Chapter 1 FUSELAGE

CONTENTS

ILLUSTRATIONS

WARNING
Aircrew ejection seats are fitted to this aircraft. Before attempting to enter the cabin, ensure that the instructions detailed on the LETHAL WARNING marker card at the front of this Handbook have been complied with.

Introduction

1. This chapter contains a general description of the fuselage together with the lubrication and servicing information necessary to maintain it in an efficient condition. Illustrations showing the method of slinging, trestling, and dismantling it into its major components, are also included.

DESCRIPTION

General

2. The fuselage is an all-metal monocoque structure, which is built in three main portions to facilitate manufacture, servicing and transportation. The front fuselage is provided with a detachable nose piece and houses the cabin, gun installation and radio equipment. The centre fuselage, which is constructed with the stub wings as an integral part, contains the engine and the forward and centre fuel tanks. The rear fuselage, which is constructed with the lower portion of the fin as an integral part and terminated by a detachable tail cone incorporating the braking parachute housing, houses the engine jet pipe and carries the hydraulically operated air brake installation. The three major components of the fuselage are illustrated in figs. 2, 3, 4 and 5.

Nose piece and front fuselage *(fig. 1 and 2)*

Structure

3. The detachable nose piece extends from the radome to frame 1C 'FWD'. It consists of a light-alloy skin supported by frames. A metal nose cone is fitted to the nose piece in lieu of the radome when Mod 1423 is embodied. The front fuselage continues from frame 1C 'AFT' to frame 18A, which forms the front frame of the forward transport joint. The structure consists of a number of frames and four longerons reinforced by a box-section keel member extending between frames 6 and 11, the whole assembly being covered with a metal skin. The nose wheel is pivoted to the keel member at frame 8, and when retracted is enclosed in the front fuselage by fairings. The cabin is housed between frames 6 and 14, while the gun installation (Mk.8 aircraft) is located under the cabin floor in mountings on frames 12 and 15. The radio bay is situated immediately forward of the front transport joint. A stowage for the starboard seat harness apron is situated on the starboard side between frames 4 and 5.

Cabin

4. The cabin, which is protected by heavy plating and provided with ejection seats, is enclosed by a windscreen and an electro-hydraulically operated hood. The hood opens upward, hinging on its rear edge, for entry and exit, and may also be jettisoned in an emergency. To enable the cabin to be pressurized, it is sealed from the remainder of the airframe by a floor extending from frame 6, which is a solid bulkhead, to a diaphragm at frame 14. Fitted on the floor are anchorage brackets for the leg restraining harnesses and seat fittings situated just behind frames 9 and 11 respectively. Above the floor the fuselage structure is enclosed to form side walls, and above these walls are shelves for controls and instruments. The instrument panels, together with the port and starboard side panels, are located at the forward end of the cabin, above the shelves, on a structure extending across the top of frame 8, which is stiffened by tubular struts and also carries the two gun sights, which are fitted on fixed mountings *(one above each instrument panel).*

Windscreen and hood

5. The windscreen consists of two flat bullet-proof centre panels and two curved side panels, all four of which are held in a cast light-alloy frame secured to the cabin decking. The centre panels each consist of two plates of glass between which is a layer of dry air to prevent misting, the air being maintained in a dry state by two silica-gel containers connected to inlets at the bottom of each windscreen panel by rubber tubing. Each centre panel is fitted with a hydraulically operated windscreen wiper (Sect.3, Chap.6). The hood is moulded from two sheets of transparent plastic mounted in a frame consisting of front and rear arch members, a longitudinal roof member and two edge members at the sides. Spigots are fitted to the hood which locate in housing blocks on the longerons to ensure positive entry of the hood into its locks. Shims are available for adjustment of the housing blocks when fitting a replacement hood. Hook and roller locking assemblies are fitted, one to the front arch member and two on each side. The complete hood lifts upward, hinging on its rear arch member on a pivot point between frames 14 and 14A.

6. The hood is opened and closed by electro-hydraulic operated jacks located in the hood fairing. A switch, which is mounted with a hood lock indicator lamp at the centre of the instrument panels, controls these jacks through a solenoid-operated control valve. The operating jack *(housed in a channel between frames 14 and 16)* raises or lowers the hood on its hinges aft of frame 14 according to the position of the cabin control. The hood is retained in the fully open position by an internal mechanical lock in the jack. A jury strut is provided to support the hood during servicing operations. The hood is provided with a rubber seal which is automatically inflated when the hood is closed and deflated when the hood is opened, partial deflation occurring before the hood

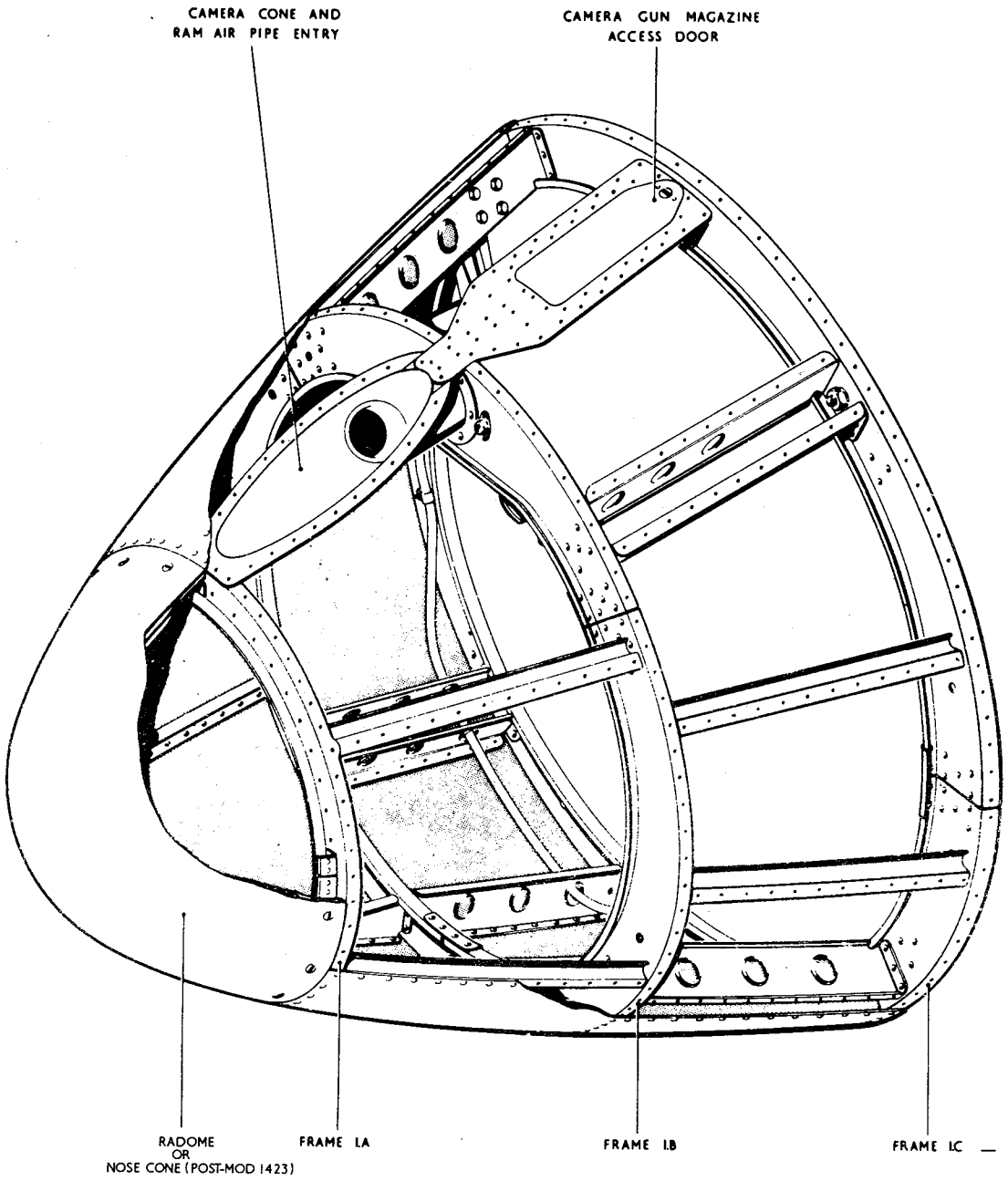

Fig. 1 Front fuselage nose piece

▶ **(Mod 1423 added)** ◀

actuation gear operates. A spring-loaded strut secured to the inside of the hood and positioned by the pilot makes provision for the hood to be partially opened during taxying. To partially open the hood:–

(1) Select hood open *(release switch after hood has opened approx. 6 in.).*

(2) Pull the handle of the strut back and down to compress the spring and allow the strut to extend.

(3) Select hood closed.

Note . . .

With the battery master switch ON it will be necessary to use the hood override switch during hood open selection.

To fully close the hood from the partially open position:–

(1) Select hood open *(release switch after hood has opened a few inches).*

(2) Pull the handle back and up to retract the strut.

(3) Select hood closed.

Note . . .

When hood switch is moved to 'CLOSE', an electric horn starts to sound 3 to 5 seconds before the hood commences to close, the horn continues to sound until the switch is released.

In an emergency the hood may be jettisoned by pulling the jettison handle which projects upwards from a panel between the two seats. The operation of this handle releases the four hood locks securing the side members and the lock at the top centre of the forward arch, it also fires the hood gas gun, the gases from which operate pistons in the hood ejection cylinders which push the hood

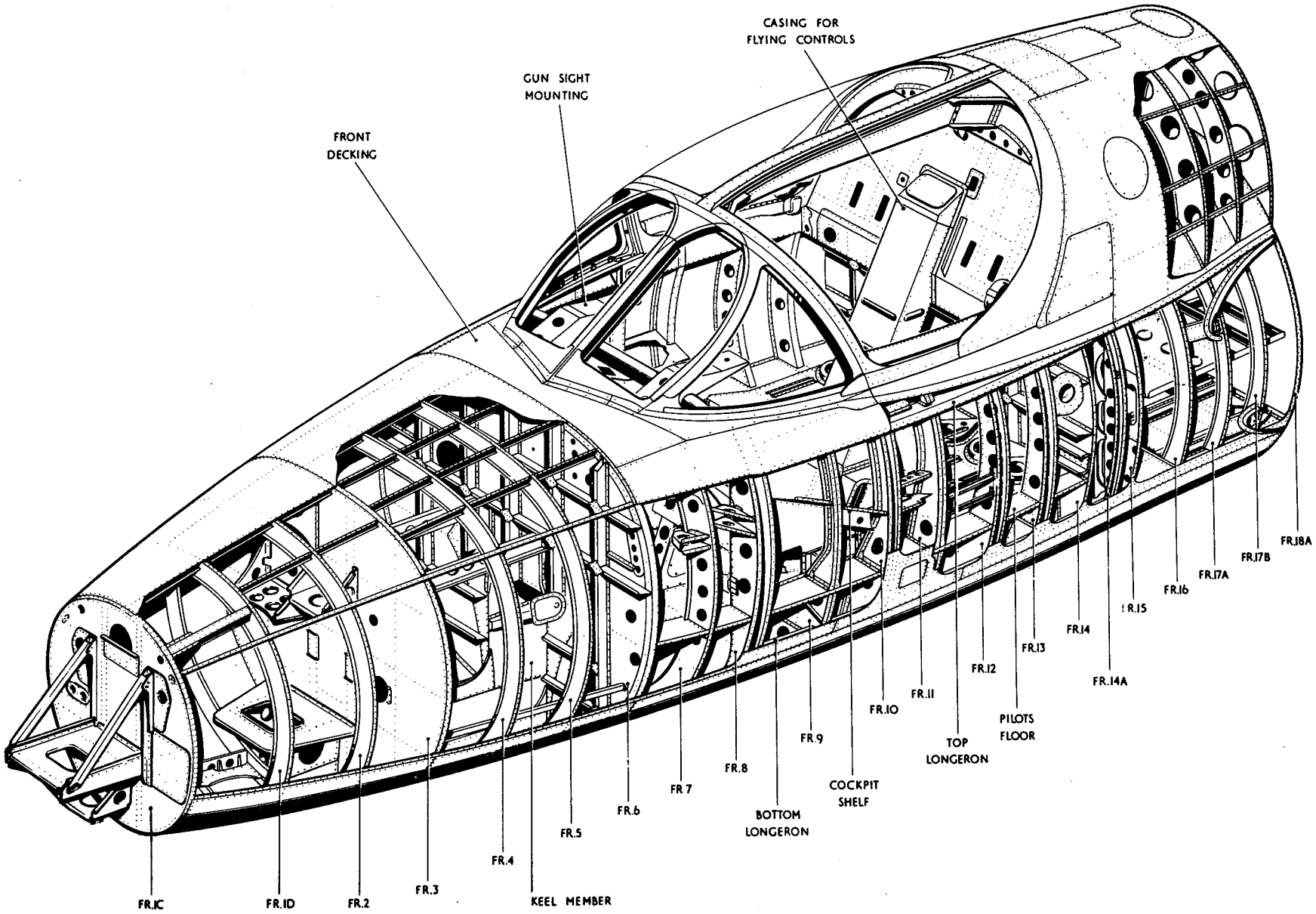

Fig. 2 Front fuselage

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upwards. In the event of the pilot being physically incapable of operating this control while the aircraft is on the ground there is an external release ring enclosed behind a transparent break-in panel on the port side of the fuselage below the hood, pulling the enclosed ring releases the locks and fires off the hood. To open the hood on the ground externally for normal servicing, an external switch is provided and is located in the nose wheel bay.

WARNING

This switch must not be operated until sufficient time has elapsed to allow the cabin pressure to dissipate.

Gun installation (Mk. 8 aircraft only)

7. The gun installation consists of one 30 mm. Aden gun, semi-buried into the starboard undersurface of the front fuselage, together with an ammunition box and an empty-case collector tank. The gun is covered by a fairing constructed in three removable sections located between frames 10 and 17B, the rear section being integral with the starboard armament and radio access door. The barrel of the gun lies along a blast trough extending forward in the front fuselage skin. The gun is electrically fired and controlled by a trigger on each of the control-column handgrips. For a full description of the gun installation, reference should be made to Sect. 7, Chap. 3.

Radio bay

8. The radio bay is located in the front fuselage, where it extends aft from frame 15 to the front transport joint. Access is obtained through the access doors in the undersurface of the fuselage, immediately forward of the transport joint. On Mk. 8B aircraft, an Integrated Flight Instrument System and TACAN are installed in addition to radio equipment. The additional accommodation being provided by the removal of the armament and radar ranging installations when converting these aircraft from the basic Mk. 8 aircraft. TACAN is fitted in Mk. 8C aircraft from which the armament, radar ranging and Z.B.X. installations are removed during conversion from the basic Mk. 8 aircraft. Descriptions of I.F.I.S. and TACAN installations will be found in the A.P., Vol. 1, Book 2 relevant to the particular aircraft mark as indicated in the Layout of A.P.4347H, N and Q at the beginning of this book.

Forward transport joint fittings

9. The front and centre fuselage structures are assembled together at a butt joint formed by the flanges of frames 18A and 18B, which are bolted together, and by special attachments at the four longerons. These attachments consist of large threaded fittings, bolted to the front fuselage longerons, which extend aft through frame 18A to engage with special captive nuts carried on spigots projecting forward through frame 19 of the centre fuselage from fittings bolted to stringers C and H. The special nuts are locked to the spigots with nickel-alloy wire when assembled to the front fuselage fittings.

Centre fuselage and stub wings *(fig 3 and 4)*

Structure

10. The centre fuselage extends from frame 18B to frame 40A, both of these frames forming transport joints. It is a monocoque structure consisting of a number of frames and stringers covered with a light-alloy skin at the top of which is a spine member enclosing the flying controls. Frames 19, 25 and 32 are of heavier construction than that of the remaining frames and continue outward to form the nose, main and rear spars of the stub wings which are an integral part of the centre fuselage structure. The stub wing consists of these three spars, together with a number of ribs and diaphragms, which are covered externally by a light-alloy skin and internally by the air intake and boundary-layer ducting. The spars contain high-tensile steel fittings to which the outer wings are attached.

Fuel tank compartments

11. The structure between frames 19 to 25 and 26 to 32 of the centre fuselage is double-skinned and divided by diaphragms to form compartments between the spars in which the front and centre flexible bag type fuel tanks are supported. For a full description of the fuel tank installation, reference should be made to Sect. 4, Chap. 2.

Engine compartment

12. The engine is located between frames 31 and 46, being mounted at frames 34 and 40A, with the engine-driven accessories gearbox attached to the port side of frame 32. A light-alloy diaphragm at frame 37 engages with the engine to form a firewall and to divide the engine compartment into two zones for cooling purposes. For further details of the engine installation, reference should be made to Sect. 4, Chap. 1.

Rear transport joint fittings

13. The centre and rear fuselage structures are assembled together at frames 40A and 40B by special attachments at fifteen points around these frames. These attachments consist of large threaded fittings bolted to the stringers of the centre fuselage and extending aft through frame 40A to engage with special captive nuts carried on fittings bolted to the stringers of the rear fuselage, which project forward through frame 40B. When assembled, these special nuts are locked together with nickel-alloy wire and the gap between the two frames is covered by a fairing strap.

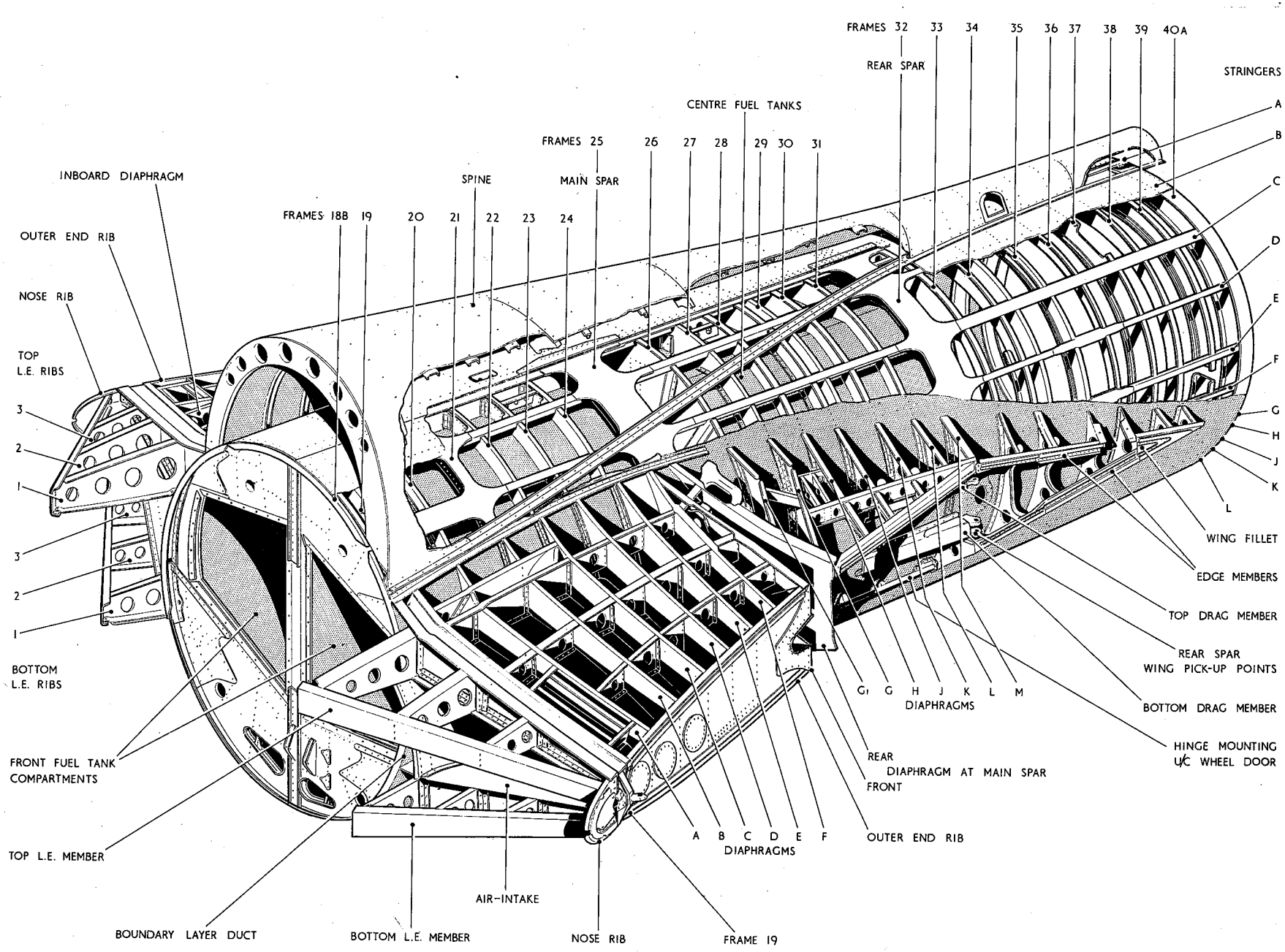

Fig. 3 Centre fuselage and stub wing (1)

Rear fuselage and tail cone (*fig. 5*)

Structure

14. The rear fuselage extends from frame 40B, the rear transport joint, to frame 57. It consists of a number of frames and stringers covered with a light-alloy skin to form a monocoque structure, at the top of which is a spine member enclosing the flying controls. Frames 52 and 55 are of heavier construction than the remaining frames and extend upward to form the major framework of the lower fin structure, which is integral with the rear fuselage. The lower fin structure consists of the above-mentioned major frames together with a dorsal fin extending forward to the spine member with an anti-buffet fairing extending aft immediately below the rudder. The upper portion of the fin, which carries the rudder, is attached to the lower part by fittings incorporated at the top of frames 52 and 55, while the tailplane is pivoted on a fitting at frame 55 and anchored at the leading-edge to the tail plane actuator in the lower fin structure. A small bumper-block type tail-skid is attached to the bottom of frame 55 to take the loads should the tail strike the ground during take-off or landing. The bottom skin between frames 47 and 50 is cut away and the gap so formed is reinforced and boxed-in by side-members and a top skin to form a housing for the hydraulically-operated air brake jack. The jack is anchored by a bolt extending between fittings bolted to the aft ends of the side-members and extends forward into the housing to engage with the air brake flap, which is attached by two extending hinges to channel fittings located between frames 45 and 46 on each side of the aircraft. The tail cone, which is detachable, incorporates the braking-parachute housing, and is secured to the rear fuselage by four toggle fasteners together with locating spigots. It extends from frame 58 to frame 63 and consists of the braking-parachute housing, which is a fairing with two upward opening spring-loaded doors extending rearward over the top of the tail piece, surmounting a structure of six frames, covered with a light-alloy skin stiffened by butt straps. The tail cone terminates in a stainless steel tail piece, a duct of which engages with the jet pipe.

Braking parachute installation

15. The braking parachute is housed in a stowage in the top of the tail cone and is streamed through two doors which are hinged to open outwards from the upper centre line of the fairing. These doors are operated by means of a spring-loaded release gear *(fig. 3A)* consisting of two telescopic spring box units which are located athwart the housing, together with a spring release unit. The inner end of the port telescopic unit is attached to the release unit, and the inner end of the starboard telescopic unit to a bracket attached to the housing. The outer ends of the telescopic units are attached to their respective door links by hinge pins so that, in effect, they form spring-loaded toggle action units to hold the doors open or closed, according to the operational position of the spring release unit. A lip on the starboard door forms a landing for the port door, which holds the starboard door in the closed position. The port door, when closed, is secured in that position by locks mounted one forward and the other aft on the housing. The doors are closed manually and, when closed, the port telescopic unit is held compressed by the release unit. The doors are opened upon the operation of the spring release unit, the actuation of which is initiated electrically by means of a control switch in the cabin. When this switch is placed to the STREAM position it energizes a solenoid, the plunger of which is in connection with a lever of the release unit assembly. Once the solenoid is energized, the plunger retracts and pulls the lever which opens the front lock by means of a connecting link, and the rear lock by means of a Bowden cable. At the same time, the solenoid lever frees the release unit lever, thereby permitting the port telescopic unit to extend and open the port door, followed by the automatic extension of the starboard unit to open the starboard door as soon as the port door is clear of its landing on that door. A mechanical indicator rod on the front lock is in the 'up' position when the lock is closed, visual indication being obtained through a sighting hole in the door. Visual indication of the rear lock being closed can also be obtained through a sighting hole in the door, but no indicator rod is provided. The parachute is attached to the aircraft by means of a shackle which engages with an electro-mechanical release unit bolted to the aircraft structure. Operation of the release unit to jettison the parachute is effected by the control switch in the cabin when it is placed to JETTISON, but an electrical inter-connection in the form of a microswitch operated by the parachute doors ensures that it is impossible to jettison the parachute until it has been streamed. A parachute warning lamp, which is mounted on the centre anti-glare shield and controlled by a microswitch that is operated by the parachute door when open, illuminates to indicate that the parachute has streamed and remains illuminated after the parachute has been jettisoned. A test switch for servicing purposes is provided in the cabin. For further information on the electrical operation and circuit details, reference should be made to Sect. 5, Chap. 1. An illustration of the parachute installation will be found in Sect. 2, Chap. 2, which also gives detailed instructions for the assembly and removal of the parachute and the mechanical opening of the doors.

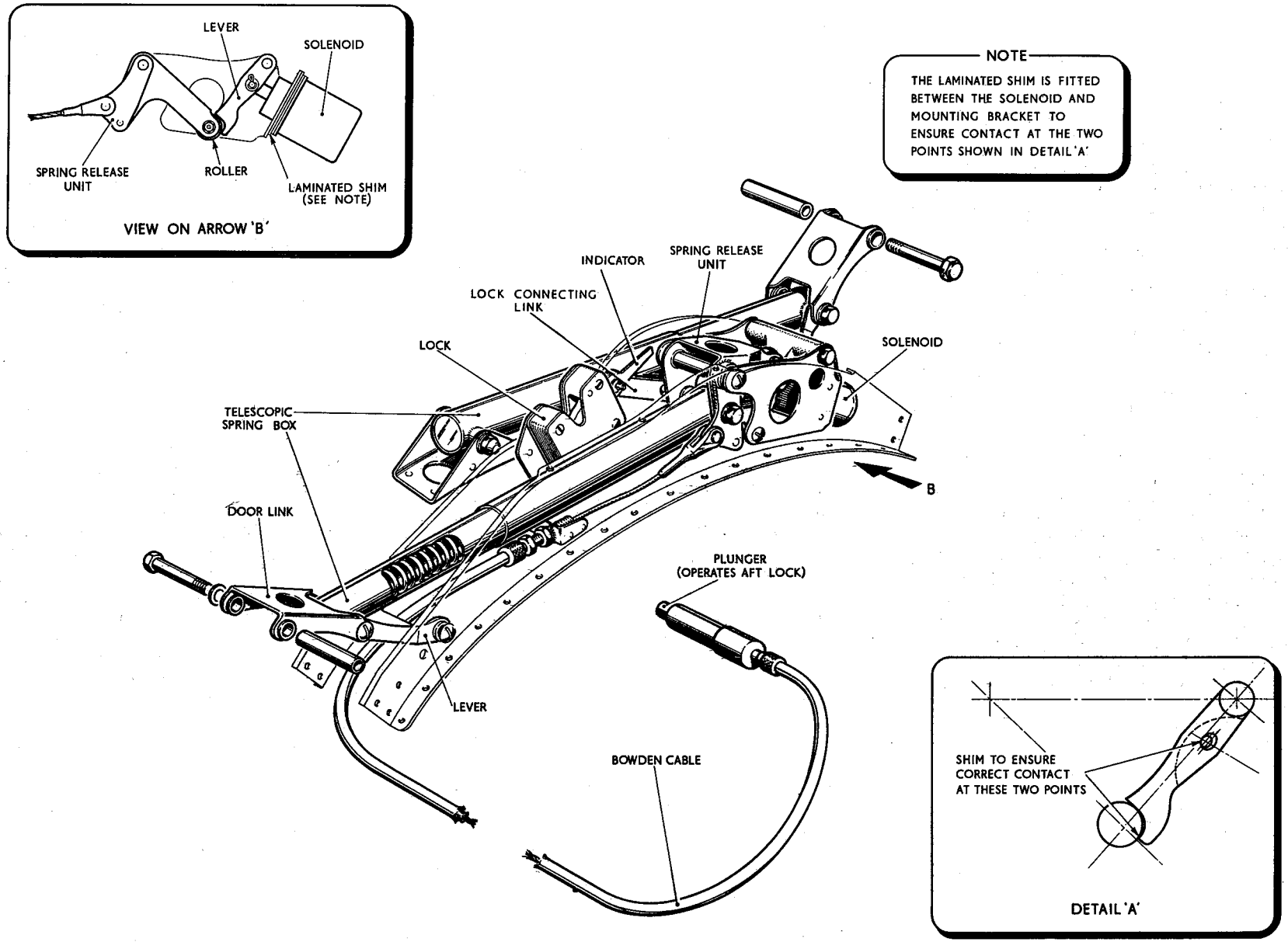

Fig. 3A Parachute door release gear

Air brake flap

16. This structure consists of a series of curved formers attached to a channel-sectioned centre rib with a hinge rib on either side and a curved nosing at the forward end. The lower surface of the structure is completely covered with a light-alloy skin, but the upper surface is only covered at the forward and centre portions. Each hinge rib carries an arm of the extended hinges, which engage with fittings incorporated in the rear fuselage. The centre rib incorporates the anchorage fitting to which the operating jack is attached. The complete assembly is carried under the rear fuselage on hinge fittings and is designed so that it embraces the fuselage when in the up position.

Jet pipe mounting

17. The jet pipe is rigidly secured to the engine at its forward end and extends aft to the duct incorporated in the tail piece of the tail cone. The pipe is supported at frame 55 by blocks, attached to each side of the pipe, which engage with adjustable mounting slides secured to the fuselage structure. These blocks move along the slides to allow for expansion of the pipe. A rail incorporated at the top of the fuselage between frames 48 and 56 is provided to facilitate jet pipe assembly and removal, small rollers on the pipe running along this rail during these operations. For further details of the jet pipe installation, reference should be made to Sect. 4, Chap. 1.

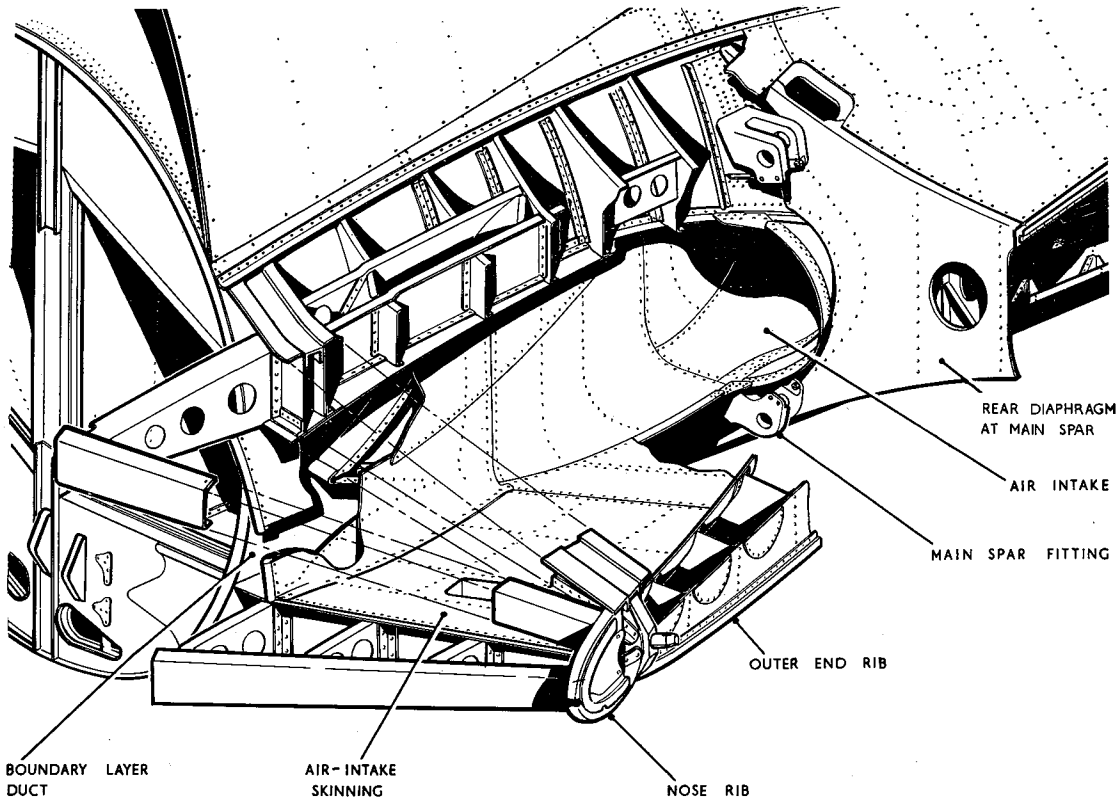

Fig. 4 Centre fuselage and stub wing (2)

SERVICING

General

18. In general, the only servicing required to the fuselage itself is that described in para. 19. Otherwise the servicing is confined mainly to the systems and accessories which are contained in the fuselage and which are dealt with in their respective chapters.

19. A regular examination of the fuselage structure must be carried out to ensure that no damage, such as buckling of the skin, corrosion, or loose nuts, rivets, etc., has occurred. If any damage is found it must be rectified in accordance with authorised procedure before the next flight. It is also necessary to check that all the detachable access panels and hinged doors are securely locked and flush with the surrounding structure. This is very important, as many of these are stress-bearing panels, and the safety of the aircraft is dependent upon their correct fitment. Extreme care must therefore be taken to ensure that these panels are not damaged or distorted in any way during fitting or removal. The drain holes at the bottom of the fuselage aft of frames 37 to 40A, 50, 52, 53, 56 and in the tail cone should be inspected frequently to ensure freedom from obstruction.

Note . . .

Any alteration in contour will give rise to a shock-wave, resulting in a vast increase in drag and corresponding loss in performance.

Nose piece attachment locking

20. To facilitate visual inspection of the nose-piece attachment locks, viewing apertures are provided in the lock levers, and the plain portion of each lock-hook is painted white.

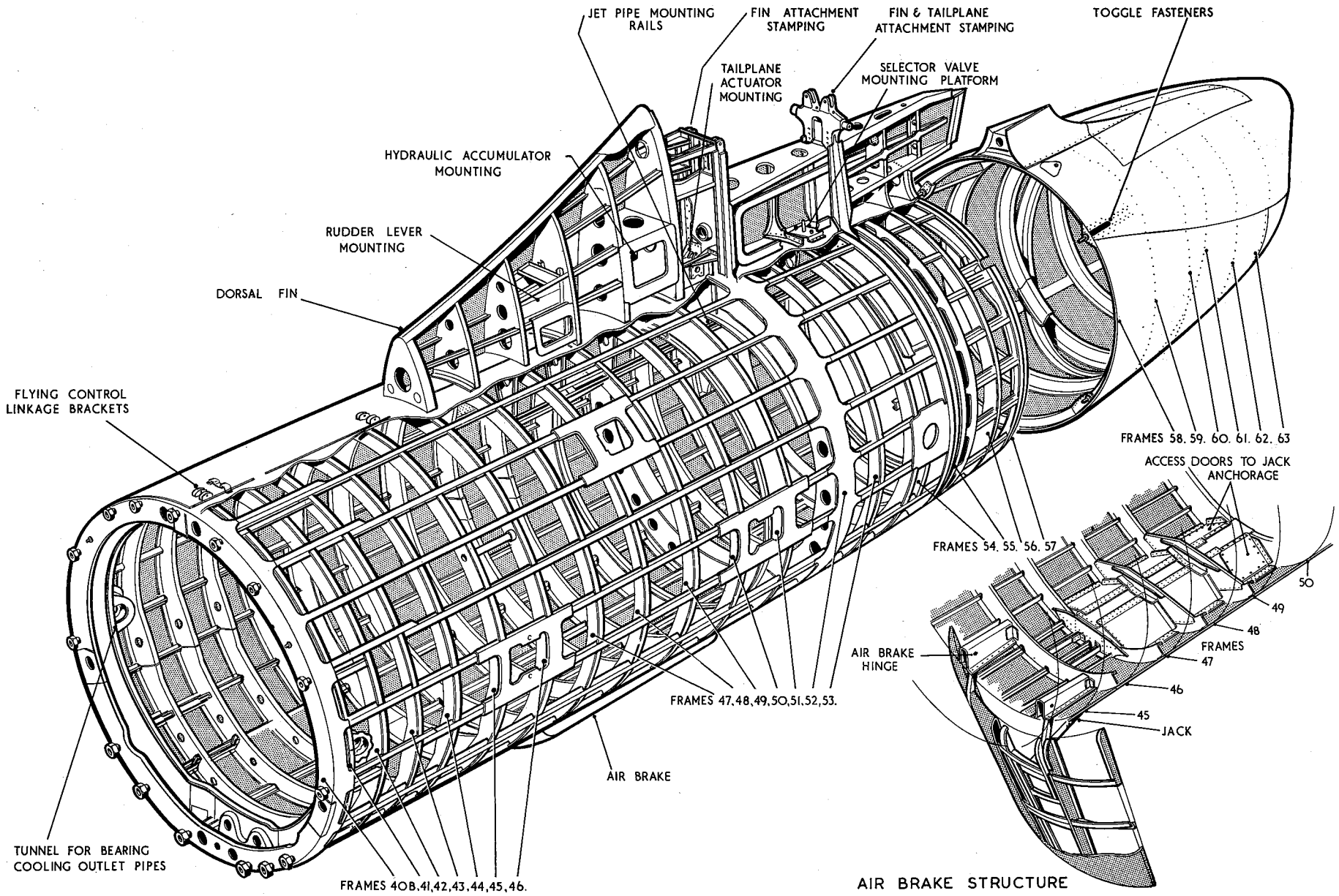

Fig.5. Rear fuselage

Windscreen dry-air sandwich

21. The procedure for examining the air driers of the windscreen dry air sandwich installation is contained in Sect. 2, Chap. 2.

Demisting of internally misted windscreen *(fig. 5a)*

21A. In the event of a windscreen becoming misted up internally the following S.T.N./Hunter/54 procedure may be adopted as a possible means of demisting :—

(1) Make up a special bolt to the dimensions shown in fig. 5a.

(2) Empty the air drier of silica gel crystals and leave empty while demisting.

(3) Replace the existing banjo bolt with the special bolt and connect an air line to the bolt head using an A.G.S. connector.

(4) Pass warm dry air at 150°F. maximum and $\frac{1}{2}$ lb/in^2 pressure through the special bolt until the windscreen is completely demisted. Continue for one further hour.

(5) Remove the air line and special bolt and refit the banjo bolt and 3 washers (*2 rubber and one light alloy*) complete with the tube and air drier, which must be filled with fresh silica gel crystals, immediately the instructions in sub-para. (4) are completed. (*Sect. 2, Chap. 2, fig. 2B*).

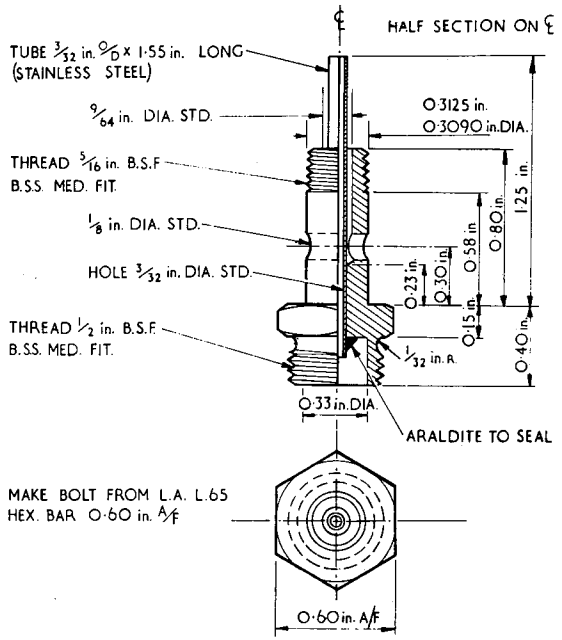

Fig. 5a Special bolt

Lubrication

22. The lubrication points for the hood mechanism and air brake, together with the types of lubricant to be used, are given on figs. 10, 11 and 35.

◀ **Bolts securing drag members rear ends to frame 32.**

22A. These should be replaced at major servicing as follows:– Remove the access panels over the port and starboard main plane rear spar pin joints and remove the eight 2 B.A. bolts and their nuts, lying immediately inboard of the pin joint and securing the flanges of the top and bottom drag members. Fit new bolts Pt.No. A.25/SC with the bolt heads inboard, new washers Pt.No. SP/15/C and new nuts Pt.No. A.27/CP. Do not over-tighten the nuts; if the bolt head or nut is at an angle to the surface, the fixture is satisfactory providing one corner of the bolt head or of the nut is bearing on the metal. Peen the bolt tails over the nuts. ▶

REMOVAL AND ASSEMBLY

General

23. The separation of the fuselage at its transport joints and the removal of various components, together with the method of slinging and trestling, is described in the following paragraphs and shown in the illustrations contained in this chapter. In general, the assembly of the units is a reversal of the removal, but where there is any special feature peculiar to assembly, it is covered in the description.

Removal of nose piece (*fig. 6*)

24. The nose piece is a quickly detachable unit held in position by four fasteners and four locating dowels. To release the fasteners, gain access through the nose-wheel bay, remove the pip pin passing through the lever and latch, and move the latch in the direction of the arrow A to free the lever, which should then be pulled in the direction of arrow B, thus freeing the hook from the fork of the nose piece. The nose piece may now be withdrawn from the front fuselage. On initial assembly, the attachment nuts should be tightened so that they grip the rubber washer without compression. After assembly, a slight gap between the shoulder of the hook and trunnion should be apparent at point C when the lever is locked home; the attachment nuts should then be adjusted if necessary. After assembling the nosepiece to the front fuselage, the four hooks *(painted white)* must be checked through the viewing aperture in the lever to ensure that they have been engaged correctly with the nose piece forks.

Removal of braking parachute

25. Before removing the tail cone the braking parachute must first be disconnected and removed as follows:—

(1) Ensure that an electrical supply is available, then operate the parachute switch in the cabin to STREAM. The parachute doors must be restrained by hand pressure to ensure that they open under manual control.

(2) Open the tail cone fillet door (*thus switching off the electrical supply*) and place the parachute switch to the JETTISON/OFF position. Apply a load of at least 10 lb to the cable between the parachute and the release slip and shut the fillet door whilst this load is being applied. This will energize the electro-mechanical release unit.

Note . . .

As the E.M.R.U. used in the installation was initially designed as a bomb slip, it will be apparent that a load should always be acting on the jaws of the slip, when electrically energized to jettison, and the instruction to apply a load to the parachute cable when JETTISON is selected is therefore important. If an aircraft has landed with a candled parachute and has subsequently jettisoned it (or if jettison has been selected when the parachute canopy was deflated) it must be assumed that the slip has been energized without the necessary load being applied. In these cases the E.M.R.U. should be removed and examined for possible rotor deterioration.

The parachute must be repacked before being replaced in the aircraft.

Note . . .

For refitment of the braking parachute reference should be made to Sect. 2, Chap. 2.

Removal and assembly of tail cone

26. The tail cone incorporating the braking parachute, is attached to the rear fuselage by four locating dowels and toggle fasteners. Before removing the tail cone, the braking parachute must first be removed. The procedure for the removal of the tail cone is as follows:—

Render the aircraft electrically safe, remove the access door on the port side of the tail cone and unscrew the electrical connection. Take the weight of the tail cone and remove the four toggle fasteners. The tail cone may now be removed.

To assemble the tail cone to the rear fuselage, proceed as follows:—

With the parachute doors open and the parachute removed, attach the tail cone by the four fasteners and re-fit the electrical connection. For refitment of the parachute and completion of the assembly, reference should be made to Sect. 2, Chap. 2.

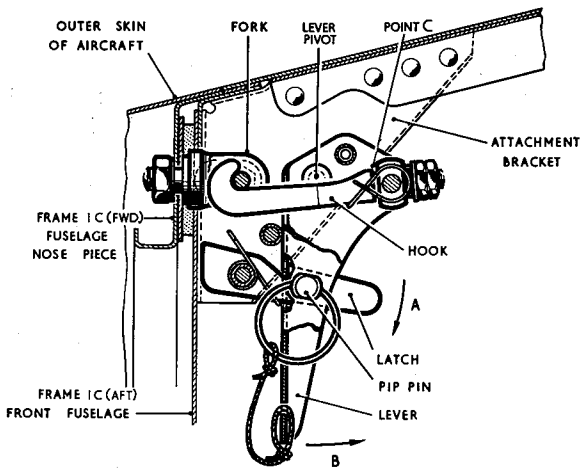

Fig. 6 Typical fastener for fuselage nose piece

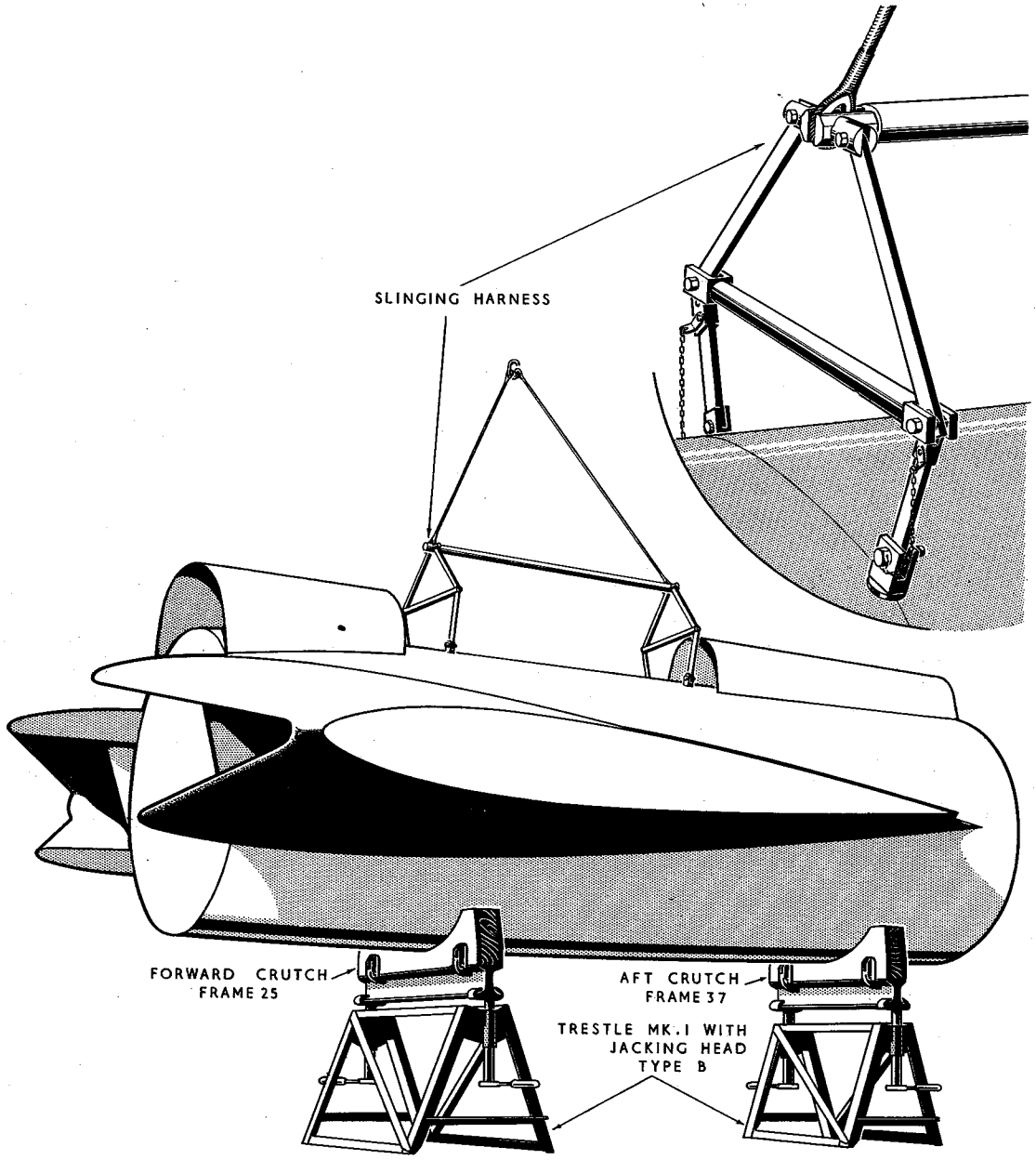

Fig. 8 Slinging and trestling centre fuselage

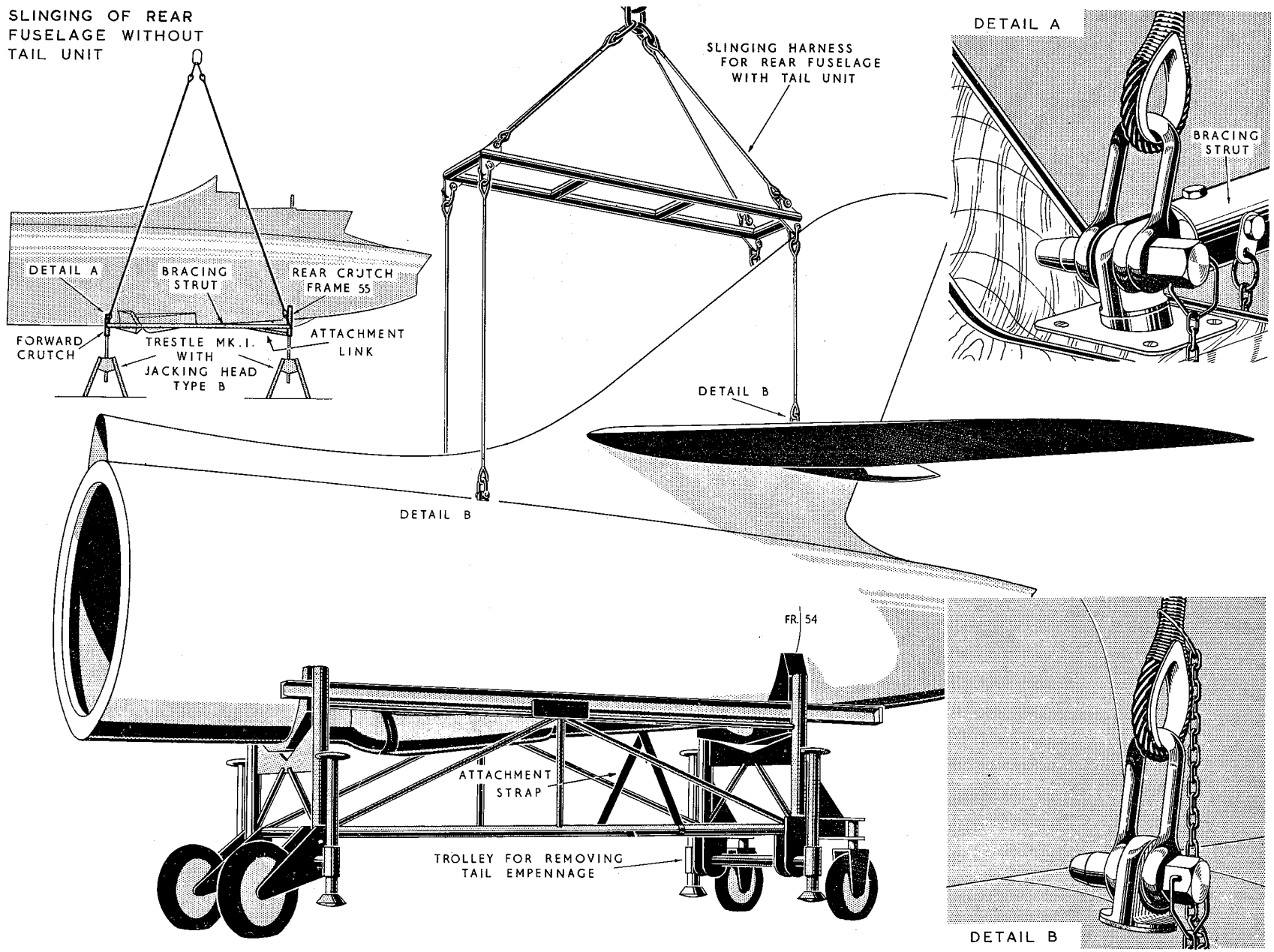

Fig. 9 Slinging and trestling rear fuselage

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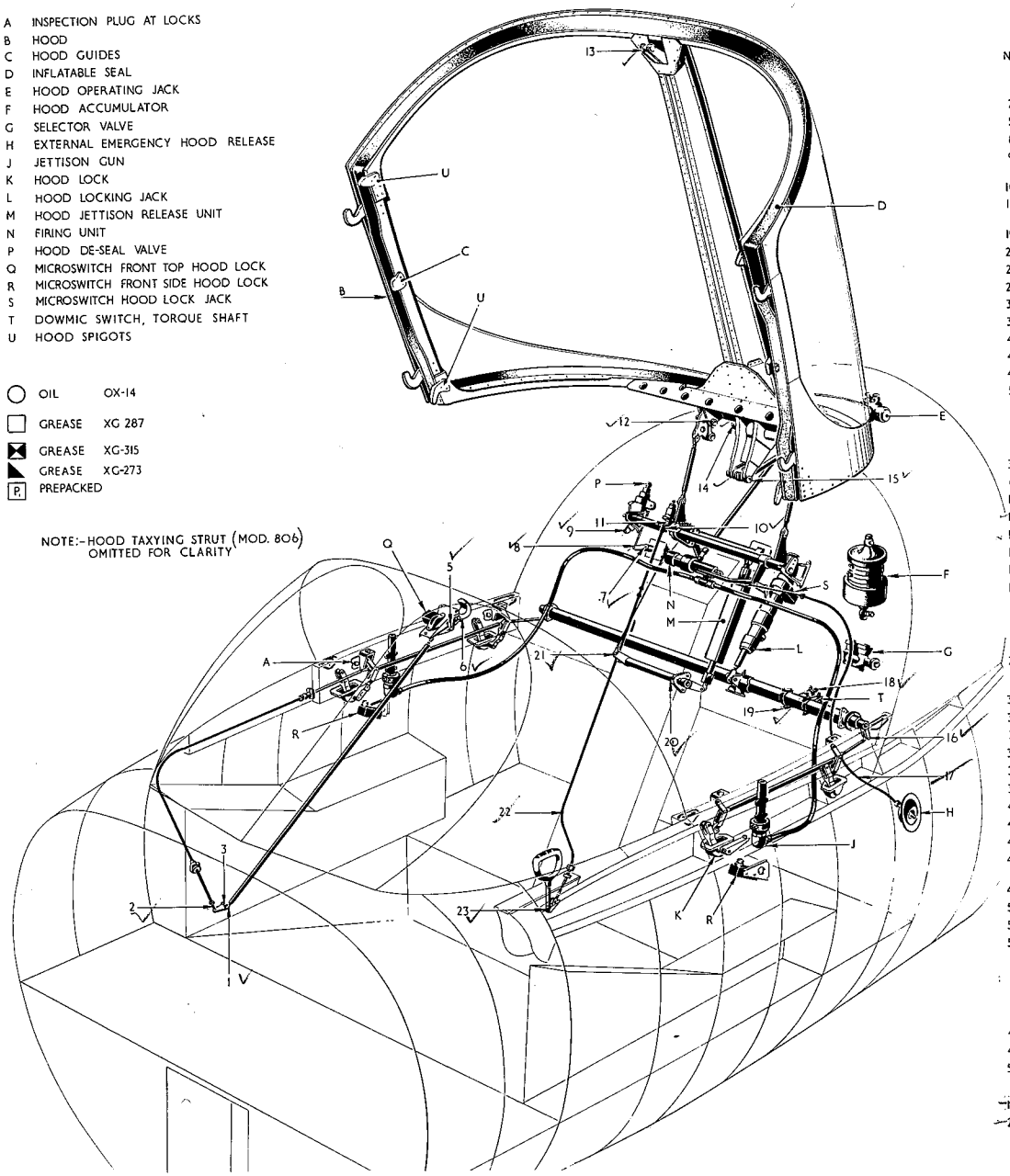
A INSPECTION PLUG AT LOCKS
B HOOD
C HOOD GUIDES
D INFLATABLE SEAL
E HOOD OPERATING JACK
F HOOD ACCUMULATOR
G SELECTOR VALVE
H EXTERNAL EMERGENCY HOOD RELEASE
J JETTISON GUN
K HOOD LOCK
L HOOD LOCKING JACK
M HOOD JETTISON RELEASE UNIT
N FIRING UNIT
P HOOD DE-SEAL VALVE
Q MICROSWITCH FRONT TOP HOOD LOCK
R MICROSWITCH FRONT SIDE HOOD LOCK
S MICROSWITCH HOOD LOCK JACK
T DOWMIC SWITCH, TORQUE SHAFT
U HOOD SPIGOTS

○ OIL OX-14
□ GREASE XG 287
⧓ GREASE XG-315
◣ GREASE XG-273
[P] PREPACKED

NOTE:- HOOD TAXYING STRUT (MOD. 806) OMITTED FOR CLARITY



LUBRICATION KEY TO FIG. 10 AND 11

Nº	DESCRIPTION	Points per Assembly	
1	CONNECTING ROD ATTACHMENT TO LEVER	1	○
2	TELEFLEX CONTROL ATTACHMENT TO LEVER	1	○
5	WINDSCREEN ARCH HOOD LOCK LEVERS	3	○
8	LEVER AND CONNECTING ROD ATTACHMENT	2	○
9	CONTROL ROD ATTACHMENT TO HOOD DE-SEAL VALVE LEVER	2	○
10	CABLE ATTACHMENTS TO LEVERS ON CROSS SHAFT	1	○
16	LEVER ATTACHMENT TO CONNECTING ROD (PORT AND STARBD)	1	○
19	LEVER ATTACHMENT TO PLUNGER	1	○
21	FORKEND ATTACHMENT TO LEVER	1	○
23	HOOD RELEASE HANDLE LEVER	3	○
29	HOOD JETTISON LEVER ADJUSTABLE LINK (PORT)	2	○
33	HOOD JETTISON LEVER ADJUSTABLE LINK (ST'BD.)	2	○
35	PIVOT POINTS ON PLUNGER LEVER	2	○
40	CONNECTING ROD TO JACK RELEASE LEVER	1	○
44	CONNECTING ROD TO HOOD JETTISON LEVER	1	○
49	LEVER ATTACHMENT TO RELEASE UNIT	1	○
52	ROD AND LEVER CONNECTIONS ON LOCK	4	○
3	LUBRICATOR BOLT ON LEVER	1	
34	BEARING BRACKET, HOOD JETTISON LEVER	1	
6	HOOK, WINDSCREEN ARCH LOCK	1	
11	DEPRESSURIZING VALVE PLUNGER	[P] –	
12	STABILIZER BRACKET ROLLERS (PORT & STAR'BD.)	3	
13	ROLLER ON HOOD	1	
14	ROLLERS ON HOOD HINGE BRACKET	2	
15	ROLLERS FOR OPERATING JACK	3	
18	SEQUENCE VALVE PLUNGER	–	
20	BEARING BRACKET (PORT & ST'BD.)	1	
27	CROSS SHAFT BEARING BRACKET (PORT)	1	□
28	TOP LEVER CONNECTION RELEASE UNIT	1	□
30	LATCH PIVOT	2	□
31	CROSS SHAFT BEARING BRACKET (ST'BD. & CENTRE)	1	□
36	JACK RELEASE	1	□
37	ROLLER, JACK RELEASE LEVER	1	□
38	BEARING BRACKET JACK RELEASE SHAFT	1	□
39	BEARING BLOCK JACK RELEASE SHAFT	1	□
41	HOOD OPERATING JACK	2	□
43	PLUNGER	[P] –	□
45	HOOD LOCKING JACK	1	□
47	LINK CONNECTING CROSS SHAFT AND LOCK RELEASE HANDLE	2	□
48	RELEASE UNIT	[P] –	□
50	HOOD LOCKING JACK	1	□
51	BEARING BRACKET TORQUE SHAFT	1	□
53	LATCH ROLLER ON LOCK	1	□
7	HOOD DE-SEAL VALVE AND DEPRESSURIZING VALVE LEVERS	1	⧓
42	TORQUE SHAFT (PORT AND ST'BD. GREASERS)	2	⧓
46	BEARING BLOCK HOOD JETTISON LEVERS	1	⧓
54	SHAFT FOR LOCK OPERATING LEVERS	1	⧓
17	CABLE	[P] –	◣
22	CABLE	[P] –	◣

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Fig. 10 Hood locking and jettison details with lubrication (1)

◀ Lubrication details corrected ▶

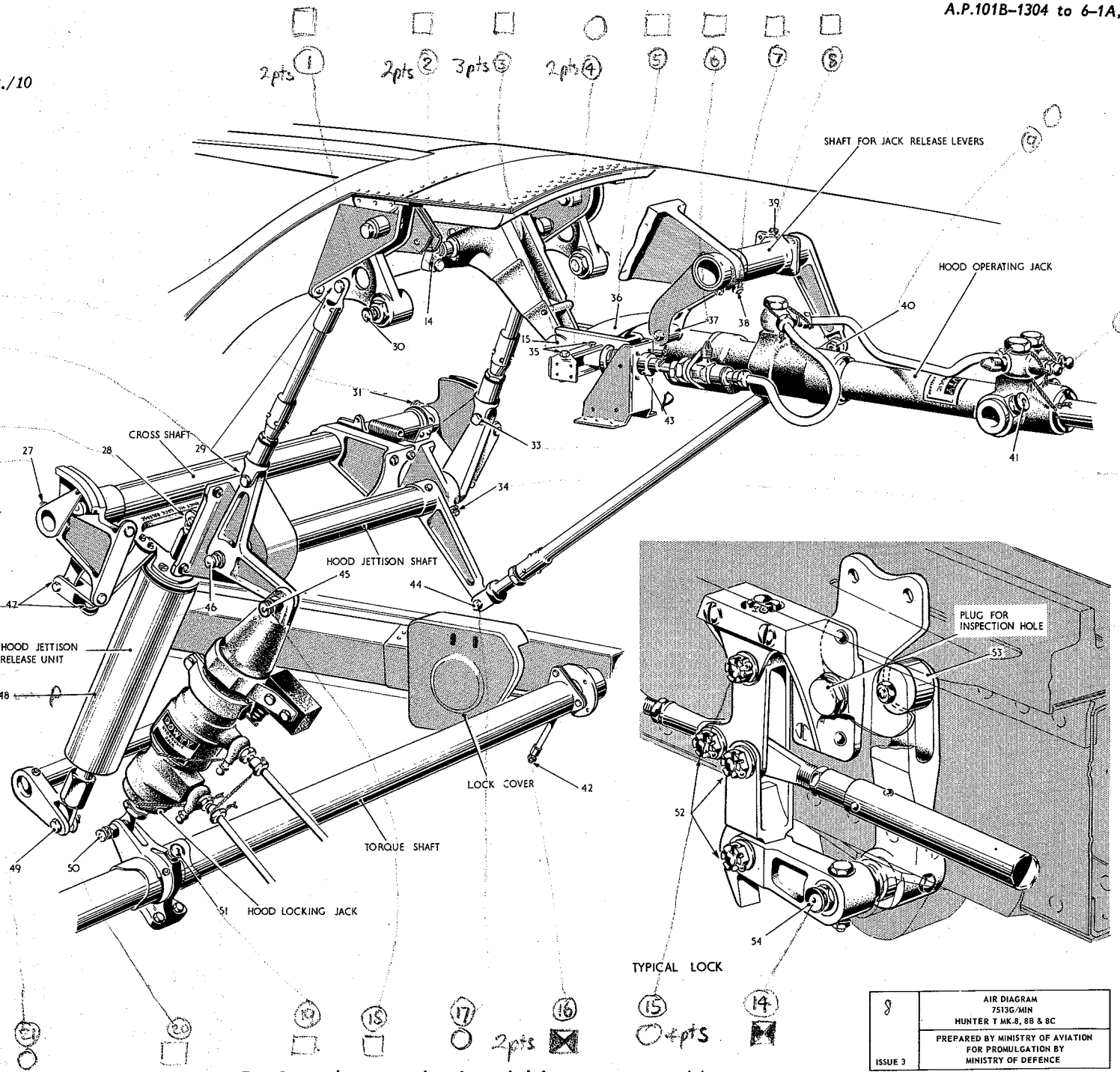

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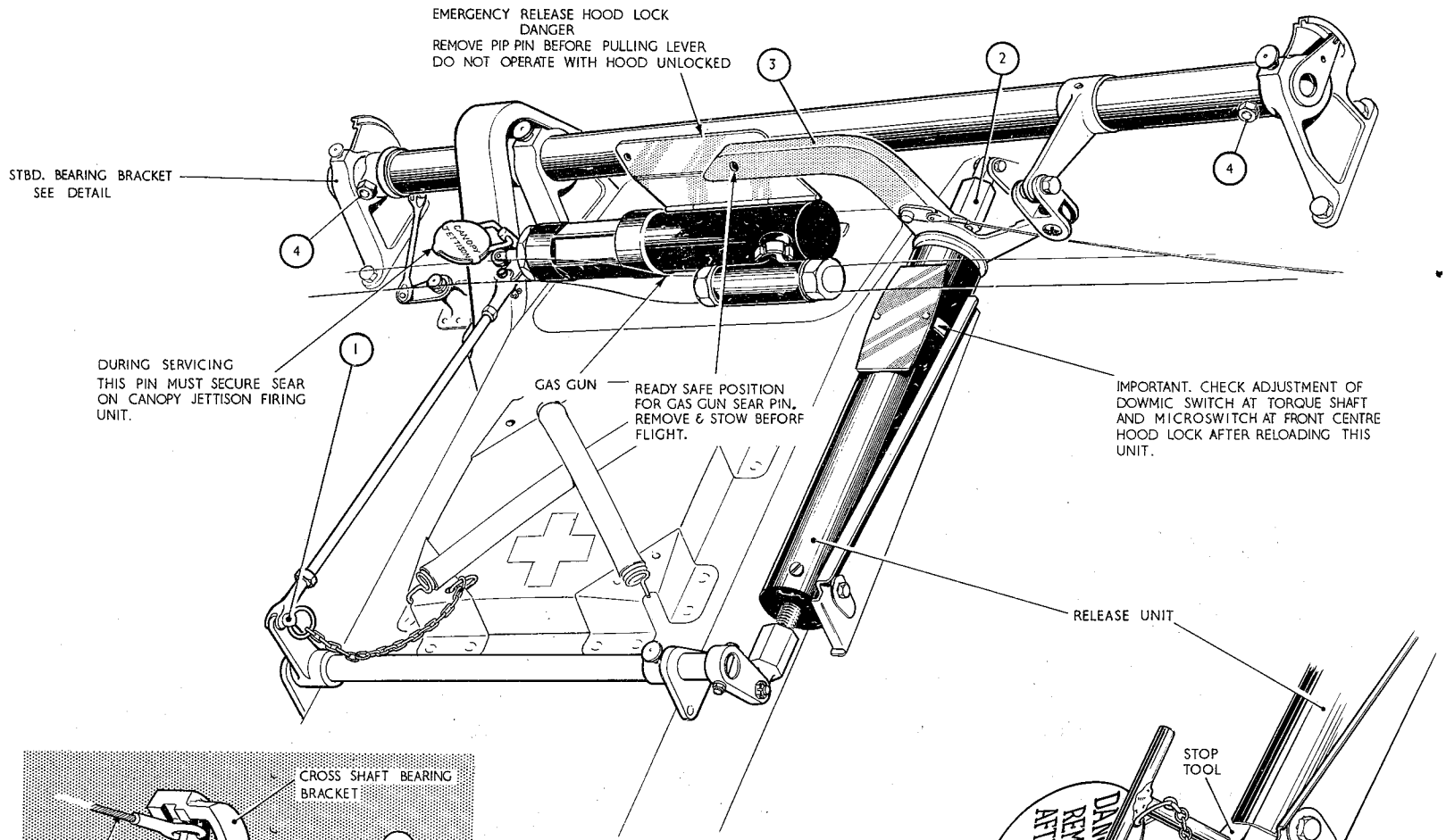
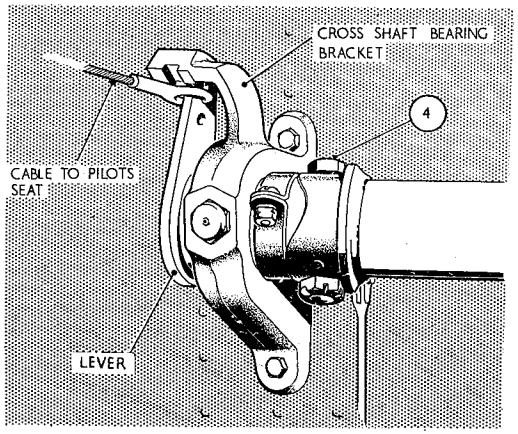
Fig.11 Hood jettison details with lubrication points (2)





DETAILS OF STBD.
BEARING BRACKET

VIEW SHOWING
STOP TOOL IN
POSITION

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Fig.12 Hood jettison release unit and gas gun

◀ Minor alterations ▶

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Removal of hood

WARNING

The hood jettison mechanism must not be operated with the hood unlocked.

29. To remove the cabin hood, first ensure that the cabin is de-pressurized, then proceed as follows:–

(1) Open the hood by operating manually the solenoid valve, access to which is obtained after removing the access door in the fairing aft of the hood on the port side of the aircraft, and using the hydraulic handpump to supply the necessary hydraulic pressure.

(2) With the hood open, remove the pip pin *(fig. 12, item 1)* from the cross shaft lever. The pip pin is attached by a chain to the lower starboard retaining bracket of the first aid kit stowage.

(3) With one person remaining in the cabin, close the hood by operating the solenoid valve manually. Ensure the hood is fully locked.

(4) Operate the hood emergency release handle located under the guard *(fig. 12, item 3)*: this action will open all locks and allow the hood to be lifted off.

The hood may also be removed when in the open position, by proceeding as follows:–

Commence with the hood open, then whilst lowering the hood restrain the hinged door aft of hood in the open position. When the hood is nearly closed but not locked, raise the arm of the hood jack hook, then manually raise the hood to the open position. Place a hood strut in position to hold the hood open. Remove the nut and bolt from the lower end of the connecting rods to the upper latches, move the latch hooks forward clear of the pivots. The hood may now be lifted clear of the aircraft.

Assembly of hood

30. To refit the cabin hood proceed as follows:–

(1) Partially extend the hood operating jack.

(2) With the front of the hood raised, fit the rollers on the hood into the housings and guide brackets on the fuselage. Lower the hood until the roller on the hinge bracket can be engaged with the hood operating jack fork end. Fit the jury strut to hold the hood open.

(3) Move the upper rear latches to secure the hood and reconnect the connecting rods.

(4) Reset the release unit as described in para. 31.

(5) Remove the jury strut and lower the hood.

Note . . .

It is important that this procedure be followed to ensure that the hook release lever is above the roller on the rocker (fig. 20).

Resetting hood jettison release unit *(fig. 12)*

31. With the pin (1) removed and the release handle (3) in the unloaded position, rotate the upper coupling (2) in an anti-clockwise direction to move the 'H' nut into the 'H' shaped hole in the release handle lever. Continue rotation of the coupling until the outer face of the 'H' nut is flush with the outer face of the release handle lever. Lock the 'H' nut by moving the release handle (3) 45 deg. backward to the 'loaded' position – if the release handle will not move, rotate the coupling further in the same direction until the handle can be freely moved to lock the 'H' nut. No further rotation of the coupling in this direction is permissible.

WARNING

It is important that the release handle is retained in this 'loaded' position throughout the remainder of the re-setting operations to prevent accidental release and possible injury to personnel.

Load the unit by rotating the coupling (2) in a clockwise direction to the full extent of its travel, to fully compress the spring of the unit, then unscrew the coupling one half-turn. Finally check the setting of the Dowmic switch on the torque shaft and the microswitches on the hood locks.

To unload the unit hold the release handle (3) in the loaded position and turn the coupling (2) anti-clockwise to its full extent.

Fitting replacement hood

Notes . . .

(1) The perspex covering of spare hoods have a protective coating of latex to prevent damage during storage and transit. This coating should be removed very carefully to avoid damage to the surface of the perspex. Tools or sharp instruments must not be used. Rubbing with the thumb will usually cause the coating to lift locally, the remainder may then be peeled off. In some cases of prolonged storage where the coating has become hard, the application of warm soapy water may prove beneficial or, in extreme cases, a small quantity of methylated spirits may be used.

(2) To ensure positive entry of the hood into its locks, housing blocks are bolted to the cockpit structure to receive spigots at the forward and rear corners of the hood. Lateral adjustment of the housing blocks is effected by shimming (fig.23A and para.45A).

32. When a replacement hood is being fitted the following minimum clearances must be obtained :—

(1) The minimum clearance between the faces of each hook on the hood and the internal faces of the hood latch *(fig. 11)* must not be less than 0·005 in. This clearance may be obtained by adjusting the bearing blocks laterally.

(2) With the hood in the flight position a minimum clearance of 0·050 in. must be obtained between the windscreen arch and the front arch of the hood; the hood rear arch and the diaphragm aft of the hood; the bottom of the hood and the top of the longeron. At these points the clearance may be obtained by filing the edge of the hood, care being taken not to damage the inflatable seal.

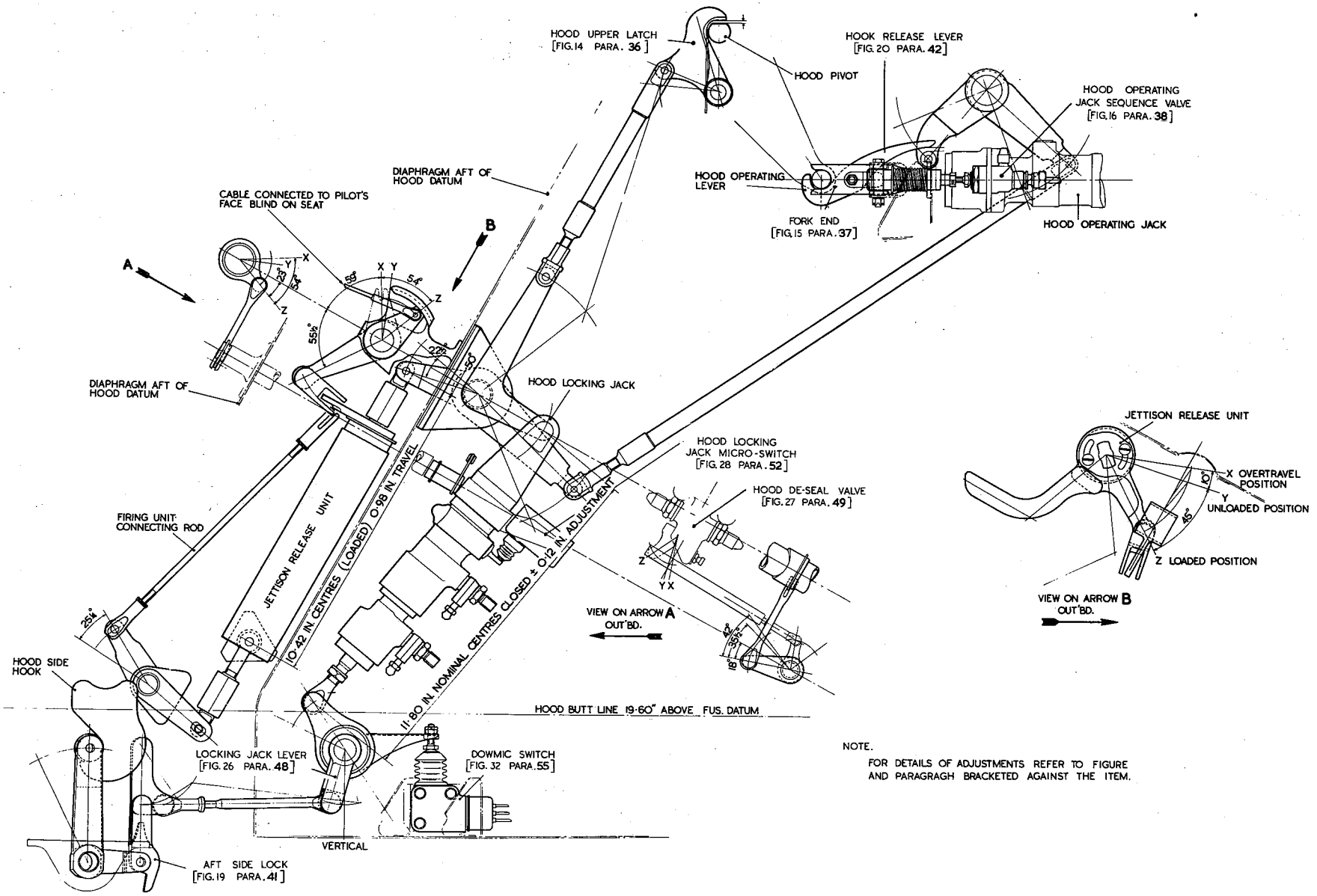


Fig. 12A Hood operating mechanism geometry

Seat removal and replacement

33. Ejection seats must be removed and replaced in accordance with the relative equipment publication. These procedures involve the removal and subsequent refitment of the bolts *(fig.12, item 4)* securing the port and starboard levers to the hood jettison cross shaft. The removal of these bolts enables the levers to be turned to release the cables to the ejection seats without disturbing the setting of the hood jettison release unit.

CAUTION

As movement of the hood cross shaft can result in operation of the release unit, care must be taken to prevent the cross shaft from moving when the levers are turned either to release or refit the cables.

Hood cross shaft

33A. The canopy-jettison operating cable from the port seat connects to the lever item 27 in fig.11. On most aircraft this lever and the adjacent cross-shaft mounting bracket are drilled with ¼ in. diameter holes and the safety pin from the port seat face-blind firing handle may be inserted through these holes to provide a 'safe for servicing' feature. On the few aircraft where these holes are not provided they are to be drilled using the following procedure:–

(1) Ensure the ejection seats are safe for servicing in accordance with current instructions.

(2) Remove the pip pin *(fig. 12, item 1)* from the lower end of the gas gun sear tie rod and the cross lever.

(3) Observing the **CAUTION** in para. 33, remove and retain the bolt and nut *(fig. 12, item 4)* securing the port lever to the hood jettison cross shaft, disconnect the cable and withdraw the lever.

(4) Mark out and drill the lever as shown in fig. 12B. Where a tooling hole is present in the lever this is to be used as a pilot hole.

(5) Refit the lever to the cross shaft, using the bolt and nut retained in sub-para.(3).

(6) Using the hole drilled in the lever as a guide, drill the cross shaft bearing bracket as shown in fig.12C ensuring, by angling the drill if necessary, that the periphery of the hole does not break into the radius of the web.

(7) Adjusting the holes as necessary, ensure that the port seat face-blind safety pin is a free fit in the holes.

(8) Refit the port seat canopy-jettison cable to the lever and insert the port seat face-blind safety pin through the new holes.

(9) Refit the pip pin to connect the lower end of the gas gun sear tie rod to the lever of the lower cross shaft.

(10) Carry out the vital and independent checks in accordance with current regulations.

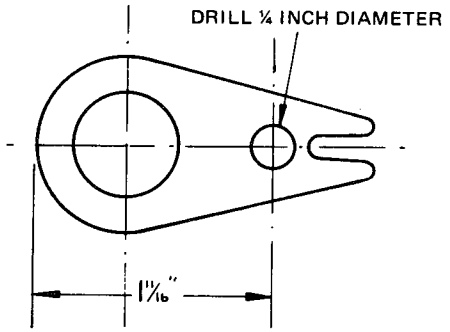


Fig.12B Cross shaft lever

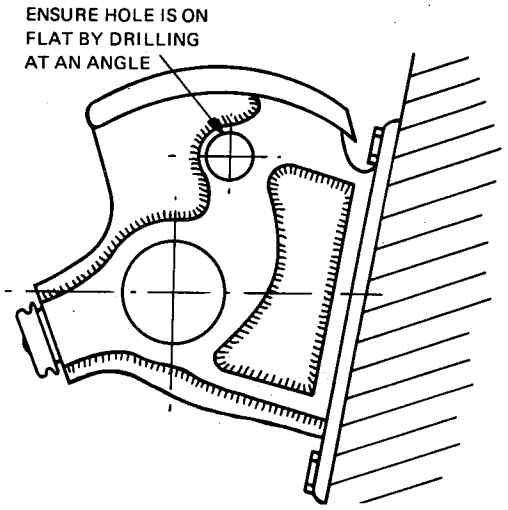


Fig.12C Cross shaft bearing bracket

Adjustment of hood and locking mechanism

34. The procedure for the various adjustments that are necessary on the hood, cockpit structure and hood operating mechanism is detailed in para.35 to 50 inclusive. All parts should be correctly lubricated *(fig. 10 and 11)* before carrying out any adjustment and on completion of each adjustment, the mechanism concerned should be checked for freedom of movement. If any one unit is considered to require adjustment, that unit must first be isolated by uncoupling those rods connecting it to adjacent units. Clearances of that unit should be re-checked in case the cause of maladjustment is due to errors in other units or in the connecting rods. On completion of the adjustment and after reconnection to the system, checks should be carried out to ensure that other components in the system have not been affected.

Note. . .

During all adjustments, with the exception of para. 35 and 36, packing (approx. 0.05 in.) must be in position between the forward ends of the hood side members and the longerons to bring the hood to the flight position.

Hood contact points—static position (fig. 13)

35. Adjust the shim under the bearing plate until the outer rollers on the hood hinge bracket make contact with the bearing plate. The bottom corner of the front arch member of the hood should be in contact with the top longeron.

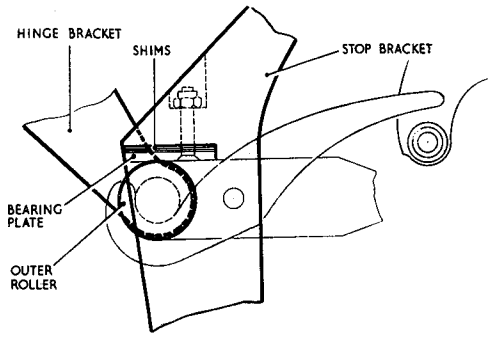


Fig. 13 Hood contact point—static position

Hood upper rear latches (fig. 14)

36. Adjust the connecting rods to the upper rear latches to bring the latch within 0·02 in. of the forward face of the special fitting at the hood pivot. The backlash should be taken up by pushing down on the lever at the top of the release unit.

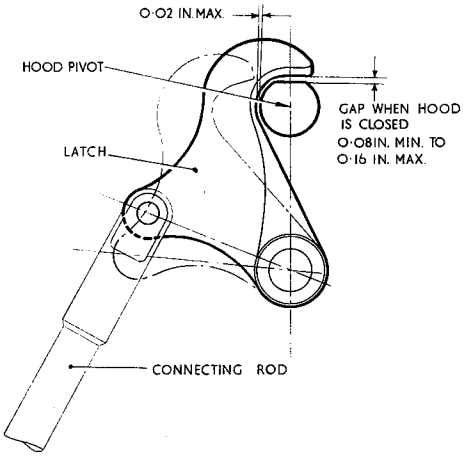


Fig. 14 Hood upper rear latches
Gap at top of hood pivot altered

Hood operating jack fork end (fig. 15)

37. With the hood in the flight position, adjust the fork end of the jack until it just touches the rear face of the centre roller on the hood hinge bracket.

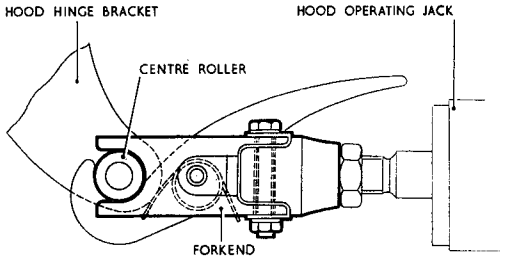


Fig. 15 Hood operating jack fork end

Hood operating jack sequence valve (fig. 16)

38. Adjust the hood operating jack sequence valve as follows:—

(1) Ensure that the end fittings have been correctly adjusted (para. 37).

(2) Close the adjusting screw to its minimum length *(i.e. dimension 'X' to be approximately 0·30 in.)*. Apply full hydraulic pressure to ensure that the jack is fully bottomed *(hood closed)*.

(3) With lever 'A' against stop 'B' adjust the plunger screw until there is a gap of 0·06 in. to 0·08 in. between the contact face of the sequence valve body, as in scrap view in fig. 16.

(4) Unscrew the adjusting screw a further four turns to ensure full compression of the sequence valve and lock with 22 s.w.g. stainless steel locking wire.

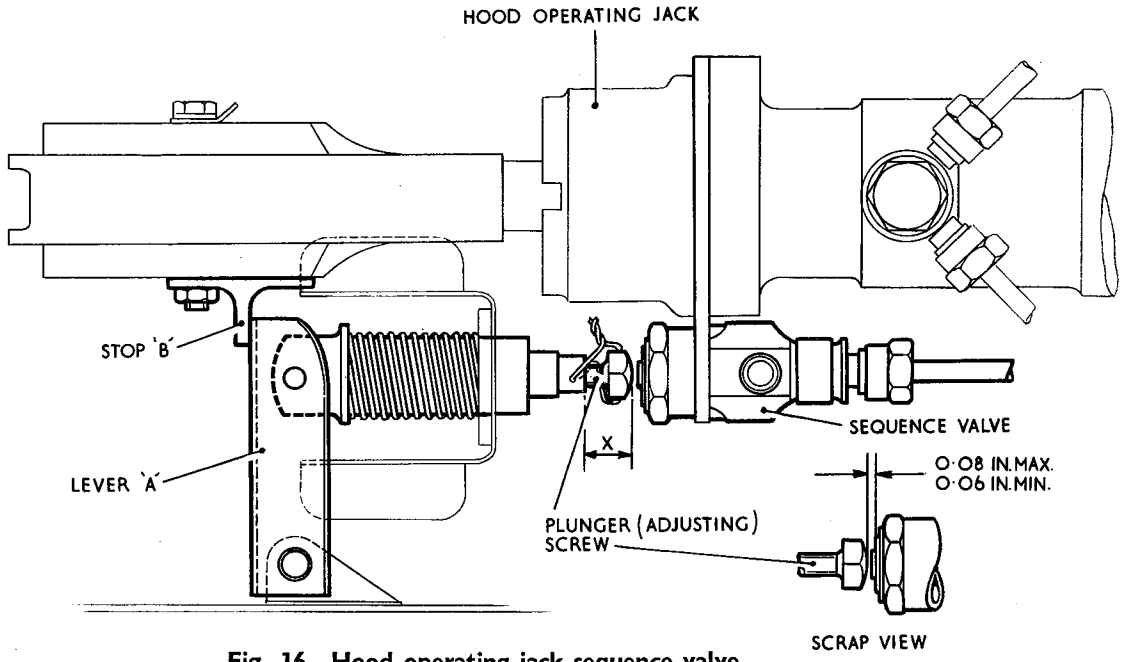


Fig. 16 Hood operating jack sequence valve

Front centre lock (fig. 17)

39. With the hood in the flight position *(i.e. the hood in a fair line with the top of the windscreen arch)* and with the hood jack in the fully retracted and locked position, check that the side lock rollers are all clear of the hooks, then :—

(1) Disconnect the toggle links from the hook.

(2) Adjust the three sets of shims 'A' fitted, under the lock mounting so that the hook just makes contact with the top of the roller with a clearance of 0·09 in. to 0·11 in. between the aft face of the roller and the hook.

(3) Reconnect hook and toggle links, ensuring that the pan-headed bolt securing the connecting rod to the toggle links is fitted with the slotted head on the starboard side.

Note . . .

Incorrect fitment of this bolt can result in intermittent operation of the "Canopy Locked" indicator light.

(4) Adjust the shims 'B' fitted under the toggle link mounting bracket to bring the toggle links into a straight line whilst maintaining the setting of the hook as in (2) above.

The backlash must be taken up by loading the connecting rod away from the lock during this adjustment.

(5) Adjust the length of the connecting rod between the lock and the bell-crank lever and the length of the Teleflex cables to hold the toggle links in this position.

A white arrow on the hook mounting bracket and a white dot on the bolt through the toggle links and connecting rod should line up when the adjustment of the front centre lock is correct, any re-adjustment of this lock will therefore necessitate the repainting of these markings.

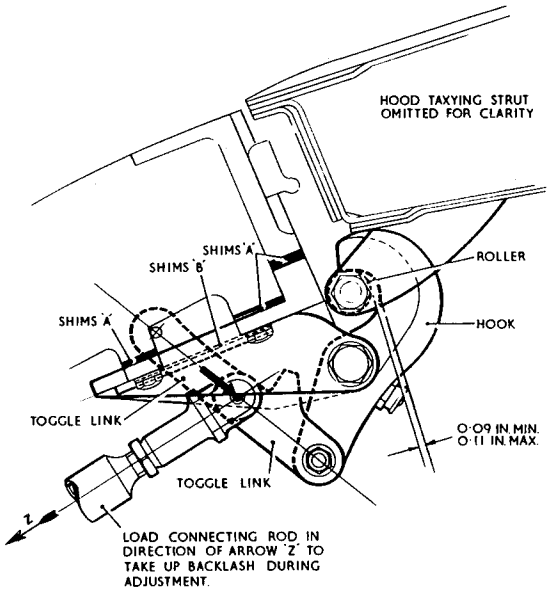


Fig. 17. Front centre lock

Forward side locks (fig. 18)

40. With the hood in the flight position and with the hood lock jack in the fully retracted and locked position :—

(1) Disconnect the connecting rod at the toggle links and tie the links clear of the locks.

(2) Adjust the shims 'X' at the bearing block mounting until the roller just makes contact with the hood hook. Care must be taken when replacing the bearing block mounting that the lock latch and roller is centralized about the hood hooks. Elongated holes in the bearing block allow for this adjustment.

(3) Re-connect the toggle links.

(4) Adjust the shims 'Y' under the toggle link mounting bracket to bring the links within 0·020 in. forward of a straight line when the clearance between the rear face of the roller and the front face of the hook is 0·04 in. to 0·06 in. *(This clearance can be checked through the inspection hole in the longeron).* Backlash to be taken up in an aft direction.

(5) Adjust the length of the connecting rod between the forward and aft locks and the Teleflex cable to hold the toggle links in this position, care being taken not to mal-adjust the settings of the front centre lock or the aft side lock.

A white dot painted on the inspection window of the lock casings, should line up with the centre bolt of the toggle links, when looking square on the locks, when this setting is correct. Any re-adjustment of the setting will, therefore, necessitate repainting of this white dot. *($\frac{1}{4}$" dia.)*

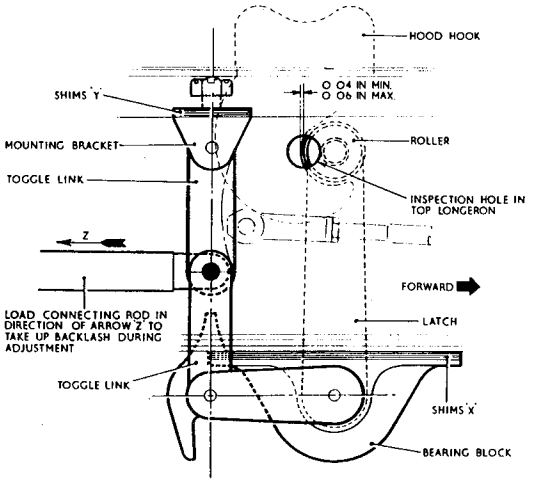


Fig. 18. Forward side lock

Aft side locks (fig. 19)

41. With the hood in the flight position and the hood lock jack in the fully retracted and locked position :—

(1) Disconnect the connecting rods at the toggle links and tie the links clear of the locks.

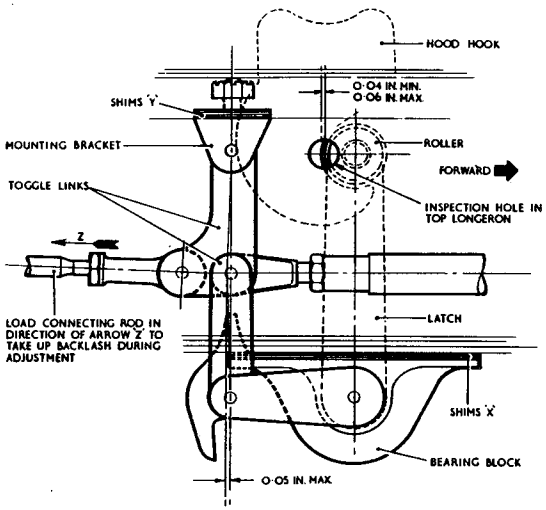


Fig. 19 Aft side lock

(2) Adjust the shims 'X' at the bearing block mounting until the roller just makes contact with the hood hook. Care must be taken when replacing the bearing block mounting that the lock latch and roller is centralized about the hood hooks. Elongated holes in the bearing block allow for this adjustment.

(3) Re-connect the toggle links.

(4) Adjust the shims 'Y' fitted under the toggle link mounting bracket to bring the links within 0·05 in. aft of a straight line when the clearance between the rear face of the roller and the front face of the hook is 0·04 in. to 0·06 in. *(This clearance can be checked through the inspection hole in the longeron).* This adjustment must be carried out with all backlash taken up in an aft direction.

(5) Adjust the length of the connecting rods to the rear locks to hold this setting, care being taken not to maladjust the setting of adjacent units.

WARNING

Should any item, such as harness webbing, be trapped between the hood and longeron when the hood is closed, a complete check must be made to ensure that the roller shafts on the side locks have not been distorted—see para. 40(2) and 41(2). It is not sufficient to check that the microswitch lights are operating correctly.

Hood operating jack hook release lever (fig. 20)

42. With the hood fully closed, adjust the length of the connecting rod to the lever assembly for the hood operating jack hook release to give the following minimum clearances :—

(1) 0·10 in. gap between the roller and the hood operating jack body.

(2) 0·15 in. gap between the roller and the underside of the lever portion of the hook.

(3) With the hood fully open (jack fully extended under hydraulic pressure of 3000 lb/in²) ensure that there is a clearance of 0·06 in.–0·08 in. between the stop on the hinge bracket and the hook release lever.

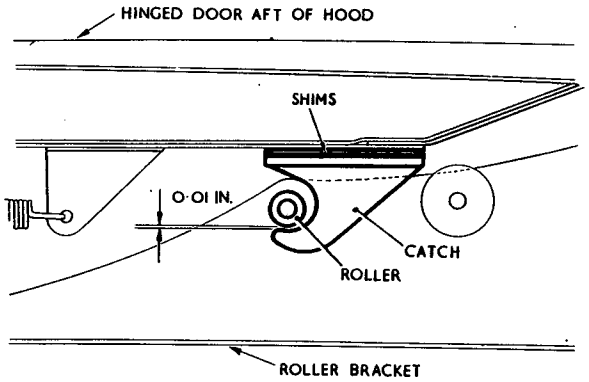


Fig. 21 Hood fairing door catches

Hood fairing door catches (fig. 21)

43. Adjust the shims under the catch of the fairing until a clearance of 0·01 in. is obtained between the upper surface of the catch and the underside of its securing roller.

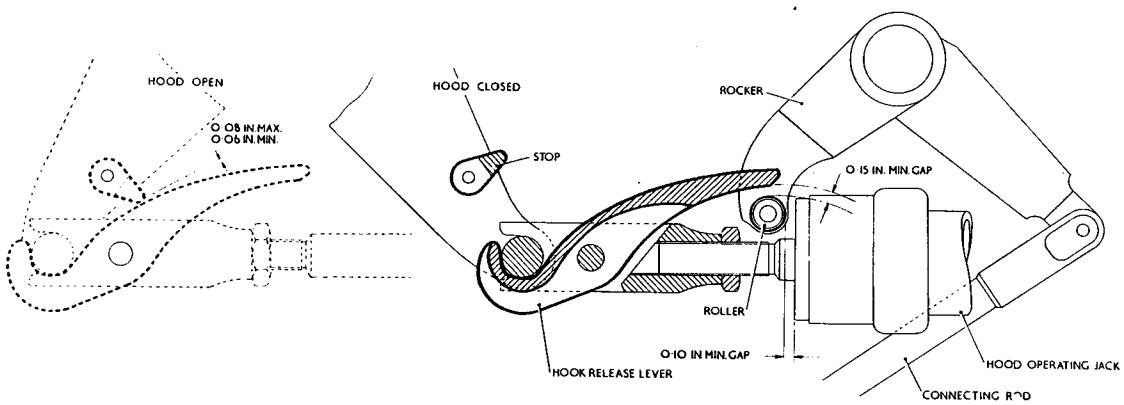


Fig. 20 Hood operating jack hook release lever

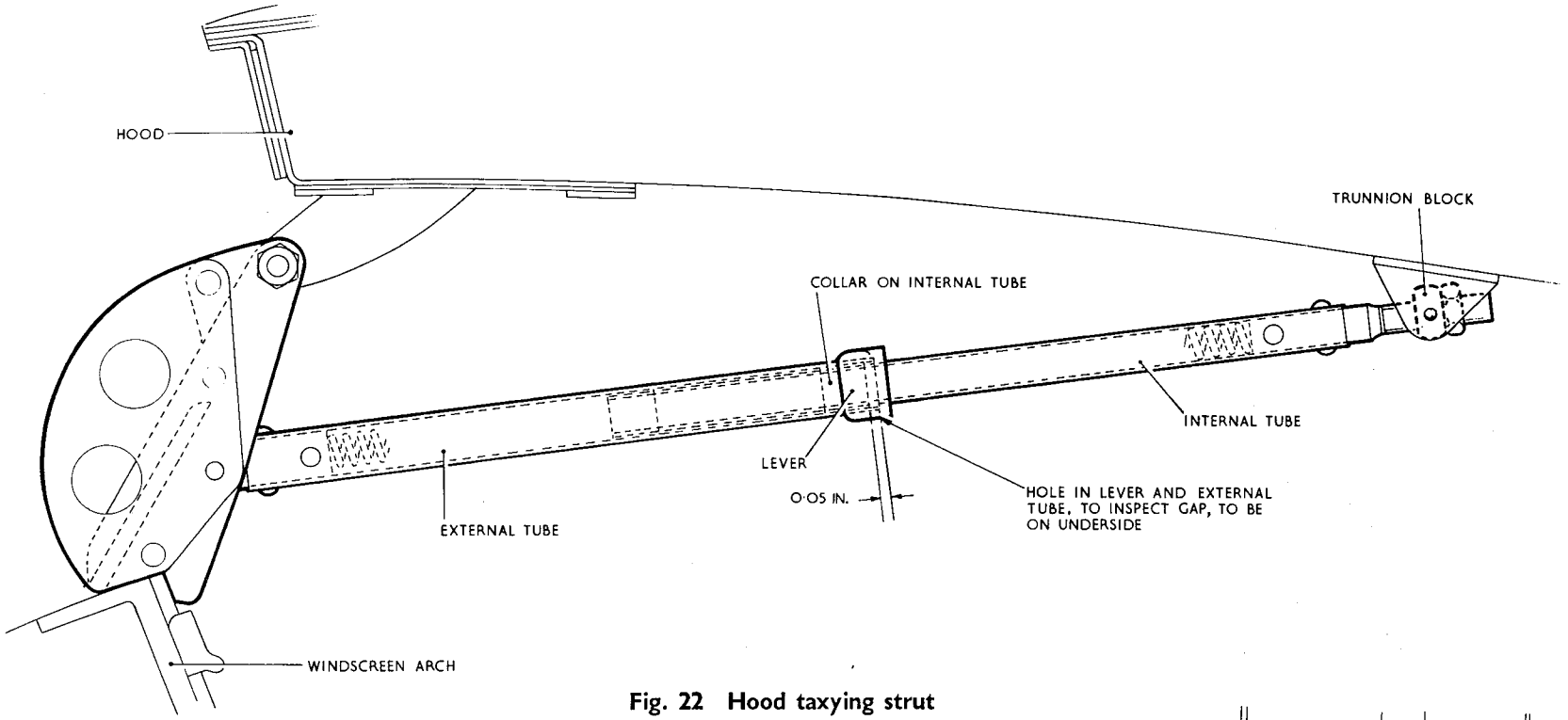


Fig. 22 Hood taxying strut

Hood taxying strut (fig. 22)

44. Adjust the hood taxying strut as follows:—

(1) With the hood open, unscrew the internal tube until the screwed end just protrudes through the trunnion block on the hood.

(2) With the strut fully extended carefully lower the hood and guide the strut on to the windscreen arch.

(3) With the hood jack fully pressurized to 3000 lb/in^2, screw the internal tube into the trunnion block until there is a gap of 0·05 in. between the end of the collar on the internal tube and the end of the external tube *(i.e. the end of the collar is in line with the centre of the inspection hole).*

(4) Screw up the lock-nut on to the trunnion and wire lock.

(5) Raise and lower the hood under full hydraulic power to check that no additional load is applied to the trunnion attachment angles.

Hood guides (fig. 23)

45. Adjust the shims between the guide and the hood until a clearance of 0·01 in. to 0·02 in. is obtained between the guide and the longeron. The bolt heads must be filed off flush with the nuts and locked by centre punch.

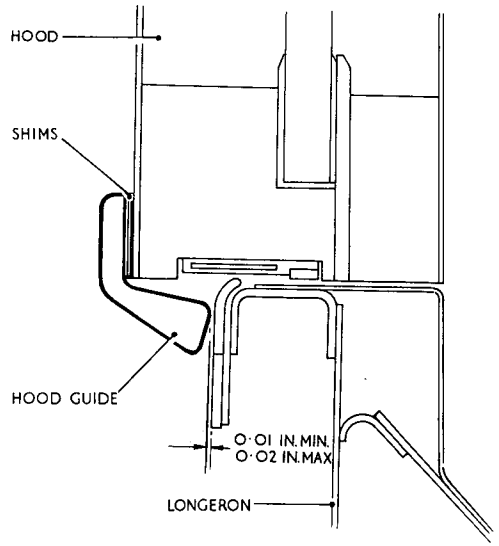
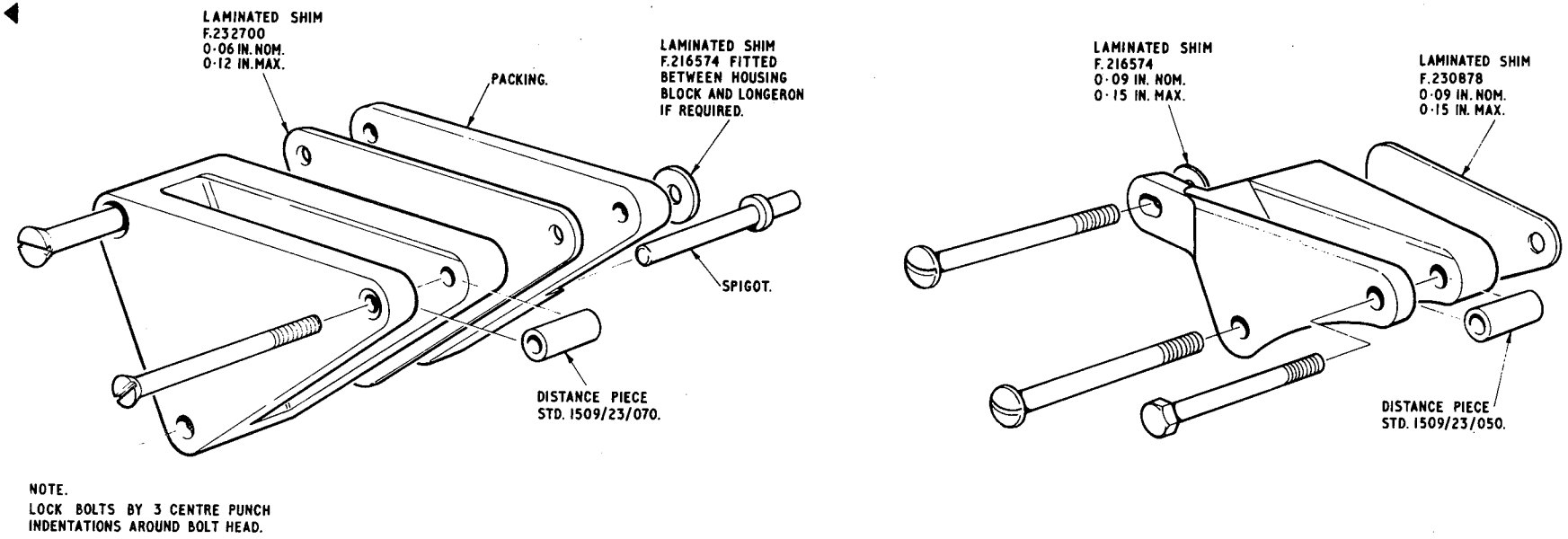
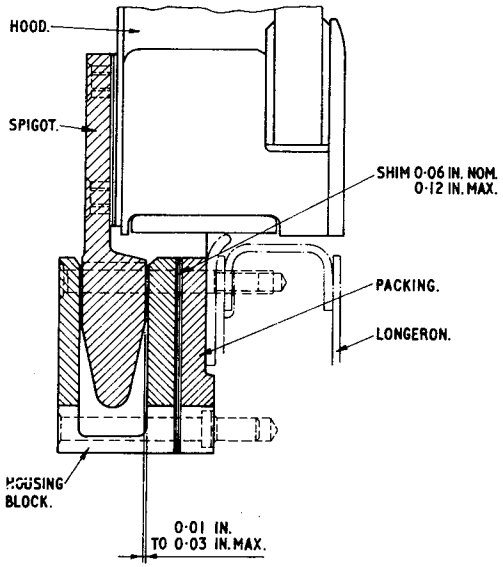


Fig. 23 Hood guides

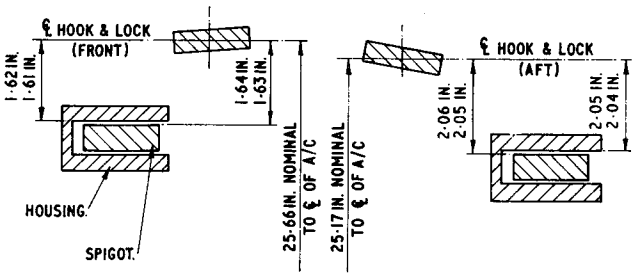


NOTE.
LOCK BOLTS BY 3 CENTRE PUNCH INDENTATIONS AROUND BOLT HEAD.

STBD. FORWARD HOUSING BLOCK ASSY.

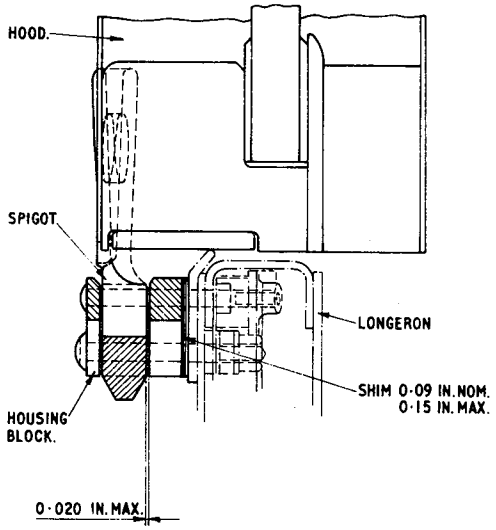


HOUSING BLOCKS (FWD.)



DIAGRAMMATIC VIEW SHOWING LATERAL LOCATION OF SPIGOTS AND HOUSINGS.

STBD. AFT HOUSING BLOCK ASSY.



HOUSING BLOCKS (AFT.)

Fig.23A Hood locating spigots and housing blocks (post Mod.778)

Hood spigot housing blocks (fig.23A)

45A. Adjust the housing blocks as follows:–

(1) Adjust the shims between the forward housing blocks and packing pieces until a clearance of 0·01 in. to 0·03 in. is obtained between the spigot and housing block socket, outboard face. Lock bolts by 3 centre punch indentations around bolt head.

(2) Adjust the shims between the aft housing blocks and longerons until a clearance of 0·02 in. max. is obtained between the spigot and housing block socket, outboard face.

Hood up sequence valve—Depressurizing valve (fig. 24)

46. Adjust the shims between the rear face of the valve mounting bracket and the valve to obtain a gap of 0·60 in. to 0·65 in. between the contact face of the plunger and the pip of the valve.

Hood seal pressurizing connection (fig. 25)

47. Adjust the connector on the hood to give a clearance of 0·09 in. to 0·10 in. between the flange of the hood connector and the face of the joint connector on the fuselage.

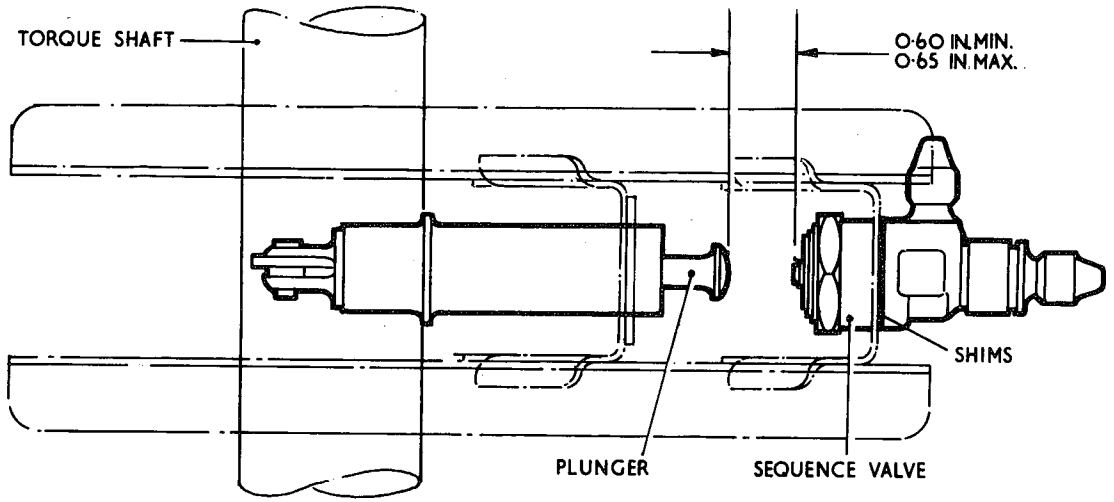


Fig. 24 Hood up sequence valve

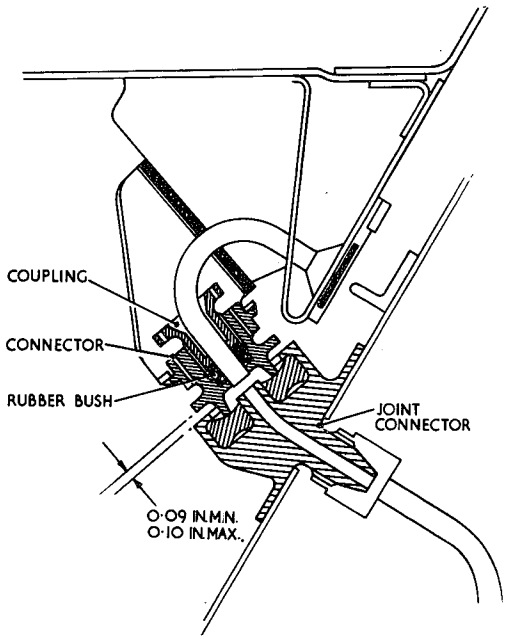


Fig. 25 Connection hood seal pressurizing

Angular setting of locking jack lever on torque shaft (fig. 26)

48. Adjust the angular setting of the locking jack lever on the torque shaft as follows:—

(1) Ensure that the jettison release unit is correctly loaded.

(2) Disconnect the rear connecting rod from each of the two rear locks and adjust the screwed eye end of the locking jack to obtain an angular setting of $35\pm\frac{1}{2}$ deg. for the jack lever on the torque shaft.

(3) Re-connect the rods to the rear locks, adjusting, as necessary, care being taken not to maladjust the settings of the locks.

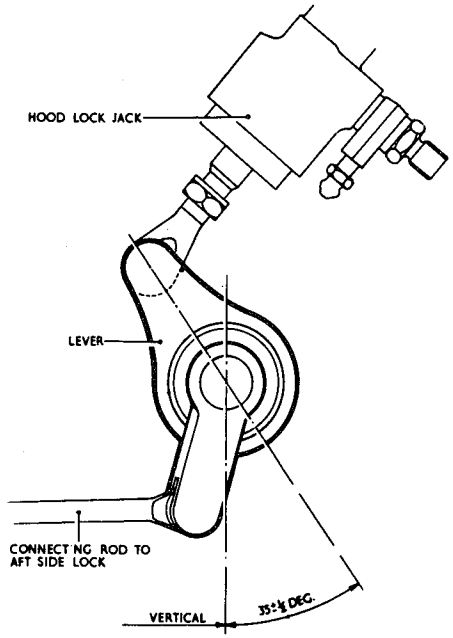


Fig. 26 Angular setting of locking jack lever on torque shaft

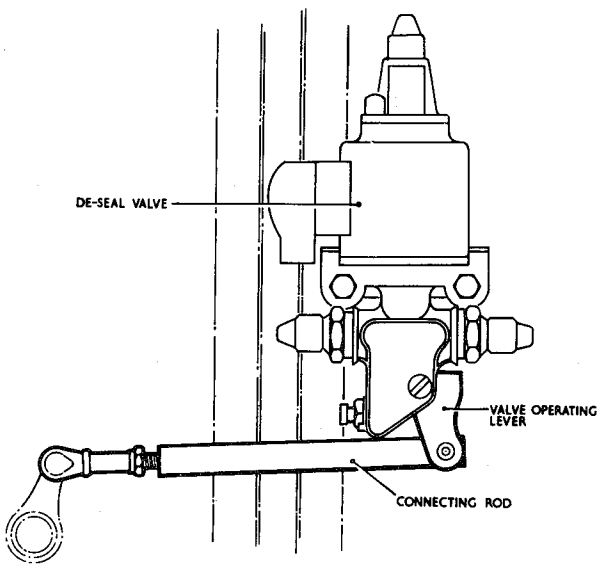


Fig. 27 De-seal valve connecting rod

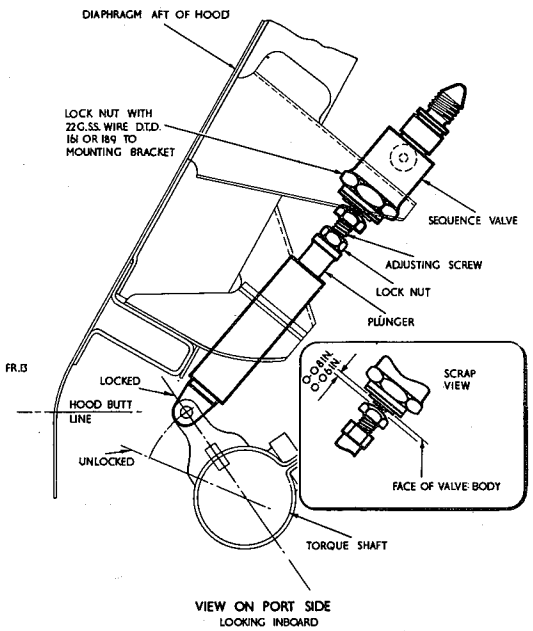


Fig. 27A Open circuit sequence valve

De-seal valve connecting rod (fig. 27)

49. With the jettison gear mechanism at the 'full travel' position, adjust the connecting rod to the de-seal valve so that the valve lever just touches the stop.

Open circuit sequence valve (fig. 27A)

50. With the hood locks fully locked and the lock jack fully bottomed, adjust the screw of the operating plunger until there is a gap of 0·06–0·08 in. between the face of the sequence valve body and the contact face of the adjusting screw, as shown in scrap view in fig. 27A. Unscrew a further four turns to ensure the operation of the valve and lock the adjusting screw.

Adjustment of hood operating mechanism microswitches

51. The procedure for setting the various microswitches of the hood operating mechanism is detailed in para. 52 to 56 inclusive.

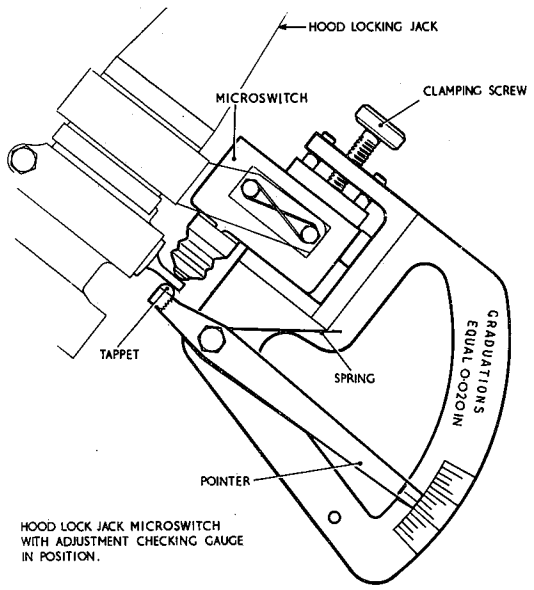


Fig. 28 Hood locking jack microswitch

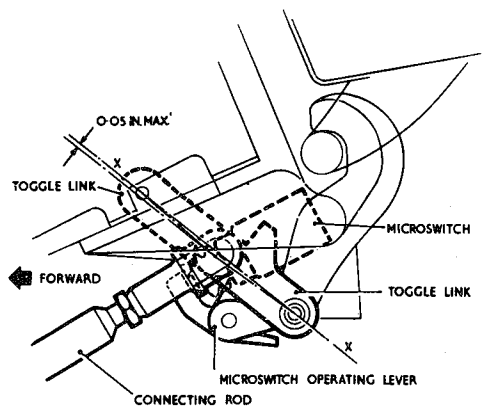


Fig. 29 Forward top centre lock microswitch

Note . . .

During all adjustments 0·05 in. temporary packing must be in position between the forward ends of the hood side members and the longerons.

Hood locking jack microswitch (fig. 28)

52. With the hood locking jack fully retracted and the internal locking sleeve of the jack fully engaged, adjust the serrated plate to give between 0·01 in. to 0·04 in. switch depression beyond the tripping point. Check the setting with the special gauge provided.

Forward top centre lock microswitch (fig. 29)

53. Adjust the position of the microswitch on the serrated plate so that the switch is just tripped to make contact when the toggle links 'X'—'X' are in a straight line. The switch must break contact before these links have reached an out of alignment figure of 0·05 in. maximum.

Note . . .

The movements of the toggle links mentioned in para. 53 and 54 may be made by slowly unwinding the upper coupling nut (fig. 12, item 2) of the hood jettison release unit. Ensure that the coupling nut is returned to the exact original position on completion of the adjustment. The green light in the cabin will come on when all microswitches have made contact and will go out when any one breaks contact.

Forward side lock microswitch (fig. 30 and 31)

54. The forward side lock microswitch should be adjusted as follows :—

(1) *Pre-mod. 813*

This switch should be assembled in the mean position of the serrated plate and adjustment made to the tappet screw so that the switch is tripped to make contact when the links at 'X'–'X' are in a straight line and break contact before these links have moved 0·15 in. out of line.

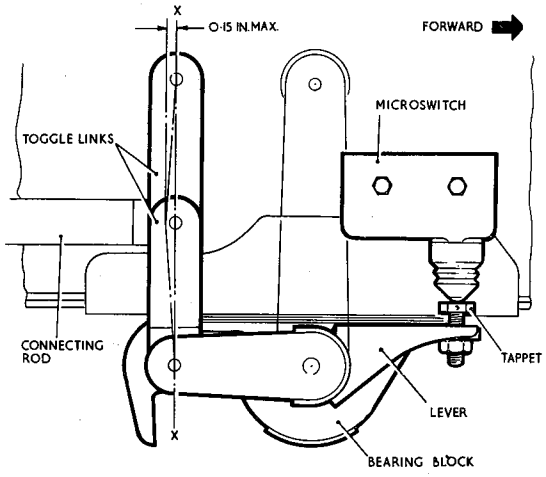


Fig. 30 Forward side lock microswitch
(Pre-mod. 813)

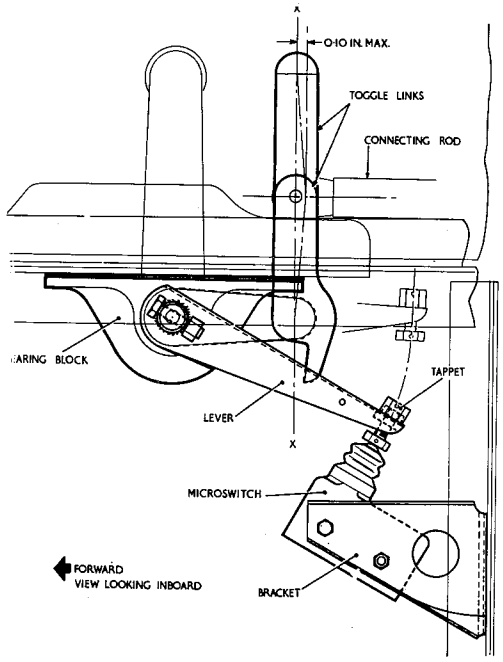


Fig. 31 Forward side lock microswitch
(Mod. 813)

(2) *Mod. 813.*

The tappets should be adjusted so that the switches are tripped to make contact when the links at 'X'–'X' are in a straight line and break contact before the links have reached an out of alignment figure of 0·10 in. maximum.

Dowmic switch—Torque shaft (fig. 32)

Note . . .

It is essential that the spring release unit is correctly loaded and adjusted before commencing adjustments to the Dowmic switch and that full hydraulic pressure is used to hold the hood lock jack in the fully retracted position whilst adjustments are being made.

55. With the hood lock jack fully retracted and the internal mechanical lock in the jack fully locked, adjust the tappet until electrical contact is just made, unscrew the tappet one further turn beyond this point.

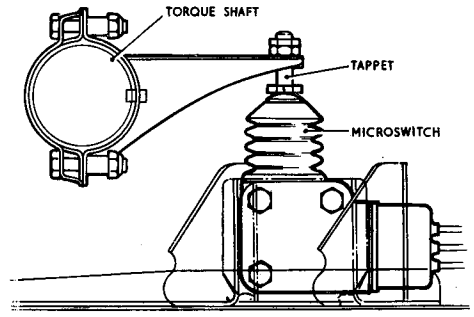


Fig. 32 Dowmic switch—torque shaft

◀ **Microswitch aft of hood** (fig. 33)

56. The procedure for setting the Hood 'Closed' microswitch is as follows :—

(1) Ensure that the nut on the pivot bolt of the operating lever is fully tightened.

(2) Check for complete freedom of movement of the lever without any tendency to bind.

(3) If, with the pivot bolt nut fully tightened, the lever movement is restricted, proceed with operations (4) to (6) inclusive.

(4) Remove the pivot bolt, lever, spring and distance tubes (*one long and two short*), taking care to prevent any falling into the cabin.

(5) Reduce the length of one short distance tube by 0·02 in. to 0·03 in. and maintain a square end to the tube.

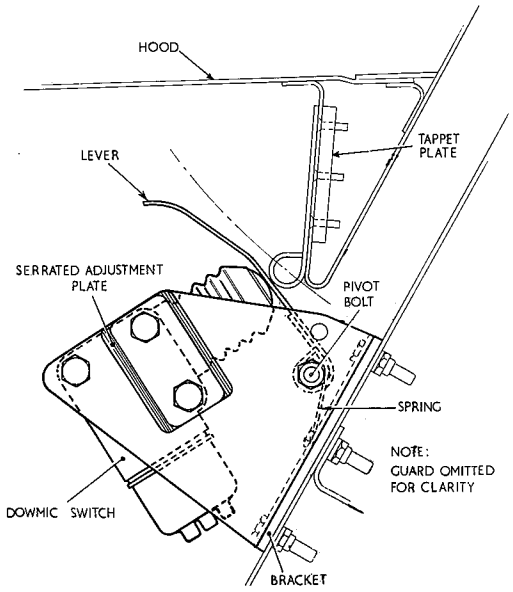


Fig. 33 Microswitch aft of hood

(6) Reassemble, fully tighten pivot bolt nut and recheck for freedom of movement.

(7) Adjust the position of the microswitch on the serrated plate to make contact when the hood is $3\frac{1}{2}$ in. open at the forward end. Check that the microswitch contact is broken when the forward end of the hood is opened to 5 in.

WARNING

It is important to ensure that the lever movement is free, to allow the microswitch to return to its normal position when the hood is opened. Should the microswitch be held in the depressed position, e.g. through seizure of the lever on its pivot bolt, with the hood open, the hood will close immediately the battery master switch is placed in the ON position, without any audio warning. This could result in serious injury to personnel.

All servicing of this assembly should be made with the battery master switch in the OFF position and the external supply disconnected. ▶

Hood operation test

57. Following the fitment of a replacement hood or after any adjustments have been made, the operation of the hood mechanism must be checked as follows :—

With the aircraft trestled up, wheels clear of the ground, ejection seats fitted and hydraulic systems serviceable with fully charge accumulators :—

(1) Unload ejection seats and hood jettison gun.

(2) Connect a hydraulic ground servicing trolley.

(3) Connect a 28 volt supply to the aircraft battery leads.

(4) Connect a footpump to the hood seal inflation ground test connection.

(5) Remove the plugs from the longeron inspection holes to permit the hood locks to be examined during the test.

(6) With the hydraulic servicing trolley running to provide hydraulic pressure and with the battery master switch OFF, use the internal hood control switch to close the hood. Check that the warning horn sounds on selecting hood CLOSE and that, after 3 to 6 seconds delay, the hood starts to close. Check that the hood closes smoothly in 4 to 6 seconds and that the horn sounds throughout the movement. Check the hood fairing door and hood locks for correct operation and that the hood lock warning light shows green. Check that, when the control switch is released, the hood lock warning light goes out.

(7) Select battery master switch ON and check that the cabin indicator lamp shows green with the hood locked shut and undercarriage down. Select undercarriage UP and check that the hood lock warning light goes out. Hold the hood override switch to OPEN and check visually that the hood control valve shut solenoid is not energized. Select CLOSE on the internal switch and check visually that the shut solenoid is energized. Release the override and internal switches. Select undercarriage DOWN and check that the hood lock warning light shows green. Select master battery switch OFF.

(8) Reduce the electrical supply to 24 volts.

(9) Using the internal hood control switch to open the hood, check that there is a delay of 3 to 7 seconds on first opening the hood and that after this delay the hood opens smoothly in 4 to 7 seconds. Check the hood fairing door and hood locks for correct operation.

(10) Increase electrical supply to 28 volts, select hood CLOSE and when the hood has closed inflate the hood seal. Check that the lock rollers are engaged with the hooks with the seal fully inflated to a pressure of 8 lb/in^2. Select battery master switch ON, select OPEN on the internal hood control switch and check that the seal deflates and that the hood remains locked shut. Check that the hood cannot be opened by the external switch with the battery master switch ON.

(11) Select battery master switch OFF, inflate seal and check that the seal deflates on selecting OPEN on the external switch and that after a delay of 3 to 7 seconds the hood opens smoothly in 4 to 7 seconds. Check that the hood fairing door and hood locks operate correctly.

(12) Close the hood by the internal switch and release the switch to stop the hood 4 to 5 in. open, measured at the top of the front arch. Move the battery master switch to ON and check that the horn does not sound, that the hood closes and locks and that the hood locked warning light shows green.

(13) Hold the hood override switch at OPEN and check that the hood opens and closes, using the internal switch. Partially open the hood, lower the hood taxying strut manually and check the hood lowering and raising to ensure correct adjustment of the hood taxying strut. Stow the taxying strut and close the hood. Release the override and internal switches.

(14) With the hydraulic ground test rig running at approximately 1200 rev/min operate the flying controls in power whilst operating the undercarriage, air-brake and flaps. Check that the hood remains locked shut and that there is no movement of the toggles.

(15) Stop the hydraulic ground test rig and check that the hood remains locked. Move the battery master switch to OFF and check the operation of the hood on the hydraulic accumulator supply. Note the number of operations to exhaust the accumulator, with intervals of 2 minutes between operations. The hood should complete the cycle (unlock, open, shut and lock) twice and finally unlock before the accumulator is discharged.

(16) Recharge the accumulator and check that the hood may be stopped smoothly in mid-movement.

(17) Remove trestles and return the aircraft to its normal condition.

Note . . .

The operations of opening and closing the hood must not be repeated more than five times successively without allowing time for the delay switches to cool.

Hood jettison mechanism test

58. Wherever replacement components are fitted or any adjustments made to the hood jettison mechanism the mechanism should be tested, to ensure correct operation, as follows :—

(1) Unload and cock the hood jettison gas gun and the guns of the ejection seats.

(2) Ensure that the jettison release unit is correctly loaded.

Note . . .

To obviate the necessity of reloading the jettison release unit after each pull-off test, the stop tool (Ref. No. 26FX/20591) may be used, as illustrated in fig. 12, after the initial check on the full unlocking system. The release handle of the jettison unit must however be reset after each test.

(3) Release the guard from over the emergency release handle.

(4) Close and lock the hood, inflate the hood seal and, using a spring balance, check the load required to operate the jettison handle at the rear of the centre console.

Note . . .

The load required to operate the jettison mechanism, except when using the emergency handle on the jettison release unit, is not to exceed 50 lb.

Check that the mechanism has operated correctly, viz.,

(a) deflated the hood seal,

(b) unlocked the hood locks,

(c) moved the hood upper rear latches clear of the hood pivots,

(d) the hood operating jack release hook has opened to release the hood operating lever from the operating jack,

(e) the sear has been pulled from the jettison gas gun.

(5) Reset the mechanism and check that the hood locks are correctly engaged on closing the hood.

(6) Remove the pip pin from the sear of the jettison gun, inflate the hood seal and check the load required to operate the handle of the jettison release unit, this must not exceed 8 lb.

(7) Reset the mechanism, refit the pip pin, close the hood and check that the locks are correctly engaged.

(8) Inflate the hood seal and using the external jettison control, check the load and the operation of the mechanism.

(9) Reset the mechanism, close the hood and inflate the hood seal. Check the load and the operation of the mechanism, [sub-para. 4(*a*) to (*e*)] using the port seat blind handle. Check that the sear has been pulled from the port seat gun and that the cable from the seat has been freed from the cross shaft.

(10) Repeat operations in sub-para. 9 with starboard seat blind.

(11) Return the aircraft to its normal condition.

Testing hood jettison gas gun cylinders (fig. 34)

59. The hood jettison gas gun cylinders should be tested as follows :—

(1) Unload the seat and hood firing units and remove the hood.

(2) Remove the P.V.C. tape from over the cylinders.

(3) Assemble the test union body to the firing unit, connect the test rig to the union body and couple up a low pressure trolley to the rig.

(4) With the test rig release valve closed run the trolley to charge the air container fully and set the output control valve to give a pressure of 90 lb/in^2 in the output line.

(5) Place a piece of hard wood across the cabin so that it lies over the top of the gas cylinders to restrain the pistons. Open the release valve of the rig quickly and check that both pistons rise in their cylinders. Shut off the air supply.

(6) Release the air pressure and return pistons to their normal position.

(7) Fit P.V.C. tape over the hood gas cylinders.

(8) Remove the test equipment refit the hood, reload the firing units and replace the firing body and lock.

(9) Replace the safety pins in the sears of the firing units.

Assembly of hood jettison gas cylinders

60. In order to ensure gas tightness at the bottom of the cylinders when replacing the hood jettison gas cylinders, screw the elbow at the bottom of the cylinder fully home and then unscrew, not more than one full turn, to obtain alignment with the pipe union nut.

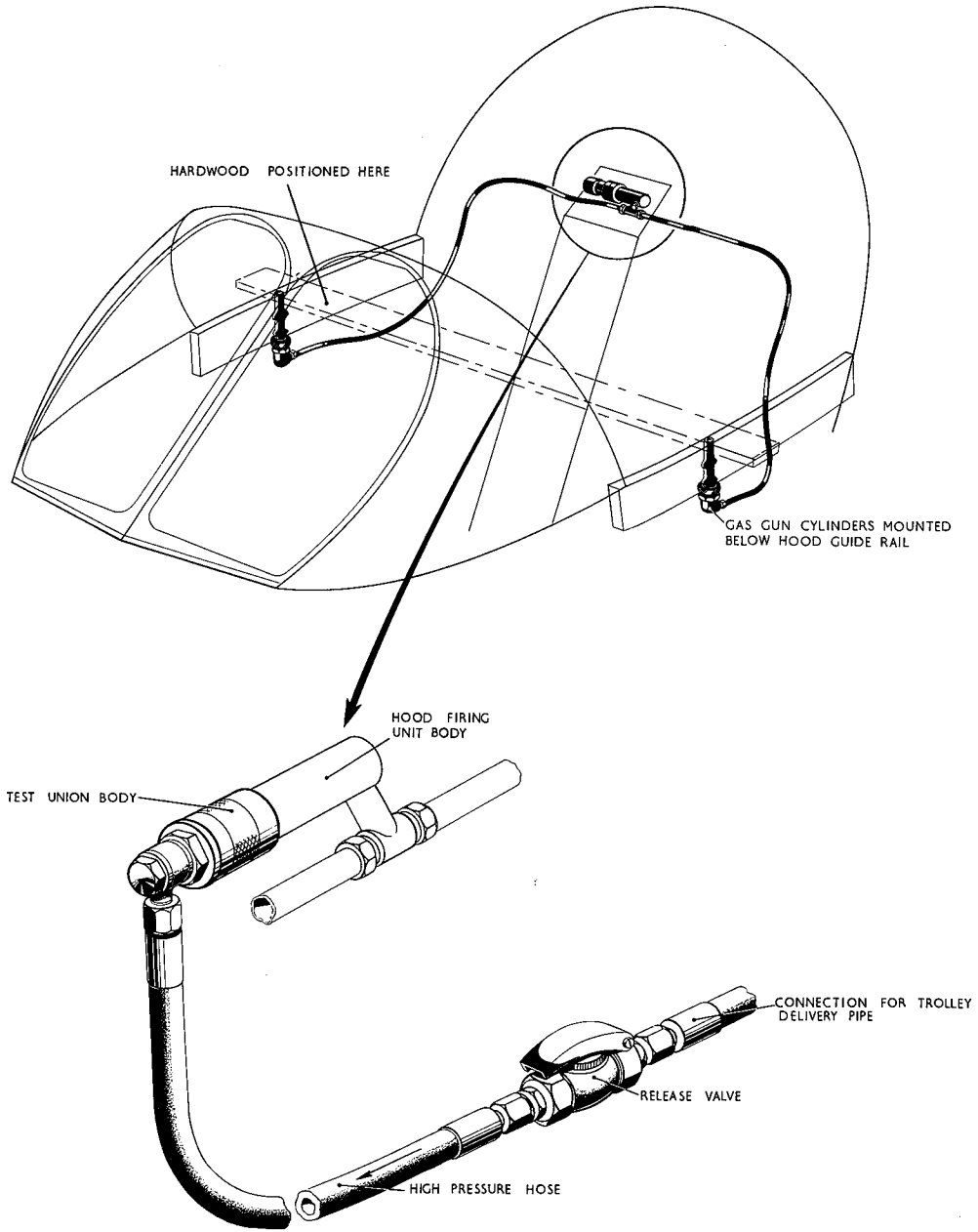


Fig. 34 Testing hood jettison gas gun cylinders

Adjustment of braking parachute microswitches

61. The braking parachute microswitches should be set as follows :—

(1) *Door microswitch*
With the door fully open set the microswitch to give a gap of 0·09 in. to 0·11 in. with the switch fully bottomed at the end of the override.

(2) *Fillet access door microswitch*
With the door closed set the microswitch to give a gap of 0.09 in. to 0.10 in. with the switch fully bottomed at the end of the override. (This will necessitate removal of the tail cone).

(3) *Door indicator microswitch*
With an Allen key slacken the clamp screw of the auxiliary actuator and move the roller arm away from the striker pad until it is up against the stop, taking care not to move the arm too far, otherwise the stop may be fractured. *The clamp screw should be slackened only enough to allow the roller arm to be moved away from the striker pad but retaining sufficient friction to allow the pad to be moved by the roller arm.* Attach a strip of metal 0·10 in. thick, with thin adhesive tape, to the underside of the striker arm and close the parachute doors gently thereby allowing the striker pad to depress the microswitch to its full override position, the final closure of the door causing the roller arm to slip on its pivot to its correct position. Open the parachute doors, tighten the clamp screw, remove the metal strip from the striker arm and carry out a functional check (Sect. 5, Chap. 1).

Assembly of guard over braking parachute door lock (Mod. 947)

62. If a new guard has to be fitted it is important that the door lock is adjusted to its highest position with the doors flush with the tail cone. The new guard is to be cut and filed to conform to the shape and fit of the guard being replaced. The filed edges of the guard are to be coated with varnish or shellac.

Lubrication of braking parachute door lock

63. Where any lock is suspected of being faulty in operation it should be dismantled and cleaned as in the case of undercarriage door locks (Sect. 3, Chap 5). On refitment, care should be taken to position the lock as mentioned in para. 62.

Removing air brake (*fig.* 35)

64. Remove the air brake as follows:—

(1) Jack up the aircraft *(Sect. 2, Chap. 4)* and retract the undercarriage. After ensuring that the area below the air brake is free from obstruction, select 'air brake out' on the throttle twist grip, and operate the hydraulic handpump until the air brake is fully extended.

(2) Select 'air brake in' to release the hydraulic pressure from the jack.

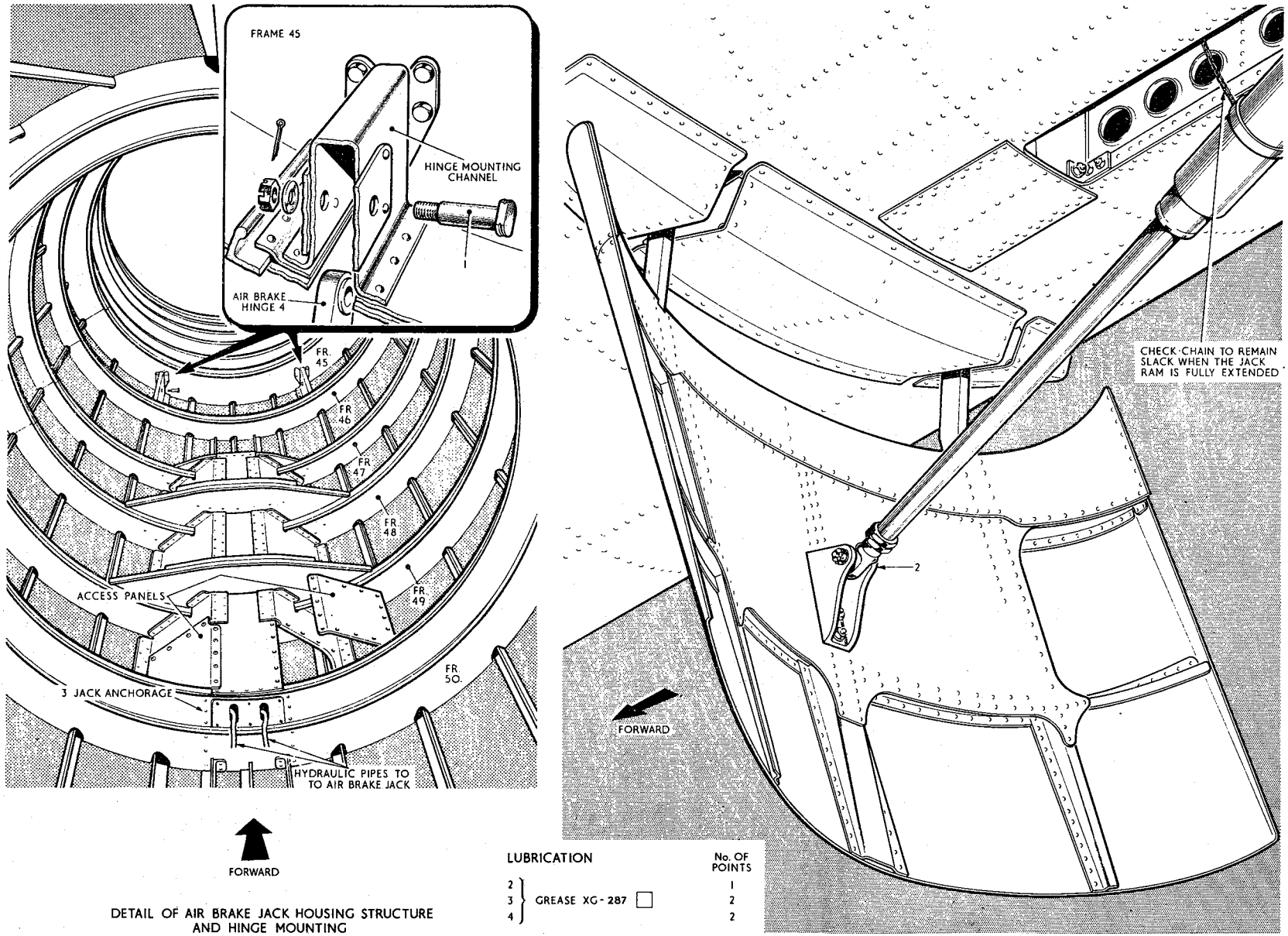
(3) Ensure that the check chain is securely attached to the aircraft structure and to the jack body.

(4) *Render the aircraft electrically safe (Sect. 5, Chap. 1).*

(5) Remove the jet pipe *(Sect. 4, Chap. 1).*

(6) Remove the split pin, slotted nut and washer from the pivot bolt (2) and withdraw the bolt.

(7) Support the air brake, and from the inside of the rear fuselage, remove the two pivot bolts (1). The air brake can now be removed.



DETAIL OF AIR BRAKE JACK HOUSING STRUCTURE AND HINGE MOUNTING

Fig. 35 Removing the air brake

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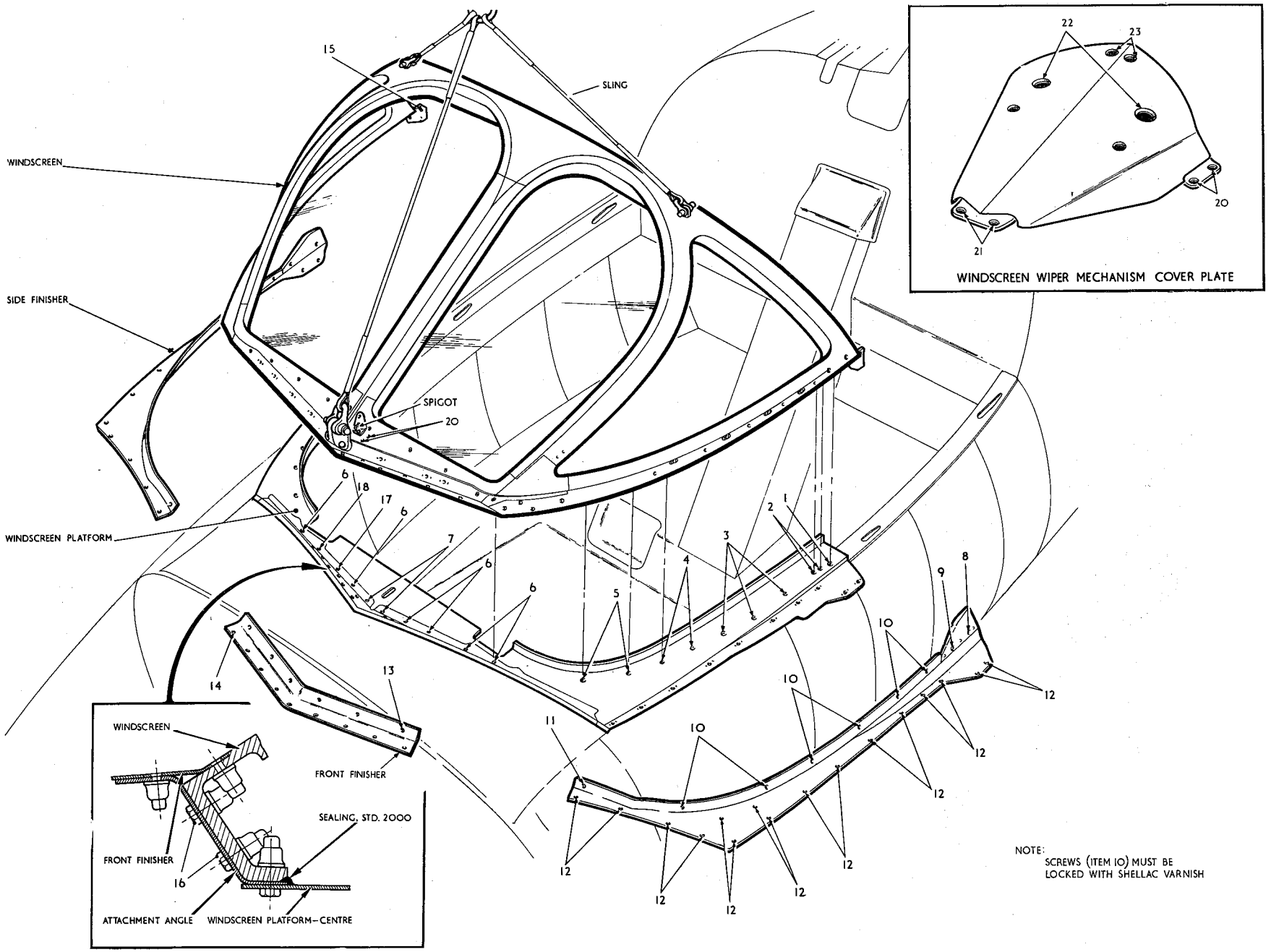

Fig. 36 Removal of windscreen

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Removing windscreen

65. To remove the windscreen unit, proceed as follows :—

(1) Render the aircraft electrically safe (*Sect. 5, Chap. 1*). Remove the gunsights, port and starboard.

(2) Release the silica-gel containers which are situated on the top surface of the J.B.2 electrical junction box. Release the cover over the containers by unfastening the securing wing nuts and replace cover. Extreme care must be taken in ensuring that the containers are retained in a practical position, safely secured to the windscreen structure, whilst the windscreen is being removed.

Note . . .

Under no circumstances are the containers to be disconnected from the windscreen panels.

(3) Disconnect the electrical cables from the microswitch and the stand-by compass which are located on the starboard side of the hood locking mechanism. Remove the screws and clips holding the electrical cables to the windscreen arch and detach the cables from the windscreen. Disconnect the hood centre lock operating rod from the mechanism by removing the special bolt which is situated at the fork-end of the hood lock operating rod.

(4) Unscrew the nuts which retain the starboard instrument panel to its spring mountings. Remove the panel and disconnect all the electrical cables supplying the instruments. Unscrew the nuts retaining the flying instruments panel to its spring mountings. Remove the panel and disconnect all the electrical cables supplying the instruments.

(5) Remove the electrical sockets on the gunsight mounting bracket by unscrewing and removing the bolts.

(6) The removal of the spray pipes should be effected as follows :—

(a) Remove the bolt holding the port quarter light spray pipe to windscreen platform, then remove the clamp on the port side.

(b) Repeat the operation for the starboard quarter light spray pipe.

(c) Remove the bolt fixing the port front light spray pipe to the top surface of the J.B.2 electrical junction box. This pipe is secured by 2 bolts and one bracket screwed to the J.B.2 electrical junction box and the end of the spray pipe. Disconnect by removing the screw holding the bracket to the spray pipe. Do not remove the bracket from the J.B.2 electrical junction box.

(d) Repeat the operation for the starboard front light spray pipe.

(e) Remove the clamp and slide the port body spray pipe out of the sleeve joint which is situated at the rear of the starboard glare shield.

(7) The port and starboard corner brackets are attached to the windscreen arch and the top longeron on each side. Remove the bolts securing the brackets to the top longerons.

(8) Dismantle and remove the radio switches and mounting plates.

(9) Release the air pressure in the hydraulic system by carefully removing the hydraulic reservoir cap.

(10) Dissipate any residual pressure in the hydraulic fluid by operating one of the systems.

(11) Disconnect the hydraulic pipes at the windscreen wiper motor and the control valve, taking care to collect the hydraulic oil in a suitable receptacle. Remove the pipes and blank off the motor and valve connections, and the ends of the pipes.

(12) Remove the screws securing the wiper blade linkage cover plate to the wiper blade spigots, bracket on the parallel linkage studs, windscreen frame and fuselage skin. Remove the cover plate (*fig. 36*) and remove the washers Part No. F.236394.

(13) Remove the split pins, nuts, and washers securing the parallel linkage to the wiper blade pivot spigots (*Sect. 3, Chap. 6, fig. 5*).

(14) Remove the split pins, nuts, washers and bolts securing the motor links to the wiper motor rod and remove the actuating arm and wiper blade assemblies (*Sect. 3, Chap. 6, fig. 5*).

(15) Remove the nuts, washers and bolts securing the wiper motor to the mounting on frame 6.

Referring to fig. 36 proceed as follows :—

(16) Remove the screws securing the front and side finishers and remove the finishers.

(17) Remove the bolts and barrel nuts at location 15.

(18) Remove the bolts at location 1 to 5 securing the windscreen to the port and starboard platforms.

(19) Remove the bolts at locations 6, 7, 16, 17 and 18 securing the windscreen to the front platform.

(20) Remove the existing bolts in the top of the windscreen frame, port and starboard. Fit an eyebolt and sling strop in place of each, using the existing nut and washer. Do not fit the sealing washers. Bolt the remaining sling strop through the lower front attachment point and into the barrel nuts provided.

(21) Check to ensure that all retaining bolts have been removed, then with the hoist, carefully ease the windscreen from the platform, breaking the seal at the same time.

KEY TO FIG 36 REMOVAL OF WINDSCREEN

		Bolt/Screw		Sealing Washer	Packing	Nut	Washer
Location	Part No.	Description	Qty.	Part No.	Sect. & Ref.	Part No.	Part No.
1	F.210638	Bolt, special	2	—	—	—	S.P.15G
2	A25/11C	Bolt, H.T.S., 2 B.A. × 1·55 in.	4	A.G.S.1186–3	—	A.G.S./2001/C1	—
3	A25/4C	Bolt, H.T.S., 2 B.A. × 0·85 in.	6	A.G.S.1186–3	—	A.G.S./2001/C1	S.P.15C
4	A25/5C	Bolt, H.T.S., 2 B.A. × 0·95 in.	4	A.G.S.1186–3	—	A.G.S./2001/C1	S.P.15C
5	A25/1C	Bolt, H.T.S., 2 B.A. × 0·55 in.	4	A.G.S.1186–3	—	A.G.S./2001/C1	S.P.15C
6	A25/5C	Bolt, H.T.S., 2 B.A. × 0·95 in.	6	—	—	—	—
7	A25/4C	Bolt, H.T.S., 2 B.A. × 0·85 in.	2	—	26FX/1327	—	—
8	Std.1700/22C	Screw, H.T.S., 2 B.A. × 2·2 in.	2	A.G.S.1186–3	—	A.G.S./2001/C1	—
9	Std.1700/16C	Screw, H.T.S., 2 B.A. × 1·6 in.	2	A.G.S.1186–3	—	A.G.S./2001/C1	—
10	Std.1702/5C	Screw, H.T.S., 2 B.A. × 0·5 in.	12	—	—	—	—
11	Std.1700/5C	Screw, H.T.S., 2 B.A. × 0·5 in.	2	—	—	—	—
12	Std.1700/1C	Screw, H.T.S., 2 B.A. × 0·1 in.	32	—	—	—	—
13	Std.1700/5C	Screw, H.T.S., 2 B.A. × 0·5 in.	4	—	—	—	—
14	Std.1700/1C	Screw, H.T.S., 2 B.A. × 0·1 in.	9	—	—	—	—
15	A.S.1242/11C	Bolt,H.T.S., C/S 2 B.A. × 1·55 in.	4	—	—	F.211028	—
16	A25/3C	Bolt, H.T.S., 2 B.A. × 0·75 in.	14	—	—	—	S.P.15C
17	A25/6C	Bolt, H.T.S., 2 B.A. × 1·05 in.	1	—	Make from 30B/1724	—	—
18	A25/5C	Bolt, H.T.S., 2 B.A. × 0·95 in.	1	—	Make from 30B/1724	—	—
19	A.S.1242–22–C	Bolt, C/S, H.T.S., 2 B.A. × 2·65 in.	2	—	—	—	—
20	A.S.1242–5–C	Bolt, C/S, H.T.S., 2 B.A. × 0·95 in.	4	—	—	—	—
21	A.S.1242–1–C	Bolt, C/S, H.T.S., 2 B.A. × 0·55 in.	2	—	—	—	—
22	Std.1700–22–E	Bolt, C/S, H.T.S., $\frac{1}{4}$ B.S.F. × 2·2 in.	2	—	—	—	F.236394
23	A.S.1242–1–C	Bolt, C/S, H.T.S., 2 B.A. × 0·55 in.	2	—	—	—	—

Replacing the windscreen

66. The location of all bolts, screws, sealing washers and nuts is given in fig. 36 and it is important that the correct length of bolt or screw is used at each attachment. The procedure for replacing the windscreen is as follows :—

(1) Attach the lifting sling to the windscreen frame as described in para. 65, sub-para. 20.

(2) Ensure that all mating surfaces are clean and free from grease.

(3) Lower the windscreen on to its platform and locate the windscreen by inserting 4 bolts of the correct length, 1 each at locations 2 and 5.

Note . . .

Ensure that a sealing washer is fitted under the head of the bolts as indicated in the Key to fig. 36.

(4) Check that all other attachment holes are in alignment with the holes in the platform. Remove the sling and replace the bolts removed from the frame.

(5) Fit all the attachment bolts, sealing washers, packing, nuts and washers in accordance with fig. 36. Tighten the windscreen down to the platform progressively all round.

(6) Fit the bolts Part No. AS/1242/11C and special nuts Part No. F.211028 at locations 15 and tighten.

(7) After tightening down the windscreen attachment bolts, seal the inside edges of the frame to the decking with 3M sealer E.C.750.

(8) Fit the front and side finishers using screws listed in Key to fig. 36.

(9) Allow 24 hours for the sealer to set and then carry out a cabin pressure test (*Sect. 3, Chap. 8*).

(10) Refit the wiper motor, actuating arms, blades, washers and cover in the reverse order of para. 65, sub-para. 15 to 11 (*Sect. 3, Chap. 6, fig. 5*).

(11) Charge all hydraulic accumulators (*Sect. 2, Chap. 2*) and top up the hydraulic reservoir.

(12) Wet the windscreen with water, and prime and bleed the windscreen wiper motor and control valve (*Sect. 3, Chap. 6*). keeping the hydraulic reservoir topped up.

(13) Refit all cables, clips etc., removed in para. 65, sub-para. 8 to 2.

Replacement of windscreen front panel

67. Before a windscreen front panel is replaced after removal, all traces of the old seal and adhesive must be removed and the frame thoroughly cleaned. Attach the seal with E.C.321, E.C.801 or Boscotex 4010 adhesive taking care to ensure that it sits correctly in the frame.

Note . . .

It is important that no sealing compound or jointing compound is permitted to come into contact with the Perspex or laminated glass. To obviate crazing due to contact with solvent vapour given off by the adhesive mask the perspex quarterlights. After replacement of panels, pressure test the cabin in accordance with the instructions given in Sect.3, Chap.8.

Examine the neoprene strips on the clamps for damage and cleanliness. Then fit the panel into the frame and secure in position by means of the clamp and clamp bolts. Fit new seals Part No. F.218465 on the bottom clamp bolts. Carefully progressively tighten the clamp bolts all around the panel. The outside of the panel must be flush with the outside of the frame structure within $\pm 0{\cdot}030$ in. The gap between the frame structure and the front edge of the outer lamination of the panel must be kept absolutely clear and, if necessary, the edge of the seal is to be cut back. Care is to be taken to ensure that the panel is not scored or scratched when cutting back the seal. Any defective barrel nuts or ferrules are to be replaced using E.C.801 adhesive and retained until set by the fitment of a temporary bolt. After fitment of a front panel or quarterlight a cabin pressure test must be carried out in accordance with Sect. 3, Chap. 8.

Replacement of windscreen quarterlight

68. The replacement of a windscreen quarterlight is similar to the procedure for a front panel (*para. 67*) except that all gaps between the outer edges of the quarterlight and the frame are to be filled with sealer E.C.801. The locking strips Ref. No. 26FX/9754 on the bottom clamp bolts should be renewed.

Replacement of parachute doors rear lock release cable

69. When fitting a new release cable carefully adjust the position of the plunger housing with shims Part No. F.220615 to ensure smooth and satisfactory engagement of the plunger.

Adjustment of brake parachute rear lock release cable *(fig. 3A)*

70. To adjust the brake parachute rear lock release cable proceed as follows :—

(1) Remove the brake parachute as described in Sect. 3, Chap. 1.

(2) Remove the guard over the front door lock and disconnect the door link from the port telescopic spring box. Lift the telescopic spring box to provide access.

(3) Slacken the lock-nut on the release cable. With the release mechanism in the position at which the front lock is just about to release, adjust the cable until all slackness is just taken up and the plunger of the rear lock is flush with the front of its housing.

(4) Tighten the lock nut on the adjuster, lower the telescopic spring box and reconnect to the door link.

(5) 'Cock' the spring release unit as described in Sect. 2, Chap. 2, para. 29, sub-para. 4, and close the doors. Remove the access panel from the forward end of the starboard door and ensure, whilst restraining the doors manually, that when the spring release unit is depressed, the roller rides up the lever. This should release the front lock and simultaneously withdraw the plunger of the rear lock, allowing the doors to open without obstruction.

(6) Repeat (5) with a packed parachute *(do not remove the cord securing the drogue flaps)* in the compartment and also by selecting STREAM.

(7) Refit the guard over the front lock.

(8) Refit the brake parachute as described in Sect. 2, Chap. 2, para. 29.

◀ **Drilling sighting holes in replacement brake parachute doors**

71. Replacement parachute doors are supplied without sighting holes for the door forward lock indicator and, in some cases, for the rear locking plunger. Holes are to be drilled and opened up, and the doors marked, to suit each individual aircraft. The procedure is as follows:—

(1) Close the starboard door.

(2) Ensure that the door forward lock indicator is fully up.

(3) Mark the inside of the starboard door immediately above the tip of the indicator as shown in fig.37 in the scrap view at detail A.

(4) Open the door and drill a 5/16 in. diameter hole at the position marked.

(5) Close the starboard door.

(6) Apply a thin coat of plasticine to the port door in the area above the 5/16 in. hole in the starboard door.

(7) Close the port door down on to the starboard door to obtain an impression in the plasticine of the 5/16 in. hole.

(8) Open both doors.

(9) From the impression in the plasticine, find the centre for the hole in the port door and drill a 1/8 in. diameter pilot hole through the door and fairing, then open up this hole with a 3/8 in. diameter drill.

(10) Open up the hole in the starboard door to the dimensions shown in fig.37 at detail A.

(11) Open up the 5/16 in. hole in the port door to the dimensions shown in fig.37 at detail B.

(12) At the rear end of the port door (if a hole does not already exist in the replacement door), drill a 1/4 in. diameter hole in the skin only and open this up to the dimensions shown in fig.37, detail C.

(13) Through the hole made in operation (12), paint the inside of the channels with gloss white paint (using a brush).

(14) Treat the edges of the holes with Alocrom 1200.

(15) Paint the end 1/4 in. of the forward lock indicator with fluorescent fire orange paint (fig.37, scrap view in detail A).

(16) Paint white patches on the port door skin, around each sighting hole, to the dimensions shown in fig.38.

(17) Close both doors and lock, ensuring the lock and plunger are fully engaged (Sect.2, Chap.2, *Assembly of braking parachute).*

(18) Paint red lines on the port door skin, at each sighting hole, as detailed in fig.38. ▶

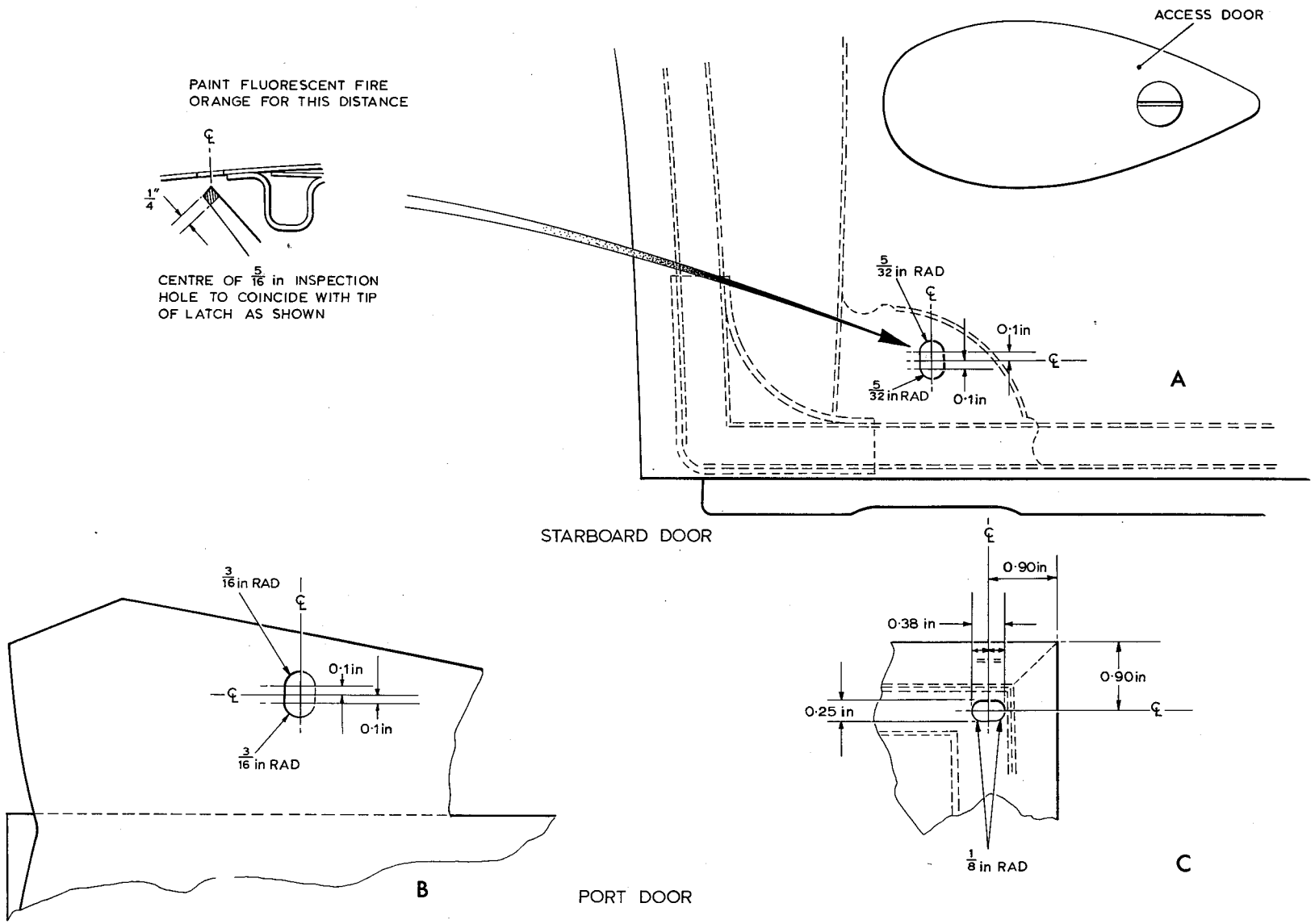


Fig.37 Brake parachute door sighting holes

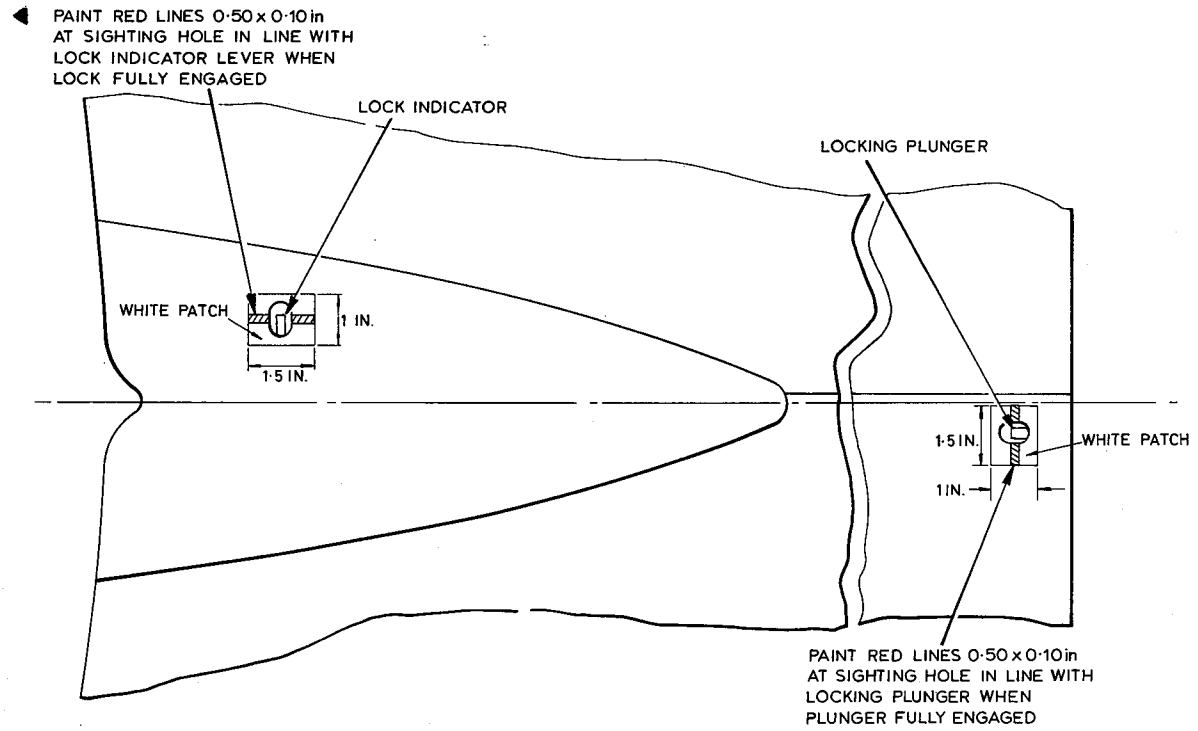


Fig.38 Lock indicator and plunger locked alignment marks

Loose bolts in air intakes

72. The bolts securing the detachable panels in the air intakes *(fig.39)* are to be checked at regular intervals for tightness. Ensure that the panels are held firmly against the aircraft structure and that all bolt heads seat firmly on the panels (the bolts are not thread-bound).

73. The assembly of these attachments was affected by STI/Hunter/406. The incorporation of the STI cannot be physically checked without disassembly but if disassembly is necessary, because of defects or for any other reason, ensure that the following requirements are complied with:–

(1) The bolts C screw into anchor nuts AGS 2008/C/1 mounted on the bottom leading edge members *(fig.3)*. Check that 18 s.w.g. packing pieces are present between the anchor nuts and the structure; if not, remove the anchor nuts and make up packing pieces (shaped to suit) from L.72 aluminium alloy sheet and fit. Use rivets AS 164/306 (3/32 in. dia. x 3/8 in. long) for securing the anchor nuts, which are to be renewed.

(2) Bolts A, B and C are not to be less than 0.6 in. long. If less than 0.6 in. long, replace with bolts STD 1700-2C.

(3) Bolts D are to be STD 1700-1C fitted with nuts A 27-C-P, peened to lock. Tighten and re-peen if found loose.

(4) Bolts E are to be A 25-2C fitted with washers SP 16-C.

(5) All other bolts are to be STD 1700-1C.

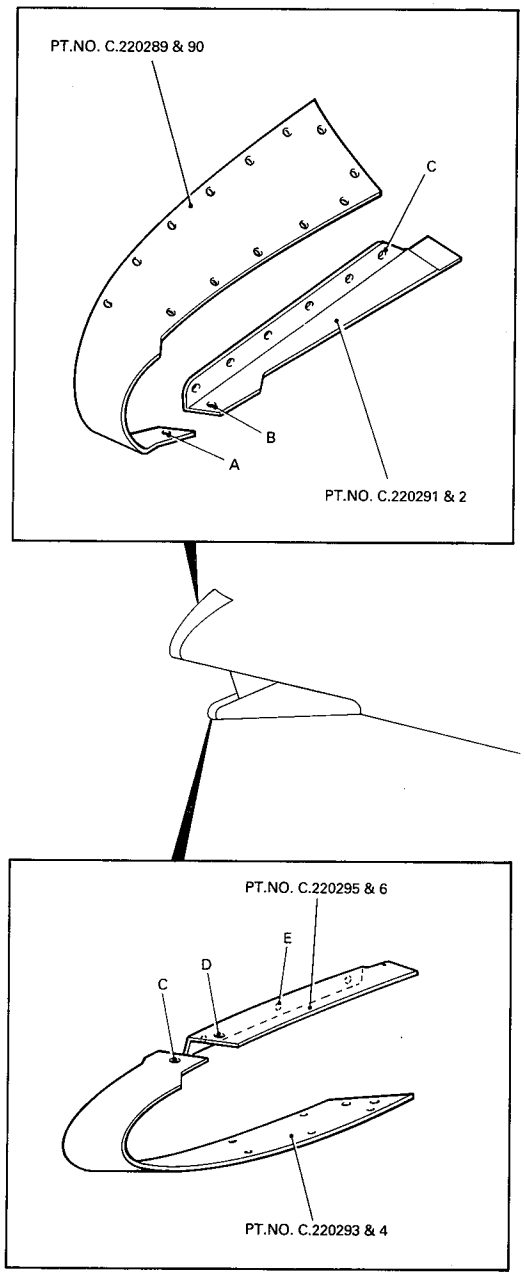


Fig.39 Panels in air intakes

CANOPY QUARTERLIGHTS

21b GENERAL

(1) The plastic material used in the manufacture of the Canopy and quarterlights is "Perspex" acrylic to DTD 5592. It has good long term ageing properties but is notch sensitive and can be chemically damaged by many solvents and their vapours.

(2) Acceptable Damage

Note:

Any damage or repair which seriously interferes with the pilots line of vision and cannot be rectified in accordance with para 5 must be repaired by component replacement.

(a) Abrasions Abrasions cause a light dulling of the surface which can be restored by polishing using the appropriate materials (para 21b(5)).

(b) Fine Scratches Fine scratches which cannot be detected by the finger nail test do not affect the strength of the component and are permissible provided they do not seriously affect the pilots vision. They may be eliminated by light abrading and polishing (para 21b(5)).

(c) Deep Scratches and cracks, impact marks In addition to the visual interference which these cause, deep scratches may also affect the strength of the component. Scratches and cracks up to 0.10 inches deep are acceptable in quarterlights provided they do not seriously affect the pilots line of vision. Scratches and cracks up to a depth of 0.04 inches deep are acceptable on canopies.

(d) Crazing Crazing generally is an alteration in the surface of the material (acrylic) and usually takes the form of numerous parallel fissures extending between 0.02" and 0.15" in length. These flat sided and obviously sharp bottomed fissures once formed will grow in length and depth, join up to become cracks and this ultimately weakens the acrylic to the point at which the component shatters under load. These fissures contain air and the air/acrylic interface reflects light, enabling the crazes to be seen if viewed under the right lighting conditions against a contrasting background. Another form of crazing is a pattern like dried mud. (Usually chemically induced). Crazing is usually produced by contamination by a chemical, often a solvent, to a component stressed by air loading or thermal gradients but stress alone can eventually produce crazing under service environmental conditions. The crazing may not become visible until sometime later. The most common places where crazing appears on Hunter acrylic transparancies and where it may remain safely are:-

(i) In the adhesive layer under the Perspex rear fairing on the canopy sides (See Figure 5a).

(ii) Opposite the air blowing holes in the cabin conditioning pipes (see Figure 2). These small patches containing vertically orientated crazes up to .1 deep in quarterlights and .04" deep in canopies are safe.

Away from these areas, isolated patches and lines of visible shallow crazing may appear. These are usually the result of contamination by unauthorized fluid crazing agents. The patches or lines are acceptable so long as they remain well separated and do not exceed 2.5 inches in any length with a depth of not more than 0.04 inches at the deepest craze. If necessary crazing may be removed by light abrading and polishing.

(3) Unacceptable Damage

Note:

Any damage or repair which seriously interfaces with the pilots line of vision and cannot be rectified in accordance with para 5 must be repaired by component replacement.

(a) Cracks and Scratches and Impact Damage

(i) Cracks and scratches caused by impact damage of 0.10 inches or more depth in quarterlights or .04" in canopies.

(ii) Cracks and scratches detectable by the finger nail test, within 0.5 inches of the canopy edge reinforcing and running parallel with the canopy reinforcing at the bottom edge of the canopy (Fig 5).

(b) Crazing

(i) Any crazing within 0.5 inches of the canopy reinforcing. (Fig 5e).

(ii) Any crazing within 0.5 in quarterlights and 0.4" canopies or in an area greater than 2.5 inches across the larger dimension or in lines (cracks) larger than 2.5" except for crazing mentioned in para 21b(2)(d)(i), 21b(2)(d)(ii).

WINDSCREEN FRONT PANEL

(4) Windscreen Front Panels

Note:

Scratches or chips on semi-toughened facing glass cannot be easily polished or removed.

(a) Scratches, Impact Damage and Oyster Shell Chips Scratches, impact damage and oyster shell chips are permissible provided that they do not seriously interfere with the pilots line of vision. They may in due course produce cracks.

(b) Cracks If any visible cracks appear at the edge of the windscreen panel, then the panel must be replaced or the growth monitored daily as it may rapidly spread across the panel.

(c) Delamination Delamination of an area greater than two square inches means that the panel must be replaced. Edge delamination out to more than 0.5" in from an edge shall also be cause for replacement.

DAMAGE ASSESSMENT AND REPAIRS

(5) Repair Procedures

(a) Abrasions and Fine Scratches Any light dulling of the surface or fine scratches not detectable by the finger nail test and not removed by washing, cleaning and polishing with DT 770A polish or equivalent. Start repair at step 8 of table B.

(b) Scratches. Minor scratches readily detected by finger nail test. Start repair at step 4 of table B.

(c) Deep Scratches Deep scratches detectable with the finger tip. Start repair with appropriate abrasive paper table A and continue with step 1 of table B.

(d) Minor Crazing Minor crazing less than 0.02" deep. Start repair with Step 1 of Table B.

(e) Chipping Chipping less than 0.04" deep. Start repair with appropriate abrasive paper table A and continue with step 1 of Table B.

TABLE A

Note:

Before starting a repair procedure and between each repair step, the canopy must be cleaned with copious amounts of clean water and detergent, carefully wiped and the surface left slightly damp.

Acrylic Thickness	Maximum Paper Grit
½" or over	240 Wet/or/Dry
3/8"	320 Wet/or/Dry
5/16"	400 Wet/or/Dry
1/4"	600 Wet/or/Dry

Note:

Any abrasive mentioned above should be followed by the use of all grits below it before continuing with table B.

ie. 320 used on 3/8" must be followed by 400 grit and 600 grit before using all steps of table B. The canopy must be washed between the use of each grit to remove repair debris.

TABLE B

Note:

Alternative working at right angles to cross the pattern always using a straight line motion. Take great care not to overheat the surface when carrying out the repair or crazing may result.

For quarterlights, most material shall be removed by fore and aft abrasion so that high visual acuity can be maintained. Lateral residual scratches leave more visible acuity loss due to the shallow through-viewing angles.

1. Transparency wash.
2. Use 1500 micro-mesh around foam block approx 3 mins per sq ft.
3. Transparency Wash.
4. Use 1800 micro-mesh around foam block approx 3 mins per sq ft.
5. Transparency wash.
6. Use 2400 micro-mesh around foam block approx 3 mins per sq ft.
7. Transparency wash.
8. Use 3200 micro-mesh around foam block approx 3 mins per sq ft.
9. Transparency wash.
10. Use 3600 micro-mesh around foam block approx 3 mins per sq ft.
11. Transparency wash.
12. Use 4000 micro-mesh around foam block approx 3

13. Transparency wash.

14. Use 6000 micro-mesh around foam block approx 3 mins per sq ft.

15. Transparency wash.

16. Use 8000 mirco-mesh around foam block approx 3 mins per sq ft.

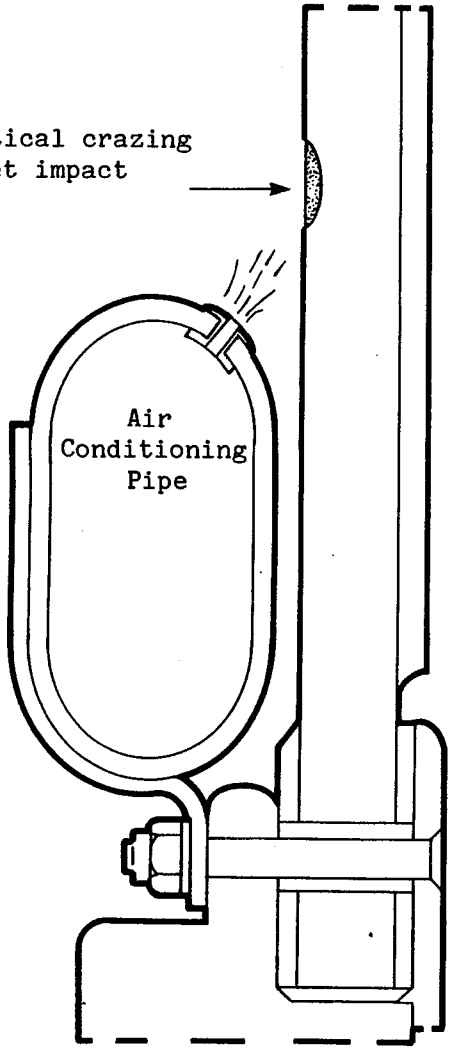
17. Transparency wash.

18. Use 12000 micro-mesh around foam block approx 3 mins per sq ft.

19. Transparency wash.

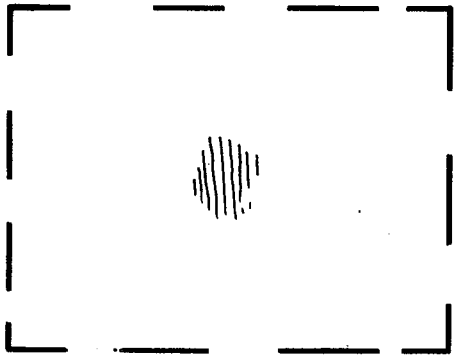
20. Apply thin film of anti-static cream/wax. Buff dry with industrial wiper, facial tissues, or flannel cloth.

21. Inspect visually for imperfections. If any damage is visible repeat whatever steps are necessary to eliminate it. Alternatively, finally polish with DTD 770 polish applied on DTD 763 cloths.



SECTION AA FIG 5a

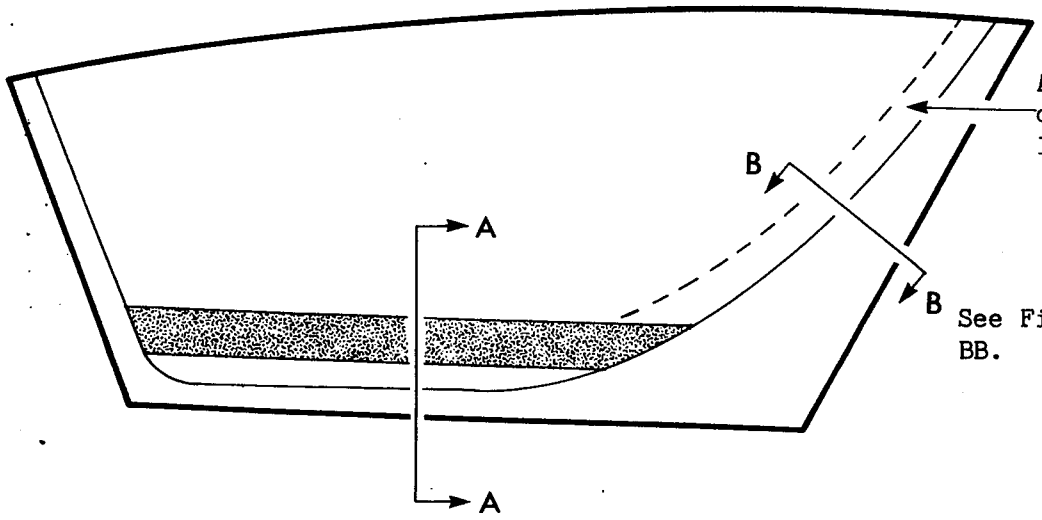
FIG 5b



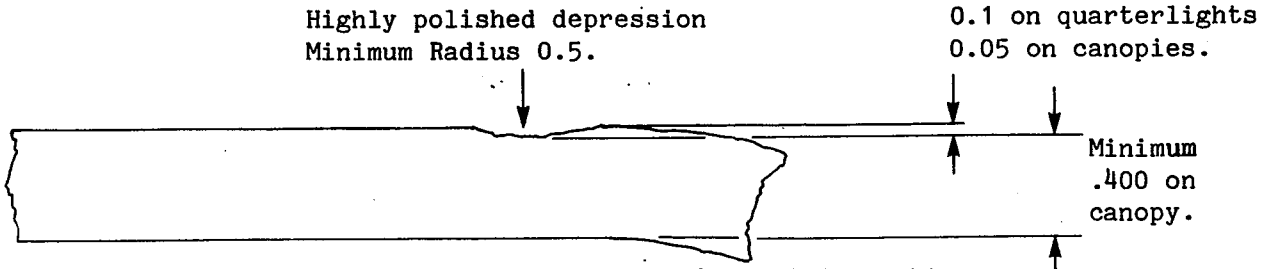
VIEW ON ARROW FIG 5b

Fig 5c

Crazing similar on quarterlights.



SIDE VIEW OF TWO SEAT HUN R CANOPY FIG 5a



DEPTH OF ABRAIDING AND POLISHING

Fig 5d

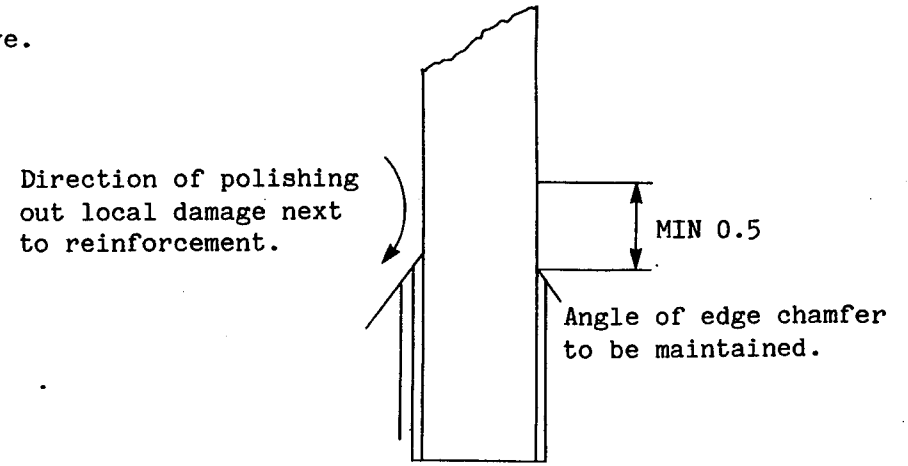


Fig 5e

2 SEAT HUNTER CANOPY

PART OF SECTION AA ON FIG 5a

BONDED ON "PERSPEX" FAIRING

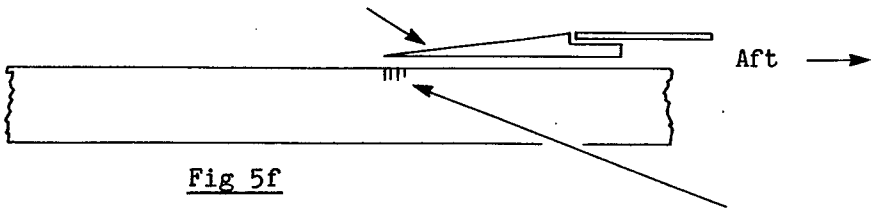


Fig 5f

CRAZING FROM ADHESIVE LINE

TWO SEAT HUNTER CANOPY FAIRING

SECTION BB ON FIG 5a