Chapter 1 FUSELAGE

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

DESCRIPTION AND OPERATION

General

1. The fuselage, or nacelle, is a semi-monocoque structure of balsa wood sandwiched between an inner and outer plywood skin. The nose fairing, the light-alloy engine cowlings and the jet pipe fairing are separate assemblies. The main constructional features are illustrated in fig. 1.

2. The fuselage is built in shell halves joined together at the top and bottom centre-lines. At the centre-line joints, the balsa packing is replaced by spruce multi-ply and at the bulkhead attachments and other places requiring reinforcement, by laminated spruce (*fig.* 1). The outer skin is covered with madapollam; details of the repair and replacement of this covering will be found in Vol. 6.

Drain holes

3. The locations of the various drain holes of the fuselage are shown in Sect. 2, Chap. 4.

Cockpit

4. The pressurised cockpit is enclosed at the front by the armour-plated No. 1 bulkhead and at the rear by No. 2 bulkhead, which is recessed to take the ejection seat guide rail. Armour plate is also fitted on either side of the guide rail recess. At the top is the metal-framed windscreen and jettisonable canopy, which slides to the rear to provide normal entry and exit to the cockpit. The cockpit floor, situated immediately above the four gun barrels, serves as the decking for the pressurised compartment. Details of the equipment fitted in the cockpit are given in Sect 1, Chapters 1 and 3.

Canopy

5. The reinforced single skin of the transparent plastic canopy (*fig.* 4), may be opened or closed from the outside by depressing the

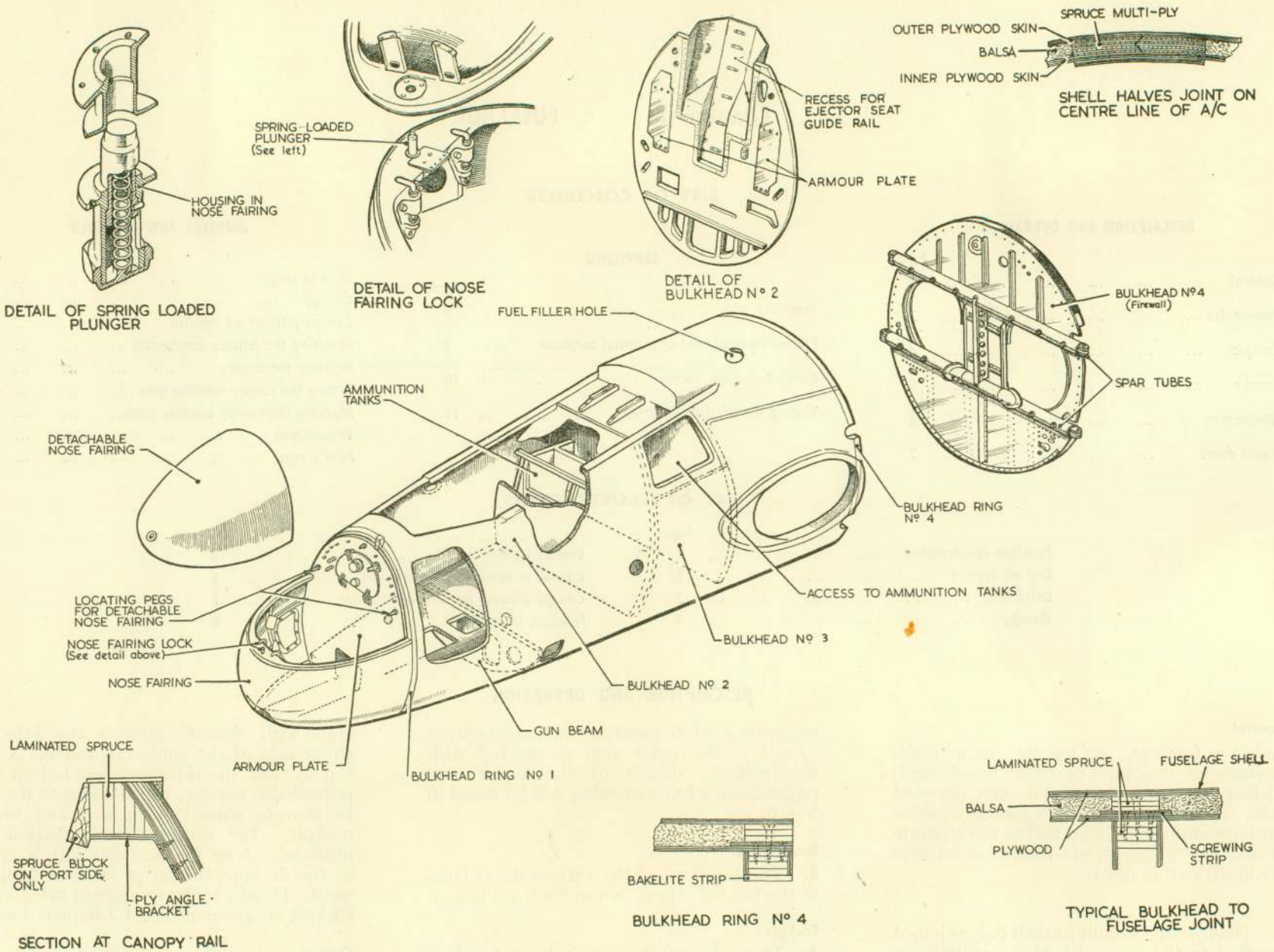


Fig. 1. Fuselage construction

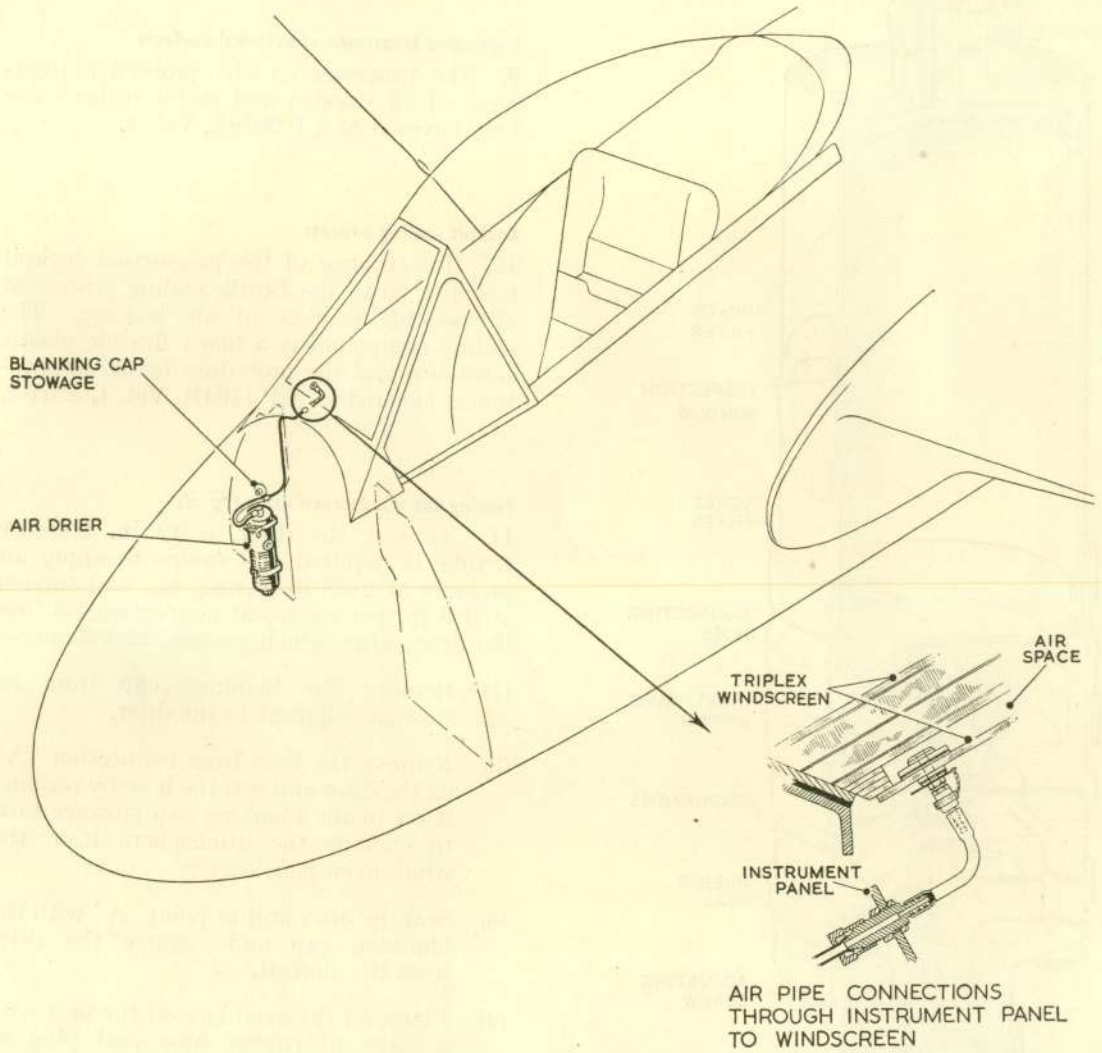


Fig. 2. Dry air system

spring-loaded plunger button on the starboard wall. From inside the cockpit, the canopy may be opened or closed by turning the crank handle which operates a rack and pinion (*fig.* 6). In an emergency, the canopy may be jettisoned by operating the yellow JETTISON lever in the cockpit, or from outside the aircraft, by opening the starboard access door to the ammunition bay and pulling the jettison cable. A second stop position for the canopy is provided for operations requiring the maximum cockpit clearance, such as filling the hydraulic reservoir or removing and replacing the ejection seat cartridge or drogue gun. The spring-loaded plunger stop on the port canopy rail is depressed to allow the canopy to override its normal position and released to operate on the second stop. To remove the canopy completely, the spring-loaded plunger stop is kept depressed until the canopy is clear of the rails. The stop is illustrated in fig. 4, detail B. Before pressurising the cockpit, the canopy must be sealed to the fuselage and windscreen by the operation of the inflatable rubber seal, the procedure for which is described in Chap. 8 of this section.

Windscreen

6. The Triplex windscreen comprises one centre bullet-proof panel and two side panels mounted in a light-alloy frame. To ensure that the air, sealed between the inner and outer sheets of the windscreen is kept dry, the drier system illustrated in fig. 2 is employed. The drier (*fig.* 3) containing silica gel crystals, is positioned just forward of the right-hand instrument panel. The crystals, which can be seen through the inspection window in the drier and which are blue when dry, should be renewed when they change colour to pink. The procedure for testing the inlet and outlet valves of the drier is given in para. 11.

Access doors

7. The position and function of the various access doors is given in Sect. 2, Chap. 4. With the exception of the armoured door in bulkhead No. 1, none are subjected to cabin pressure.

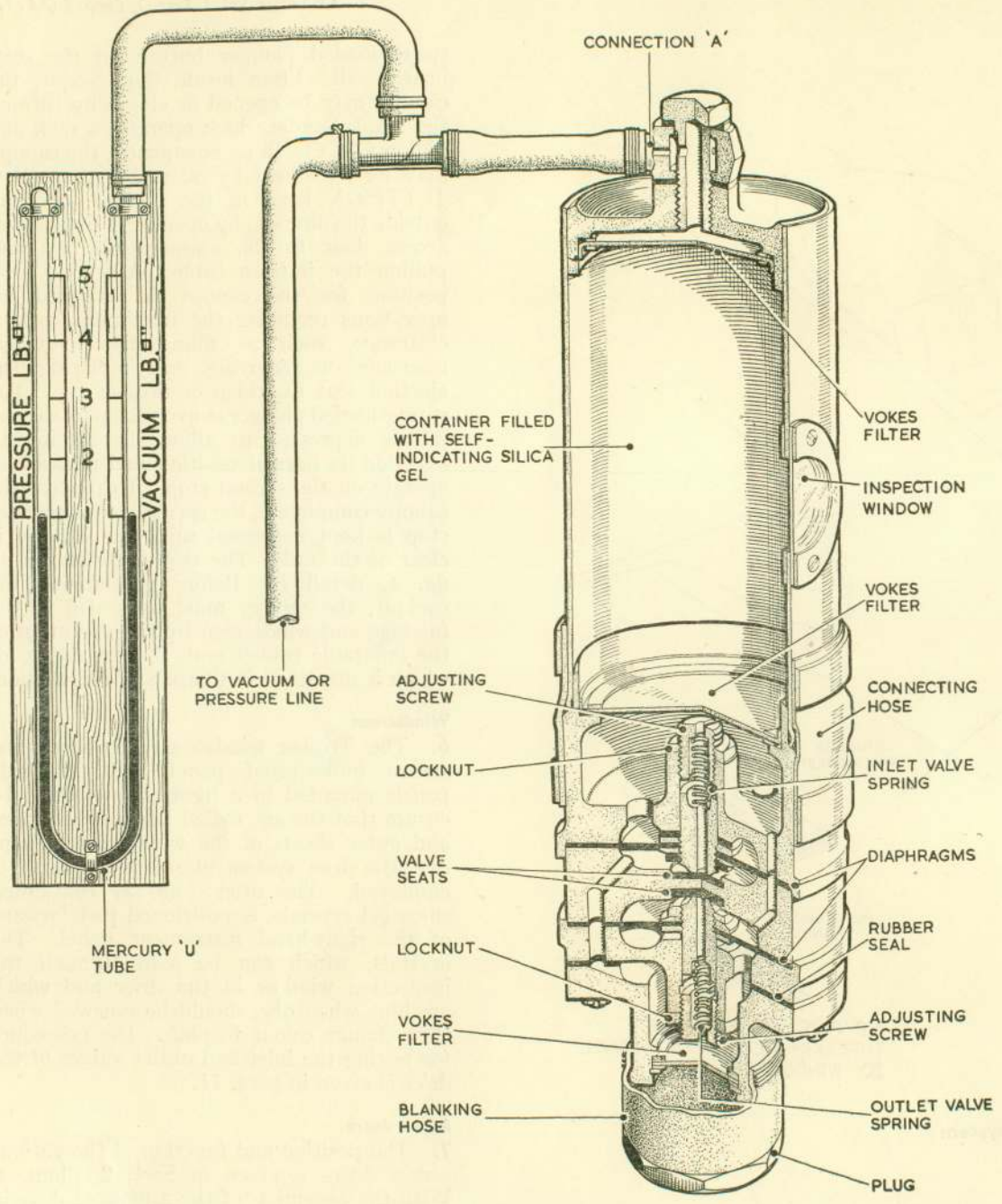


Fig. 3. Drier test

Trestling

8. The trestling of the fuselage with wings and engine removed is shown in fig. 8.

Protective treatment of external surfaces

9. The processes for the protective treatment of all wooden and metal surfaces are fully covered in A.P.2656A, Vol. 1.

Cockpit sealing process

10. The interior of the pressurised cockpit is subjected to the Bostik sealing process at all possible sources of air leakage. The sealing compound is a black flexible plastic substance and the procedure for its application is covered in A.P.1464B, Vol. 1, Part 2.

Testing the windscreen drier (*fig. 3*)

11. To test the drier, a 12 in. mercury U-tube is required and means to apply air pressure at 2·75 lb. per sq. in., and suction at 0·5 lb. per sq. in. at connection 'A' on the drier, after which proceed as follows:—

(1) Remove the blanking cap from its stowage adjacent to the drier.

(2) Remove the hose from connection 'A' on the drier and seal the hose by pushing it on to the blanking cap stowage boss to exclude the atmosphere from the windscreen panel cavity.

(3) Seal the drier unit at point 'A' with the blanking cap and remove the drier from the aircraft.

(4) Blank off the open base of the unit with a piece of rubber hose and plug as illustrated.

(5) Remove the blanking cap from connection 'A' and connect the U-tube and pressurising equipment, then apply pressure at 2·75 lb. per sq. in. The complete assembly must be air-tight.

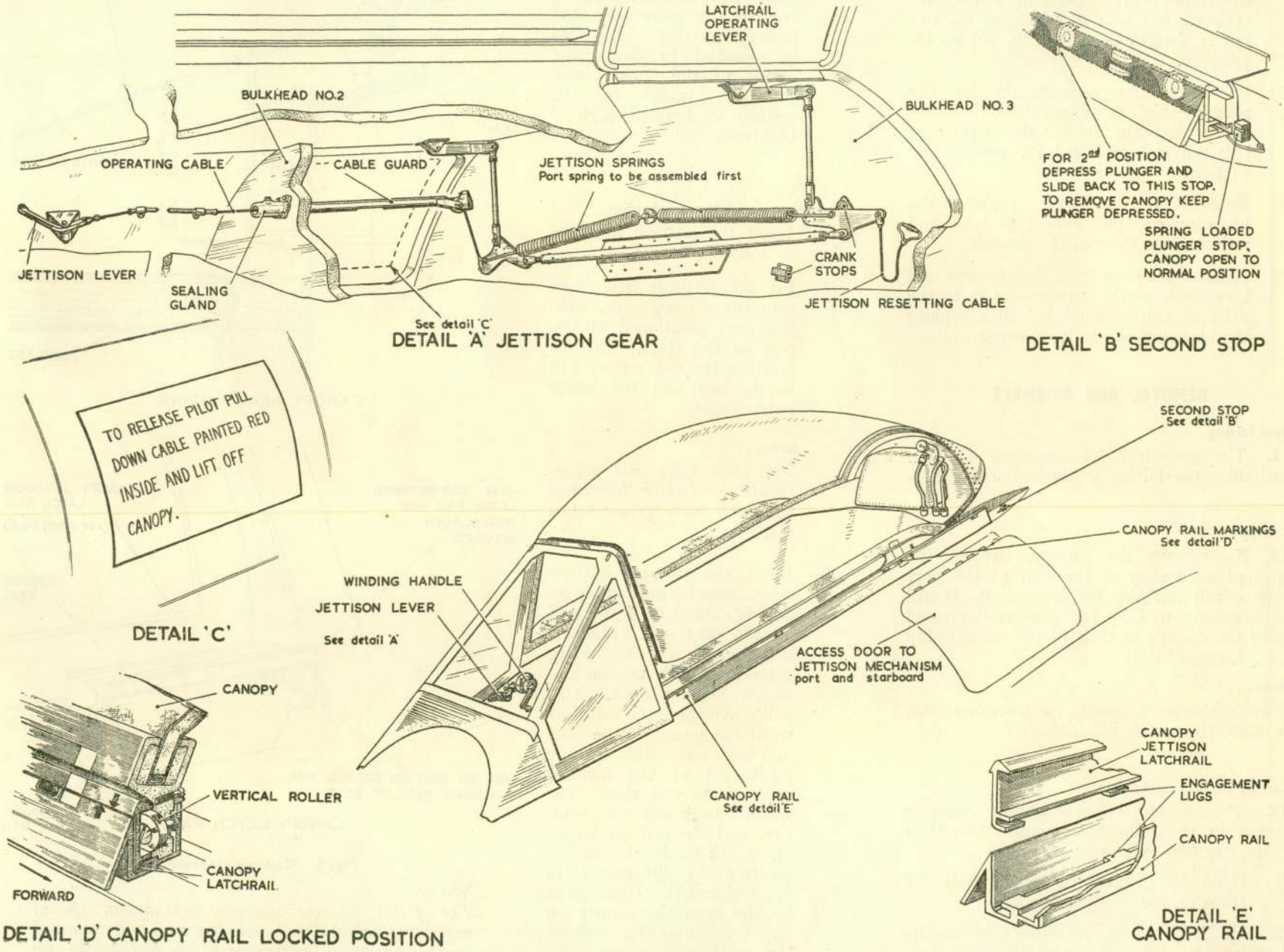

LATCHRAIL OPERATING LEVER
BULKHEAD NO.2
BULKHEAD NO. 3
OPERATING CABLE
CABLE GUARD
JETTISON SPRINGS
Port spring to be assembled first
JETTISON LEVER
SEALING GLAND
CRANK STOPS
JETTISON RESETTING CABLE
See detail 'C'
DETAIL 'A' JETTISON GEAR
FOR 2nd POSITION DEPRESS PLUNGER AND SLIDE BACK TO THIS STOP. TO REMOVE CANOPY KEEP PLUNGER DEPRESSED.
SPRING LOADED PLUNGER STOP, CANOPY OPEN TO NORMAL POSITION
DETAIL 'B' SECOND STOP
TO RELEASE PILOT PULL DOWN CABLE PAINTED RED INSIDE AND LIFT OFF CANOPY.
DETAIL 'C'
SECOND STOP See detail 'B'
CANOPY RAIL MARKINGS See detail 'D'
WINDING HANDLE
JETTISON LEVER
See detail 'A'
ACCESS DOOR TO JETTISON MECHANISM port and starboard
CANOPY RAIL See detail 'E'
CANOPY
VERTICAL ROLLER
CANOPY LATCHRAIL
FORWARD
DETAIL 'D' CANOPY RAIL LOCKED POSITION
CANOPY JETTISON LATCHRAIL
ENGAGEMENT LUGS
CANOPY RAIL
DETAIL 'E' CANOPY RAIL

Fig. 4. Canopy

(6) Remove the blanking hose and plug from the lower end of the drier and check that the outlet valve opens at a pressure between 0·4 and 0·5 lb. per sq. in., but is airtight below 0·4 lb. per sq. in. pressure.

(7) Substitute the vacuum rig for the pressure rig at connection 'A' and check that the inlet valve opens at between 0·4 and 0·5 lb. per sq. in. suction.

(8) Remove the test rig, replace the blanking cap on connection 'A' and re-install the drier in the aircraft.

(9) Remove the hose from the stowage and keeping it pinched, reconnect it to the drier at connection 'A,' then replace the blanking cap on its stowage.

REMOVAL AND ASSEMBLY

Nose fairing

12. The procedure for removing the detachable nose fairing is illustrated in fig. 1.

Canopy

13. To remove the canopy, depress the spring-loaded stop at the rear of the port canopy rail and slide the canopy off. It will be necessary to keep the plunger depressed until the canopy is clear of the second stop (*fig.* 4, *detail* 'B').

Note . . .

When replacing the canopy the procedure given in para. 16 must *be followed.*

Canopy jettison mechanism

14. The canopy jettison mechanism may be tested in the following manner, two men being required for the operation :—

(1) Open the canopy approximately 1½ turns on the winding handle.

(2) Unclip the canopy resetting cable handle from its clip on No. 3 bulkhead. Access is through the port ammunition loading door.

(3) Pull the canopy jettison lever in the cockpit *at the same time* maintaining a counter pressure on the canopy resetting cable. This is essential to damp the action of the springs and prevent damage to the jettison mechanism on No. 3 bulkhead.

Resetting the jettison mechanism

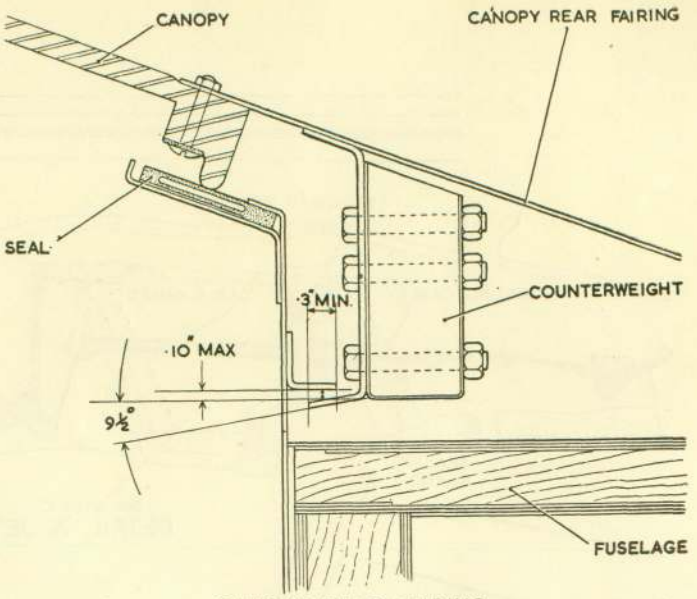
15. Reset the jettison mechanism as follows :—

(1) Fit the jettison latch rails into the canopy rails, with the pegs positioned at the rear of the slots. In this position the red arrows will be in line and the white bands offset.

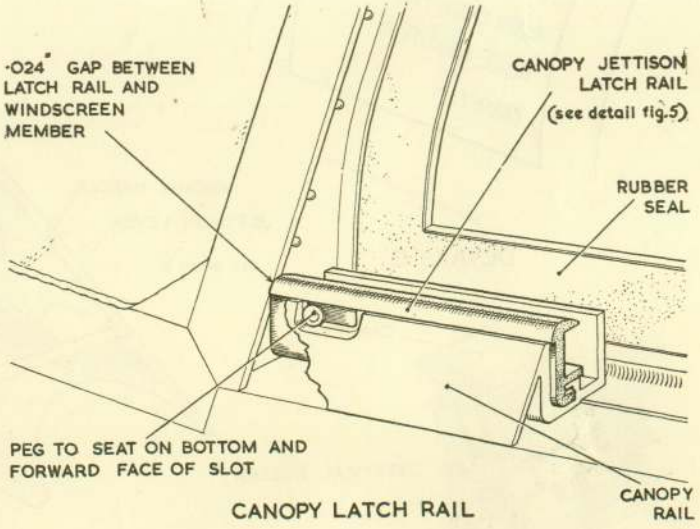
Note . . .

The latch rails and rollers should be lightly lubricated with anti-freeze grease before assembly.

(2) Reset the canopy jettison mechanism by pulling the resetting cable (*fig.* 4), located on the port side of No. 3 bulkhead, access being gained through the ammunition loading door. This will move the latch rails forward the length of the slots and the pegs will now be positioned at the forward ends of the rail slots. The white bands will now coincide and the red arrows be offset. This is the locked position as illustrated in fig. 4, detail D. There must be the clearance shown on fig. 5 between the ends of the jettison rails and the windscreen members, to allow free jettison in flight.



CANOPY REAR FAIRING



CANOPY LATCH RAIL

Fig. 5. Canopy clearances

Note . . .

The joints of the jettison mechanism should be lightly lubricated with anti-freeze oil and examined for free movement. Stiffness of the mechanism can prevent correct engagement on resetting, with consequent danger of inadvertent jettison.

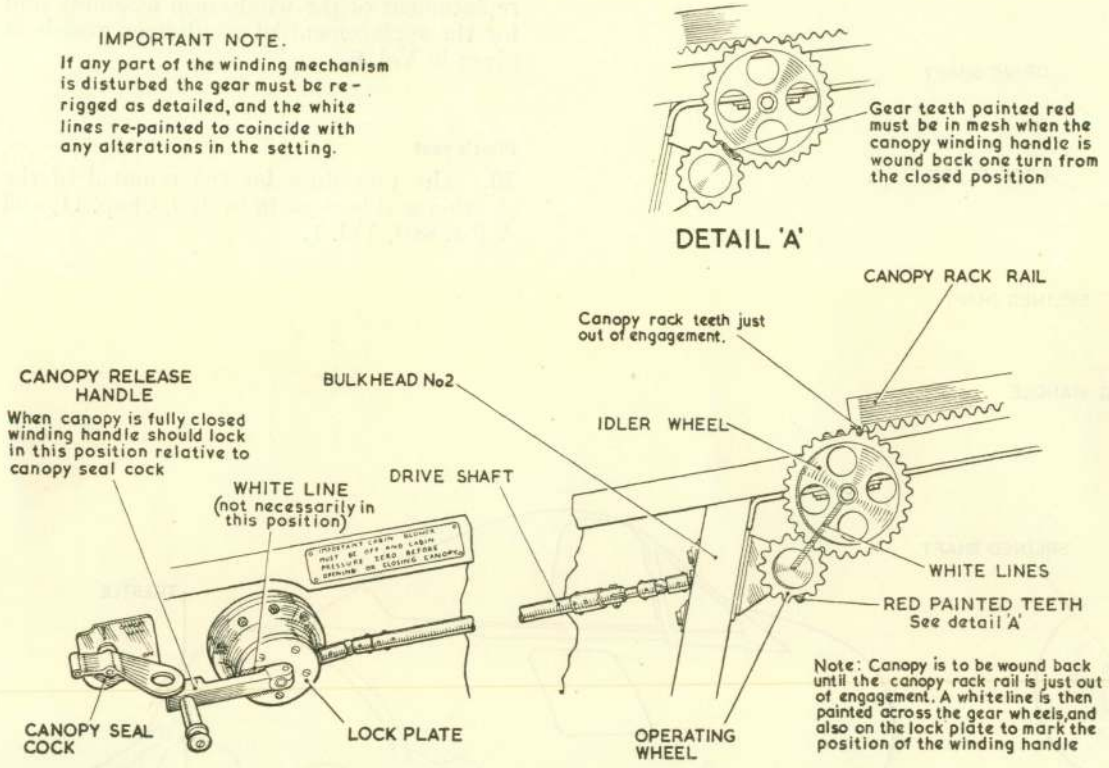


Fig. 6. Canopy winding gear mechanism

Refitting the canopy

16. The canopy is refitted as follows :—

(1) Set the canopy winding gear with the white lines painted across the pinion and idler gear wheels lined up, and with the edge of the canopy winding handle against the white line on the locking plate on the winding gear box (*fig.* 6).

(2) Position the canopy on the fuselage and slide it into the rails, until the canopy rack rail engages with the winding gear teeth and the canopy is past at least the second stop position. Instructions for setting the canopy winding gear and painting the lines, are given in para. 17 and 18.

Note . . .

If any part of the winding gear mechanism or locking adjustment on the gear box in the cockpit is disturbed, the canopy winding gear must be re-rigged as detailed in para. 17. *The white lines must be removed and repainted to coincide with any alteration in the setting. This instruction is important, to obtain a free jettison of the canopy in an emergency.*

Setting the canopy winding gear

17. To obtain satisfactory jettisoning of the canopy under low speed and low altitude conditions, the following directions must be strictly adhered to :—

(1) Wind the canopy to the fully closed position and ensure that the winding handle is approximately in the position indicated in fig. 6. This ensures that the initial movement of the handle will partially turn off the seal cock and also serves as a reminder that the seal must be deflated before opening the canopy.

(2) Close the canopy by winding the handle hard forward with the release button depressed, then release the handle and allow it to find its own position. Remove the handle from the splined shaft and refit it with the catch in correct relation to the slot on the lockplate, as shown in fig. 7.

Note . .

This method of rigging is important, as it ensures that there is no undue friction load between the front edge of the canopy and the windscreen member, and cures any tendency for the canopy not to jettison at low air speeds and low altitudes without cabin pressure.

(3) Ensure that there is the correct overlap and gap between the angle bracket, which is attached to the canopy rear fairing, and the angle bracket on the extension of No. 3 bulkhead, shown in fig. 5.

Note . . .

The foregoing instructions apply only to the refitting of the existing canopy ; the procedure for fitting a new canopy is given in Vol. 6 *of this Air Publication.*

Marking the canopy winding gear

18. When the canopy winding gear has been set as detailed in para. 17, the canopy is to

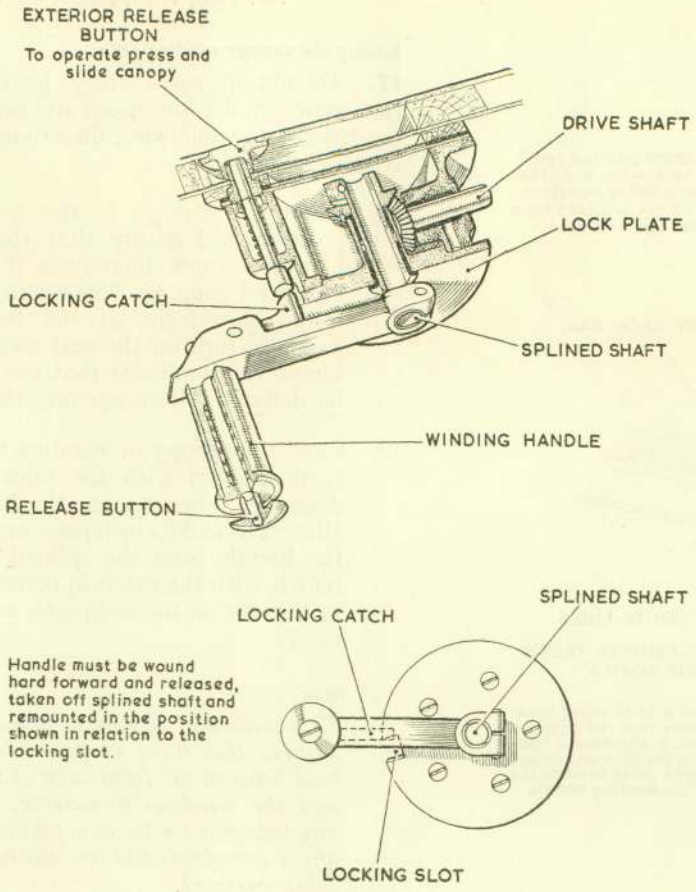


Fig. 7. Canopy winding gearbox mechanism

be wound back past the second stop until the canopy rack teeth are just out of engagement from the idler gear wheel. A $\frac{1}{4}$ in. wide white line is then painted across the idler and operating gear wheels, and the position of the canopy winding handle is also marked by painting a white line across the locking plate (*fig.* 6). The lines enable the canopy to be replaced without re-setting the micrometer adjustment at the winding handle. If *any part* of the canopy winding mechanism is disturbed, the mechanism *must* be re-rigged as detailed in para. 17, and the white lines removed and repainted to coincide with the alteration in the setting.

Windscreen

19. The procedure for the removal and replacement of the windscreen assembly and for the replacement of windscreen panels is given in Vol. 6.

Pilot's seat

20. The procedure for the removal of the ejection seat is given in Sect. 3, Chap. 11, and A.P.4288B, Vol. 1.

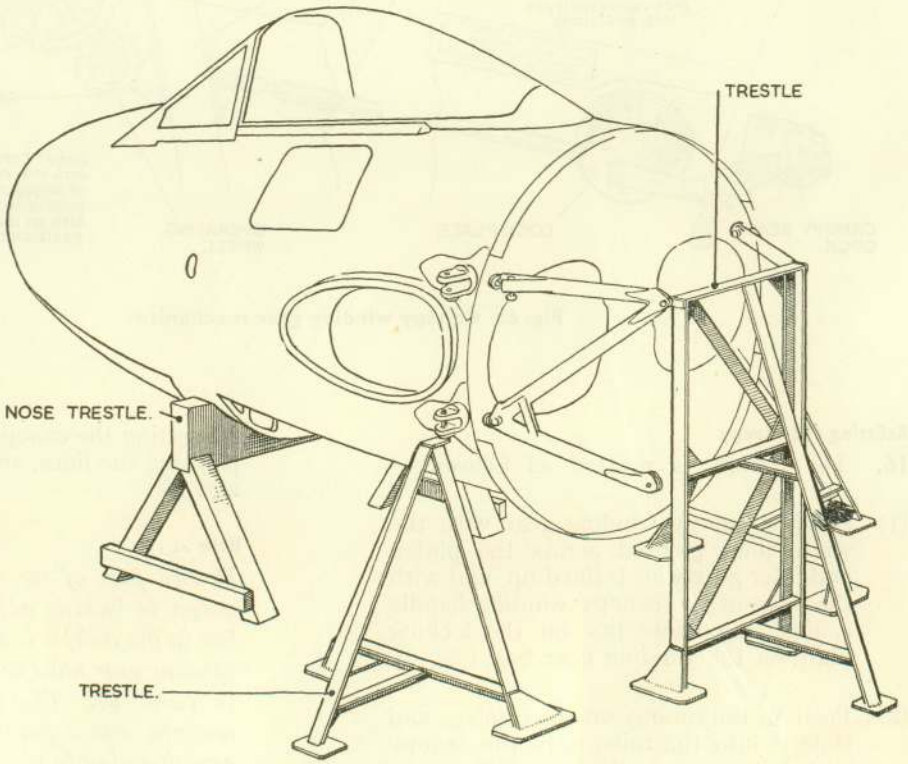


Fig. 8. Fuselage trestling

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