Chapter 2 PREPARATION FOR FLIGHT

(Completely revised)

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WARNING

AN AIRCREW EJECTION SEAT IS 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.

THIS IS VERY IMPORTANT

ENGINE

When the aircraft is being manoeuvred on the ground with the engine running, or when the engine is being run for any purpose it is essential that all personnel keep well clear of the air intakes and jet exhausts. **To remain in proximity (fig 1) is hazardous to safety.**
The air intake safety guards must be fitted at all times when the engine is being ground run.

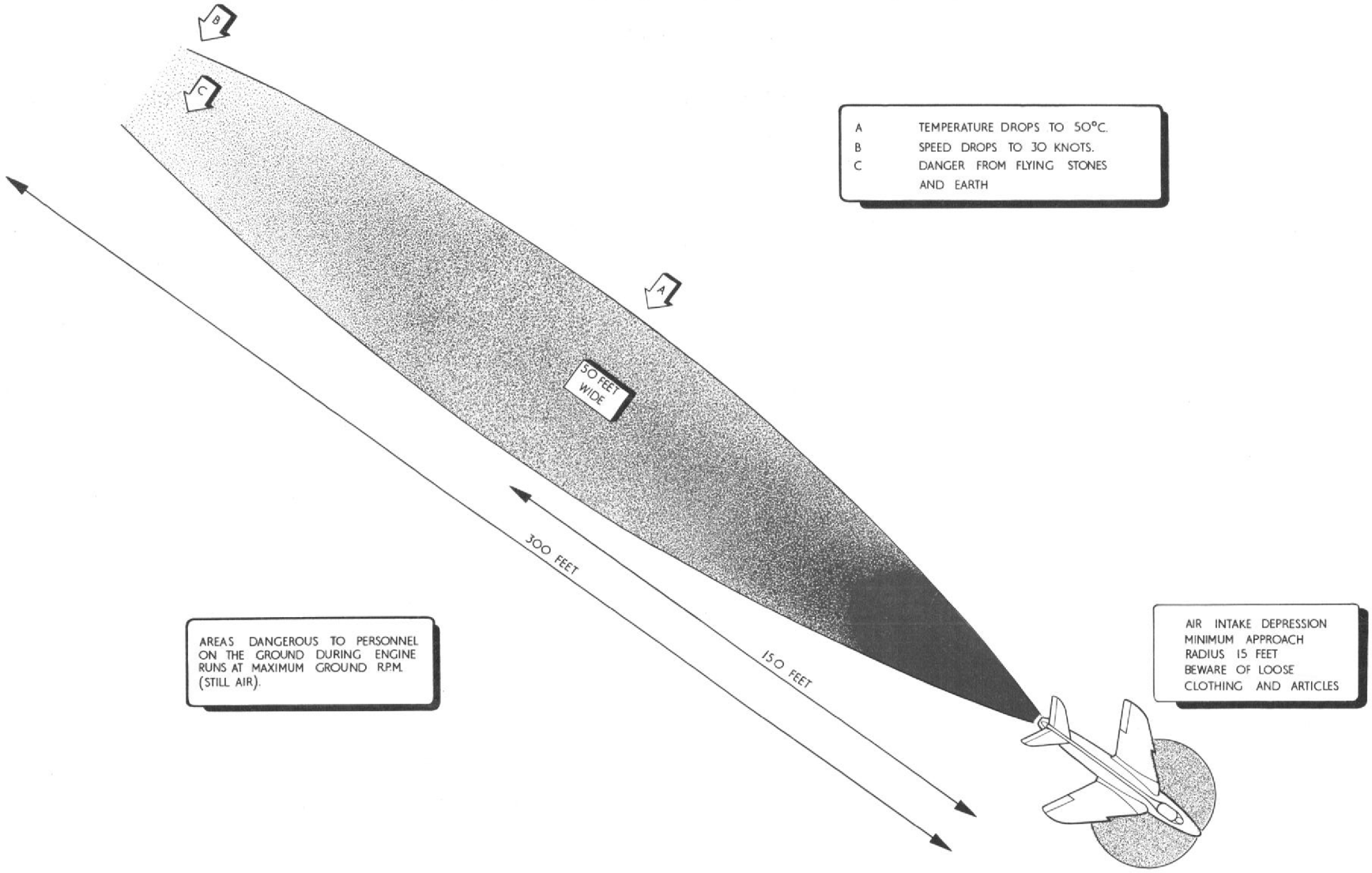

Fig. 1 Jet efflux danger areas

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Introduction

1. This chapter describes the replenishing of the various systems and certain servicing operations which may be found necessary during the preparation of the aircraft for flight, the location of the various servicing points being given in fig. 2. When the necessary operations are completed a check must always be made to ensure that all tools have been removed and that all panels and access doors lie flush with the surrounding surfaces and are securely fastened. The position of the access doors and the removable panels is shown in Sect. 2, Chap. 4. The operations described in the following paragraphs are grouped for convenience under their various systems and do not, therefore, constitute the order in which the operations are to be carried out.

Refuelling

2. The aircraft is refuelled under pressure through a $1\frac{1}{2}$ in. standard coupling in the port wheel bay *(fig. 2, item 12)*. High pressure refuellers, capable of refuelling at a rate of 150 gallons per minute at a pressure of 45–50 lb. per sq. in., should be used, but if these are not available, existing refuellers may be used with an adapter hose.

3. The disposition of the tanks, their interconnections and diagrams of the fuel system are given in Sect. 4, Chap. 2. The procedure for refuelling the system is as follows:—

(1) Ensure that the defuelling cock (*fig. 2, item* 17) accessible via the engine starter access door, in the bottom of the fuselage, is turned OFF and locked (*See para.* 4(7)).

Note . . .

The defuelling cock is normally locked in the OFF *(flight) position. It is only turned to* ON *during defuelling.*

(2) Ensure that the L.P. fuel cock in the cabin is OFF. *This is important.*

(3) Ensure that the ganged cocks at the bottom of the rear transport joint are ON. *(If the transport joint butt strap is in position, the cocks will already be* ON.)

(4) Ensure that the refueller is earthed and connect the bonding of the hose to the aircraft structure. Remove the sealing cap from the refuelling coupling in the port wheel bay and connect up the refueller hose in its place.

Note . . .

Ensure that the refuelling pressure relief valves in the underside of the stub wings are free to operate. This is particularly important when icy conditions prevail or when the aircraft has not been used for an appreciable time. To test a valve screw a $\frac{1}{4}$ *in. B.S.F. bolt into the threaded hole in the valve and then pull the valve down.*

(5) Start the refueller pump and set the refueller control to RE-FUEL.

(6) If using the internal power supply, set the battery master switch on the leg panel in the cabin to ON, if using external power supply ensure that the switch is set to OFF. Set the time switch in the port wheel bay to ON and the drop tank refuelling selector switch as required. *(The refuelling indicator lights in the wheel bay, one for each refuelling valve, should then come* ON*).* If a low-pressure refueller is being employed, refuelling may take longer than 8 minutes and *this will necessitate switching on the time switch for a second cycle*. The servo valves in the aircraft fuel system will automatically close when the tanks are full and the refuelling circuit will cease to operate.

Note . . .

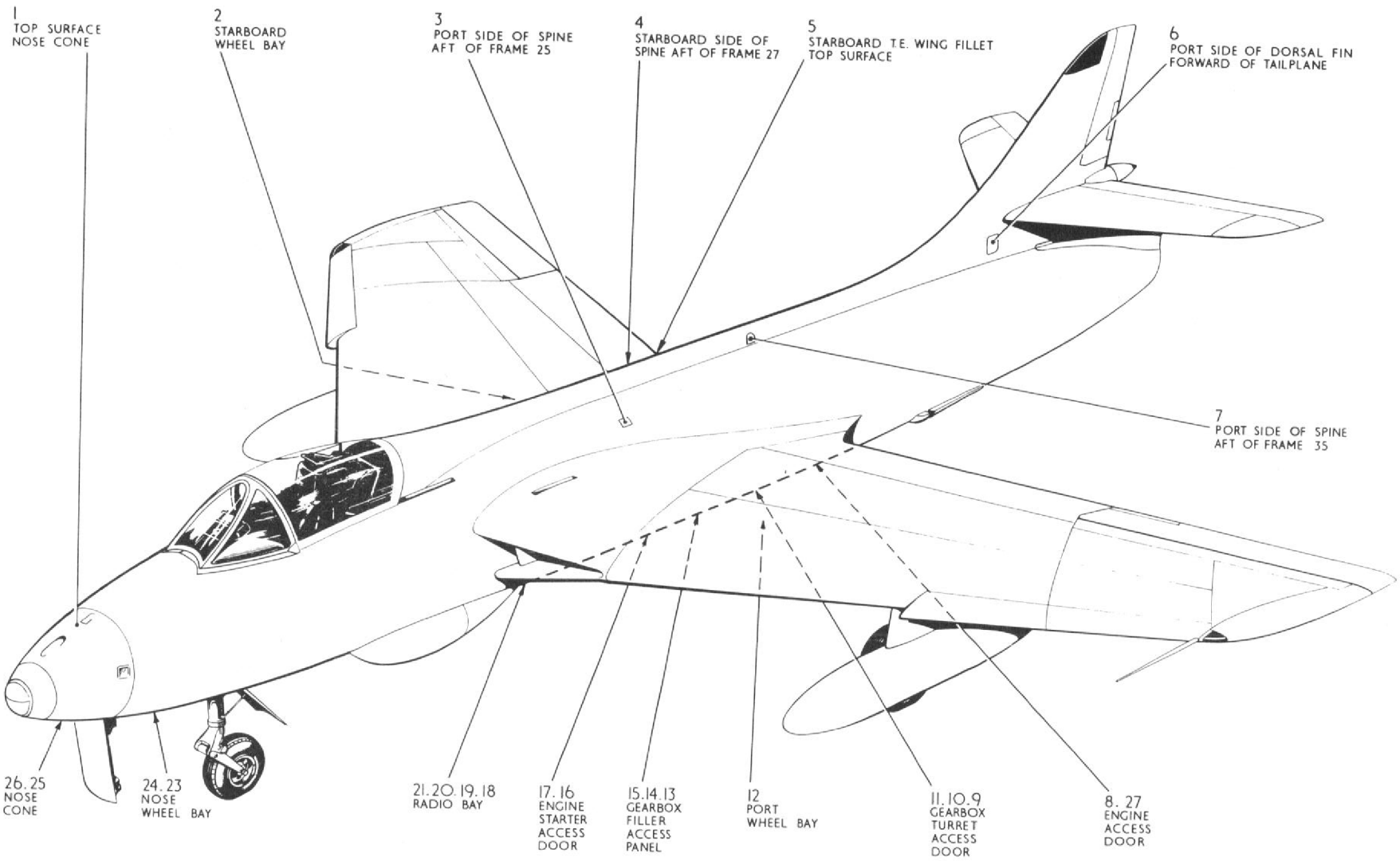
During refuelling, after 50–100 gallons of fuel have passed into the aircraft, ensure that air is passing out of the refuelling pressure relief valves. This is particularly important when icy conditions prevail or when the aircraft has not been used for an appreciable time.

(7) When refuelling is completed, the refuelling indicator lights will go out. Check the contents of the fuel tanks by means of the fuel gauges in the cabin.

(8) Remove the refuelling equipment and replace the sealing cap on the refuelling coupling in the port wheel bay. Switch off the time switch if it has not completed its full cycle, leave the drop tank refuelling selector switch in the position selected and switch off the battery master switch if using the internal power supply.

Note . . .

A switch (fig. 2A) in the port stub wing (accessible through the port wheel bay) enables selective refuelling, according to the position of the switch, of either, wing tanks only, wing tanks and inboard drop tanks or wing tanks, inboard and outboard drop tanks. In the latter position, when inboard drop tanks are not fitted, the wing and outboard drop tanks will be refuelled.



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4 COLD AIR UNIT DIPSTICK
5 HYDRAULIC RESERVOIR FILLER
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Fig. 2 Servicing points

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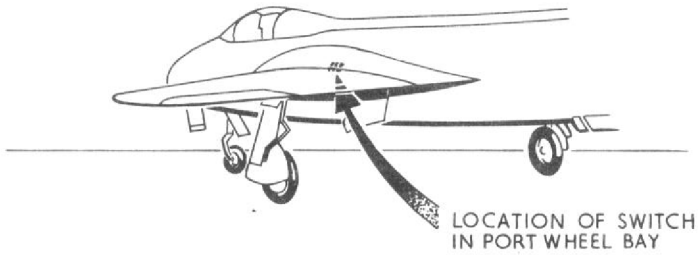


KEY TO FIG. 2A—Drop tank refuelling selector switch

The drop tanks will be refuelled during refuelling according to the position of the switch as follows:—

Switch position	Drop Tanks Fitted	Refuelled
I	Inner and outer	All
	Outer only	Outer
	Inner only	No
II	All configurations	None
III	Inner and outer	Inner
	Outer only	No
	Inner only	Inner

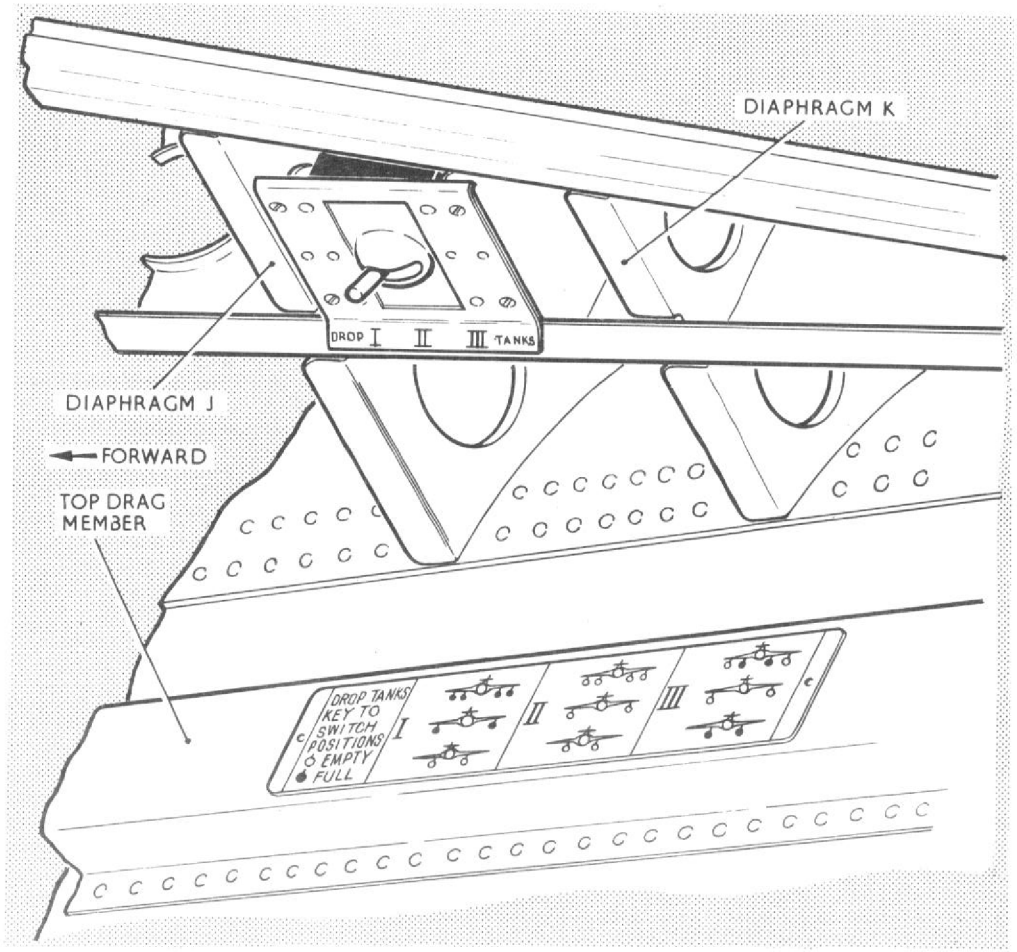


Fig. 2A. Drop tank refuelling selector switch

Defuelling

4. The aircraft is defuelled through the refuelling coupling in the port wheelbay, being either sucked out by a refueller or pumped out by the tank booster pumps. An air pressure supply is required to transfer the fuel from the rear, wing and drop tanks to the front tanks during this operation. The air pressure, which must not exceed 120 lb. per sq. in. is fed into the system through an external supply connection in the spine of the centre fuselage *(fig. 2, item 7)*. The procedure for defuelling the aircraft is as follows:—

(1) Ensure that the refueller is earthed and connect the bonding of the hose to the aircraft structure. Remove the sealing cap from the refuelling coupling in the port wheel bay and connect the refueller hose.

(2) Connect an external air pressure supply to the external air pressurization connection in the spine of the centre fuselage *(fig. 2, item 7)* and apply a pressure not exceeding 120 lb. per sq. in. *(Generally the cabin pressurization test rig is used for this purpose, after it has been set to 10 lb. per sq. in. pressure).*

(3) Set the refueller control to DEFUEL.

(4) Turn the L.P. cock to OFF and the selector cocks to AUTO.

(5) Remove the locking pin from the lever of the defuelling cock, disengage the locking latch from the lever and turn the cock *(fig. 2, item 17)* to ON.

(6) Start the refueller pump to draw out fuel.

(7) As soon as the refueller commences to suck air, switch on the booster pumps to ensure that all fuel in the system is drained off. Switch off the booster pumps as soon as the refueller commences to suck air again and stop the refueller pump.

(8) When the tanks are empty, turn the defuelling cock to OFF immediately, move the locking latch to engage with the lever of the cock and lock in position with the locking pin.

Note . . .

During initial assembly of the locking latch to the defuelling cock, the latch attachment bolt, Part No. F.250214 must be adjusted so that the slot of the latch engages with the lever of the cock allowing no movement of the lever in the fully closed position (Sect. 4, Chap. 2). The stops on the cock are internal, it is therefore essential that the cock be turned to its full extent to ensure that it is fully closed.

(9) Disconnect and remove the defuelling equipment, re-fit the sealing cap on the refuelling coupling and the cap and access panel of the air pressurization connection.

Draining water from fuel system

5. Drainage of water and sediment that may have accumulated in the fuel system is facilitated by the provision of small drain valves located at the lowest points in the fuel system, together with a small plug in the engine filter casing. The position of these valves is indicated in fig. 2, items 16, 18 and 27. These valves and drain plug must be used periodically to draw off a few pints of fuel and any water and sediment that may have accumulated. To use the valves, remove the sealing caps and insert a suitable length and diameter of hose into each valve in turn. Inserting the hose pushes open the spring loaded valve, which closes again automatically when the hose is removed. A suitable container should be made available for the reception of the drained fluid. This fluid must afterwards be discarded. When the drainage of water is completed, replace the sealing caps, replace and secure the access panels. When draining water from 230 gallon drop tanks the drain plugs in the tanks must not be unscrewed more than three turns, using Allen key (Ref. 1C/6252).

Refilling hydraulic reservoir

Note . . .

Every care must be taken to ensure that only clean hydraulic fluid is introduced into the system. Fluid drained from the system during bleeding must NOT be put back into the reservoir. Hydraulic fluid has a detrimental effect on paint, electrical cables, rubber, etc., and although a drip tray is provided at the filler neck of the reservoir, great care must be taken to ensure that no fluid is spilled on such parts. The specification of the fluid to be used is given in the Leading Particulars.

6. Access to the filler cap of the hydraulic reservoir is obtained by removing an access panel from the top surface of starboard wing fillet *(fig. 2, item 5)*. The filler cap is provided with a sight glass to facilitate the checking of the fluid level in the reservoir.

Proceed as follows:—

If, with the aircraft standing on its alighting gear with the hydraulic accumulators inflated with *air* but not charged with *oil*, and with the landing flaps and air brake up, the fluid level is no longer visible through the sight glass, the reservoir must be topped up. To top up, remove the filler cap slowly, to release any built-up pressure that may exist in the reservoir, and pour in fluid until it reaches the *top* of the filler neck. A container fitted with a flexible nozzle should be used to facilitate the operation. When topping up is completed, replace the filler cap securely and mop up any spilled fluid.

WARNING

When high pressure air is admitted to a closed volume previously contaminated with inflammable substances, spontaneous combustion or 'dieselling' may take place.

The conditions most conducive to this occurrence are when the closed volume is small (as in a pressure gauge) and the inflation is carried out quickly so that there is a rapid rise in pressure.

The techniques required for the avoidance of such conditions are cleanliness of equipment and the admission of high pressure air slowly.

When charging or testing the pressure in undercarriage shock absorbers, hydraulic accumulators, pneumatic valves, gauges and similar pneumatic/hydraulic components :—

(1) All equipment used, including test gauge adapters and feed connections from the pressure source, must be free from contamination by dirt, grease, fluid or oil.

(2) Adapter control screws or cocks which admit high pressure air to the component or test gauge must be opened slowly to prevent a rapid rise of pressure.

Charging hydraulic emergency and anti-'G' air bottles

7. The high pressure air bottles for the emergency operation of the alighting gear and landing flaps and the anti-'G' air bottles are mounted at the rear of the cabin. It is essential to ensure that these bottles are fully charged before each flight. Pressure gauges are installed in the cabin to register the pressure in the bottles, should the indicated pressure be below that given in the Leading Particulars, the bottles must be recharged to the correct pressure through the *in situ* charging valve *(fig. 2, item21).*

Note . . .

If either the alighting gear or flaps emergency system has been used, it will be necessary to reset the air release valves, after which the hydraulic system must be primed and bled. The air bottles must then be recharged.

Charging wheel brake accumulators

8. Access to the hydraulic accumulators for the wheel brakes, together with their charging connection is from within the nose wheel bay. The pressure is indicated on the brake accumulator pressure gauge in the cabin. *If after dissipating the hydraulic pressure, by operating the brake lever a number of times, the pressure shown on the gauge is below that stipulated in the Leading Particulars, the accumulators must be recharged through the charging connection (fig. 2, item 23).*

Charging aileron boosters accumulator

9. The hydraulic accumulator for the aileron boosters, together with its charging connection and associated pressure gauge, is accessible from within the starboard wheel bay. *The hydraulic pressure should be dissipated by operating the aileron controls until the hydro-booster jacks cease to operate. The air pressure should then be checked and if the pressure shown on the gauge is below that stipulated in the Leading Particulars, the accumulator must be recharged through the adjacent charging connection (fig. 2, item 2).*

Charging elevator booster accumulator

10. Access to the hydraulic accumulator for the elevator booster, together with its charging connection, may be obtained by removing an access panel *(fig. 2, item 6)* in the port side of the dorsal fin, just forward of the tail plane. The access panel is provided with a window to enable the accumulator pressure to be checked by reference to a pressure gauge located adjacent to the accumulator. On completion of recharging operations the valve cap must be replaced, tightened and the outer sleeve of the cap wire-locked to the hexagon of the valve body.

If, after dissipating the hydraulic pressure by operating the elevator control until the hydro-booster jack ceases to operate, the pressure indicated on the gauge is below that stipulated in the Leading Particulars, the accumulator must be recharged.

11. The aileron and elevator selector valves are fitted with an override device which enables 'Power Off' to be selected manually, so ensuring that it is always possible for servicing operations to be carried out by the use of the handpump. The operating procedure is contained in Sect. 3, Chap. 6.

Charging oxygen cylinders

12. The three oxygen cylinders are mounted in the front fuselage, two being mounted vertically with their valves uppermost between frames 4 and 6 on the starboard side of the aircraft, and the other one on the port side where it lies athwart frame 5 with its valve facing forward. A charging valve, common to all three cylinders, is mounted on the forward face of frame 6 just below the rear of the starboard pair of cylinders. Access to the cylinders and charging valve may be obtained from within the nose wheel bay. The cylinders may be recharged in-situ through the charging valve to the pressure quoted in the Leading Particulars, or the cylinders may be replaced by fully-charged cylinders as described in Sect. 3, Chap. 10 of this volume. The charging valve is provided with a protective cover to keep it free from oil and grease. This cover must be removed before charging can be effected and replaced immediately after charging has been satisfactorily completed. The procedure for in-situ charging is described in A.P. 1275A, Vol. 1, and A.P.1275G, Vol. 1.

WARNING

It is essential in the interests of safety that oxygen installations are kept free from oil, grease or moisture.

Batteries

13. The main and standby batteries are carried in the radio bay in the front fuselage, access being obtained via the radio access doors (*fig.* 2, *item* 20). These batteries must be checked periodically for state of charge as described in Section 5, Chapter 1, which also contains instructions for the changing of the batteries.

Note . . .

Before attempting to connect the batteries, ensure that the Cannon plugs are not shorting against the aircraft structure.

Topping-up liquid starter fuel tank

14. A small access panel in the top port side of the centre fuselage *(fig. 2, item 3)* gives access to the filler for the liquid starter fuel tank. The dipstick is marked for four starts *(approx. ½ gall. per start)*. The tank should be topped up to the upper mark on the dipstick. *(Care should be taken to ensure that no liquid is spilled as it is detrimental to electric cables, etc.)*

Topping-up cold air unit

15. A small hole in the top starboard side of the centre fuselage *(fig. 2, item 4)*, between frames 27 and 28 gives access to the cold air unit dipstick and filler orifice. The oil level in the unit should be examined daily and topped-up as necessary with oil as specified in the Leading Particulars until it reaches the full mark on the dipstick. The oil should be poured through the dipstick orifice in small quantities, otherwise a false level will be indicated on the dipstick.

Refilling engine oil sump

16. The engine oil sump is filled under pressure through a self-sealing connection which is accessible through the main engine access door *(fig. 2, item 8)*. The sump is provided with a sight glass to indicate the oil level. If the level is low, as indicated by the sight glass, oil should be pumped in through the self-sealing connection until the level is correct. The oil specification is given in the Leading Particulars.

Note . . .

It is not necessary to prime the oil system, although it is advisable to turn the engine over to ensure oil circulation and pressure indication before running the engine. After the initial ground run, the level should be re-checked and the sump replenished if necessary.

Refilling accessories gearbox and turret

17. The accessories gearbox and the turret which is incorporated in the drive assembly, are each provided with a filler and dipstick. Access to the gearbox filler is through an access door on the underside of the fuselage forward of the rear spar *(fig. 2, item 13)* and that of the turret through a larger door situated just aft of the rear spar *(fig. 2, item 10)*. Before checking the level, ensure that the dipstick of each unit is pressed right home before removing. If the level is low, as indicated by the dipstick, replenish until the oil is level with the overflow pipe. The specification of the oil for topping up both units is given in the Leading Particulars.

Refilling fuel filter de-icing tank

18. The fuel filter de-icing tank is mounted in the engine bay and a contents indicator is located on the gearbox filler access door landing in the bottom of the fuselage, just forward of the rear spar frame. The indicator is marked for FULL and USED indication only and replenishment of the tank is accomplished by means of two self-sealing couplings adjacent to the indicator, one serving to pass fluid to the tank from an external supply, and the other permitting the release of the air displaced from the tank by the incoming fluid. During the process of filling the tank, the displaced air escapes to the supply tank through a pipe which contains a sight glass and, when fluid is observed through the sight glass, the aircraft tank is full. A re-set plunger is incorporated in the contents indicator unit, and this must be depressed to re-set the indicator when replenishment of the tank is satisfactorily completed. The specification of the fluid to be used for filling the tank is quoted in the Leading Particulars.

Priming the fuel system

19. Priming consists of bleeding the fuel pumps and the system generally to remove all air, or oil if the engine has been inhibited. Bleeding must always be carried out if the engine is newly installed, whenever it has been inhibited or when there has been any disconnection in the system at any point, or the fuel tanks have been drained. The system should be bled at each point, working upwards from the lowest bleed point. The procedure is described in the Engine Volume I.

Note . . .

The high-pressure fuel pumps are fuel lubricated, consequently they will suffer damage if the engine is turned over when the pumps are dry. It is essential, therefore, to ensure that the engine is not turned before the system is primed. To obviate the risk of fire when starting the engine, mop up any fuel that may have been spilled. It may be necessary to bleed the system again if fluctuations of rev/min are experienced during the initial ground run after bleeding, as such fluctuations may be due to trapped air having moved round into the pumps under running conditions.

WARNING

Before attempting to start the engine, ensure that all personnel are at a safe distance from the air intakes and jet exhaust and take the necessary action to prevent any person walking into these danger zones (fig. 1) and also the starter exhaust when starting the engine.

Armament safety break

20. An armament safety plug, located in the port stub wing, *must* be removed from its socket during the loading of stores and servicing of the equipment, except when carrying out functional checks. The plug, which is fitted with a red warning pennant, is accessible through a small hinged door which is fitted in a panel under the wing just forward of the main spar pin joint. The door is provided with a toggle fastener to facilitate access.

Note . . .

When replacing the safety plug, the red marks on the plug and socket must line up, this will prevent damage to the plug and socket and ensure correct electrical connection.

Precautions prior to running the engine

21. Before running an engine which has been newly installed, or which has been inhibited or an engine in which there has been any disturbance of the components of the fuel system, such as disconnected pipes, draining, etc., the fuel system must be primed *(described in para. 19)*. Remove the air intake and jet pipe sealing covers and examine the engine to ensure that the air intake ducts and engine are free from accumulations of fuel or oil and that no cleaning cloths or tools have been left around the engine. The air intake safety guards must be fitted prior to ground running the engine.

Starting preliminaries

22. Before starting the engine, the aircraft should be headed into wind with the tail pointing away from other aircraft. Main wheels should be effectively chocked in accordance with A.P.1464G, Vol. 1, Part 2, Sect. 5, Chap. 11. For full power engine run and especially when slam acceleration and deceleration checks are being made, double chained checks must be used.

Engine starting

23. The engine is started by means of a Plessey *(iso propyl nitrate liquid fuel)* starter. A description of the starter installation is given in Sect. 4, Chap. 1. For a description of engine starting procedure refer to the Ground Handling Notes.

Running up engine with batteries removed

24. Running up the engine with the batteries removed is not possible on this aircraft as the engine starter cannot be energized from an external supply.

Undercarriage deflection check

◀ **25.** The main and nose undercarriage legs must be checked in accordance with the instructions given in A.P.1803E, Vol. 1, and recharged as necessary. ▶

Checking tyre pressures

26. Due to the heavy loads imposed on the tyres of this aircraft, it is most important to ensure that the correct inflation pressures are maintained. When checking the pressures, as called for in the Servicing Schedule, a tyre pressure gauge must always be used.

Air drier

27. The air drier for the dry-air sandwich of the windscreen is located on the rear face of frame 7 just forward of the cabin port shelf and is connected to the valve on the windscreen by a rubber tube. The system must be examined as follows:—

(1) Examine the windscreen for signs of internal misting and moisture deposits. The presence of moisture indicates leaking connections, a cracked transparent panel, saturated silica gel or a blanked off air drier.

(2) Examine the system for damage and security and check the colour of the silica gel crystals in the air drier tube. The crystals, which are normally blue in colour, should be changed when they turn red. Use silica gel Ref. No. 33C/790, when replenishing the air drier tube.

◀ (3) On replacement of an air drier ensure that it is not taped or otherwise blanked off. ▶

Note . . .

◀ *Pre S.T.N./Hunter/54*

Before attempting to remove the air drier tube, the windscreen dry-air sandwich must be sealed against the ingress of moisture by unscrewing and removing the banjo bolt and rubber tube from the windscreen valve connection. The valve is spring loaded and will close thus sealing the windscreen. The instructions for the re-assembly of the banjo and banjo bolt are given in fig. 2b.

Post S.T.N./Hunter/54

Before attempting to remove an air drier, the windscreen dry air sandwich must be sealed against the ingress of moisture by blanking off that end of the rubber tube disconnected from the air drier. See fig. 2b for assembly of banjo. ▶

Removal of locking devices and covers

28. Before flight, remove the following locking devices, as well as any weather covers that may be fitted:—

(1) Control surface locking clamps *(always before flying controls locking gear)*.

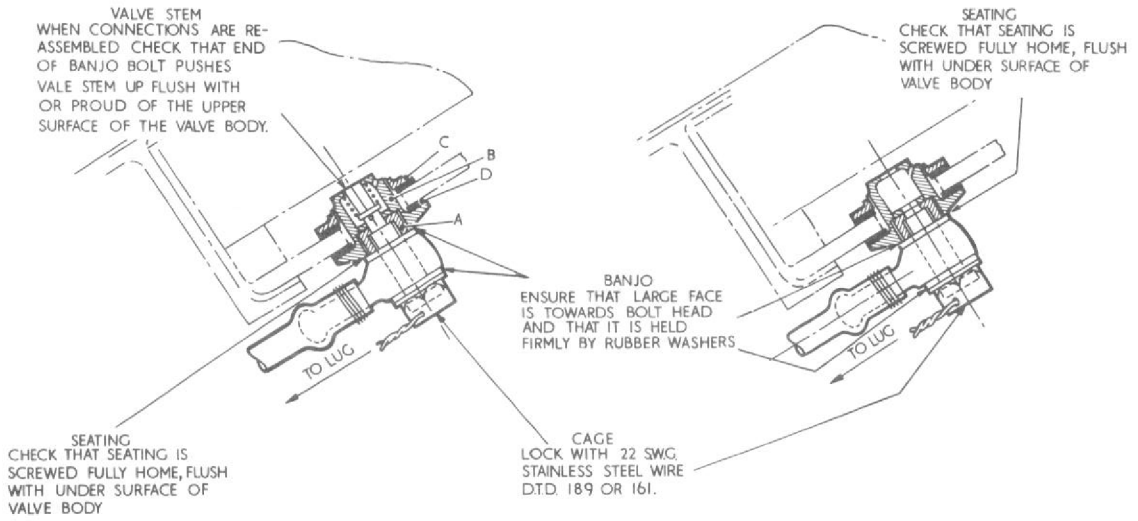
(2) Flying controls locking gear.

(3) Air intake sealing covers, or safety guards if they have been fitted. Jet pipe and pitot head sealing covers. Any other covers.

(4) Any picketing equipment and attachments.

(5) Undercarriage safety stops.

(6) Pilot's ladders.



◀ **Fig. 2b. Windscreen air drier banjo assembly** ▶

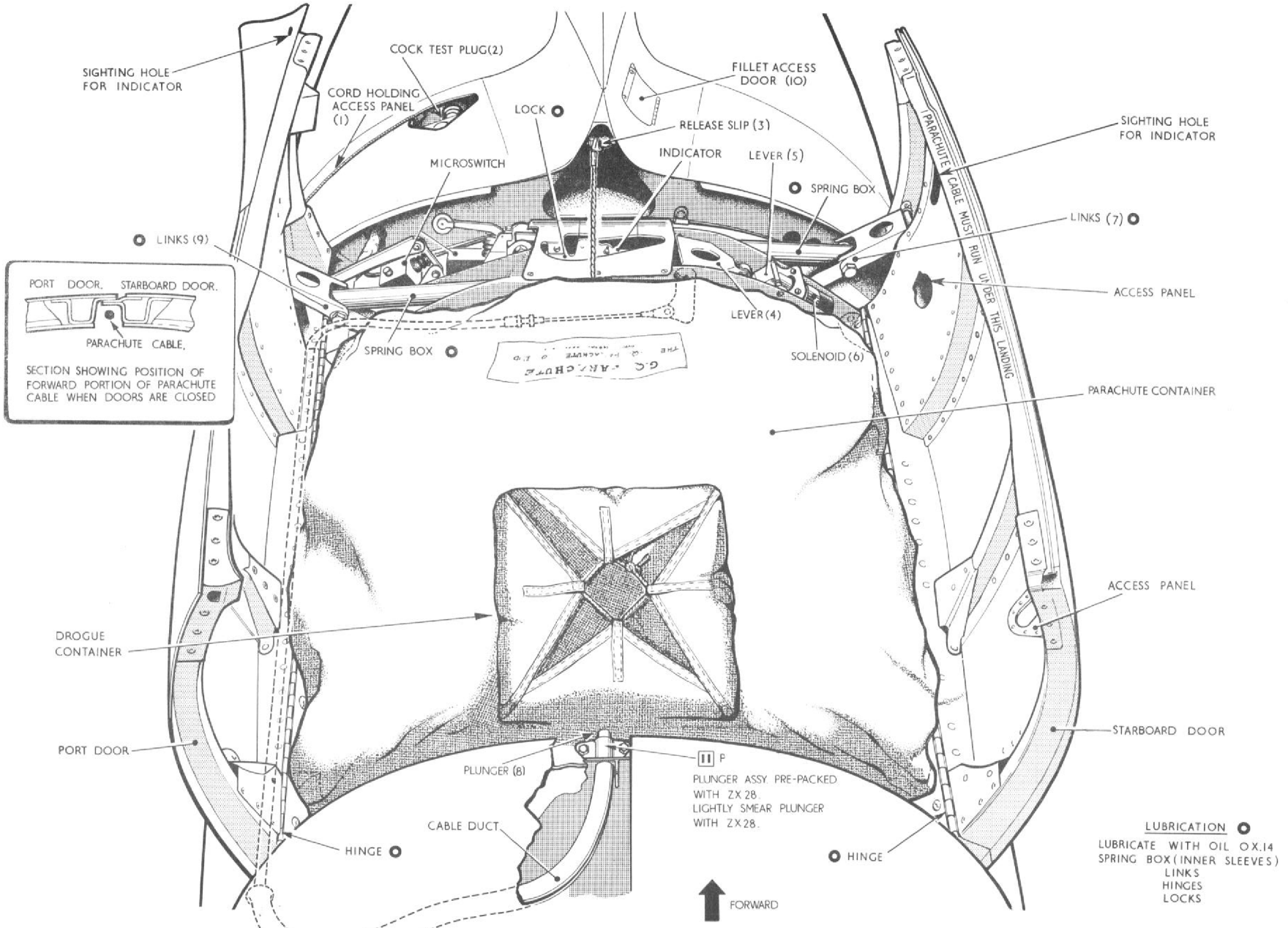


Fig. 3. Braking Parachute

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Assembly of braking parachute *(fig. 3.)*

29. The braking parachute is housed in a fairing located above the tail cone and is streamed through two hinged doors which are opened upon operation of a spring-loaded release gear, the actuation of which is initiated electrically by means of control switches in the cabin. A description and illustration of the release gear will be found in Sect. 3, Chap. 1. The sequence of the assembly of the parachute into its container above the tail cone is as follows:—

(1) Open the fillet door (10) adjacent to the parachute release. This door, when opened, operates a micro-switch which cuts off the electrical supply to the release slip. It must be left open until the parachute is fitted and the parachute doors closed.

(2) Place the parachute into the container, insert the shackle into the jaws of the release unit and close the jaws by hand, gaining access through the fillet door (10)

(3) Check that the release slip is cocked by using the test plug (2) after removing access panel (1). The cocking test is described in Sect. 5, Chap. 1.

(4) Depress the lever (4) on the starboard side of the parachute housing, ensuring that it engages fully with the lever (5) operating the solenoid (6). (Sect. 3, Chap 1, Fig. 3A).

(5) Ease the links (7) attached to the spring box, upwards and close the starboard door after first ensuring that the parachute cable is laid so that it will lie under the landing of the door when the door is closed.

(6) Hold the starboard door down to restrain the drogue, cut and remove the cord securing the drogue flaps, ease the links (9) attached to the spring box, upwards and close the port door, pressing down firmly to ensure engagement of the door locks.

WARNING

It is important to ensure that the parachute pack has not been jammed between the doors and the landings and that the pack has not moved to the rear of the housing so that a high load is placed on the rear door lock when the doors are closed.

(7) Inspect for engagement of the front locks by looking through the sighting hole in the door and ensuring that the indicator rod on the lock is in the UP position. Also examine rear lock through adjacent sighting hole and ensure that the plunger (8) is fully engaged.

(8) Finally, *and before each flight*, check again that the release slip is cocked as in sub para. (3) of this para.

(9) Close the fillet door (10).

(10) Place the parachute test switch in the cabin to the TEST position and check that the two filaments in the warning lamp glow to indicate that the electrical circuit is serviceable. Return the switch to the normal position.

Mechanical opening of parachute doors

30. In the event of electrical failure, or if it is necessary to open the parachute doors for any purpose, the following procedure should be adopted:—

(1) Isolate the electrical services from the parachute release by opening the fillet door (10).

(2) Remove the access panel from the forward end of the starboard parachute door, apply hand pressure to the doors to prevent them springing open, depress the lever (5) with a suitable tool and gradually release the pressure on the doors to allow them to rise, under control.

Note . . .

Once the parachute doors have been opened the drogue flaps will fly open, allowing the drogue to rise. The parachute will, therefore, have to be removed, repacked and eventually reassembled to the container as described in para. 29.
(The removal of the parachute is described in Sect. 3, *Chap.* 1.)

Note . . .

All pivot points as well as the spring box assemblies for both port and starboard doors are to be lubricated, at those periods laid down in the Servicing Schedule, as detailed in fig. 3. *The E.M. release unit must be serviced in accordance with the instructions given in A.P.*1664A, *Vol.* 2.

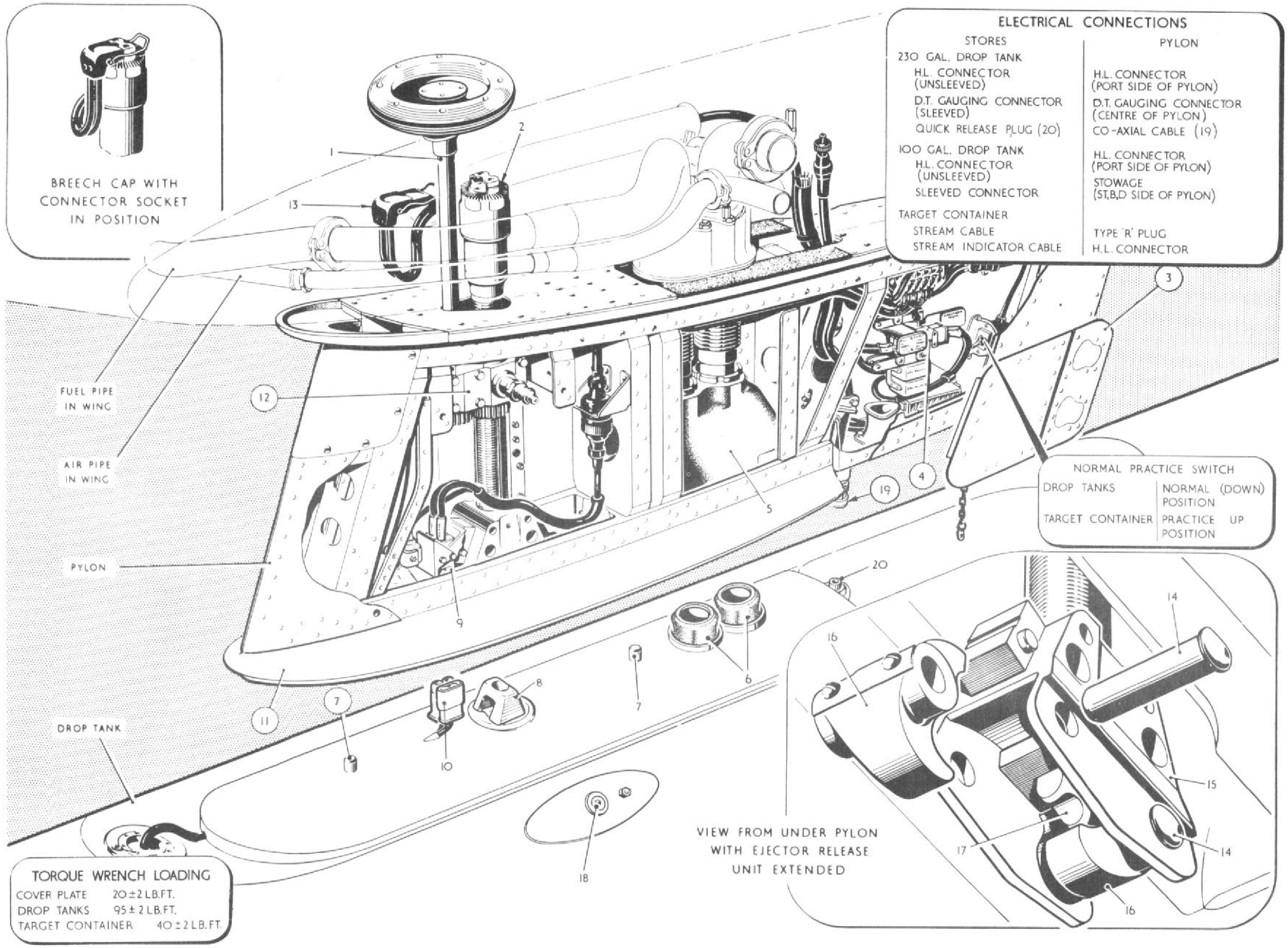

Fig. 4 Loading of stores on inboard pylon

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Fitting and removal of inboard drop tanks (Fig. 4)

WARNING

Personnel handling explosive release and ejector units, as fitted to the inboard pylons on this aircraft, should be conversant with the safety precautions detailed in A.P.1664E, Vol. 1, Part 1, Chap. 1.

31. Prior to fitting the 230 gal drop tanks, the spigot bushes on the pylon must be checked for excessive wear. If the measurement across the worn portion of the rear bush or across the minor axis of the front bush exceeds 0·525 in. the bush should be replaced.

Note . . .

230 gallon drop tanks held in store should be inhibited and when this is completed a warning label fixed to the tank, adjacent to the filler cap, with transparent adhesive tape. Before fitting a tank from store, therefore, all traces of inhibiting oil must be removed by washing out the tank with lead free gasoline (Ref. 34A/9100447 or 34C/9100454) and the warning label removed. Care must be taken to ensure that scrupulous cleanliness is observed and that no foreign matter is introduced into the tank.

The procedure for the fitting of the drop fuel tanks to the inboard pylons is described in the following sub-para.:—

(1) Disconnect the armament safety break in the port wing, remove the rear doors *(3)* and disconnect the pylon safety breaks *(4)* at all pylons, i.e. inner and outer, port and starboard. Ensure that the NORMAL/PRACTICE switch is in the (NORMAL) position.

(2) Wheel the drop tank into position under the pylon and lubricate the front and rear locating spigots *(7)* with anti-seize compound ZX-28. Inspect the sealing rings at (6) for serviceability and smear the outer surface of the rings with Hellerine fluid (Ref. 34B/1225).

(3) Remove the access panel *(26FX/10085)* in the wing top skin. Attach a crutching tool shaft *(1), (M.L. Aviation Ltd., D.L.617-41B or D.L.617-113B)* complete with handle *(M.L. Aviation Ltd., D.L.617-348C)* into the socket of the crutching mechanism *(12)* of the ejector release unit *(2)* and turn in an anti-clockwise direction to lower the unit ◀ sufficiently to enable the jaw pins *(14)* in the bottom of the housing *(15)* to be removed.

Note . . .

The threads of the ejector release unit must be regreased with ZX-28 before each loading.

(4) With the ejector release unit lowered, a firm pressure on the end of the jaw pins will release the spring lock in the jaws and allow the pins to be withdrawn and the jaws *(16)* to be removed. Remove adapter *(17)*, in the bottom of the housing. ▶

Note . . .

The adapter (17) is only used for 100-gallon drop tanks and other stores fitted with suspension lugs Ref. 12A/2076.

◀ (5) Carefully raise the drop tank using hoists and a sling so that one jaw, hooked in the suspension lug, can be secured to the jaw housing with a jaw pin, without exerting any force on the end of the extension rod at the bottom of the ejector release unit piston tube assembly. Then hook the other jaw in the suspension lug and secure to the jaw housing with the remaining jaw pin. Ensure that the flat on the head of each jaw pin is engaged with the shoulder on the jaw housing.

Note . . .

It is important that the top of the suspension lug should not be forced up against the extension rod, as the use of undue force imparts a shear load to the rivet securing the plunger wedge to the piston tube assembly. If this rivet is sheared any store subsequently carried with the ejector release unit in this condition will be inadvertently released. ▶

(6) Plug in the unsleeved connector *(10)* on the drop tank to the sleeved connector *(9)* on the pylon. Remove the ◀ co-axial cable *(19)* from the stowage in the pylon and connect to the socket *(20)* on the drop tank. ▶

Note . . .

If 100-gallon drop tank is being fitted, the sleeved connector on the tank is plugged into the stowage on the starboard side of the pylon and the unsleeved connector from the tank plugged into the sleeved connector on the port side of the pylon.

(7) By means of the crutching tool raise the tank until the fore and aft spigots *(7)* are engaged in the holes provided in the sole plate *(11)* of the pylon, and the tank adapters *(6)* are making contact with the fuel and air valves in the valve body *(5)*. Check that the electrical cables from the tank to the plugs are not trapped between the tank and the sole plate.

(8) Apply the final crutching load by using a torque wrench (Ref. I.L./171) set to 95 ± 2 lb ft, attached to the adapter on the crutching tool.

(9) Remove the torque wrench and crutching tool, connect socket *(13)* to the breech cap and replace the access panel in the wing.

(10) Reconnect the safety breaks *(4)* and replace the rear doors *(3)* on all pylons.

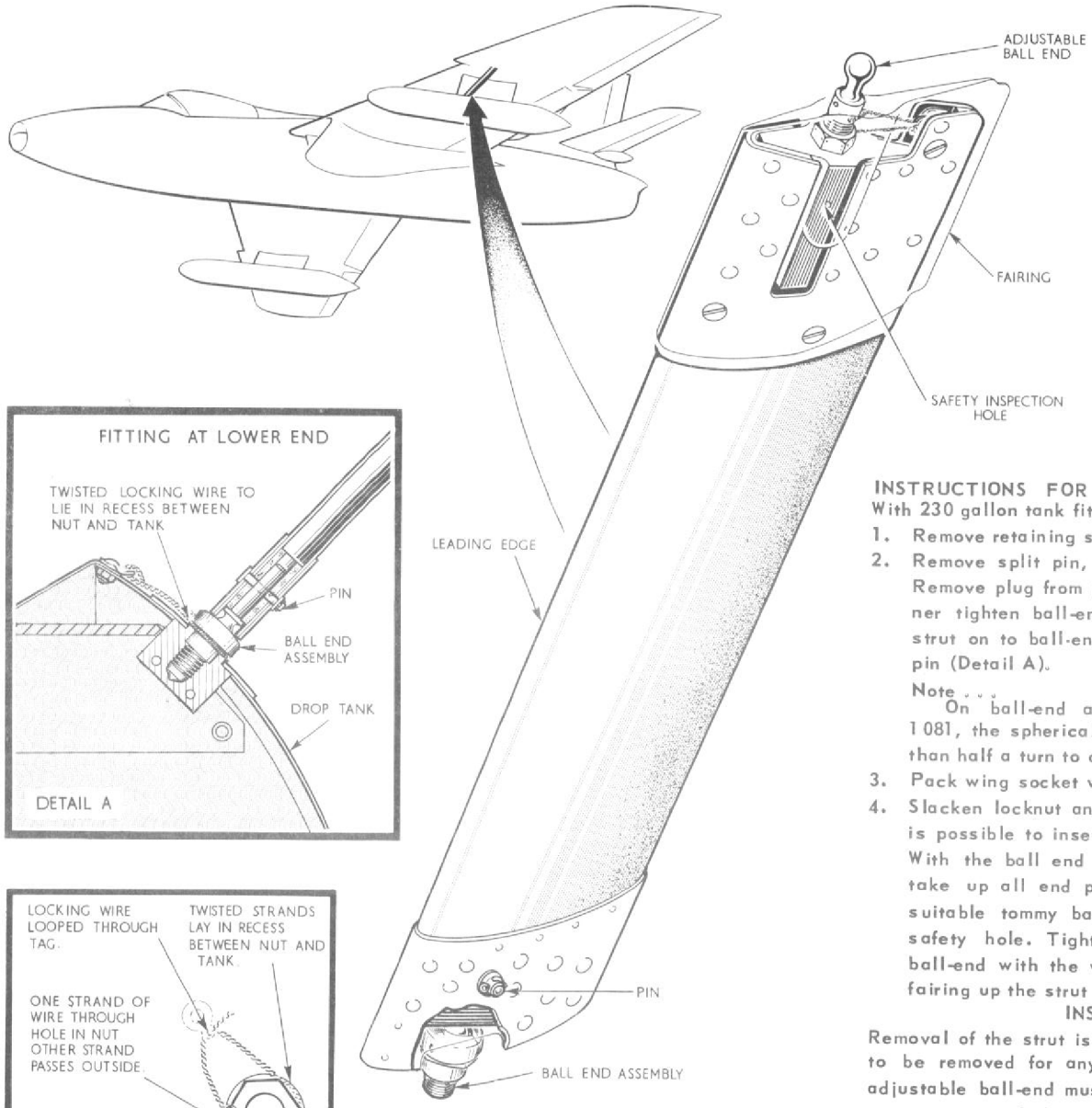
(11) Fit the special bracing strut between the drop tank and the wing as described on fig. 5 *after filling the drop tank with fuel.*

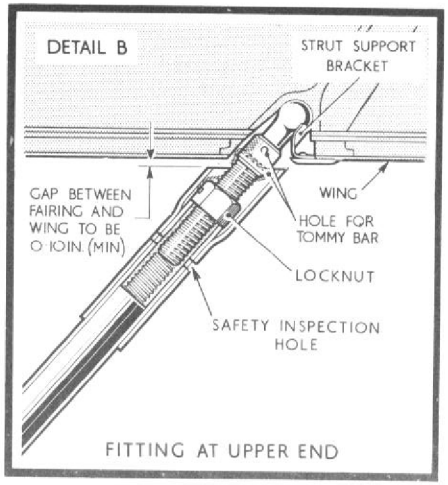
(12) Immediately before flight replace the armament safety break.

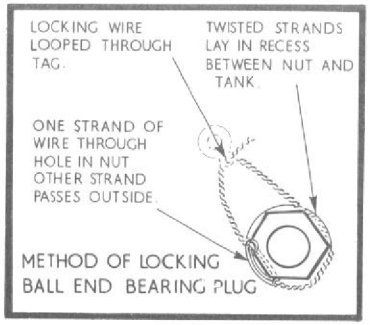
32. The removal of the inboard drop fuel tanks is a reversal of the above procedure.

Note . . .

To prevent swinging of the release unit when the pylon is installed with no stores fitted, Cover Plate (Part No. B.235438) with suspension lug (Ref. 11A/5044) must be fitted on the underside of the pylon and crutched up with the torque wrench set to 20 ±2 lb ft.







INSTRUCTIONS FOR FITTING DROP TANK STRUT

With 230 gallon tank fitted and full.

1. Remove retaining screws, slide fairing down strut.
2. Remove split pin, washer and pin; and remove lower ball assembly. Remove plug from outboard side of tank, fit ball-end and with a spanner tighten ball-end plug and wire lock. Lubricate with ZX-28. Fit strut on to ball-end assembly and secure with pin, washer and split pin (Detail A).

   Note . . .
   On ball-end assemblies (Pt.No.F.252506) introduced by Mod. 1081, the spherical nut is to be finger tight and backed off not more than half a turn to obtain alignment.
3. Pack wing socket with ZX-28.
4. Slacken locknut and screw adjustable ball-end into the strut until it is possible to insert the ball-end into the wing socket without force. With the ball end fully home in the socket, adjust the ball-end to take up all end play and then tighten a further full turn using a suitable tommy bar. Check to ensure that ball-end registers in the safety hole. Tighten the locknut, and wire lock the locknut and ball-end with the wire through the lower tommy bar hole. Slide the fairing up the strut and refit securing screws.

INSTRUCTIONS FOR REMOVAL

Removal of the strut is the reverse of the above procedure. If the tank is to be removed for any purpose, the strut must be removed first. The adjustable ball-end must always be unlocked and screwed into the strut prior to removal. If the tank is to be refitted, the lower ball-end should be left (fully locked) on the tank.

Fig.5 Fitting drop tank strut

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Fitting and removal of outboard drop fuel tank

33. The sequence for fitting the drop fuel tank to an outboard pylon is given below :—

(1) Disconnect the Armament Safety break in the port wing.

(2) Remove the pylon rear doors and disconnect the servicing breaks at all pylons i.e. inner and outboard, port and starboard.

(3) Position the drop tank under the pylon and lubricate the front and rear spigots with anti-seize compound ZX-28. Inspect the sealing rings for serviceability and smear the outer surface of the rings with Hellerine fluid (Ref. 34B/1225).

(4) Remove the Chekaleke plugs *(3, fig. 6)* from the sighting holes on the port and starboard sides of the pylon and check that the gap between the top of the release housing *(2, fig. 6)* and the bottom of the plungers *(1, fig. 6)* does not exceed 0·10 in.

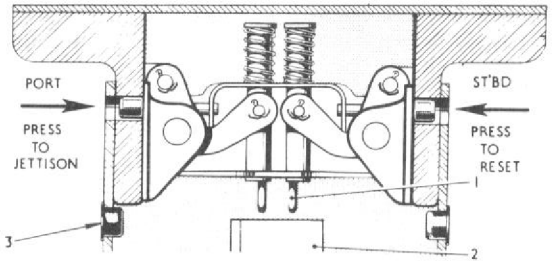

Fig. 6 Jettison and reset mechanism (outboard pylon)

Note . . .

To avoid damage to the jettison and reset mechanism it is essential that only a tool similar to that illustrated in fig. 7 is used to operate the jettison and reset buttons. After operation, an inspection must be made to ensure that the buttons have returned to their normal position, which is 0·10 in. below the skin level of the pylon.

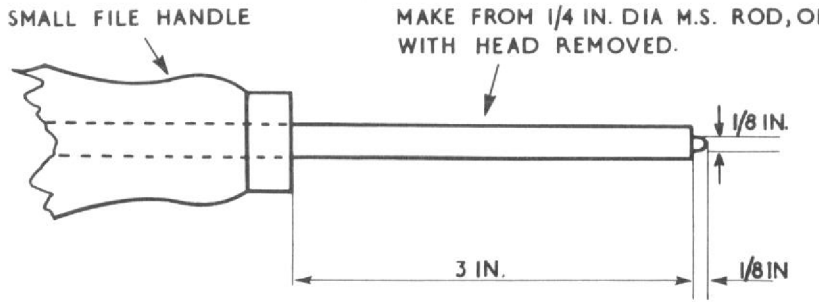

Fig. 7 Tool for operating jettison and reset button

(5) If the electro-mechanical release is not open, press the jettison button on the port side of the pylon and then reset by pressing the reset button on the starboard side of the pylon. (Should the electro-mechanical release be already open, only the reset button need be used).

(6) Remove the access panel (complete with locking tube) from the wing top skin and place a crutching spanner *(Ref. 26FX/95645)* over the hanger bolt and ensuring that the annular groove on the spanner is flush with the wing skin, unscrew the special nut and lower the hanger bolt to which is attached the E.M. Release Unit.

(7) Position the drop tank under the pylon and raise it sufficiently to allow the electrical connectors on the tank to be plugged into their appropriate connectors on the pylon.

(8) Raise the tank further until the suspension lug is engaged by the electro-mechanical release and check that the release is fully cocked by means of the cocking test socket and test set. *(Sect. 5, Chap. 1.)*

(9) By means of the crutching spanner, raise the tank until the fore and aft spigots on the tank are engaged in the sole plate and the tank adaptors are making contact with the fuel and air valves in the pylon. Care must be taken not to trap the electrical cables between the tank and the sole plate of the pylon.

(10) Apply the final crutching load by using a torque wrench *(Ref. 1L/171)*, set to $80 \pm \frac{2}{0}$ lb. ft., attached to the adapter on the crutching spanner and again check through the sighting holes in the pylon that the gap between the top of the release housing and the bottom of the plungers does not exceed 0·10 in. Replace the Chekaleke plugs.

(11) Re-check that the release unit is fully cocked by means of the cocking test socket and test set. Replace the servicing breaks in all pylons and close the rear doors.

(12) Remove the torque wrench and crutching spanner and replace the access panel (complete with locking tube) in the wing.

(13) Immediately before flight, replace the Armament Safety break.

34. To remove an outboard drop fuel tank, support the tank and press the jettison button on the port side of the pylon.

Note . . .

When stores are not being carried on the pylons, a security bar, 0·50 in. dia., and 2·75 in. long (Part No. F.224996) must be clamped between the closed jaws of the release unit and drawn up (hand tight) to the sole plate.

Fuel flow check with drop tanks fitted

35. After the fitment of previously unused drop tanks, tanks which have been broken down for servicing or whenever pylons or pylon fuel valves have been replaced, it is recommended that the following flow checks are made. These checks are to ensure that the wing fuel system and drop tank flow is satisfactory and are applicable to both inboard and outboard tanks:—

Fuel flow check using aircraft booster pumps.

(1) Refuel the aircraft. Leave the refueller connected with the engine running but with the pump clutch disconnected.

(2) Connect an external power supply of not less than 26 volts D.C. to the external supply plug.

(3) Connect an air trolley delivering between 10 – 100 lb. per sq. in. pressure to the air pressurization connection. Select Wings on the tank selection switches.

(4) Turn the defuelling cock to ON and L.P. cock to OFF and turn ON the air pressure from the trolley.

(5) Turn the refueller defuelling valve to ON leaving the pump clutch disconnected.

Note . . .

The refueller pump is not to be operated during this test.

(6) Switch ON the aircraft booster pumps and check the rate of flow by timing the gallons gone meter on the refueller. The rate of flow will probably not stabilize until after the first 10 gallons have passed, therefore the timing should commence at 10 gallons gone.

(7) From timing the gallons gone meter the rate of flow should be controlled to 48 gallons per minute maximum by throttling the flow at the defuelling cock. The acceptable flow rate is between 31 and 48 gallons per minute.

(8) Transfer pressure switches may operate and is acceptable at high rates of flow provided the out of balance condition at the end of the test is within the limits (sub-para. 10).

(9) If the transfer switches operate below a flow rate of 33 gallons per minute the cause must be investigated.

(10) Defuelling is to be continued until one of the aircraft fuel gauges is reading approximately 960 lb. At this point switch OFF the booster pumps, shut off the air supply and the refueller valve. Check that the port and starboard fuel gauges read within 120 lb. of each other. If outside this limit the cause must be investigated.

(11) When this test is satisfactorily concluded, remove the air supply from the spine connection and replace the blanking cap. Close and lock the defuelling cock. Select AUTO on the tank selection switches. Refuel the aircraft.

Note . . .

If the refueller is fitted with a serviceable and accurate flowmeter the rate of flow may be read directly from the flowmeter and timing is unnecessary.

Ground running check (alternative to fuel flow check operations 1 to 11).

If more convenient the engine may be ground run as follows as an alternative tc the fuel flow check:—

(12) With the pylons and drop tanks fitted, the system is to be emptied by defuelling.

(13) Pressure refuel the system keeping an accurate check on the quantity of fuel required to fill the system.

(14) Start the engine and run up to maximum rev/min as quickly as possible.

(15) Reduce rev/min to 7,500 and with both booster pumps ON and tanks selector switches selected to WING, continue engine run for $10\frac{1}{2}$ minutes.

(16) After $10\frac{1}{2}$ minutes increase rev/min to maximum, switch OFF the port booster pump and continue for a further $2\frac{1}{2}$ minutes. During this time the fuel transfer failure warning must not operate.

(17) At the end of this $2\frac{1}{2}$ minute period, switch ON the port booster pump and switch OFF the starboard pump and continue for a further $2\frac{1}{2}$ minutes. During this time the fuel transfer failure warning must not operate. (Total time at max. rev/min 5 minutes).

(18) Stop engine in the normal manner and return tank selector switches to AUTO. Refuel the aircraft.

Note . . .

If the fuel transfer failure warning operates the cause must be investigated.

Hood and windscreen spray drains

36. Three polythene bottles *(Sect. 3, Chap. 8, Fig. 5A)* are provided for the drainage of any water that may exist in the hood and windscreen spray pipes. The bottles are provided with straps by which they are secured with pip-pins to mountings at frames 8 and 10 on the starboard side of the cabin and at frame 12 on the port side. Flexible drain pipes are attached to, and feed into, the caps of the bottles. Each bottle contains sponge rings, which are taped together to form single elements and to facilitate the removal of the elements from the bottles. Daily under normal conditions and, more frequently under conditions of extreme humidity, the bottles with straps still attached, should be unscrewed from their respective caps, after first removing the pip-pins. The sponge elements should then be removed by means of the tapes, the elements squeezed dry, the bottles emptied and the elements replaced in the bottles. When replacing the bottles, it is essential to ensure that they are screwed fully home into their respective caps to ensure an effective seal before the pip-pins are re-fitted to secure the bottles into their mountings. Ensure that the vent holes in the caps are not obstructed.

Hood jettison control

37. Before every flight, ensure that the hood jettison control has not been wholly or partly operated. This can be checked by examining the release unit to ensure that the painted red lines on the lever and body of the release unit correspond. If they do not, the release unit must be set to the loaded position as described in Sect. 3, Chap. 1.