Chapter 2 PREPARATION FOR FLIGHT

LIST OF CONTENTS

LIST OF 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.

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.

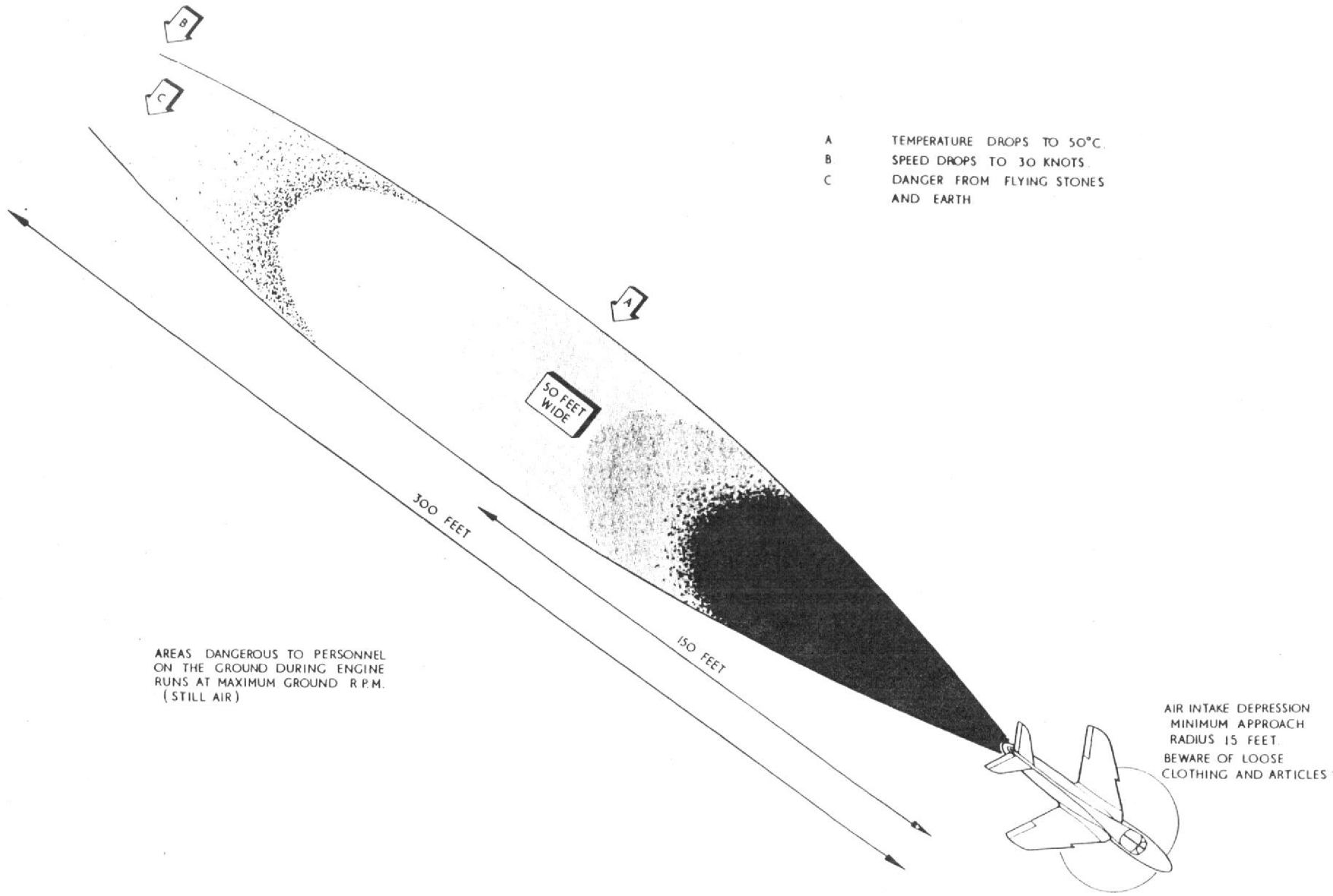


Fig. 1 Jet efflux danger areas

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 1½in. standard coupling in the port wheel bay *(fig.2, item 11)*. 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 15)* accessible via the engine starter access door, in the bottom of the fuselage, is turned OFF and locked (*para. 4(8)*).

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 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 ¼ in. B.S.F. bolt into the threaded hole in the valve and then pull the valve down.

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

◀(5) (a) *Pre Mod.1381 aircraft* – If using 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.

(b) *Post Mod.1381 aircraft* – The battery master switch is to be OFF whether using the internal or an external power supply.

(5A) Set the time switch in the port wheel bay ▶ to 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 vents from the pressure relief valves. This is particularly important when icy conditions prevail or when the aircraft has not been used for an appreciable time.

◀(6) When refuelling is completed, total the fuel contents as follows:– Add the amount put in (as recorded on the refueller gauges) to the amount remaining after the previous flight (as entered by the pilot in the Form 700). ▶

(7) Remove the refuelling equipment and replace the sealing cap on the refuelling ◀ coupling. Check that the cap attachment chain length conforms with the details specified in Sect.4, Chap.2, *Refuelling coupling.*

(8) Switch OFF the time switch if it has not run a full cycle, and the battery master switch if using the internal power supply on pre Mod.1381 aircraft. ▶

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 centre, wing and drop tanks to the front tanks during this operation. The air pressure, which must not exceed 120 lbf/in^2 is fed into the system through an external supply connection in the spine of the centre fuselage *(fig. 2, item 5)*. 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 a pneumatic servicing trolley *(Ref. No. 4F/1805)* to the external air pressurization connection in the spine of the centre fuselage and apply pressure.

Note . . .

On aircraft pre Mod. 1325, wherever it is necessary to pressurize the fuel system using an external air supply connected to the ground pressurization connection, the integrity of the non-return valve fitted in the pipe line between the air filter and the engine must first be established as follows:–

Disconnect the flexible air pressurizing hose at the engine end, connect and start the external air supply and blow air through the disconnected hose, if the non-return valve has failed, detached parts of the valve will be discharged from the open end of the hose. Where no defects are found, shut off external air supply, reconnect flexible hose and proceed with normal pressurization. Change non-return valve if found defective.

(3) Set the refueller control to DEFUEL.

◀ (4) Turn the L.P. cock to OFF and connect an external power supply or set the battery master switch to ON. Set the engine master switch to ON. ▶

(5) Remove the locking pin from the lever of the defuelling cock, disengage the hinged locking plate from the lever and ◀ turn the cock *(fig. 2, item 15)* 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. Disconnect the external power supply or set the battery master switch to OFF. Set the engine master switch to OFF.

(8) Turn the defuelling cock to OFF, move ▶ the hinged locking plate to engage with the lever of the cock and lock in position with the locking pin.

Note . . .

During initial assembly of the hinged locking plate to the defuelling cock, the hinged plate attachment bolt, Part No. F.250214 must be adjusted so that the slot of the plate 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 14 and 16. 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.

Refilling hydraulic reservoir

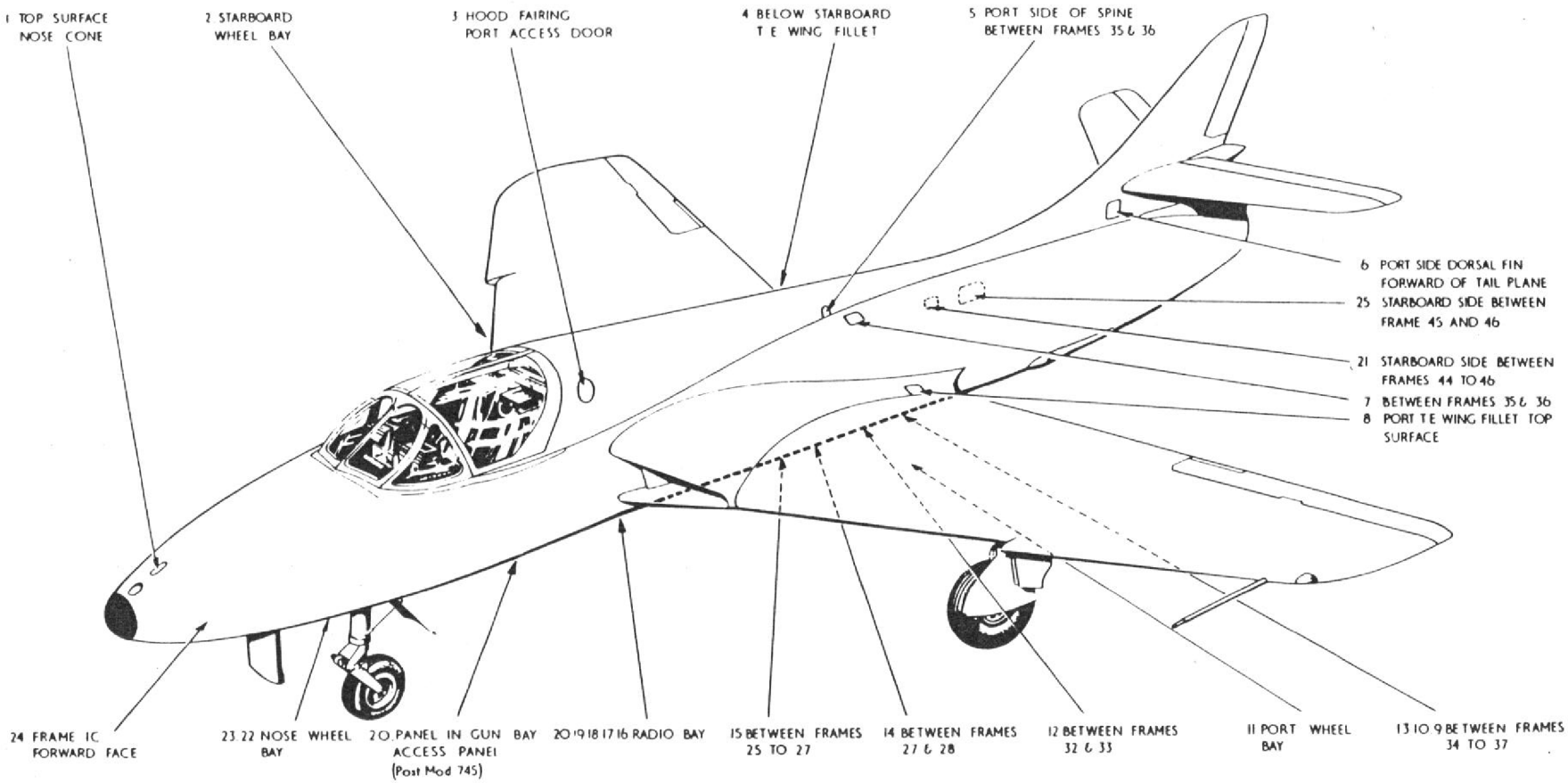
Note . . .

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 port wing filler *(fig. 2, item 8)*. 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.



1 CAMERA GUN
2 CHARGING CONNECTION - AILERON ACCUMULATOR
3 CABIN HOOD ACCUMULATOR
4 ENGINE OIL SUMP FILLER
5 EXTERNAL AIR CONNECTION - FUEL SYSTEM
6 CHARGING CONNECTION - ELEVATOR ACCUMULATOR
7 COLD AIR UNIT DIPSTICK
8 HYDRAULIC RESERVOIR FILLER
9 ENGINE FUEL FILTER
10 HYDRAULIC HANDPUMP
11 RE-FUELLING AND DE-FUELLING COUPLING
12 ACCESSORIES GEARBOX FILLER
13 HYDRAULIC EXTERNAL SUPPLY VALVES
14 FUEL SYSTEM DRAIN VALVES (2)
15 FUEL SYSTEM DE-FUELLING COCK
16 FUEL SYSTEM DRAIN VALVES (2)
17 EXTERNAL ELECTRICAL SUPPLY SOCKET
18 BATTERIES
19 CHARGING CONNECTION-EMERGENCY AND ANTI-G AIR BOTTLES AND HOOD ACCUMULATOR
20 CHARGING CONNECTION - OXYGEN CYLINDERS
21 FUEL FILTER DE-ICING FILLER CONNECTIONS
22 EXTERNAL HOOD SWITCH
23 CHARGING CONNECTION - WHEEL BRAKES ACCUMULATORS
24 GROUND PRESSURIZING CONNECTION
25 FUEL FILTER DE-ICING CONTENTS INDICATOR

Fig. 2 Servicing points

WARNING

When high pressure air is admitted to a closed volume previously contaminated with inflamable 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 or hydraulic components, it is essential to ensure that:—

(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, item 19)*.

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.

Charging cabin hood accumulator

11. The accumulator for the ground, or emergency, operation of the cabin hood is located in the hood fairing on the port side of the aircraft, and an in situ charging valve, together with the accumulator pressure gauge is situated adjacent to the anti-G and hydraulic emergency air charging connection *(para.7)*. The hydraulic pressure should be dissipated by opening and closing the hood until the hood jack ceases to operate and if the air pressure indicated on the gauge is below that stipulated in the Leading Particulars, the accumulator must be recharged.

Charging oxygen cylinders

WARNING

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

12. Access to the charging valve for the oxygen cylinders can be obtained after removing a panel at the rear of the gun bay access panel (post Mod. 745) or the radio access door (pre Mod. 745) *(fig. 2, item 20)* on the underside of the fuselage. The cylinders must be recharged in situ to the pressure quoted in the Leading Particulars. The procedure for in situ charging is described in the relative equipment publication.

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 18)*. These batteries must be checked periodically for state of charge as described in Sect.5, Chap. 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.

Stowage of kit and equipment

14. Special stowages for kit and equipment are provided for use during ferrying and are described in Sect. 2, Chap. 5.

Topping-up cold air unit

15. An access door in the top port side of the centre fuselage *(fig.2, item 7)*, between frames 35 and 36 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 filler cap for the engine oil sump is accessible through an access panel situated in the starboard side of the fuselage, just below the wing trailing edge fillet *(fig.2, item 4)*. The sump has a capacity of 16 pints and the oil level should be checked with the aircraft on level ground and with the engine cold. The level is indicated by a graduated sight glass window in the sump wall. Only oil as specified in the Leading Particulars must be used. Before replacing the filler cap ensure that the sealing washer in the filler neck is clean and undamaged and when replacing the cap, ensure that the self-locking wing nut is tightened down securely.

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

17. The accessories gearbox is mounted in the bottom of the engine bay just aft of the rear spar on the port side of the aircraft and an access panel *(fig.2, item 12)* in the underside of the centre fuselage is used to gain access to the filler neck and dipstick. Before checking the level of the oil ensure that the dipstick is pressed fully home before removing. If the oil level, as indicated on the dipstick, is low, the gearbox must be replenished. The specification of the oil to be used, when filling, is given in the Leading Particulars

◀ **Refilling fuel filter de-icing tank** *(pre Mod.1396)*

18. The fuel filter de-icing tank is located between frames 44 and 45 on the starboard side of the rear fuselage. The replenishment couplings and contents indicator are mounted adjacent to the tank *(fig.2, items 21 and 25)*. The tank is replenished as follows:–

(1) Remove the blanks from the two self-sealing couplings and connect a replenishing can to the larger coupling.
(2) Connect a short length of hose to the smaller coupling.
(3) Feed fluid, as specified in the Leading Particulars, into the system until it flows from the short hose.
(4) Remove the hoses and refit the blanks to the couplings.
(5) Depress the plunger at the side of the pointer on the contents indicator dial, move the pointer to FULL and release the plunger to hold the pointer in this position.

Priming the fuel system

19. After any component in the engine fuel system has been disconnected, the aircraft fuel tanks have been drained, the engine has been newly installed or has been inhibited, the engine fuel system must be primed in accordance with the procedure described in the engine publication. ▶

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.

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

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).

◀ **21.** Before running the engine ensure that there is no requirement to bleed the engine fuel system *(para.19)*. Remove the air intake, jet pipe and centre fuselage sealing covers. Examine the engine and air intake ducts to ensure that they are free from accumulations of fuel, oil or any loose articles. 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 the relative equipment publication. For full power engine run and especially when slam acceleration and deceleration checks are being made, double chained chocks must be used.

Engine starting

23. The engine is started through the medium of a triple-breech turbo starter unit. The unit is described in the relative equipment publication. A stowage for starter cartridges is provided on the inside of the engine starter access door.

WARNING

Personnel handling aircraft fitted with turbo starter units should be fully conversant with the relevant information, precautions and warnings contained in the relative equipment publication.

Running up engine with batteries removed

24. While it is not recommended that the engine be run with the aircraft's batteries removed, this can be done, provided the Cannon plugs on the ends of the battery leads are insulated or placed in such a position that there is no possibility of them shorting against the aircraft structure.

Undercarriage deflection check

25. The main and nose undercarriage shock absorbers must be checked in accordance with the instructions detailed in Sect. 3, Chap. 5 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 two air driers for the dry-air sandwich of the windscreen are located on the lid of Junction Box No.2 and are connected to the valves on the windscreen by rubber tubing. 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 tubes. The crystals, which are normally blue in colour, should be changed when they become saturated and turn red. Use silica gel *(Ref. 33C/790)* when replenishing the air drier tubes.

(3) Before flight, ensure that the air driers are not blanked off.

Note . . .

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. 2A 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.

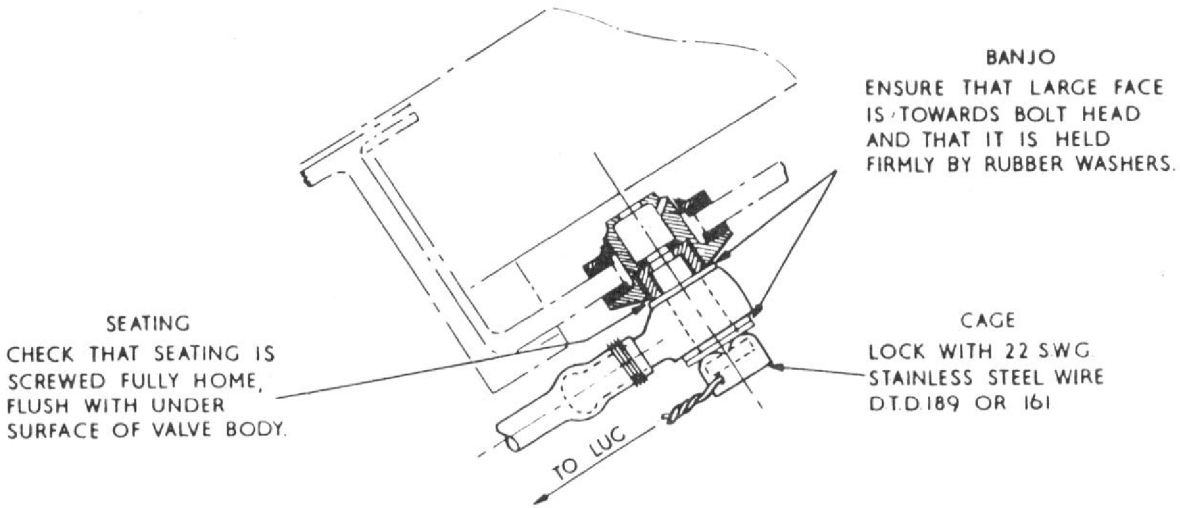


Fig. 2A Windscreen air drier banjo assembly

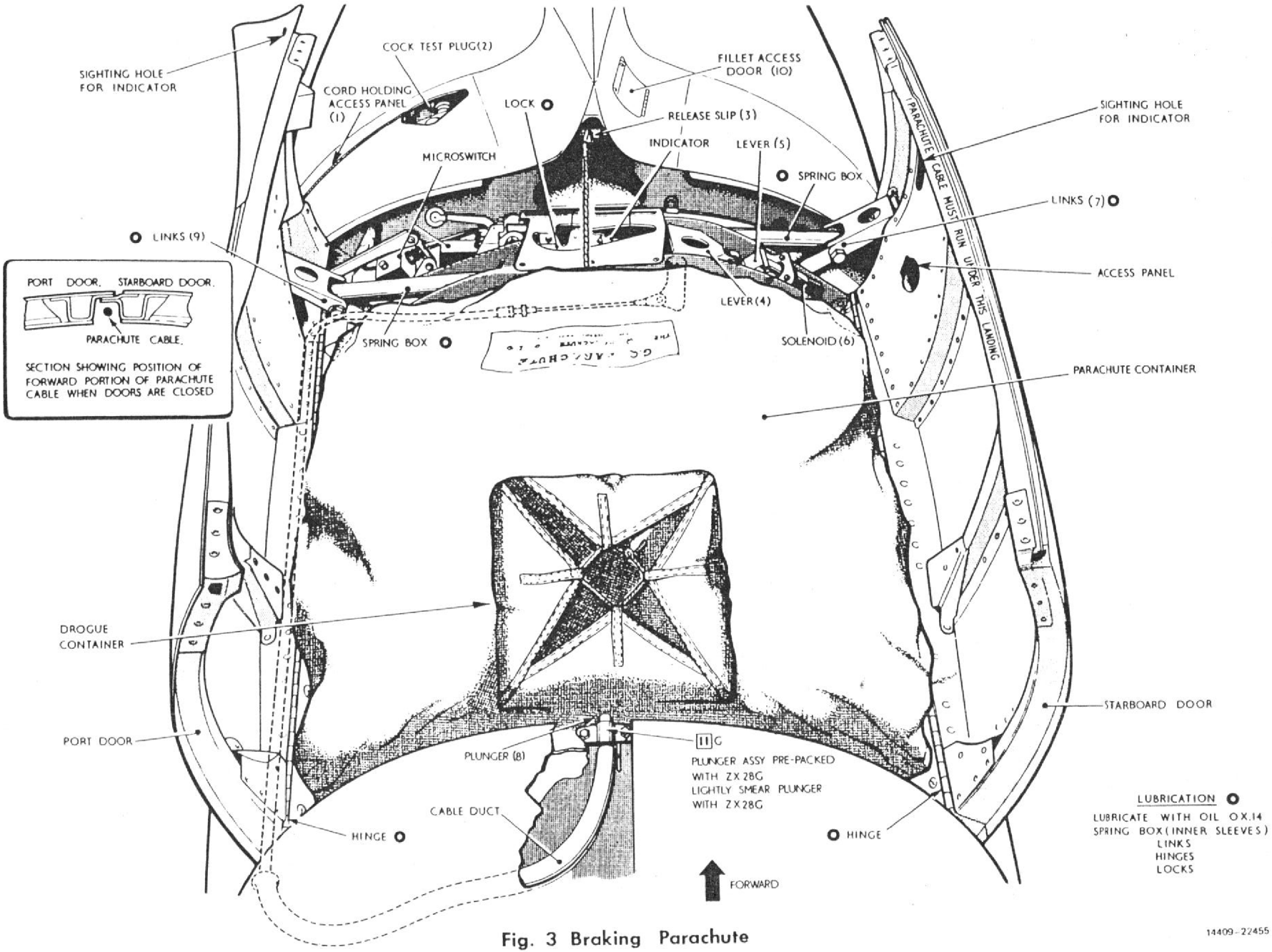


Fig. 3 Braking Parachute

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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:—

Note. . .

Before attempting to refit a braking parachute or close the parachute compartment doors it must be ensured that the selector switch in the cabin is in the JETTISON/OFF *position.*

(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) Check the engagement of the door locks through the sighting holes in the doors. The front lock is correctly engaged when the tip of the indicator (painted fluorescent orange) is in line with the red line on the rectangular white patch around the sighting hole. The rear lock is correctly engaged when the front face of the locking plunger (8) is in line with the red line on a similar white patch around the sighting hole. The correctly-locked relationships of the indicator, plunger and markings is illustrated in Sect.3, Chap.1.▶

(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).

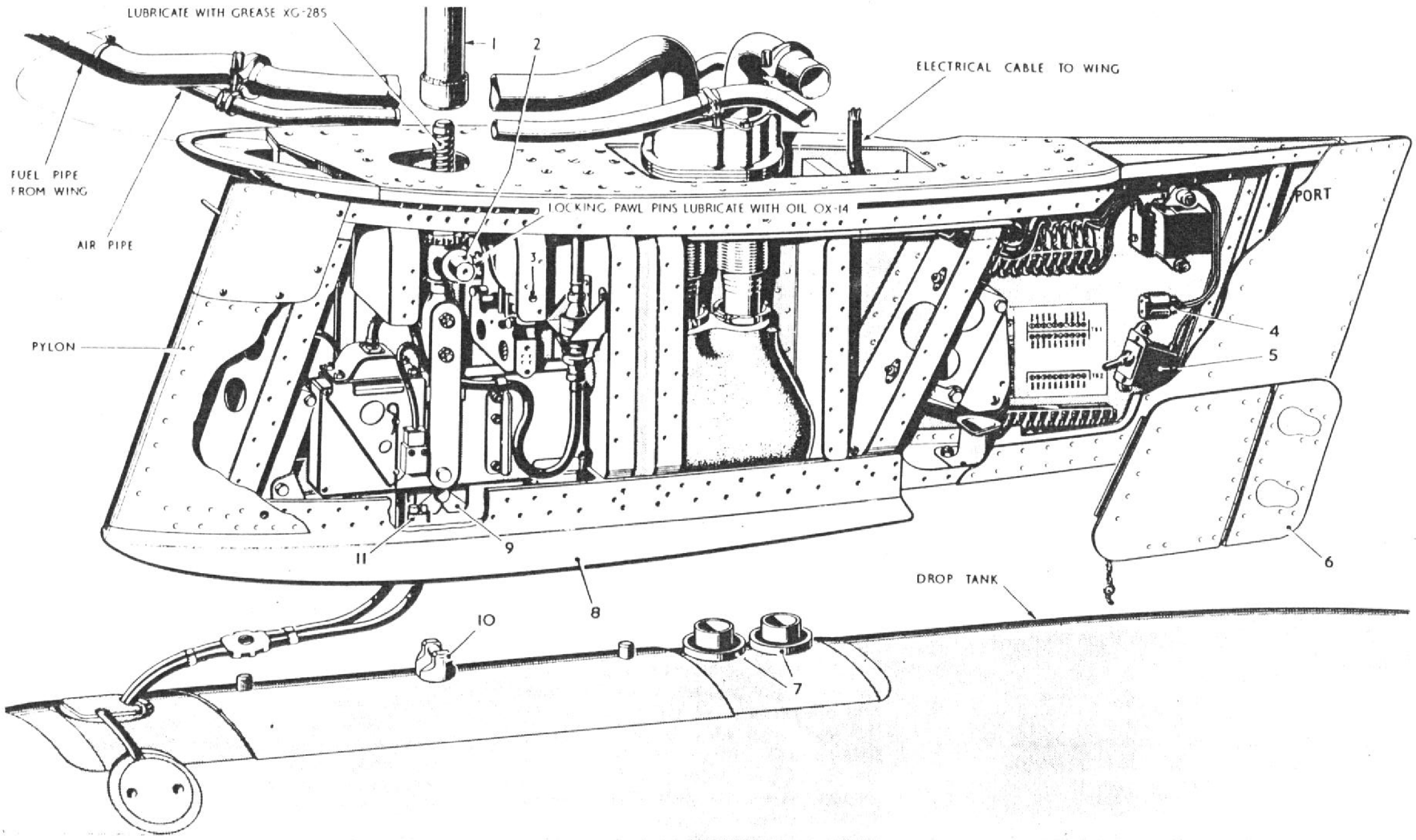
(2) Remove the access panel from the forward end of the starboard parachute door, apply hand pressure to the doors to prevent them springing open, depress the lever (5) with a suitable tool and gradually release the pressure on the doors to allow them to rise, under control.

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. 110 series.*▶



ELECTRICAL CONNECTIONS (11)	
STORE	PYLON
100 GAL DROP TANK	
L L CONNECTOR	STOWAGE
H L CONNECTOR	H L CONNECTOR
PRACTICE CARRIER	
BUTT CONNECTOR	BUTT CONNECTOR

TORQUE WRENCH LOADING (1)	
DROP TANKS	80 $^{+2}_{-0}$ LB FT
PRACTICE CARRIER	20 $^{+2}_{-0}$ LB FT
TRANSPORT SECURITY BAR (NO STORES CARRIED)	HAND TIGHT USING SPANNER B224080

NORMAL / PRACTICE SWITCH (5)	
DROP TANKS	NORMAL (DOWN) POSITION
PRACTICE CARRIER	PRACTICE (UP) POSITION

Fig.4 Loading of stores on inboard pylon

Fitting and removal of inboard drop tanks

31. 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.

◀ (2) Remove the Chekaleke plugs *(3, fig.5)* from the sighting holes on the port and starboard sides of the pylon and check that a gap exists between the top of the release housing *(2, fig.5)* and the bottom of the plungers *(1, fig.5)* and that this gap does not exceed 0.10 in.

Note. . .

To avoid damage to the jettison and reset mechanism it is essential that only a tool similar to that illustrated in fig.6 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.

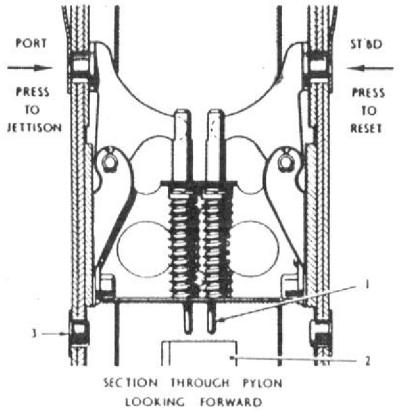


Fig. 5 Jettison and reset mechanism (Inboard pylon)

(3) If the electro-mechanical release unit *(9)* is not open, press the jettison button *(3) (shown also on fig.5)*, on the port side of the pylon, using a tool similar to that shown in fig. 6, 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 on the starboard side should be used.)*

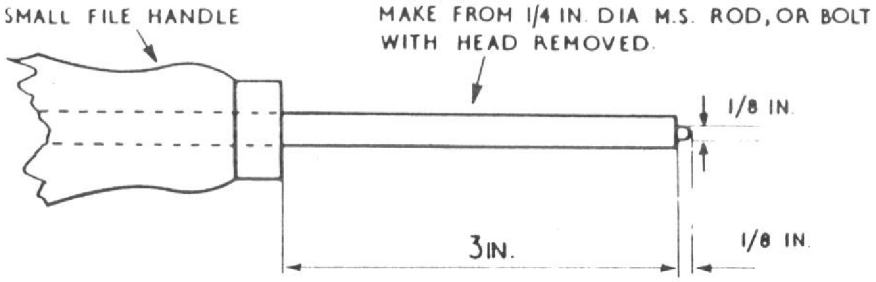


Fig. 6 Tool for operating jettison and reset button

(4) Open the access door *(6)* on the outboard side of the pylon and check that the changeover switch *(5)* is in the DOWN position.

(5) Remove the access panel in the wing top skin and place a crutching spanner *(1) (Ref.26FX/95645)* over the hanger bolt of the release housing support *(2)* and, ensuring that the appropriate annular groove on the spanner is flush with the wing skin, lower the release housing.

◀ (6) Position the drop tank under the pylon and lubricate the front and rear spigots with anti-seize compound ZX–38. Inspect the sealing rings for serviceability and smear the outer surface of the rings with ZX–36.

(7) Raise the tank sufficiently to allow the polythene connector without sleeve *(11)* to be plugged into the sleeved connector on the port side of the pylon and the polythene connector with sleeve to be plugged into the stowage on the starboard side of the pylon.

(8) Raise the tank until the tank lug *(10)* is engaged by the electro-mechanical release unit *(9)* and check that the release is fully cocked by means of the cocking test socket *(4)*.

(9) By means of the crutching spanner *(1)* raise the tank until the fore and aft spigots are engaged in the sole plate *(8)* and the tank adapters *(7)* are making contact with the fuel and air valves in the valve body. Check that the electrical cables from the tank to the connectors are not trapped between the tank and the sole plate.

◀ (10) Apply the final crutching load by using a torque wrench (Ref. 1L/171) set to 80 $\pm \frac{2}{0}$ lbf ft attached to the adapter on the crutching spanner. Check again through the sighting holes in the pylon that a gap exists between the top of the release housing *(2, fig.5)* and the bottom of the plungers *(1, fig.5)* and that this gap does not exceed 0.10 in. Replace the Chekaleke plugs *(3, fig.5)*.

(11) Re-check that the release unit is fully cocked by means of the cocking test socket and test set, and close the rear door.

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

(13) 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. . .

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.

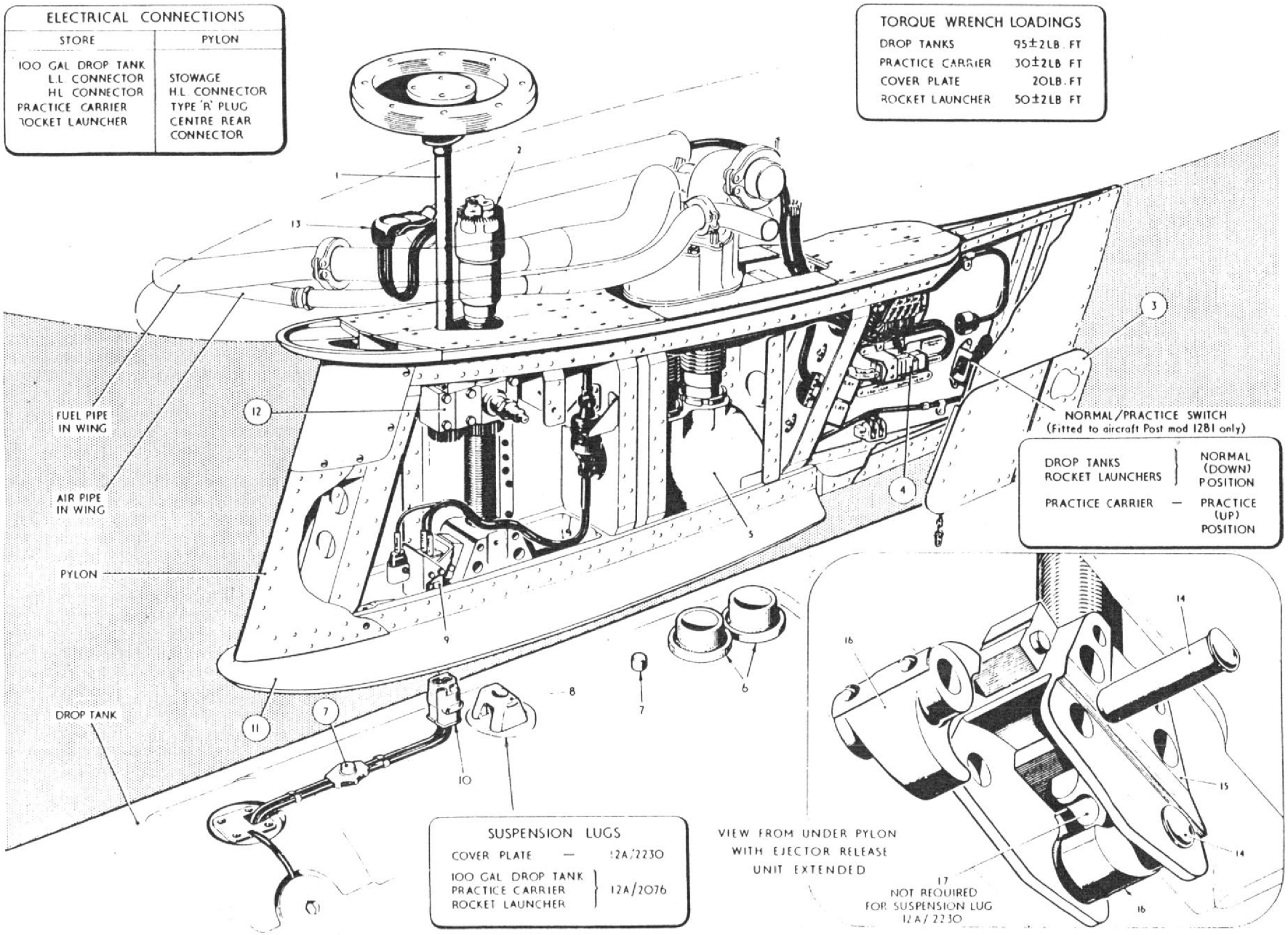


Fig. 6A Loading of stores on inboard pylon - Post mod. 1191 and 1281

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Fitting and removal of inboard drop tanks—Post Mod. 1191 and 1281 (Fig. 6A)

WARNING

Personnel handling explosive release and ejector units, as fitted to the inboard pylons (Post Mod. 1191) on this aircraft, should be conversant with the safety precautions detailed in A.P.1664E, Vol. 1, Part 1, Chap. 1.

32A. The procedure for the fitting of the drop fuel tanks to the inboard pylons is described in the following sub-para.:—

When loading a store on E.R.U's Post Mod. M.L.94 a check must be made with a $\frac{1}{8}$ in. dia. rod through the inspection hole in the housing to ensure that the piston is fully home and the split pin undamaged.

(1) Disconnect the armament safety break in the port wing, remove the rear door (3) and disconnect the pylon safety break (4). Ensure that the PRACTICE/NORMAL switch (*if fitted*) is in the NORMAL (*down*) position.

◀ (2) Position the drop tank under the pylon and lubricate the front and rear locating spigots *(7)* with anti-seize compound ZX–28G. Inspect the sealing rings at (6) for serviceability and smear the outer surface of the rings with ZX–36 *(Ref. 34B/1459)*. ▶

(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 28G 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.

Note . . .

The adapter (17) is only used on E.R.U's Pre M.L. Mod. D.L.94 for 100-gallon drop tanks and other stores fitted with suspension lugs No. 29.

It is important that the top of the suspension lug should not be forced up against the adapter (17), 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.

(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. 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 pin is engaged with the shoulder on the jaw housing.

(6) Make the appropriate electrical connections between drop tank and 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 *(10)* are not trapped between the tank and the sole plate.

(8) Apply the final crutching load by using a torque wrench *(Ref. 4L/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 break *(4)* and replace the rear door *(3)* on the pylon.

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

32B. 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. 12A/2230) must be fitted on the underside of the pylon and crutched up with the torque wrench set to 20 lb ft.

Fitting rocket launcher and practice bomb carrier—Post Mod. 1191 and 1281

32C. The procedure for fitting the rocket launcher and the practice bomb carrier to the inboard pylon is similar to that for fitting drop tanks, with the exception of the electrical connections and the torque wrench loadings which are as follows:—

Rocket launcher

The connector on the rocket launcher is plugged into the centre socket in the pylon and the torque wrench is loaded to 50 ± 2 lb ft.

Practice bomb carrier

The socket on the practice bomb carrier is connected to the type R plug in the pylon and the torque wrench is loaded to 30 ± 2 lb ft. The PRACTICE/NORMAL switch must be in the PRACTICE (*up*) position.

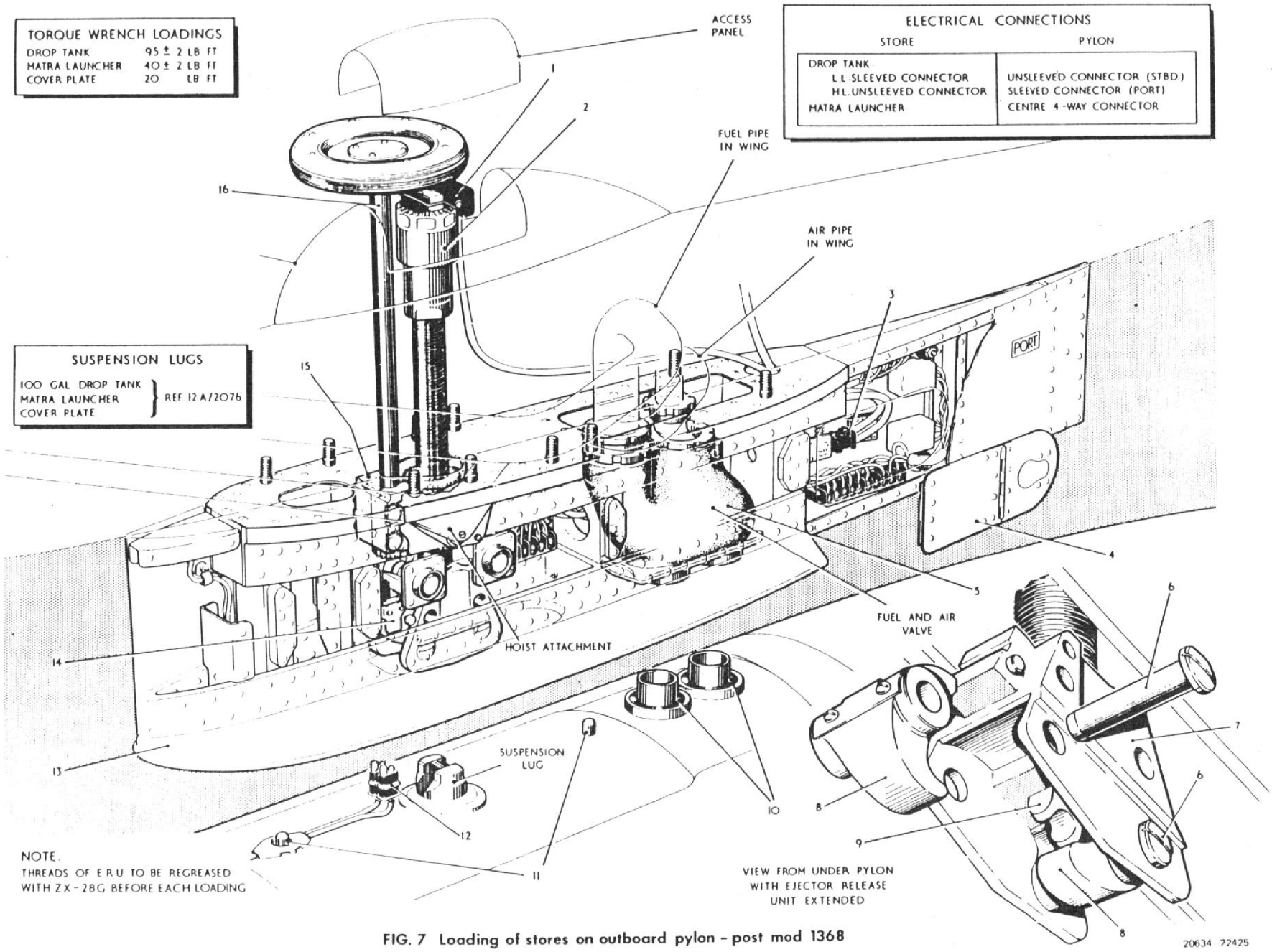

FIG. 7 Loading of stores on outboard pylon - post mod 1368

‹ Nomenclature of lubricant corrected ›

Fitting and removal of outboard drop tanks (fig. 7)

WARNING

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

33. The procedure for fitting the drop fuel tanks to the outboard pylons is described as follows :—

(1) Disconnect the armament safety break in the port wing, remove the rear door *(4)* and disconnect the pylon safety break *(3)*.

(2) Position the drop tank under the pylon and lubricate the front and rear locating spigots *(11)* with anti-seize compound ZX–28G. Inspect the sealing rings at *(10)* for serviceability and smear the outer surface of the rings with ZX–36 *(Ref. 34B/1459)*.

(3) Remove the access panel from the fairing on the wing top skin and ensure that the breech cap end of connector *(1)* is stowed in the fairing. Attach a crutching tool shaft *(16) (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 *(15)* of the ejector release unit *(2)* and turn in an anti-clockwise direction to lower the unit sufficiently to enable the jaw pins *(6)* in the bottom of the housing *(7)* to be removed.

Note . . .

The threads of the ejector release unit must be regreased with ZX–28G 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 *(8)* to be removed.

Note . . .

On E.R.U's Pre M.L. Mod. D.L.94 the adapter (9) must be in position when fitting 100 gallon drop tanks and other stores fitted with suspension lugs No. 29.

It is important that the top of the suspension lug should not be forced up against the adapter (9), 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.

(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. 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 pin is engaged with the shoulder on the jaw housing.

(6) Make the appropriate electrical connections between drop tank and pylon.

(7) By means of the crutching tool raise the tank until the fore and aft spigots *(11)* are engaged in the holes provided in the sole plate *(13)* of the pylon, and the tank adapters *(10)* are making contact with the fuel and air valves in the valve body *(5)*. Check that the electrical cables from the tank to the connectors *(12)* are not trapped between the tank and the sole plate.

(8) Apply the final crutching load by using a torque wrench (Ref. 1L./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 *(1)* to the breech cap and replace the access panel in the wing fairing.

(10) Reconnect the safety break *(3)* and replace the rear door *(4)* on the pylon

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

34. The removal of the outboard drop fuel tanks is a reversal of the fitting 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. 12A/2209) must be fitted on the underside of the pylon and crutched up with the torque wrench set to 20 lb ft.

Fitting and removal of Matra launcher

34A. The procedure for fitting and removal of the Matra launcher is similar to that for fitting and removal of the drop tanks *(para. 33 and 34)* with the exception of the electrical connections and the torque wrench loadings which are as follows :—

The connector on the Matra launcher is plugged into the centre 4-way connector in the pylon and the torque wrench is loaded to 40 ± 2 lb ft. The adapter *(9)* must be used.

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 and 100 p.s.i. pressure to the air pressurization connection.

(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. 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 to 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, continue engine run for 10½ minutes.

(16) After 10½ minutes increase rev/min to maximum, switch OFF the port booster pump and continue for a further 2½ minutes. During this time the fuel transfer failure warning must not operate.

(17) At the end of this 2½ minute period, switch ON the port booster pump and switch OFF the starboard pump and continue for a further 2½ 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. Refuel the aircraft.

Note . . .

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