      | Hot air duct and expansion joint | 1              |
|   | FRS.110K        | Coupling                        | 1              | 38  | 73379-103          | Coupling                         | 1              |
| 19  | 73379-Sht. 47   | Flexible pipe                   | 1              |   | VGS.6318/12        | Clamp                            | 2              |
| 20  | 73379-Sht. 47   | Flexible pipe                   | 1              |   | VGS.6286-Sht. 3/12 | Sealing ring                     | 2              |
| 21  | FRS.325V        | Flight refuelling coupling      | 1              |   | A.5520-Sht. 5      | Non-return valve                 | 1              |
| 22  | 73345-375       | Pipe                            | 1              | 39  | 73379-Sht. 21      | Flexible pipe                    | 1              |
| 23  | FRS.325V        | Flight refuelling coupling      | 1              |   | A25-2E             | Bolt                             | 4              |
| 24  | 73345-205       | Pipe                            | 1              | 40  | 73379-Sht. 21      | Flexible pipe                    | 1              |
| 25  | FRS.325R        | Flight refuelling coupling      | 1              |   | A25-2E             | Bolt                             | 4              |
| 26  | B.9807105-9     | Non-return valve                | 1              | 41  | 73379-Sht. 27      | 3 in. Main duct                  | 1              |
|   | FRS.325R        | Flight refuelling coupling      | 2              | 42  | VGS.6318/12        | Pipe clamp                       | 1              |
| 27  | 73345-209       | Pipe                            | 1              |   | VGS.6286-Sht. 3/12 | Sealing ring                     | 1              |
| 28  | B.9807105-9     | Non-return valve                | 1              | 43  | 73379-229          | Pipe joint shield                | 1              |
|   | FRS.325R        | Flight refuelling coupling      | 2              | 44  | 73379-237          | Hot air pipe                     | 1              |
| 29  | 71079-3139      | Half clamp                      | 2              | 45  | 73379-229          | Pipe joint shield                | 1              |
|   | AGS.2001-C2     | Stiffnut                        | 3              | 46  | 73379-Sht. 21      | Flexible pipe                    | 1              |
|   | A.25-1C         | Bolt                            | 3              |   | A25-2E             | Bolt                             | 4              |
| 30  | 71079-3401      | Hot air pipe                    | 1              | 47  | 73379-Sht. 21      | Flexible pipe                    | 1              |
| 31  | 73379-247       | Hot air pipe                    | 1              |   | A25-2E             | Bolt                             | 4              |
| 32  | 70637-5         | Flexible pipe                   | 1              | 50  | 73379-253          | Pipe                             | 1              |
| <i>Before fitting 73379-251, remove and store the following:—</i> |                 |                                 |                |   |                    |                                  |                |
|   |                 |                                 |                | 48  | AGS.1140D          | Blanking nipple                  | 1              |
|   |                 |                                 |                |   | AGS.904-D          | Coupling sleeve                  | 1              |
|   |                 |                                 |                | 49  | 73379-251          | Pipe                             | 1              |
|   |                 |                                 |                |   | AGS.1170-D         | Nipple                           | 1              |
|   |                 |                                 |                |   | AGS.1142-D         | Nipple                           | 1              |

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## KEY TO FIG. 7. Piping on bomb-bay roof—continued

| Item | Part No.      | Description | No. off | Item | Part No.   | Description            | No. off |
|------|---------------|-------------|---------|------|--|------------------------|---------|
| 51   | 71079-3139    | Half clamp  | 2       | 77   | 73387-34/3   | Pipe                   | 1       |
|      | AGS.2001-C2   | Stiffnuts   | 3       |      | AGS.1170-B   | Nipple                 | 1       |
|      | A25-1C        | Bolt        | 3       | 78   | AGS.1107-A   | Coupling               | 1       |
| 52   | 73379-255     | Pipe        | 1       | 79   | 73387-34/21  | Pipe                   | 1       |
|      | AGS.1170-D    | Nipple      | 2       |      | AGS.1142A  | Nipple                 | 1       |
| 53   | 73387-34/9    | Pipe        | 1       | 80   | 73387-45/17  | Pipe                   | 1       |
|      | AGS.1170-B    | Nipple      | 1       |      | AGS.1142   | Nipple                 | 1       |
| 54   | 73387-34/11   | Pipe        | 1       | 81   | 73387-45/19  | Pipe                   | 1       |
|      | AGS.1170-B    | Nipple      | 1       |      | AGS.1142B  | Nipple                 | 1       |
| 55   | 73387-34/13   | Pipe        | 1       | 82   | 73387-45/15  | Pipe                   | 1       |
|      | AGS.1142-B    | Nipple      | 1       |      | AGS.1142B  | Nipple                 | 1       |
| 56   | 16645-33      | Tee-piece   | 1       | 83   | 73387-45/13  | Pipe                   | 1       |
| 57   | 73387-34/15   | Pipe        | 1       |      | AGS.1142B  | Nipple                 | 1       |
|      | AGS.1142-A    | Nipple      | 2       | 84   | AGS.1140B  | Nipple                 | 4       |
| 58   | 73387-34/3    | Pipe        | 1       |      | AGS.904B   | Union nut              | 4       |
|      | AGS.1142B     | Nipple      | 2       |      | SP9-C6   | Split pin              | 4       |
| 59   | A.5680-Sht. 1 | Drain       | 1       |      | AGS.1112B  | Adapter                | 4       |
| 60   | 73387-34/17   | Pipe        | 1       |      | AGS.1115B  | Washer plate           | 4       |
|      | AGS.1170-B    | Nipple      | 1       |      | A.5036-21  | Locking wire tag       | 8       |
|      | AGS.1142-B    | Nipple      | 1       |      | A25-2B   | Bolt                   | 24      |
| 61   | 73387-34/19   | Pipe        | 1       |      | A24-BP   | Nut                    | 24      |
|      | AGS.1170-B    | Nipple      | 1       |      | SP.13B   | Washer                 | 24      |
| 62   | 73387-34/17   | Pipe        | 1       | 85   | VGS.380-169  | Clip                   | 8       |
|      | AGS.1142-B    | Nipple      | 1       |      | A25-1B   | Bolt                   | 8       |
| 63   | A5680-Sht. 1  | Drain       | 1       |      | A24-BP   | Nut                    | 8       |
| 64   | 73387-34/3    | Pipe        | 1       |      | SP47-B   | Spring Washer          | 8       |
|      | AGS.1142-B    | Nipple      | 2       | 86   | 73345-269  | Pipe } Starboard       | 1       |
| 65   | 16645-33      | Tee-piece   | 1       |      | AGS.1142-B   | Nipple } No. 3 cell    | 2       |
| 66   | 73387-34/23   | Pipe        | 1       |      | 73345-271  | Pipe } Port            | 1       |
|      | AGS.1142-A    | Nipple      | 2       |      | AGS.1142-B   | Nipple } No. 3 cell    | 2       |
| 67   | 73387-34/25   | Pipe        | 1       |      | 73345-273  | Pipe } Starboard       | 1       |
|      | AGS.1142-B    | Nipple      | 1       |      | AGS.1142-B   | Nipple } transfer tank | 2       |
|      | AGS.1170-B    | Nipple      | 1       |      | 73345-275  | Pipe } Port            | 1       |
| 68   | 73387-34/27   | Pipe        | 1       |      | AGS.1142-B   | Nipple } transfer tank | 2       |
|      | AGS.1142-B    | Nipple      | 1       | 87   | 73345-277  | Special adapter        | 4       |
| 69   | 16645-33      | Tee-piece   | 1       |      | A5036-21   | Locking wire tag       | 4       |
| 70   | 73387-34/3    | Pipe        | 1       | 88   | 73387-45/19  | Pipe                   | 1       |
|      | AGS.1142-B    | Nipple      | 2       |      | AGS.1142-B   | Nipple                 | 1       |
| 71   | A5680-Sht. 1  | Drain       | 1       | 89   | 73345-395  | Pipe                   | 1       |
| 72   | 73387-34/29   | Pipe        | 1       |      | AGS.1142-B   | Nipple                 | 1       |
|      | AGS.1142-A    | Nipple      | 2       |      | AGS.904-A  | Outer sleeve           | 2       |
| 73   | 73387-34/17   | Pipe        | 1       |      | AGS.952-A  | Collar                 | 2       |
|      | AGS.1142-B    | Nipple      | 1       |      | AGS.1186-A   | Washer                 | 1       |
|      | AGS.1170-B    | Nipple      | 1       |      | AGS.1135-A   | Banjo bolt             | 1       |
| 74   | 21250-47      | Tee-piece   | 1       |      | AGS.1129-A   | Banjo bolt             | 1       |
| 75   | 73387-34/33   | Pipe        | 1       | 90   | <i>Remove the following before fitting item 89</i> |                        |         |
|      | AGS.1142-B    | Nipple      | 2       |      | SP9-C6   | Split pin              | 1       |
| 76   | 73387-34/17   | Pipe        | 1       |      | AGS.904-A  | Outer sleeve           | 1       |
|      | AGS.1142-B    | Nipple      | 1       |      | AGS.1140-A   | Nipple plug            | 1       |

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