

SECTION 2

**GROUND HANDLING AND
PREPARATION FOR FLIGHT**

(LIST OF CHAPTERS OVERLEAF)

SECT

2

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SECTION 2

GROUND HANDLING AND PREPARATION FOR FLIGHT

LIST OF CHAPTERS

Note.—A detailed list of contents appears at the beginning of each chapter

- 1 Ground handling
- 2 Preparation for flight
- ◀ 3A Loading and C.G. data
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Chapter 1 GROUND HANDLING

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1. This chapter contains general information on handling and picketing and moving the aircraft on the ground. The equipment

necessary for ground handling is listed in Chap. 4 of this Section. *Reference must be made to the Lethal Warning card at the front*

of the book before entering the aircraft. Before entering the flare bay, refer to para. 15.

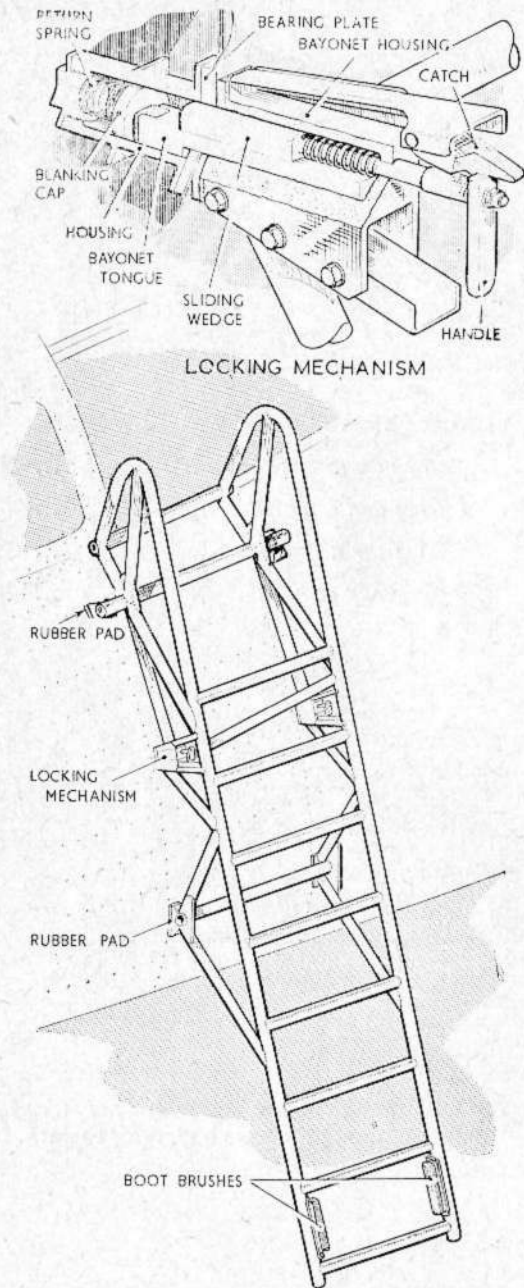


Fig. 1. Pilot's entrance ladder

Pilot's entrance ladder (fig. 1)

2. The entrance ladder Ref. No. 26FZ/95485, which is designed to remain in position while the aircraft is taxiing, is of welded tubular construction with non-slip rungs. Rubber padded support structure, to conform with the fuselage contour, is built on to the stiles, and upper and lower channel members, attached to the centre supports, carry the locking mechanism. This mechanism comprises two fixed bayonet tongues and parallel sliding wedges, the handles of which project from the rear of the housings. The female housings, which incorporate spring-loaded blanking caps, are built into the port side of the fuselage immediately above the datum line between frames seven and nine.

3. To attach the ladder to the fuselage, raise the catches, withdraw the sliding wedge handles and insert the two rubber-tipped bayonet tongues into the female housings, depressing the spring-loaded blanking caps. Lower the ladder to engage the bayonet tongues behind the bearing plates and push the sliding wedge handles forward to lock the ladder to the fuselage.

4. To remove the ladder, the wedges are withdrawn and the ladder raised slightly to disengage the bayonet tongues, allowing the spring-loaded caps to blank off the housings. Entrance to the pilot's station is described in Sect. 1, Chap. 1.

Navigator's entrance step

4A. A standard entrance step Ref. No. 4G/2169 is provided to facilitate entrance to the Navigator's station.

Alighting gear safety locks

External (fig. 2)

5. Alighting gear safety locks must always be fitted before ground handling is commenced and may only be removed immediately prior to flight. The main undercarriage locking arrangements consist of two U-shaped sleeves which are fitted, one to each undercarriage jack piston-rod, between the jack body and the piston-rod end-fitting; they are secured

by quick-release pins. The nose wheel unit is locked by inserting a quick-release pin into a hole in the lower end of the radius rod; this prevents the lock lever disengaging the nose of the stay link.

◀ Note . . .

Check that the undercarriage DOWN button is depressed before removing the ground safety locks. The control can be re-set, if necessary, by inserting a piece of stiff wire into the hole in the UP button and pressing it until the button releases. ▶

Internal

6. The undercarriage UP selector switch is locked by the attachment of a spring locking clip which prevents the UP switch from being depressed. When not in use the clip is stowed on the side structure of the pilot's raised floor.

Towing (fig. 3)

7. The aircraft may be towed forward from the nose wheel axle, the towing gear consisting of a towing arm (Ref. No. 4GB/2792) and axle adapter (Ref. No. 26FZ/95022). A release mechanism is incorporated in the towing arm to prevent damage to the nose undercarriage in the event of an overload. The correct pull-off load is 9,200 lb. (i.e., with the locking-pin inserted at position 'A' on the load index plate). The towing equipment is fully described in A.P.2817A, Vol. 1 and 6. The aircraft may also be towed either forward or backward by attaching a 50 ft. towing bridle (Ref. No. 4G/4139) to the towing eyes on the main undercarriage axles. When towing from the main wheels, the aircraft must be controlled with a steering arm (Ref. No. 26FZ/95087) attached to the nose wheel axle. During all towing operations a member of the ground crew should be in the cockpit to operate the brakes when necessary. The hydraulic brake gauge at 2,750 lb. per sq. in. will permit 6 operations of the brake units. At a pressure of 1,425 lb. per sq. in. the brakes will cease to function but pressure may be maintained by using the hand pump.

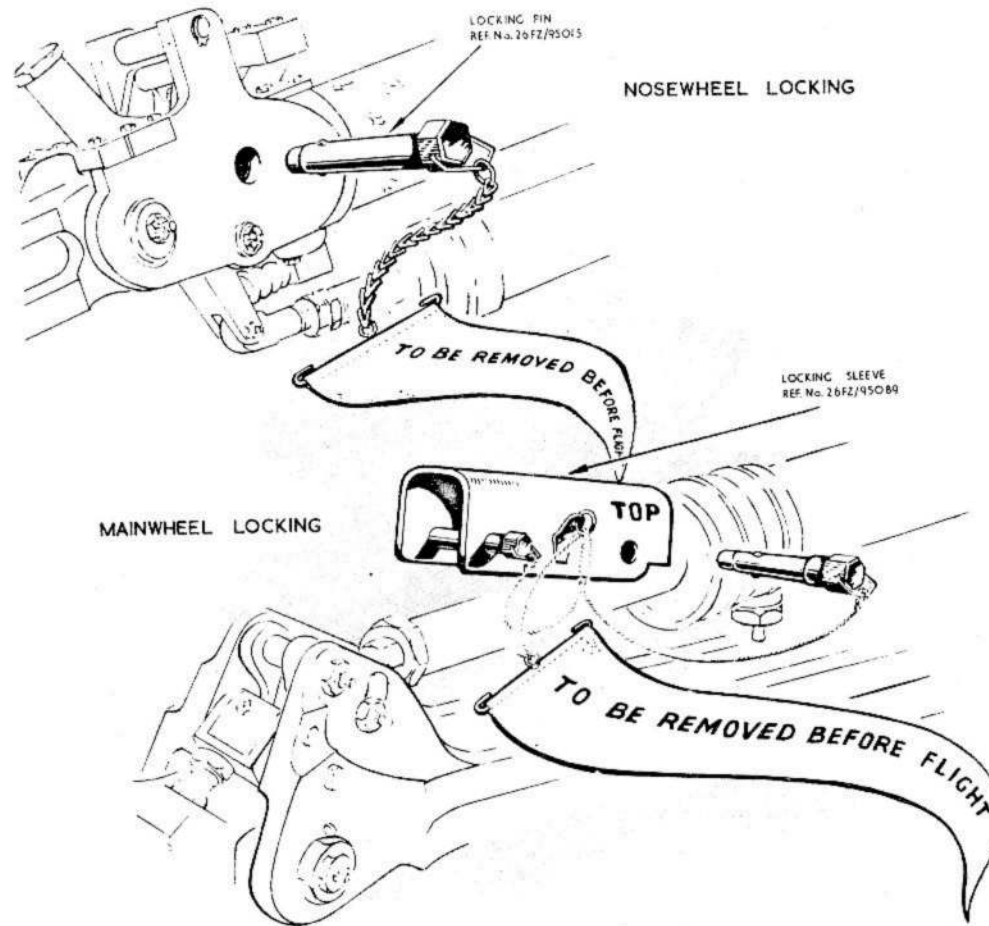


Fig.2 Alighting gear - external safety locks

Picketing (fig. 4)

8. The aircraft must, where possible, be picketed facing into wind with locks applied to the elevators (para. 11) and chocks positioned fore-and-aft of each wheel (see footnote). When picketing the aircraft, the following safety precautions must be observed:-

- (1) For wind and gusts from any direction up to 40 knots, control locks must be fitted and chocks placed fore-and-aft of each wheel.
- (2) For wind and gusts between 40 and 80 knots, the nose undercarriage is to be picketed, control locks fitted and wheels chocked fore-and-aft.
- (3) For wind and gusts exceeding 80 knots, the aircraft must be secured at all picketing points, control locks fitted, and wheels chocked fore-and-aft.

Note...

The chocks placed fore-and-aft of each wheel are to be securely chained and tensioned at all times until the aircrew has entered the aircraft and effective wheel braking has been applied.

9. The main points of anchorage are at the nose-wheel, where a lashing is placed over the stay links on the shock-absorber strut, and at each undercarriage unit where a lashing is passed through a detachable ring-bolt, screwed from outboard into the upper hinge-pin of the torque linkage; these points are closed by cover plates in the undercarriage fairings when not in use. Three secondary points are provided, one in the underside of each main plane, where screw-thread holes for detachable ring-bolts are provided in the main spars, and a third screw-thread hole at frame 42 in the lower surface of the rear fuselage; when not in use, these holes are closed by threaded blanking plugs. All lashings must be properly secured to ground anchors. The picketing ring-bolts are stowed inside the rear fuselage on the port side above the rear access hatch.

Note...

Whenever the aircraft is parked in the open overnight, the tail plane is to be left in the fully down trim position. This will prevent condensation forming on the exposed part of the actuator jack, avoiding the risk of icing on a subsequent flight.

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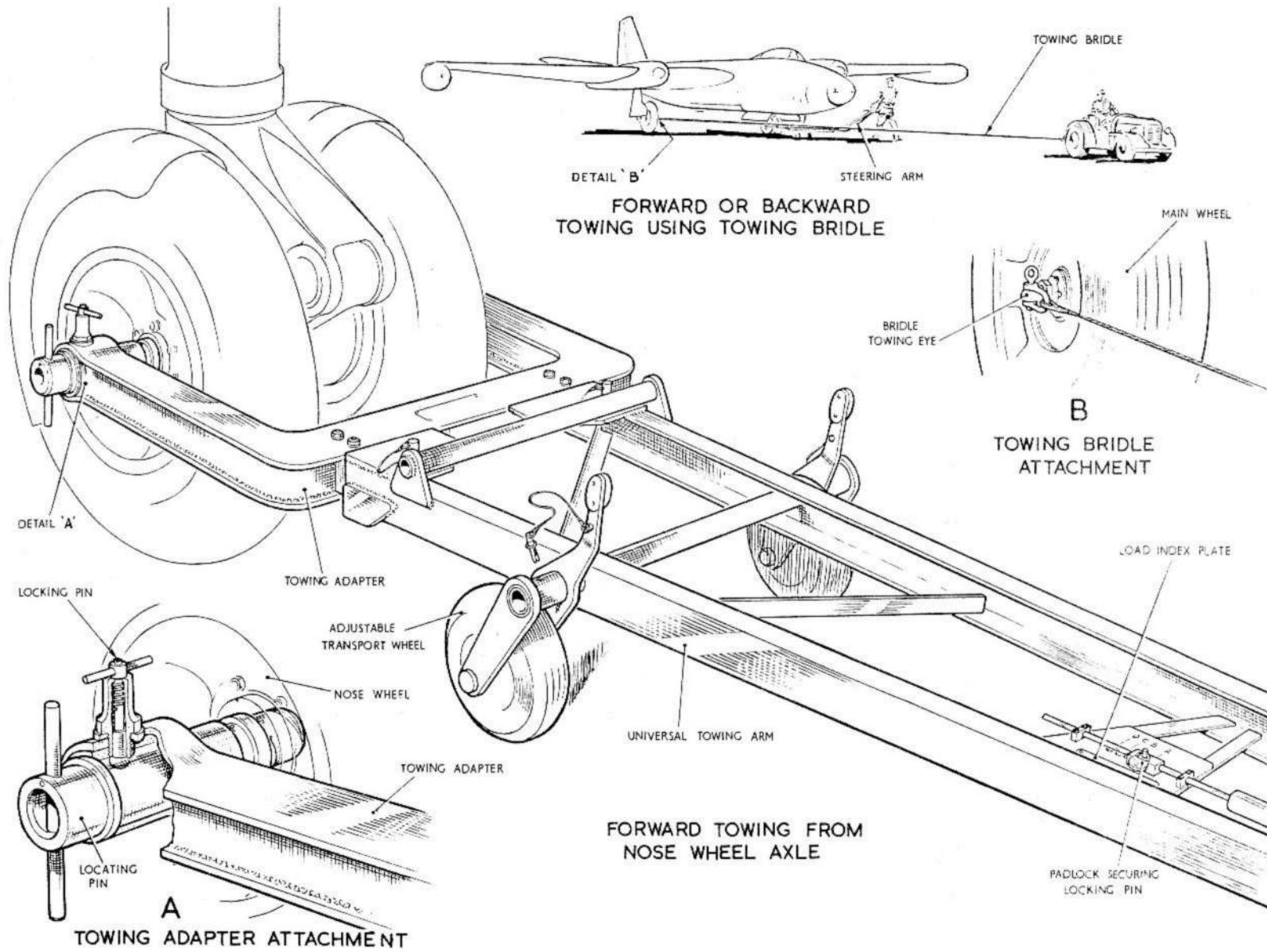


Fig.3 Towing

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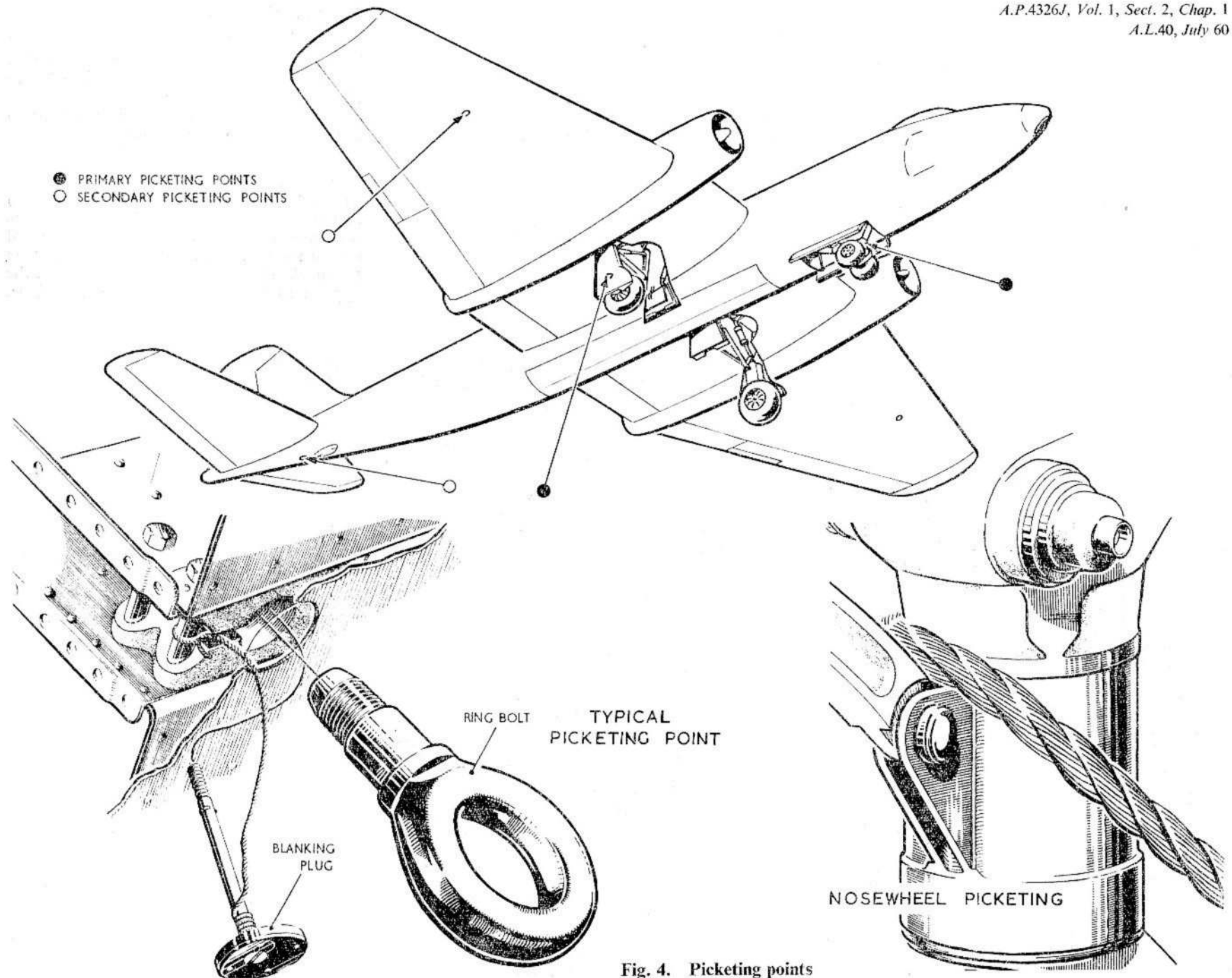


Fig. 4. Picketing points

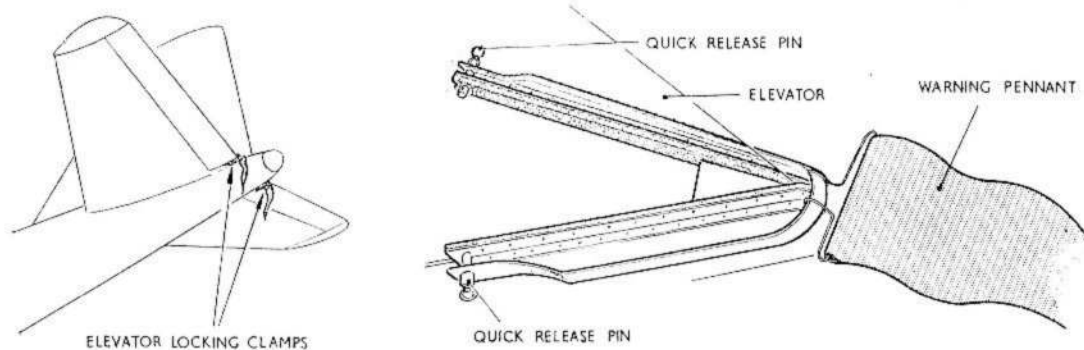


Fig. 5. Elevator locking clamp

Control surface locks

Internal locking

10. The flaps are locked in the UP position by means of a pip-pin which is inserted in the side-plates of the switch lever in the cockpit; when not in use the pin is stowed on the pilot's floor support-structure.

Elevator (fig. 5)

11. Set the elevator in its neutral position and fit the lock (Ref. No. 26FZ/1867) with its web between the elevator and the outboard end of the tab. Secure the lock by inserting the quick-release pins into the sockets on the upper and lower surfaces of the tail plane.

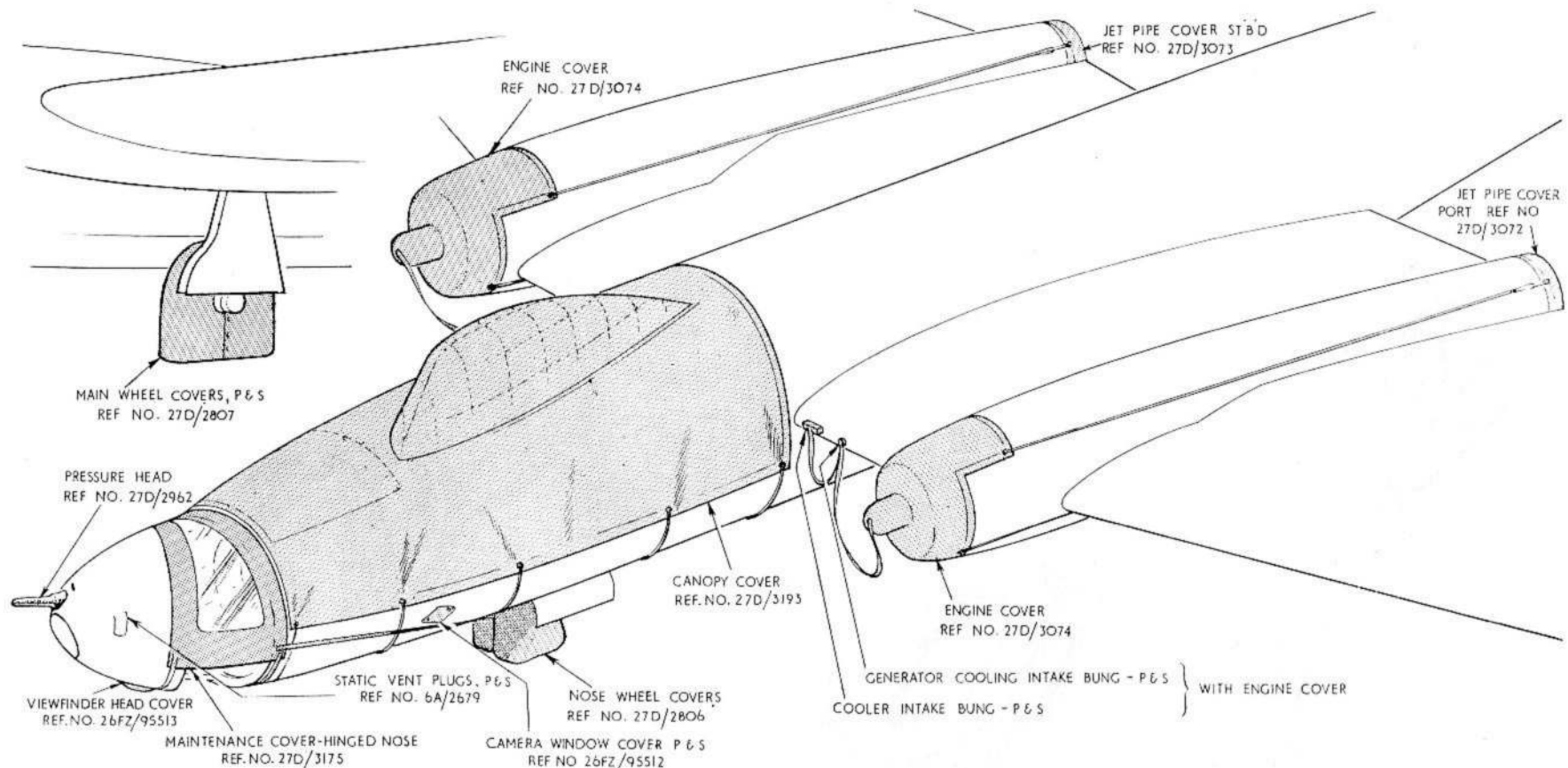


Fig. 6. Weatherproof covers

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◀ Inflation seals

12. To ensure complete weatherproofing, the canopy, frangible hatch and hinged nose seals must be inflated when the aircraft is parked without covers. The seals should be inflated from an external ground source, using an inflator Ref. No. 4F/1812 and a pressure gauge Ref. No. 6A/768 connected to the union in the nose undercarriage bay at the rear of the pressure bulkhead. This union is common to all three seals and is labelled SEAL INFLATION. A minimum pressure of 8 lb. per sq. in. is required but pressures in excess of 150 lb. per sq. in. must not be applied. ▶

Weatherproof covers (fig. 6)

13. The canopy, wheels, nose and pressure head covers and the static vent plugs must always be fitted when the aircraft is picketed. Covers must also be fitted to the engine air intakes and the jet pipe openings as soon as possible after stopping the engines, and should only be removed immediately prior to starting.

Flare bay doors safety lock (fig. 7)

14. The flare bay doors switch on the pilot's port console must be locked in the open position, by use of the spring-loaded catch provided, immediately after opening the flare bay doors and before commencing any servicing operations in the flare bay. The spring catch is locked in the aft position when not in use.

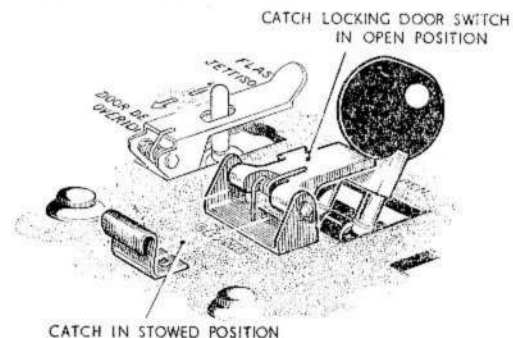


Fig. 7. Flare bay doors safety lock

Crashed aircraft

Entry into aircraft

15. Should the normal method of entry be impossible, the aircraft may be entered by cutting away, with an axe or other suitable implement, the pilot's canopy; this area is marked by yellow-painted broken lines.

Lifting and removal

16. The exact method and equipment for lifting and removing the aircraft will depend upon local conditions and requirements. General information, a description of equipment and suggested methods are given in A.P.4658A.

WARNING . . .

Before commencing lifting operations, refer to the current regulations relating to crashed aircraft, and carry out the following precautions:—

- (1) The ejector seat cartridges must be removed or the firing mechanism made safe as detailed in A.P.4288.
- (2) Disconnect all batteries, including emergency batteries.
- (3) All explosives must be made safe and removed.
- (4) The fuel remaining in the tanks should be removed by means of hose inserted through the filler-cap orifices.

Lifting the aircraft (fig. 8)

17. Should it be possible to lift the aircraft by cranes or gantries, the following method may be adopted:—

Note . . .

A complete set of slings (Ref. No. 26FZ/95273) is capable of lifting an aircraft at its maximum all-up weight. If, owing to crane limitations, this weight is beyond the combined capacity of the cranes available, the weight of the aircraft must be reduced accordingly.

(1) Remove the top cowling, service panel and bottom cowling from each engine.

(2) Open the main spar jacking point access panel and remove the detachable panel immediately aft of this point.

(3) Cut through the top jet pipe cowl on the outboard side, aft of the main spar to provide access for the sling cable.

(4) Position the cranes at each outer wing leading edge immediately outboard of the engine. Ensure that the cranes are positioned on good solid ground or suitably supported by sleepers, etc.

(5) Anchor the tail of the aircraft to prevent swinging, but allowing enough slack in the line for lifting.

(6) Lower the slings with one cable on each side of the engine firewall until the cable ends protrude beneath the engine cowlings.

(7) Attach the lifting arms to the cables (detail A), with shoulder bolts (Part No. E.A3.88.317), $\frac{3}{4}$ in. Whitworth nuts, and special washers (Part No. E.A3.88.319), and raise the slings until the spherical head of the lifting arm engages in the main spar jacking point.

(8) Raise the aircraft and position a 10 ton hydraulic jack (Ref. No. 4Q/2625) and trestle (Ref. No. 4Q/2652), suitably supported on a firm foundation, with adapter (Ref. No. 4Q/2626) beneath each main plane jacking point.

(9) Lower the aircraft until the seating collar on the lifting arm is engaged with the jack adapter.

(10) Retaining the tension on the slings, trestle the fuselage as instructed in Sect. 2, Chap. 4.

Emergency removal

18. The method of removing crashed aircraft from runways, and the equipment required, is as follows:—

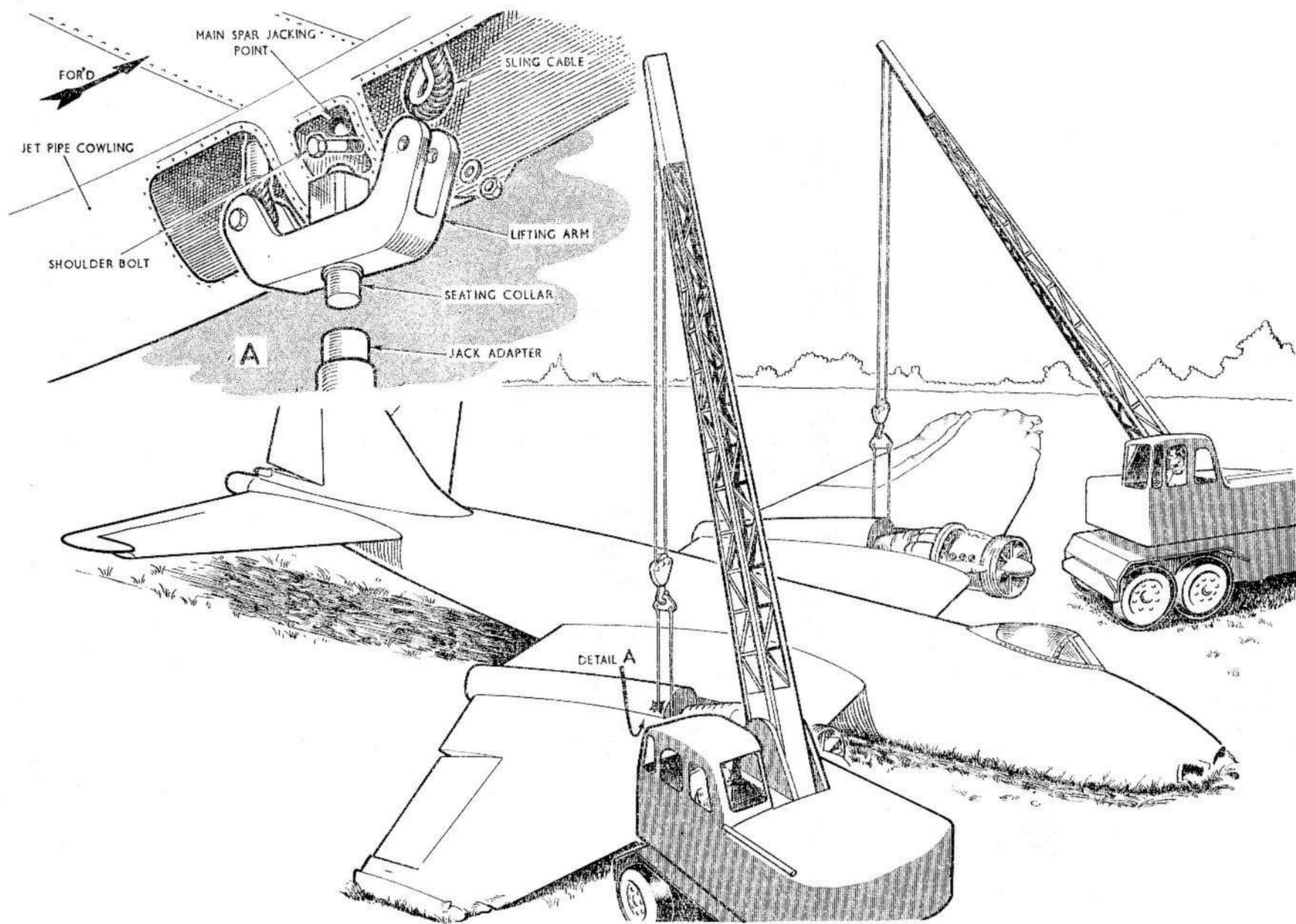


Fig. 8. Lifting a crashed aircraft

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Equipment required:—

- (a) Two bridle attachment crow bars complete with stop-plates and pip-pins (*local manufacture fig. 9*).
- (b) Two 50 ft. towing bridles (*Ref. No. 4G/4139*) fitted with one $\frac{3}{4}$ in. shackle (*Ref. No. 28 Y/6051*) on each end.
- (c) Suitable towing/winching vehicles.

Recommended method:—

- (1) Place the point of a bridle attachment crow bar on the inboard front corner of the main spar attachment panel and, using a sledge hammer, drive the bar through the top panel.
- (2) When the crow bar has penetrated the upper access panel and entered the mainplane, thread a towing bridle shackle and stop plate over it and fit the pip-pin.
- (3) Locate the point of the bridle attachment bar on the lower access panel and force the bar through the mainplane until the upper pip-pin prevent further penetration.
- (4) Thread the other shackle end of the towing bridle, and stop plate over the protruding lower end of the bar and secure with a pip-pin.
- (5) Repeat this operation on the opposite mainplane.
- (6) Connect the towing bridles to a suitable vehicle and tow/winch clear.

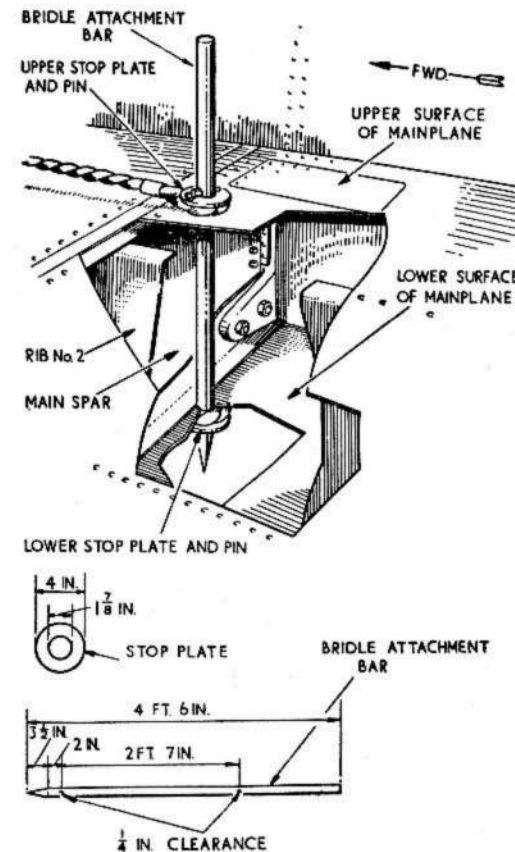


Fig. 9 Emergency towing equipment

Chapter 2 PREPARATION FOR FLIGHT

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Introduction

1. This chapter gives information on the general preparation of the aircraft for flight. The location of the replenishing and servicing points is illustrated in Fig. 1 and 2.

Fuel tanks

2. When refuelling the fuselage tanks, the top tanks transfer cock must be closed. On no account should refuelling be commenced at top tanks Nos. 3 and 4 or at rear tank No. 5. Fill top tanks Nos. 1 and 2 first followed by top and rear tanks Nos. 3, 4 and 5. Set wing tank transfer cock at NORMAL and fill the integral wing tanks and wing tip tanks and finally fill the belly tank No. 6. Before filling the tanks ensure that the fuel hose and refueller are correctly earthed prior to removing the filler caps. The tanks should only be filled from a refueller fitted with a Streamline filter (Ref. No. 4K/2371). The filler caps for the top fuselage tanks and rear tank are located on the top surface of the fuselage. On the starboard side of the fuselage between frames 16 and 17 is positioned an access panel concealing the filler cap for the belly tank. Filler caps for the integral wing tanks are located on the upper surface of the main plane and the wing tip tanks have filler caps in their upper surface.

Checking fuel tank contents

3. All tanks, with the exception of the wing tip tanks, are fitted with capacitor type fuel contents gauge units which indicate correct readings on the gauges mounted on the engine instrument panel irrespective of the attitude of the aircraft. Each integral wing tank, the rear tank and belly tank have separate gauges but the top fuselage tanks (Nos. 1, 2, 3 and 4) share a common gauge. The gauges register when the battery isolation switch is ON or when an external electrical supply is connected. The wing tip tanks are filled to the base of the filler cap.

Water drains

4. Three water drain valves are provided in

the lower surface of the belly tank. As these valves are of the spring-loaded plunger type they are operated by applying pressure to the plunger head.

Engine starting fuel tanks

5. A tank for each engine is mounted on the main plane leading edge between the engine and the fuselage. On removing an access panel on the upper surface of the leading edge (Sect. 2, Chap. 4, fig. 3) the tank filler cap is revealed. The capacity of the tank is two gallons and the fuel specification is given in the Leading Particulars. When required the tank may be drained by opening the valve on the tank lower surface.

Oil sump

6. The engine oil sump is replenished by a pressure rig which is connected to the oil filler (*fig. 1*). Check the oil level sight glass and observe the quantity of oil required; the amount required to raise the level from LOW to FULL is approximately 2 pints. Remove the oil filler cap by turning it anti-clockwise and withdraw it from the bayonet connection of the oil filler. Ensure that the bayonet connection and the pressure rig adapter are clean, then connect the rig to the oil filler. Operate the rig until the correct level is shown on the sight glass. Disconnect the rig, wipe away any spilled oil and fit the oil filler cap. Refer to the Leading Particulars for specification of sump oil.

Accessories gearbox

Checking the oil level

7. Release the fasteners and remove the upper surface access panels to the gearbox filler (*Chap. 4, fig. 3*) and check the oil level by means of the dipstick which is calibrated FULL and REFILL.

Draining and refilling

8. Release the fasteners and remove the undersurface access panel to the gearbox drain (*Chap. 4, fig. 2*). Break the locking wire, remove the drain plug and drain the oil in to a suitable container. Before refilling,

the gearbox should be flushed with clean oil as follows:—

- (1) Break the locking wire, unscrew the filler cap.
- (2) Pour oil OX—38 through the funnel in the filler cap until the oil flowing out of the drain hole is quite clean.
- (3) Refit and wirelock the drain plug.
- (4) Fill the gearbox with 3.5 pints of oil, OX—38, check the contents with the dipstick and adjust as necessary.
- (5) Refit the filler cap, tighten and wirelock the cap wing nut to the cranked arm.
- (6) Refit the upper and lower surface access panels.

For further details of servicing and maintenance reference should be made to A.P. 2240A, Vol. 1, Sect. 4, Chap. 2.

Hydraulic tanks

Services system hydraulic tank

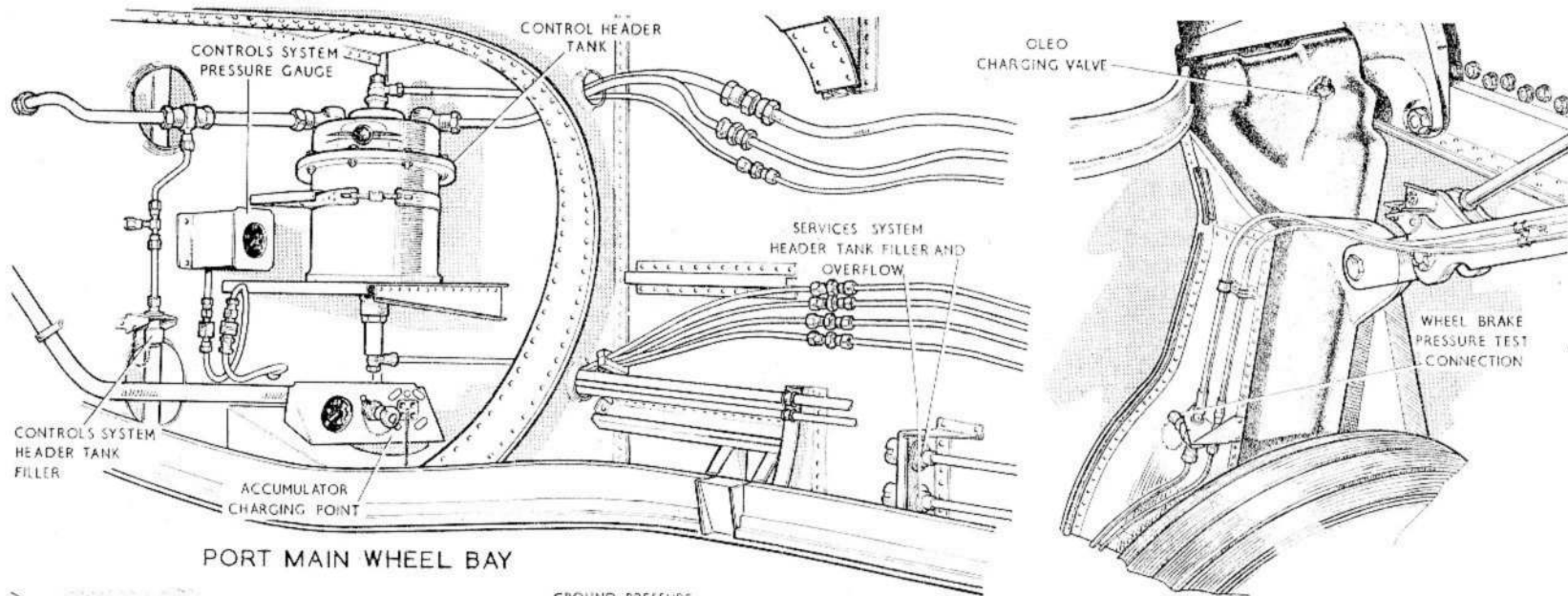
9. The services system hydraulic tank, mounted on the port side in the top of the front camera compartment, is filled through a connection (*fig. 1*) in the port undercarriage bay using a hand pump. The correct fluid level is obtained when fluid flows from an overflow connection beside the filler connection. For fluid specification refer to the Leading Particulars. Refer to Sect. 3, Chap. 6, for further details.

Note . . .

The appropriate spanner must be used to ensure that the blanking cap is screwed up tight.

Controls systems hydraulic tank

10. The "controls" systems hydraulic tanks, mounted one in each main undercarriage bay, are filled through the self sealing coupling beside each tank using a hand pump. Refer to Sect. 3, Chap. 6 for more detailed information. Fluid should be pumped into the tank until the sight glass is full of fluid and the indicator at the base of the tank protrudes at least 0.10 in. It should be noted that the sight glass will fill before the indicator moves. For fluid specification refer to the Leading Particulars.



PORT MAIN WHEEL BAY

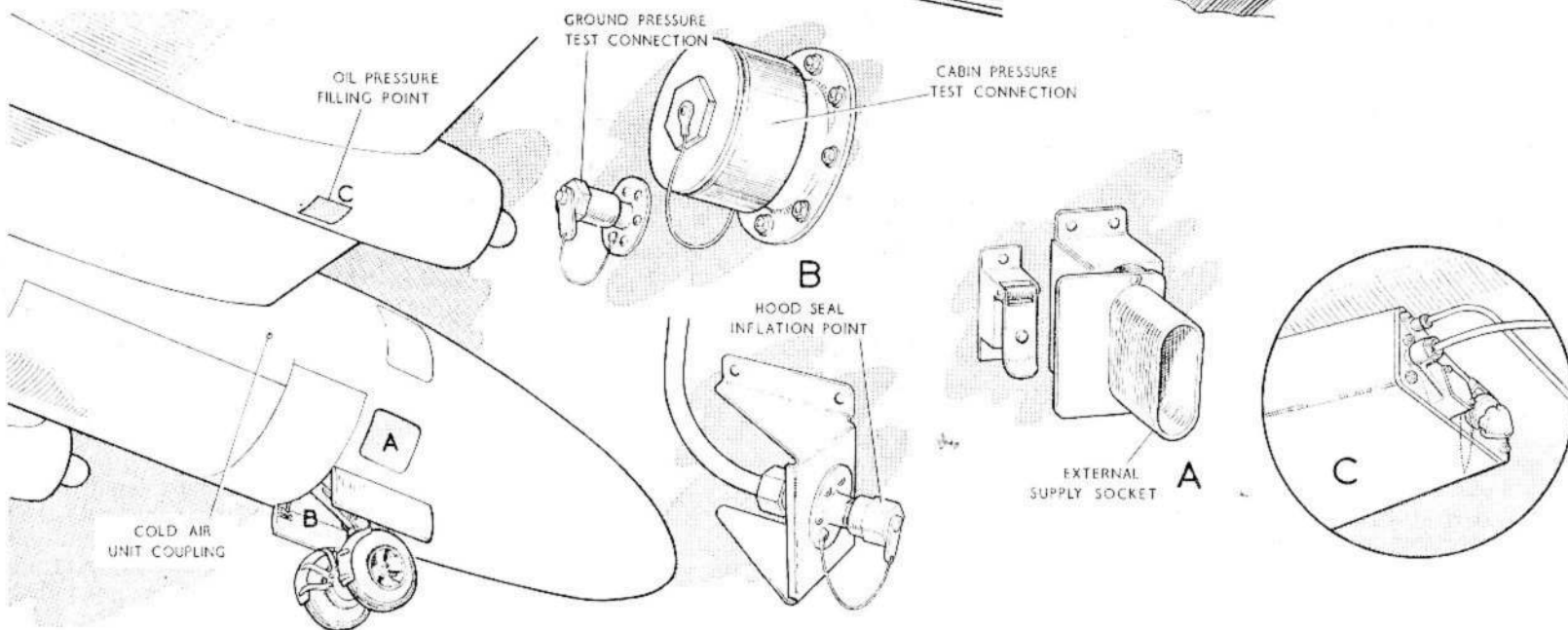


Fig. 1. Servicing points

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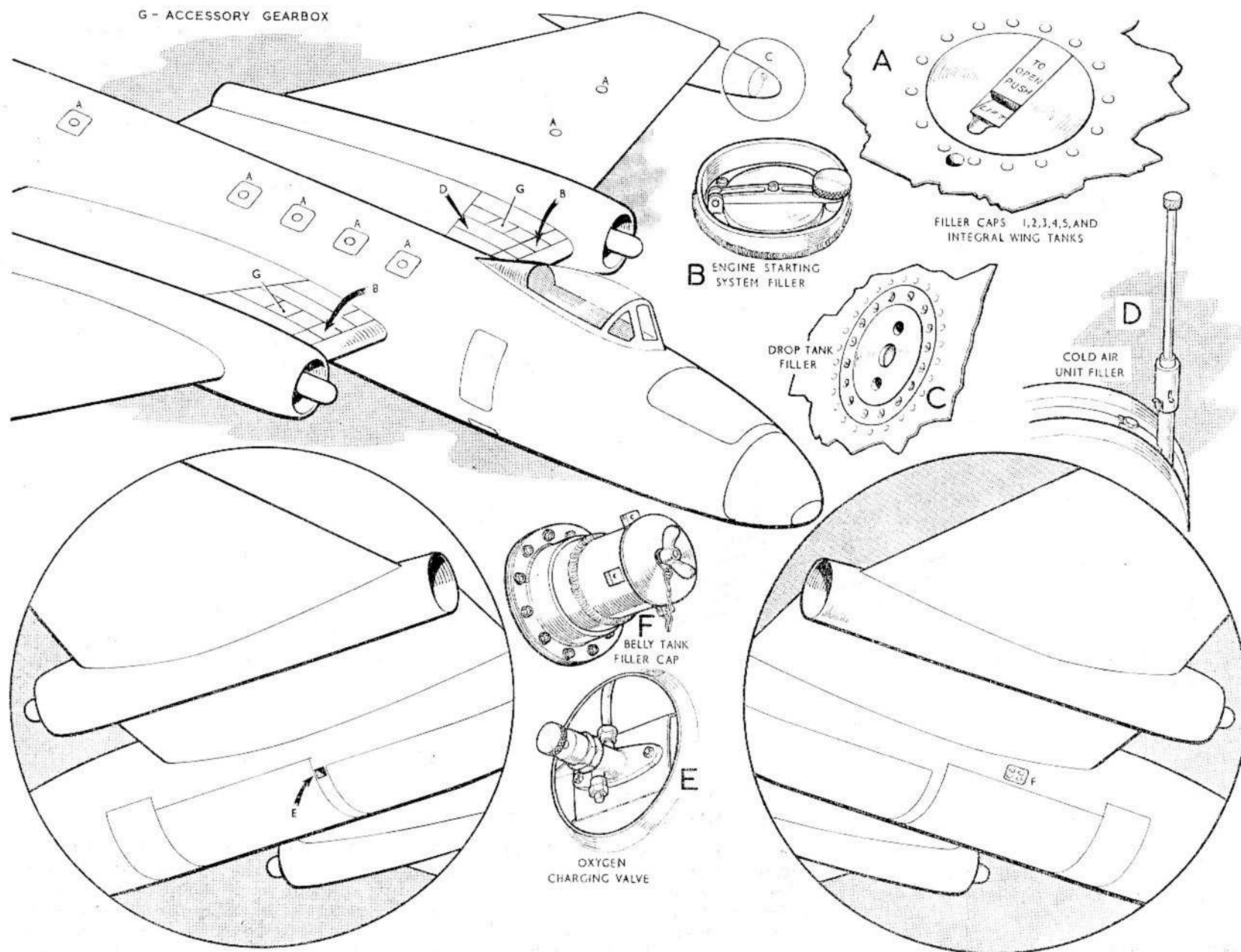


Fig. 2. Servicing points

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OLEO PRESSURES
(WHEELS OFF GROUND)

450 ± 25 LB./SQ. IN. 545 ± 25 LB./SQ. IN. 640 ± 25 LB./SQ. IN.

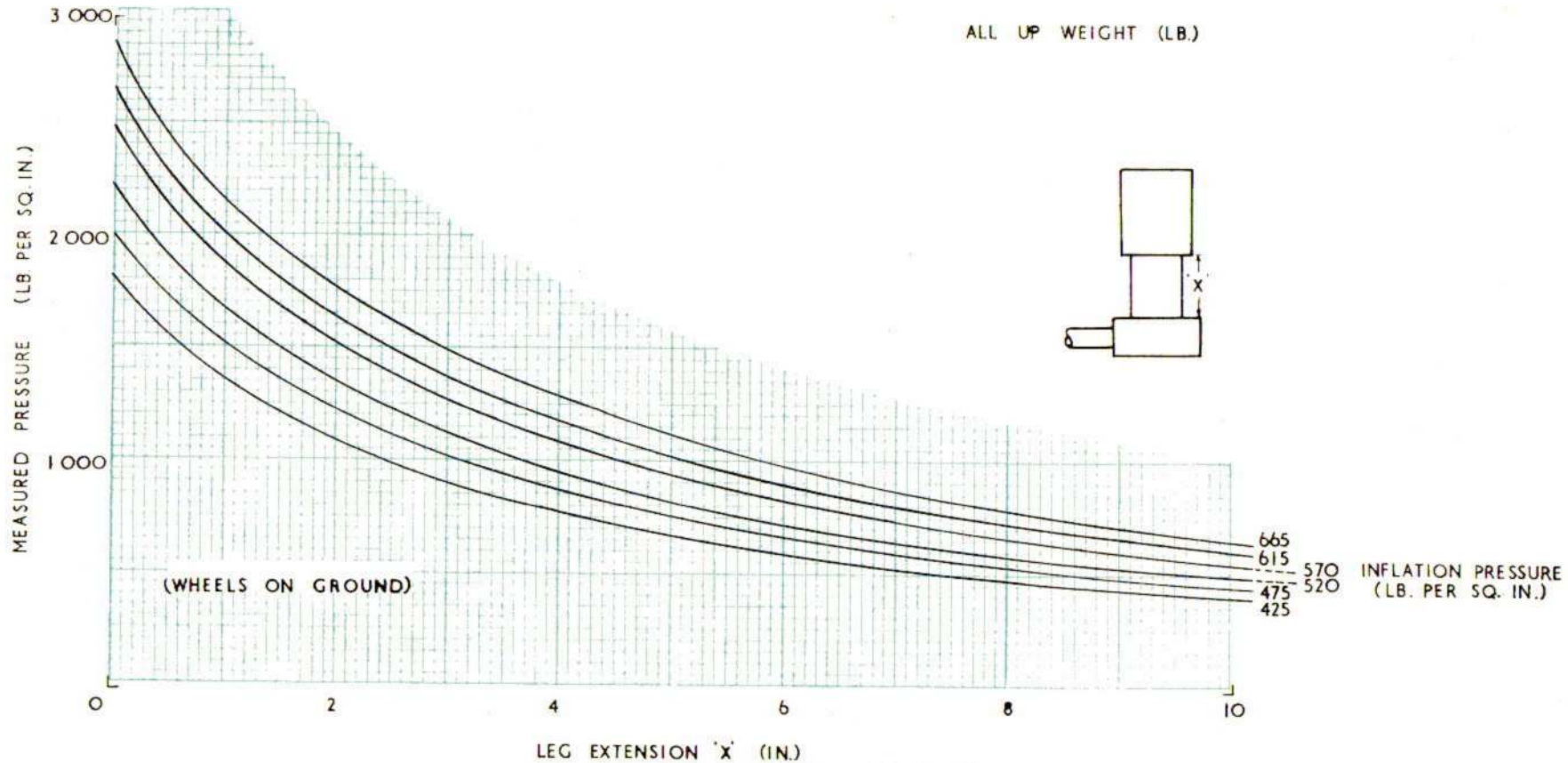
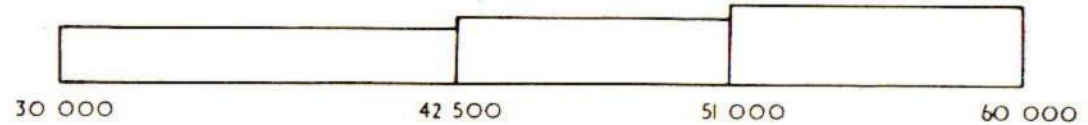


Fig. 3. Main undercarriage inflation charts

Note . . .
The appropriate spanner must be used to ensure that the blanking cap is screwed up tight.

Checking pressures
Hydraulic accumulators

11. The eight accumulators included in the

three hydraulic systems, are all charged with nitrogen, four through a common charging valve mounted on a panel in the port main undercarriage bay and four through a similar valve on the port side of the fuselage just inside the rear fuselage entrance hatch. Mounted on the panel with each charging valve are a pressure gauge and multiple

inflation cock, which incorporates four cocks, one for each accumulator served by the charging valve. Before charging the accumulators or checking the nitrogen pressure all fluid pressure must be exhausted from the system. Full details of these operations are given in Sect. 3, Chap. 6.

Lighting gear shock absorbers

12. With the aircraft jacked clear of the ground the oleo inflation pressure should be checked by fitting a Turner inflation adapter (Ref. No. 4G/4131) and pressure gauge (Ref. No. 4G/3027) to the connection at the top of the undercarriage leg (*fig. 1*). Ensure that the pressure obtained is within the limits shown on the diagram (*fig. 3*). When the weight of the aircraft is on the wheels the inflation pressure of the main undercarriage shock absorber struts may be determined by measuring the strut extension and pressure and checking these measurements against the graph in *fig. 3*.

Example:—

If the all-up weight of aircraft = 45 000 lb.
 measured strut extension = 4.0 in.
 and strut pressure = 1 000 lb.
 per sq. in.

then by plotting the strut extension and pressure on the graph an inflation pressure of between 520 and 575 lb. per sq. in. is obtained. Inflation pressures obtained by this method should be checked on the accompanying diagram which shows the correct inflation pressures for the various all-up weights with the strut fully extended.

13. The nose undercarriage is liquid sprung and is not inflated with air, consequently graphs are not provided for checking its condition. The serviceability of the unit, however, may be checked by measuring the extension of the shock-absorber under normal static loaded condition. The minimum leg extension is shown in *fig. 4*.

Tyre pressure

14. The main and nose undercarriage tyre pressures for various all-up weights are given in the Servicing Schedule (A.P.4326J, Vol. 4, Part 2).

Oxygen system

15. The oxygen contents gauges are on the starboard side of the Pilot's instrument panel

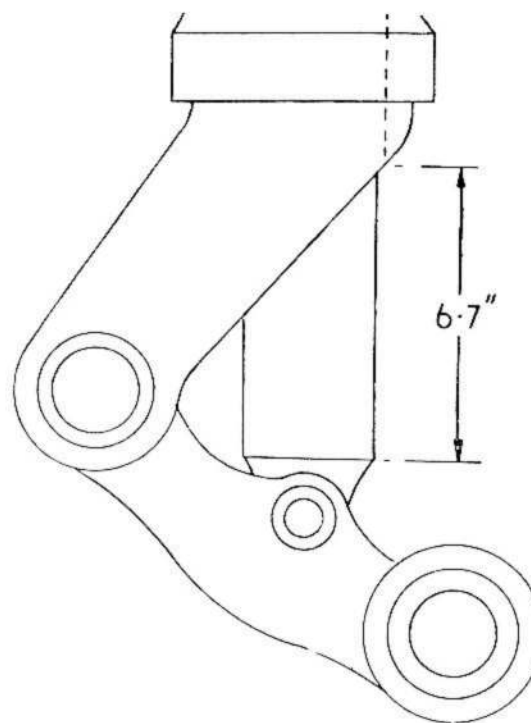


Fig. 4. Nose undercarriage shock absorber extension

and the charging valve is located on the port side of the fuselage at spar frame 21. Procedure for charging the oxygen cylinders is described in Sect. 3, Chap. 10.

De-misting system

16. The air drier unit is mounted under the cabin furnishing on the fuselage port side at the navigator's seat position. An access panel incorporating a window is provided and a visual check must be made to ensure that the silica gel crystals in the tell-tale compartment of the unit are blue. Should

the crystals be pink the alumina drying agent and the tell-tale crystals must be renewed (Refer to Sect. 3, Chap. 8).

*Electrical system**Battery isolation switch*

17. As a number of electrical circuits are without switches and feed directly from the main positive supply a battery isolation switch is fitted to prevent battery drain when the aircraft is on the ground with the engines stopped. The switch is located on the starboard console and must be switched OFF immediately after stopping the engines. During servicing, the aircraft batteries must not be used. Ensure that the isolation switch is OFF and connect an external electrical supply.

External electrical supply socket

18. The external electrical supply socket is located on the main electrical panel, access to which is through a door in the lower half of the fuselage. During servicing operations, when electrical power is required, ensure that the battery isolation switch is OFF and connect an external power supply to this socket.

Ground running of engines◀ *Note . . .*

First check that the undercarriage ground safety locks are fitted and the undercarriage DOWN button depressed (Chap. 1). ▶

19. The aircraft must be headed into wind for all ground running, to prevent the hot exhaust gases entering the air intakes and causing overheating. Before starting an engine ensure that the aircraft is well clear of buildings and other aircraft; these, if less than 100 yards behind the aircraft are liable to be damaged by the stream of hot gases or

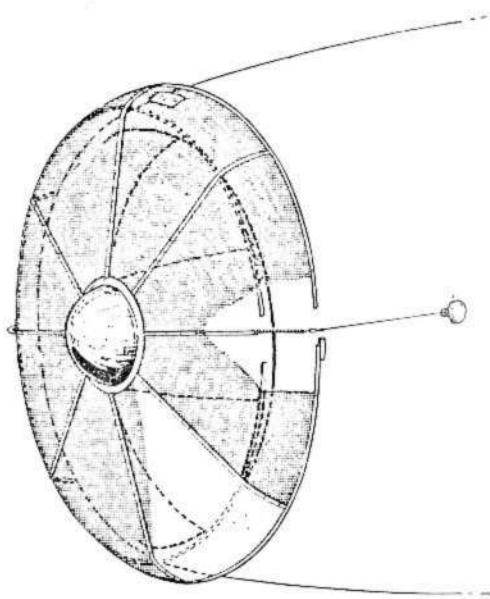
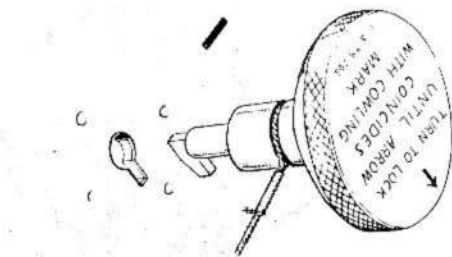


Fig. 5. Engine safety guard



by loose objects thrown up by the air stream from the jet pipe. The ground in the immediate vicinity of the front of the aircraft must be kept clear of loose objects which may be drawn into the engine. All personnel should keep at least five yards clear of the air intakes and safety guards (*para.* 18) must be fitted to the air intakes. The aircraft must never be positioned on tarmac for ground running; if possible, position it on concrete, but if a concrete base is not available the engines may be run-up on grass.

Safety guards

20. The safety guards (Ref. No. 26FZ/95473) must always be fitted when ground running the engines. The method of attachment is shown in fig. 5.

External tel-mic socket

21. The external tel-mic socket is mounted on the fuselage side in the starboard wheel bay.

◀ Note...

Windscreen rain repellent

Check the availability of repellent fluid by noting that the float is at the top of the sighting glass. If the float is below this level the canister is empty and must be changed.

IMPORTANT

If the rain repellent switch is inadvertently operated the fluid must be removed from the windscreen as described in Sect. 5, Chap. 1, Group H. ▶

CHAPTER 3A - LOADING AND C. G. DATA

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GENERAL INFORMATION

1. This chapter deals with the effects of different and varying loads upon the C. G. Position.

C. G. DATUM POINT

2. The location of the C. G. datum point is 4.695 ft. forward of the front spar datum and 0.455 ft. below the fuselage horizontal datum line. Its position is indicated by a screw on the port side of the fuselage marked C. G. datum. This screw may be used to suspend a plumb line when the C. G. of the aircraft is to be determined by weighing (A. P. 4747A). All moment arms are measured in feet units parallel to the fuselage datum and are positive when they refer to items aft of the C. G. datum and negative when they refer to items forward of this datum.

C. G. LIMITS

3. The approved C. G. limits corresponding to various weights are shown in fig. 2.

WEIGHT LIMITS

4. Clearance is given for operational flying at the following weights:-

Maximum permissible take-off weight (with full jettisonable tanks)	57 500 lb.
Maximum permissible take-off weight (less jettisonable tanks)	53 300 lb.
Maximum normal landing weight	40 000 lb.

EFFECT OF UNDERCARRIAGE RETRACTION

5. The moment resulting from undercarriage retraction is - 1 454 lb. ft. This must be taken into account when making calculations for undercarriage retracted condition.

BASIC WEIGHT AND MOMENT RECORD

Airframe

6. Each aircraft is supplied with an R. A. F. Form 4908 from which the current basic weight and moment must be obtained for the purpose of all loading related to that aircraft. This R. A. F. form must be kept up to date at all times for the effect of modifications and for any deviations from the list of equipment given in Table 2.

Engine change unit

7. When an E. C. U. change is made which involves engines of different modification standard, the weight and moment differences must be recorded on the Form 4908. The weight and moment arm of an E. C. U. is quoted on the engine Log Card. The engine C. G. is 1.75 ft. aft of the engine front suspension line, and this line is 2.75 ft. forward of the aircraft C. G. datum point; the E. C. U. moment arm from the aircraft datum is therefore $(2.75 - 1.75) = 1.00$ ft. forward.

8. The weight of the engine should be multiplied by its corrected moment arm to find its moment about the aircraft C. G. datum, and the difference recorded on the Form 4908.

BALLAST

9. A ballast beam is fitted in the nose. It can accommodate up to 77 standard 10 lb. ballast weights (A. S. 4589). Fuselage bending strength considerations however dictate that not more than 70 weights should be fitted when the aircraft is equipped in accordance with the tables in this chapter. It will be found expedient to fit first those weights which go beneath and act as supports to the bridge pieces. Weights should be

evenly distributed about the middle of that section of the beam designed for their retention. The ballast weight moment arm is then 15.0 feet forward of the C. G. datum and the following formula for calculation of the amount of ballast required is based on this assumption.

$$W_b = \frac{M_1 - 2.3 W_1}{17.3}$$

where W_b = Weight of ballast (lb.)
 M_1 = Moment of aircraft loaded excluding fuel and ballast (lb.ft.)
 W_1 = Weight of aircraft loaded excluding fuel and ballast (lb.)

NOTES ON DETERMINATION OF C. G. POSITION

10. (1) The maximum permissible aft limit of C. G. is + 2.46 ft., but it is recommended that the C. G. of the aircraft loaded, but excluding fuel, be adjusted to + 2.3 ft. With the C. G. so adjusted and provided that the fuel usage drill shown in Part 1, Chap. 2 of Pilot's Notes is adhered to, the C. G. will not move beyond the permissible limits at any stage of take-off, flying and landing.

(2) Ballast, which is considered as an item of operating equipment, will be found to be a necessary fitment for most operational roles and the amount required must be calculated for each role (para. 9).

(3) If the aircraft is to be flown with less than maximum fuel, the quantity must be distributed in the tanks in accordance with the totals shown in the right-hand columns of the fuel drill in Part 1, Chap. 2 of Pilot's Notes. For example if only 16 000 lb. (2 000 gallons) is required this should be loaded as follows:-

6 848 lb. in integral tanks

1 000 lb. in rear tank

remainder 8152 lb. in top and belly tanks combined.

PROCEDURE FOR LOADING CALCULATIONS

11. (1) Obtain the current basic weight and moment from the appropriate R. A. F. Form 4908.
- (2) Add to the basic weight and moment the weights and moments of crew and personal equipment from Table 3, and role equipment as appropriate from Tables 6 to 15. This gives the operating weight and moment excluding ballast.
- (3) Add to the operating weight and moment any expendable load items, except fuel, required for the mission from Table 5. This will give the weight and moment of the aircraft fully loaded except for fuel and ballast.
- (4) Calculate the C. G. and determine the amount of ballast required to bring the C. G. to the recommended position shown in fig. 2.
- (5) Check that the take-off weight does not exceed the maximum permissible weight quoted in para. 4, by adding the weight of fuel and the weight of ballast to the weight of the aircraft fully loaded except for fuel and ballast.

12. Typical example

The following example has been worked out assuming that the aircraft is to carry out Role D (night low altitude with F97 cameras) with full jettisonable tanks.

- (1) Basic weight
 Obtain the basic weight from the appropriate R. A. F. Form 4908, ensuring that this has been adjusted where necessary for modification and

basic equipment changes. For the purposes of this example a basic weight is chosen which is representative of an aircraft

basically equipped up to and including A.L.210 in appendix 'A' Serial No.2127.

	Weight lb.	(-) Negative	Moment lb.ft. (+) Positive
◀ (1) Basic weight (typical aircraft)	28428		70473
(2) Operating weight			
Basic weight	28428		70473
Add:			
Crew and personal equipment	505	7904	
Role D equipment (including lightweight discharger crate)	520		4885
	<hr/>	<hr/>	<hr/>
		7904	75472
<u>Operating weight</u>	<u>29453</u>		<u>67454</u>

- (3) Loaded weight excluding fuel and ballast
 Add to the operating weight and moment the weight and moment of any items of expendable load (Table 5) appropriate to the mission. In this example Role D is chosen. Wing jettisonable tanks are fitted and this role involves the carriage of photographic flashes, all or some of which may still be on the aircraft at landing. These items are all aft of the C.G. of the aircraft and their presence at a minimum fuel state brings about the most aft C.G. condition.

	Weight lb.	(-) Negative	Moment lb.ft. (+) Positive
Operating weight	29453		67454
Add: Expendable load items (excluding fuel) required in role 'D'.			
Photo-flashes 1.75in. No. 2 Mk.1 (60 off)	103		1042
Wing jettisonable tanks	282		1259
	<hr/>	<hr/>	<hr/>
Loaded weight, excluding fuel and ballast	<u>29838</u>		<u>69755</u> ▶

◀ (4) C.G. of loaded weight, excluding fuel and ballast = $\frac{69755}{29838}$
= 2.337 ft.

This C.G. is aft of the recommended position of + 2.3 ft. and must be adjusted by the inclusion of nose ballast calculated as shown in para. 9.

$$W_b = \frac{69755 - (2.3 \times 29838)}{17.3}$$

$$= \frac{69755 - 68627}{17.3} = \frac{1128}{17.3}$$

$$= 65 \text{ (i.e. } 6 \times 10 \text{ lb. standard weights)}$$

(5) Take-off weight	Weight lb.	Moment lb.ft.	
		(-) Negative	(+) Positive
Weight excluding fuel and ballast	29838		69755
Ballast	60	900	
Total fuel in wings and fuselage tanks	22184		46171
Fuel in jettisonable tanks	<u>3904</u>		<u>15140</u>
		3600	131066
<u>Take-off weight</u>	<u>55986</u>		<u>130166</u>

C.G. at take-off = $\frac{130166}{55986} = +2.325 \text{ ft.}$

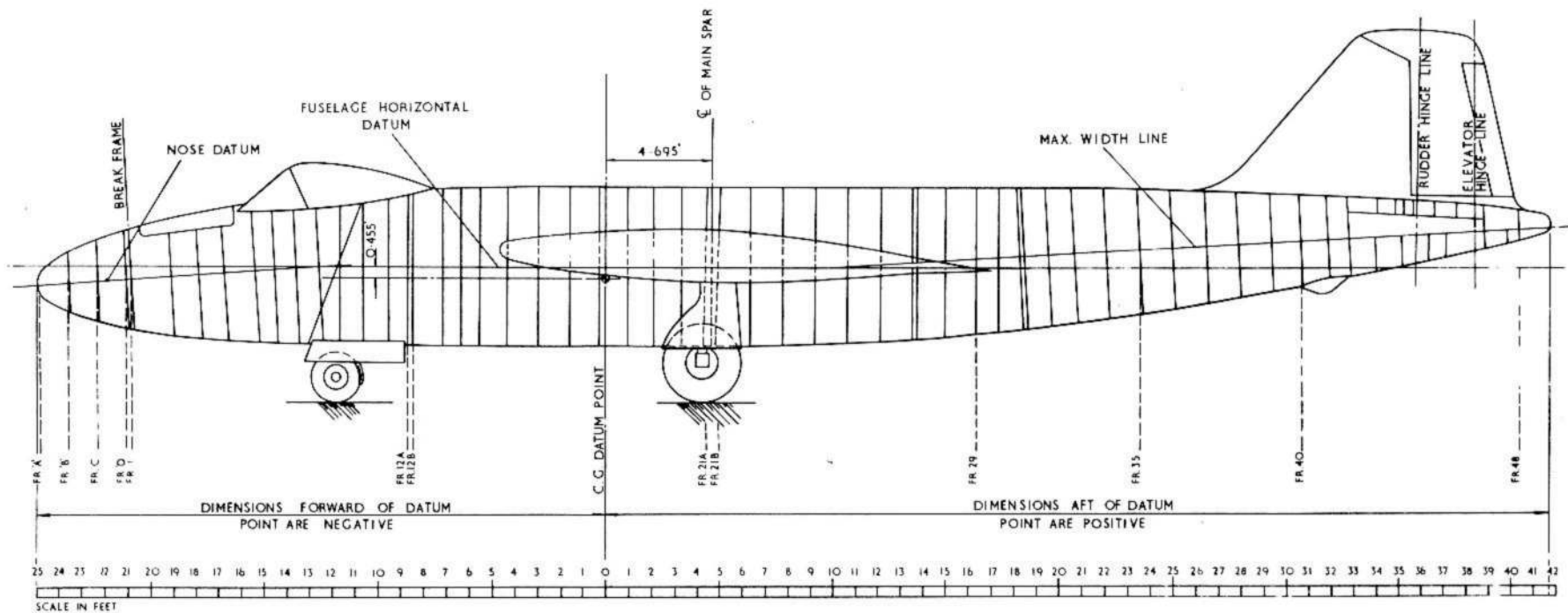
C.G. flying (undercarriage retracted) $\frac{130166 - 1454}{55986} = \frac{128712}{55986} = +2.299 \text{ ft.}$

This take-off weight does not exceed the maximum permissible take-off weight (with jettisonable tanks full) and the loading will be satisfactory, subject to the fitment of the ballast and adherence to the fuel management drill.

MODIFICATIONS

13. (1) The typical basic weight used is representative of an aircraft to modification standard Y7 leaflet dated Jan 1970. ▶

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- NOTES -
- 1 EQUIPMENT LISTED IN TABLES 1-16 CAN BE LOCATED ON THE ABOVE DIAGRAM BY REFERENCE TO THE ARMS QUOTED
 - 2 WEIGHT LIMITATIONS ARE GIVEN IN PARAGRAPH 4
 - 3 C.G. LIMITATIONS ARE SHOWN IN FIG 2

Fig.1 LOCATION REFERENCE DIAGRAM

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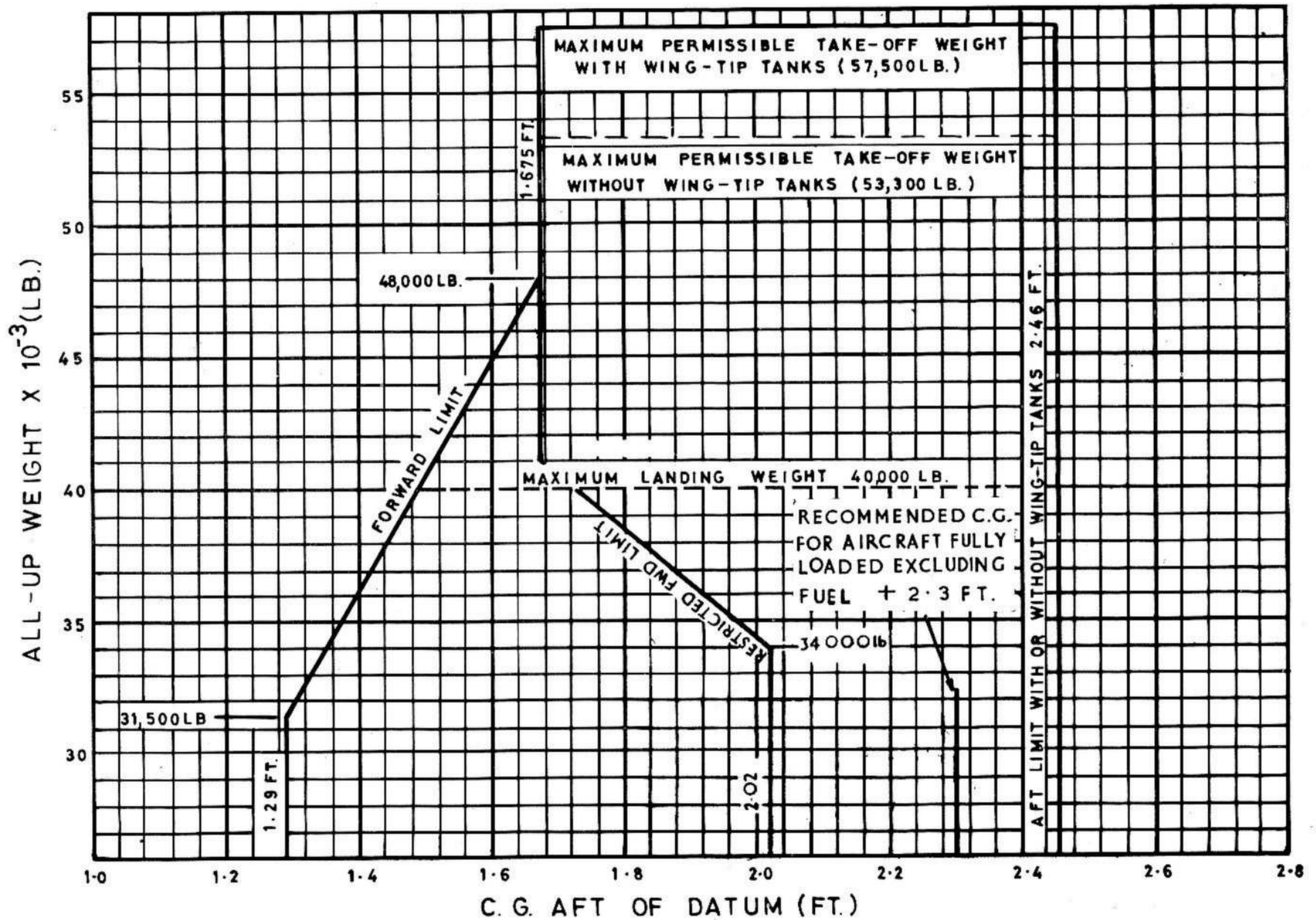


Fig.2 FLIGHT C.G. LIMITS

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TABLE 1

SUMMARY OF DRAINABLE AND UNDRAINABLE UNUSABLE FUEL TO BE INCLUDED IN BASIC WEIGHT

Location	Weight lb.	Arm ft.	Moment lb. ft.
Fuel, pipes in wings	30.0	+ 4.035	+121.0
Fuel, pipes in fuselage	13.0	+ 5.433	+ 70.6
Fuel, recuperators	64.0	+ 1.323	+ 84.7
No. 6 tank and collector box (30 gal. unusable and undrainable)	240.0	- 1.101	-264.0
TOTAL TRAPPED (undrainable) FUEL	347.0		+ 12.3

Note...

- (1) Due to the disposition of certain fuel pipes and the fact that the wing tanks are normally drained with the L. P. cocks closed, the above weight of fuel will remain trapped when the fuel tanks are drained.
- (2) Since all fuel in pipelines and unusable fuel in tanks is included in the basic weight, the following fuel weights must be added when determining the basic weight after weighing the aircraft.

Drainable fuel in pipelines	16.0	+ 2.977	+ 47.6
Drainable but unusable fuel in integral tanks	32.0	+ 2.183	+ 69.9

TABLE 2
REMOVABLE EQUIPMENT INCLUDED IN BASIC WEIGHT

Appendix 'A' Item	Ref. No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb. ft.
26A	12L/203	1	Destructor, aircraft, No.1, Mk.1	3.25	-10.60	- 34
33A	7B/1784	1	Pistol, signal, 1½", Mk.2	3.75	-18.80	- 71
38A	12K/1314	1 set	Cartridges, seat ejection, No. 3, Mk. 3 (pilot).	1.60	-12.00	- 19
39A	12K/1315	1 set	Cartridges, seat ejection, No. 4, Mk. 3 (navr).	1.60	-18.70	- 30
42A	12D/	9	Cartridges, signal pistol, 1½"	3.10	-19.50	- 60
17B	5J/9499955	1	Battery, alkaline, 24V, Saft type 20 VO.35 .	76.35	- 9.27	-708
18B	5J/3458	1	Battery, alkaline, 24V, Type 19 V O.7	17.30	-14.94	-258
19B	5J/9001514	1	Battery, lead acid, 24V, Type J	5.69	-13.45	- 77
167B	5CX/369	1	Lamp, Inspection, Mk.2, c/w lead	0.80	-17.30	- 14
85C	6A/4833	1	Clock, fluorescent, Mk.5A	0.75	-21.00	- 16
or	or		or			
86C	6A/2197	1	Clock, fluorescent, Mk.4	0.44	-21.00	- 9
or	or		or			
87C	6A/2958	1	Clock, fluorescent, Mk.4B	0.37	-21.00	- 8
or	or		or			
88C	6A/2089	1	Clock, fluorescent, Type 5 A.C.A.	0.38	-21.00	- 8
149C	6B/633	1	Amplifier, ground position	3.00	-15.40	- 46
151C	6B/541	1	Indicator, ground position	25.00	-21.40	-535
228cC	26FZ/30741	1	Curtain, camera, EB8-17-171	3.44	+16.30	+ 56
228dC	26FZ/30743	1	Curtain, camera, EB8-17-173	4.30	+18.40	+ 79
228eC	26FZ/30744	1	Curtain, camera, EB8-17-193	3.70	+23.10	+ 85
150D	9A/02430	1	Oxygen charge	23.50	+ 9.30	+219
150D	9A/02430	1	Kit, first aid	3.00	-17.35	- 52
21cA &) 21dA)	EB8.84.1	1	Ballast beam assy. (less ballast weights)	181.50	-15.30	-2777
	EB8.11.1085/6	2	Aperture fairing	60.20	+ 9.47	+570
			<u>Radio</u>			
			<u>A 1961 - Intercommunication</u>			
1E	10U/16596	1	Amplifier, Type A 1961	6.44	-15.00	- 97
2E	10D/17805	1	Box, junction, Type 154	1.75	-15.00	- 26
37E	10AJ/121	1	Mounting, Type 936	0.42	-15.00	- 6

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Table 2 - REMOVABLE EQUIPMENT INCLUDED IN BASIC WEIGHT (contd)

Appendix 'A' Item	Ref. No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb. ft.
<u>A. R. I. 23172 - Radio altimeter Mk. 7B</u>						
57E	10D/21798	1	Box, junction, Type 16107	1.00	+22.65	+ 23
58E	10D/22437	1	Box, junction, Type 16507	1.00	+21.40	+ 21
74E	5841-99-954-2618	1	Computer, amplifier, Type 16089	4.75	+21.40	+102
75E	10L/16720	1	Control unit, Type 16095	1.88	-14.50	- 27
76E	5826-99-103-9075	1	Delay unit, Type 16119	1.50	+19.93	+ 30
78E	10Q/16459	1	Indicator, electrical, Type 16094	0.88	-15.00	- 13
79E	10AJ/698	1	Mounting (T. R.), Type 16096	1.98	+19.15	+ 38
80E	10AJ/699	1	Mounting (amp) Type 16097	0.56	+21.40	+ 12
84E	5841-99-954-2617	1	Trans./Receiver, Type 16098	16.00	+19.15	+306
-	-	2	Aerials, consisting of			
77E	10D/22920	2	Horn, waveguide)			
83E	5826-99-104-6011	2	Duplexer)	7.00	+19.65	+138
<u>A. R. I. 5877 - Radio compass (AD. 722)</u>						
130E	10U/17211	1	Amplifier, R. F., Type 8281	5.30	-21.10	-112
131E	10U/17212	1	Amplifier, I. F. Type 8282	9.00	-14.15	-127
132E	10L/16287	1	Control unit, Type 8283	2.40	-15.01	- 36
170E	10Q/16327	1	Indicator, electrical, Type 8720	1.80	-14.81	- 27
171E	10AJ/1572	1	Mountings, Type 8288, (amplifier R. F.)	1.90	-21.10	- 40
172E	10AJ/1573	1	Mountings, Type 8289, (amplifier I. F.)	1.50	-14.15	- 21
<u>A. R. I. 18090 - Radio altimeter Mk. 6A</u>						
220E	10Q/93	1	Indicator, electrical, Type 7921	10.00	-18.35	-184
221E	10AJ/216	1	Mounting, Type 1033/2	1.75	+14.83	+ 26
223E	10AJ/221	1	Mounting, Type 1040	0.60	-18.35	- 11
227E	10D/19806	1	Trans./Receiver, Type T. R. 7923	35.00	+14.83	+519

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Table 2 - REMOVABLE EQUIPMENT INCLUDED IN BASIC WEIGHT (contd)

Appendix 'A' Item	Ref.No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb. ft.
<u>A. R. I. 18107/4 - T. A. C. A. N.</u>						
588E	10B/20275	1	Aerial, Type 100B	0.75	+12.75	+ 10
590E	10L/16310	1	Control unit, Type 7750	1.23	-19.30	- 24
591E	10D/22534	1	Coupling unit, Type 9546	7.13	+27.50	+196
684E	10Q/16355	1	Indicator, electrical, Type 9547	1.50	-21.20	- 32
684E	10Q/16355	1	Indicator, electrical, Type 9547	1.50	-14.73	- 22
685E	10AJ/251	1	Tray, mounting, Type 9274	6.00	+26.05	+156
686E	10AJ/258	1	Tray, mounting, Type 9545	1.90	+27.50	+ 52
688E	10D/22927	1	Trans/Receiver, Type 220C	50.00	+26.96	+1348
<u>A. R. I. 5851 - Green satin</u>						
692E	10B/16389	1	Aerial, system, Type 501	40.00	+ 8.73	+349
850E	10Q/16095	1	Indicator, electrical, Type 101	21.00	-21.35	-448
886E	10Q/16094	1	Tracking unit, Type 100	48.00	+15.67	+752
887E	10D/18843	1	Trans/Receiver, T. R. 3710	116.00	+15.10	+1752
<u>A. R. I. 5848 (C. 3P. 7) (C. 3. Q. 9) I. F. F. Mk. 10</u>						
897E	10B/20275	2	Aerial, Type 100B	1.50	+12.75	+ 19
901E	16K-1660-036290932	1	Coding unit, Type KY. 95A/APX-25	} 10.50	+23.15	+243
or	or	or				
902E	10D/21270	1	Coding unit, Type 6466			
903E	10AJ/646	1	Mounting, Type 6475	0.75	+23.15	+ 17
904E	10L/16192	1	Control unit, Type 927	0.70	-18.33	- 13
905E	16K1-1660-	1	Control unit, Type C1128/APX-25	} 1.10	-18.70	- 21
or	-036290585	or				
906E	10L/16479	1	Control unit, Type 6465			
964E	10F/19511	1	Switch unit, Type 6850	2.17	+23.03	+ 50
965E	10D/20334	1	Trans/Receiver Type 4585	32.00	+24.33	+779

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Table 2 - REMOVABLE EQUIPMENT INCLUDED IN BASIC WEIGHT (cont'd)

Appendix 'A' Item	Ref. No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb. ft.
			<u>A. R. I. 23090/9 H. F. /SSB Collins 618T3</u>			
	110D/6043307	1	Trans./Receiver Type M15	50.0	-16.5	-825
	110L/1098405	1	Control Unit Type M53	2.0	-19.5	- 39
	110B/9541665	1	Aerial Tuning Unit Type 490T-1	19.7	-16.5	-325
	5831-99-914-8966	1	Pre Amplifier Type UA6002	0.63	-15.7	- 10
			<u>A. R. I. 18011 - I. L. S.</u>			
1126E	10D/17815	1	Box, junction, Type 157	2.80	-16.04	- 45
1125E	10D/17921	1	Box, junction, Type 164	0.93	-15.21	- 14
1257E	10L/263	1	Control unit, Type 705	1.75	-11.80	- 21
1260E	10Q/61	1	Indicator, electrical, Type 7	1.45	-14.70	- 21
1261E	10AJ/118	1	Mounting, Type 933	2.75	-16.05	- 44
1270E	10D/17818	1	Receiver V. H. F. localiser/marker R.1964 (S. R. 14C)	18.00	-16.28	-293
1271E	10D/17819	1	Receiver V. H. F. glide path, R.1965 (S. R. 15C)	17.00	-15.83	-269
			<u>A. R. I. 23057 - U. H. F. Standby</u>			
1326E	10AJ/9701497	1	Mounting, Type 1031	0.77	-14.91	- 11
1327E	10D/9456726	1	Trans/Receiver, Type M6	8.75	-14.91	-130
			<u>A. R. I. 18120/2 - U. H. F. Homer</u>			
1327aE	10B/16907	2	Aerial, Type 11421	3.00	-21.70	- 65
1327bE	10D/20573	1	Box, junction, Type 9636	0.88	-10.90	- 10
1327cE	10D/19276	1	Box, junction, Type 7372	0.40	-16.50	- 7
1327vE	10Q/5826-99- 403-9193	1	Indicator, Azimuth deviation, Type S. T. C. RL7003-46M	1.45	-20.90	- 30
1327wE	10U/5821-99- 103-1767	1	Amplifier, audio frequency, Plessey CP194189	7.00	-10.08	- 71
1327xE	10U/5831-99- 103-1768	1	Amplifier, radio frequency, Plessey CP194187	12.00	-13.82	-166
1327yE	10AJ/279	1	Mounting, Type 11502 (for A. F. unit)	1.00	-10.08	- 10
1327zE	10AJ/280	1	Mounting, Type 11503 (for R. F. unit)	1.00	-13.82	- 14

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Table 2 - REMOVABLE EQUIPMENT INCLUDED IN BASIC WEIGHT (contd)

Appendix 'A' Item	Ref.No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb. ft.
			◀ <u>A. R. I. 23143/1 - U. H. F. - V. H. F. (P. T. R. 175)</u> ▶			
1328E	10B/9118266	2	Aerial, U. H. F., McMichael	3.10	- 6.55	- 20
1329E	10B/9513781	1	Aerial, V. H. F., (Drg.No. W. T. 44025/E)	1.00	- 8.90	- 9
1399E	10AD/9326361	1	Box, interconnecting, Type ARC/52	1.20	-11.15	- 13
1400E	10AL/9455739	1	Control unit, Type C 1607/4	3.22	-13.00	- 42
1400aE	10L/1070030	1	Control unit, Type C 1607/7	2.25	-19.50	- 44
1401E	10L/9433247	1	Control, receiver muting	1.25	- 8.75	- 11
1402E	10F/18374	1	Relay, magnetic, Type 1741	0.66	- 8.75	- 6
1406E	10AJ/9428544	1	Mounting, Type MT 1447	3.25	-10.50	- 34
1407E	10H/9711781	1	Trans/Receiver, Type P. T. R. 175	50.00	-10.50	-525



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TABLE 3

Completely revisedCREW & PERSONAL EQUIPMENT (COMMON TO ALL ROLES)

Appendix 'A' Item	Ref. No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb. ft.
-	-		Pilot	180.00	-12.46	-2243
539B	5A/3391	1	Torch, electric, Type 0, c/w cells	0.72	-14.23	-10
155C	6F/171	1	Writing pad, knee-type	1.38	-13.30	-18
158C	13/94	1	Compass set.....	0.25	-12.30	-3
6D	15A/1313	1	Parachute assy., back type, Mk. 42, c/w harness and canopy	27.00	-11.20	-302
18D	27C/2393	1	Survival pack, personal, Type R	31.00	-12.31	-382
46D	22C/1300602/607	1	Suit, air ventilated, Mk, 2C	1.88	-12.46	-23
56D	10D/21490	1	Transmitter, S. A. R. B. E., Type 10050.....	2.27	-12.31	-28
69D	22C/2274	1	Jacket, life-saving, Mk. 7	5.20	-11.98	-62
PILOT c/w PERSONAL EQUIPMENT				249.70	-12.30	-3071
		1	Navigator	180.00	-19.04	-3427
8D	15A/1328	1	Parachute assy., back type Mk. 45.....	27.00	-17.91	-484
18D	27C/2393	1	Survival pack, personal, Type R.....	31.00	-19.10	-592
46D	22C/1300602/607	1	Suit, air ventilated, Mk. 2C	1.88	-19.04	-36
56D	10D/21490	1	Transmitter, S. A. R. B. E. Type 10050.....	2.27	-18.91	-43
69D	22C/2274	1	Jacket, life-saving, Mk. 7	5.20	-18.58	-97
131C	6B/469	1	Case, carrying, navigator's equipment.....	1.00	-19.96	-20
			containing:-			
539B	5A/3391	1	Torch, electric, Type O, c/w cells	0.72	-19.96	-14
129C	6E/320	1	Binoculars, prismatic, 7 x 50 m. m.	2.13	-19.96	-43
130C	6E/9604560	1	Binoculars, prismatic, Mk. 5, 5 x 40 m. m.	2.00	-19.96	-40
148C	6B/2645	1	Computer, dead reckoning, Mk. 4A	0.75	-19.96	-15
156C	6B/47	1	Protractor, Douglas, 5 in.	0.14	-19.96	-3
157C	6B/260	1	Rule, navigation, Mk. 1	0.13	-19.96	-3
158C	13/94	1	Compass set	0.25	-19.96	-5
159C	6B/349	1	Straight edge, Mk. 3, 20 in.	0.30	-19.96	-6
163C	6B/9101001	1	Watch, stop	0.25	-19.96	-5
NAVIGATOR c/w PERSONAL EQUIPMENT				255.02	-18.95	-4833
TOTAL CREW & PERSONAL EQUIPMENT (COMMON TO ALL ROLES)				504.72		-7904

RESTRICTED

TABLE 4
COMPREHENSIVE LIST OF VARIABLE LOAD ITEMS

Appendix 'A' Item	Ref.No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb.ft.
PHOTOGRAPHIC:-						
<u>F49 Cameras</u>						
171C	14A/1989727	1	Camera, F49, Mk.2, 6 in. lens	53.00	+23.00	+1219
172C	14A/1989732	1	Camera, F49, Mk.2, 6 in. lens			
			(climatic proofed).....	53.00	+23.00	+1219
173C	14A/1989728	1	Camera, F49, Mk.3, 12 in. lens.....	65.00	+23.00	+1495
174C	14A/5852	1	Adaptor for F49, Mk.2, 6 in. lens	2.50	+23.00	+ 58
175C	14A/5853	1	Adaptor for F49, Mk.3, 12 in. lens	5.00	+23.00	+ 115
176C	14A/4331	1	Magazine, Type F49, Mk.2, 200 exposure (climatic proofed)	22.00	+23.00	+ 506
177C	14A/1985642	1	Magazine, Type F49, Mk.2, 250 ft.	40.00	+23.00	+ 920
178C	14A/5851	1	Mounting, Type 125	21.50	+23.00	+ 495
183C	EB8-83-2401	1	Camera pack, F49, Mk.4	269.57	+ 8.60	+2318
19aA	EB8-83-2403	1	Adaptor beam	26.83	+ 8.68	+ 233
185C	EB8-81-6193	1	Box, camera control, c/w wiring	11.55	-20.17	- 233
184C	14A/6463	1	Mounting, Type 133	43.00	+ 8.38	+ 360
181C	14A/1062902)	1	Camera, F49, Mk. 4 c/w magazine	174.00	+ 8.39	+1460
182C	14A/1062904)					
◀ <u>F95 Cameras</u> ▶						
202C & 203C	14A/ 14A/4656	1	Cameras, F95, Mk.2, 12 in. lens c/w loaded magazine	18.36	-23.60	- 433
202C & 203C	14A/ 14A/4656	2	Cameras, F95, Mk.2, 12 in. lens c/w loaded magazine	36.72	-16.98	- 624
207C	26FZ/32579	1	Camera base plate (Assy drg.No.EB8.83.1597)	1.23	-23.60	- 29
207C	26FZ/32579	2	Camera base plate (Assy drg.No.EB8.83.1597)	2.46	-16.98	- 42
202C & 204C	14A/ 14A/4557	1	Camera, F95, Mk.2, 4 in. lens c/w loaded magazine	16.00	-23.60	- 378
202C & 204C	14A/ 14A/4557	2	Camera, F95, Mk.2, 4 in. lens c/w loaded magazine	32.00	-16.98	- 543
209C	EB8-83-2371	1	Camera base plate	2.65	-23.60	- 63
208C	EB8-83-2339	2	Camera base plate	2.80	-16.98	- 48

Table 4 – COMPREHENSIVE LIST OF VARIABLE LOAD ITEMS (contd)

Appendix 'A' Item	Ref.No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb. ft.
◀ F95 Cameras contd. ▶						
202C & 205C	14A/ 14A/6530	1	Camera, F95, Mk. 2, 4 in. lens with A.E.C. c/w loaded magazine	22.00	-23.40	- 515
202C & 205C	14A/ 14A/6530	2	Camera, F95, Mk.2, 4 in. lens with A.E.C. c/w loaded magazine	44.00	-16.98	- 747
◀ F96 Cameras ▶						
210C	14A/5016	2	Camera, F96, Mk. 1, 24 in. lens	139.00	- 7.00	- 973
210C	14A/5016	2	Camera, F96, Mk.1, 24 in. lens	139.00	+17.45	+2426
211C	14A/5012	2	Camera, F96, Mk.1, 48 in. lens	149.00	- 7.00	- 1043
211C	14A/5012	2	Camera, F96, Mk.1, 48 in. lens	149.00	+17.45	+2600
211aC	14A/5012	1	Camera, F96, Mk.1, 48 in. lens	74.5	- 7.00	-522
212C	14A/4861	1	Intervalometer, F96, Mk.1, c/w wedge plate adaptor	2.75	-21.82	- 60
213C	14A/4682	1	Control, image movement, F96 Mk.1	0.50	-22.75	- 11
214C	14A/4849	2	Magazine, F96, Mk.1, 500 ft.	126.00	- 7.00	-882
214C	14A/4849	2	Magazine, F96, Mk.1, 500 ft.	126.00	+17.45	+2198
215C/6C	EB8-83-989/91	2	Mounting for F96 cameras	47.00	- 7.00	-329
218C/9C	EB8-83-993/5	2	Mounting for F96 cameras	44.00	+17.45	+ 768
217C	EB8-83-2345	1	Mounting, adjustable	91.00	- 6.98	- 635
214aC	14A/4850	1	Magazine, F96, Mk.1 250 ft.	45.00	- 7.00	- 315
	◀ 14A/1935061	1	Camera F96 Mk.1 (12 in. lens) c/w 250 ft. magazine.	96.00	+23.00	+2208
	14A/1935061	1	Camera F96 Mk.1 (12 in. lens) c/w 500 ft. magazine.	113.00	+23.00	+2599
	14A/193507	1	Camera F96 Mk.1 (6 in. lens– c/w 250 ft. magazine.	89.00	+23.00	+2047
	14A/193507	1	Camera F96 Mk.1 (6 in. lens– c/w 500 ft. magazine.	106.00	+23.00	+2438
	CAN/0491/STC (Part)		Adaptor structure for F96 camera.	19.00	+23.00	+ 437 ▶

Table 4 - COMPREHENSIVE LIST OF VARIABLE LOAD ITEMS (contd)

Appendix 'A' Item	Ref.No. or Part No.	Qty.	Description	Weight lb.	Arm ft.	Moment lb. ft.
<u>F97 Cameras</u>						
222C	14A/4592	2	Cameras, F97, Mk.2	28.00	- 6.81	- 191
225C	14A/4276	1	Control, camera, Type F97, Mk.2	4.00	-21.08	- 84
227C	26FZ/14093	1	Cradle, (port) Assy. drg. No. EB8.83.581	4.44	- 7.05	- 31
228C	26FZ/14094	1	Cradle, (stbd) Assy. drg. No. EB8.83.583	4.44	- 7.05	- 31
228aC	14A/3468	1	Drive, flexible	1.17	- 6.81	- 8
228bC	14A/4594	2	Magazine, Type F97, Mk.2	22.00	- 6.81	- 150
<u>◀ Miscellaneous equipment</u>						
1A	EA2-97-5003	1	Auxiliary beam	185.00	+ 9.21	+ 1704
27A-31A	EA2-97-5001	1	Crate, discharger container	817.50	+10.12	+ 8273
			Crate, discharger container (lightweight)	200.00	+10.12	+ 2024
	AGS.650	70	Ballast weight	700.00	-15.00	- 10500 ▶
92D	27C/2379	2	Allowance for survival packs, Type 'A' equipped to scale 'B' in A.P.108E-0601-1 and 0602-1	60.00	+25.73	+ 1544

Note:

The weight of 27C/2379 will vary according to the scale chosen in above mentioned publication.

TABLE 5
EXPENDABLE LOAD ITEMS

Appendix 'A' Item	Ref.No. or Part No.	Qty.	Description	Weight Lb.	Arm ft.	Moment lb. ft.
			◀ Fuel at 8 lb. per gal:—			
-	-	-	Fuel, No.1 tank, 260 gal. (top tank)	2080.00	- 4.240	- 8819
-	-	-	Fuel, No.2 tank, 260 gal. (top tank)	2080.00	- 1.554	- 3232
-	-	-	Fuel, No.3 tank, 220 gal. (top tank)	1760.00	+0.972	+1711
-	-	-	Fuel, No.4 tank, 220 gal. (top tank)	1760.00	+3.328	+5857
-	-	-	Fuel, No.5 tank, 540 gal. (rear tank)	4320.00	+9.127	+39429
-	-	-	Fuel, No.6 tank, 372 gal. (belly tank)	2976.00	- 1.571	- 4675
-	-	-	Fuel, collector box, 45 gal. (belly tank)	360.00	+2.640	+ 950
-	-	-	Fuel, integral tanks, 856 gal. (wing tank)	6848.00	+2.183	+14950 ▶
TOTAL FOR FUEL IN WINGS AND FUSELAGE				22184.00		+46171
-	EB8-20-5357/8	2	Wing-tip tanks and fairings (incl. explosive bolts and detonators)	282.00	+4.465	+1259
-	-	-	Fuel, wing-tip tanks, 488 gal. at 8 lb/gal	3904.00	+3.878	+15140
TOTAL FOR WING-TIP TANKS & WING-TIP TANKS FUEL				4186.00		+16399
PHOTOGRAPHIC CARTRIDGES						
◀ 37A	12D/1271	252	Photoflashes, 1¼ in. No.2, Mk.1 (1.24 lb. each)	313.00	+ 10.12	+3168
		60	Photoflashes 1¼ in. No. 2 Mk.1 (1.71 lb. each)	103.00	+ 10.12	+1042 ▶

TABLE 6-ROLE AI EQUIPMENTDAY HIGH ALTITUDE PHOTO RECONNAISSANCE(F49 CAMERA, 6in. LENS & F96 CAMERAS, 48in. LENS.)

APPENDIX 'A' ITEM	REF. NO. or PART NO.	QTY.	DESCRIPTION	WEIGHT LB.	ARM FT.	MOMENT LB. FT.
171C or 172C	14A/1989727 or 14A/1989732	1	Camera, F49, Mk.2, 6in. lens.....	53.00	+23.00	+1219
174C	14A/5852	1	Adaptor for F49 Mk.2 camera, 6in. lens...	2.50	+23.00	+ 58
176C or 177C	14A/4331 or 14A/1985642	1 or	Magazine, Type F49, Mk.2, 200 exp..... Magazine, Type F49, Mk.2, 250 ft.....	22.00 40.00	+23.00 +23.00	+ 506 + 920
178C	14A/5851	1	Mounting, Type 125.....	21.50	+23.00	+ 495
211C	14A/5012	2	Camera, F96, Mk.1, 48in. lens.....	149.00	- 7.00	-1043
211C	14A/5012	2	Camera, F96, Mk.1, 48in. lens.....	149.00	+17.45	+2600
212C	14A/4861	1	Intervalometer, F96, Mk.1, c/w wedge plate adaptor	2.75	-21.82	- 60
213C	14A/4862	1	Control, image movement, F96, Mk.1	0.50	-22.75	- 11
214C	14A/4849	2	Magazine, F96, Mk.1, 500ft.....	126.00	- 7.00	- 882
214C	14A/4849	2	Magazine, F96, Mk.1, 500ft	126.00	+17.45	+2198
215C/6C	EB8-83-989/91	2	Mounting for F96 camera	47.00	- 7.00	- 329
218C/9C	EB8-83-993/5	2	Mounting for F96 camera	44.00	+17.45	+ 768
22D	27C/2379	2	Allowance for aircraft survival packs	60.00	+25.73	+1544
Total - Role AI with 200 exposures loaded in F49 camera				803.25	◀ +8.79 ▶	+7063
Total - Role AI with 250ft. mag. loaded in F49 camera				821.25	◀ +9.10 ▶	+7477

TABLE 7-ROLE A2 EQUIPMENT

DAY HIGH ALTITUDE PHOTO RECONNAISSANCE

(F49 CAMERA, 6in. LENS & F96 CAMERAS, 24in. LENS)

APPENDIX 'A' ITEM	REF. No. or PART NO.	QTY	DESCRIPTION	WEIGHT		ARM		MOMENT	
				LB.		FT.		LB.	FT.
171C or 172C	14A/1989727) or) 14A/1989732)	1	Camera, F49, Mk.2, 6in. lens	53.00		+23.00		+1219	
174C	14A/5852	1	Adaptor for F49, Mk.2. camera 6in. lens	2.50		+23.00		+ 58	
176C	14A/4331	1	Magazine, Type F49, Mk.2, 200 exp.....	22.00		+23.00		+ 506	
177C	14A/1985642	1	Magazine, Type F49, Mk.2, 250 exp.....	40.00		+23.00		+ 920	
178C	14A/5851	1	Mounting, Type 125	21.50		+23.00		+ 495	
210C	14A/5016	2	Camera, F96, Mk.1, 24in. lens	139.00		- 7.00		- 973	
210C	14A/5016	2	Camera, F96, Mk.1, 24in. lens	139.00		+17.45		+2426	
212C	14A/4861	1	Intervalometer, F96, Mk.1, c/w wedge plate adaptor	2.75		-21.82		- 60	
213C	14A/4862	1	Control, image movement, F96, Mk.1.	0.50		-22.75		- 11	
214C	14A/4849	2	Magazine, F96, Mk.1, 500 ft.	126.00		- 7.00		- 882	
214C	14A/4849	2	Magazine, F96, Mk.1, 500 ft.	126.00		+17.45		+2198	
215C/6C	EB8-83-989/91	2	Mounting for F96 camera, Assy. Drg. No. EB8-83-989/91	47.00		- 7.00		- 329	
218C/9C	EB8-83-993/95	2	Mounting for F96 camera	44.00		+17.45		+ 768 ⁸	
92D	27C/2379	2	Allowance for aircraft survival packs	60.00		+25.73		+1544	
Total - Role A2 with 200 exposures loaded in F49 camera				783.25		◀ + 8.88 ▶		+6959	
Total - Role A2 with 250 ft. mag. loaded in F49 camera				801.25		◀ + 9.20 ▶		+7373	

TABLE 8-ROLE A3 EQUIPMENT
DAY LOW LEVEL OBLIQUE PHOTO RECONNAISSANCE
(F95 CAMERAS, 12 in. LENS)

APPENDIX 'A' ITEM	REF.NO. or PART NO.	QTY.	DESCRIPTION	WEIGHT LB.	ARM FT.	MOMENT LB. FT.
202C & 203C	14A/) 14A/4656)	1	Camera, F95, Mk.2, 12 in. lens, c/w loaded magazine	18.36	-23.60	- 433
202C & 203C	14A/) 14A/4656)	2	Camera, F95, Mk.2, 12 in. lens, c/w loaded magazine	36.72	-16.98	- 624
207C	26FZ/32579	1	Camera base plate, Assy. Drg. No. EB8-83-1597	1.23	-23.60	- 29
207C	26FZ/32579	2	Camera base plate, Assy. Drg. No. EB8-83-1597	2.46	-16.98	- 42
92D	27C/2379	2	Allowance for aircraft survival packs	60.00	+25.73	+1544
Total - Role A3				118.77	◀ + 3.50 ▶	+ 416

TABLE 9-ROLE A4 EQUIPMENT
DAY LOW LEVEL OBLIQUE PHOTO RECONNAISSANCE
(F95 CAMERAS, 4 in. LENS)

202C & 204C	14A/ 14A/4557	1	Camera, F95, Mk.2, 4 in. lens c/w loaded magazine	16.00	-23.60	- 378
202C & 204C	14A/ 14A/4557	2	Camera, F95, Mk.2, 4 in lens c/w loaded magazine	32.00	-16.98	- 543
209C	FB8-83-2371	1	Camera base plate	2.65	23.00	- 63
208C	EB8-83-2339	2	Camera base plate	2.80	-16.98	- 48
92D	27C/2379	2	Allowance for aircraft survival packs	60.00	+25.73	+1544
Total - Role A4				113.45	◀ + 4.51 ▶	+ 512

TABLE 11A - ROLE A7 EQUIPMENT

DAY PHOTO RECONNAISSANCE

(F49 CAMERA, 12 IN. LENS, F95 CAMERAS, 4 IN. LENS
& F96 CAMERAS, 48 IN. LENS)

APPENDIX 'A' ITEM	STORES REF. OR PART NO.	QTY.	DESCRIPTION	WEIGHT LB.	ARM FT.	MOMENT LB. FT.
1A	EA2-97-5003	1	Auxiliary beam	185.00	+ 9.21	+1704
173C	14A/1989728	1	Camera, F49, Mk.3, 12 in. lens	65.00	+23.00	+1495
175C	14A/5853	1	Adaptor for F49, Mk.3 camera, 12 in. lens	5.00	+23.00	+ 115
176C	14A/4331	1	Magazine, Type F49, Mk.2, 200 exp.	22.00	+23.00	+ 506
or	or		or			
177C	14A/1985642	1	Magazine, Type F49, Mk.2, 250 ft.	40.00	+23.00	+ 920
178C	14A/5851	1	Mounting, Type 125	21.50	+23.00	+ 495
202C	14A/)	1	Camera, F95, Mk.2, 4 in. lens, c/w loaded			
&204C	14A/4557)		magazine	16.00	-23.60	- 378
202C	14A/)	2	Camera, F95, Mk.2, 4 in. lens, c/w loaded			
&204C	14A/4557)		magazine	32.00	-16.98	- 543
209C	EB8-83-2371	1	Camera base plate.....	2.65	-23.60	- 63
208C	EB8-83-2339	2	Camera base plate.....	2.80	-16.98	- 48
211C	14A/5012	1	Camera, F96, Mk.1, 48 in. lens	74.50	- 7.00	- 522
211C	14A/5012	2	Camera, F96, Mk.1, 48 in. lens	149.00	+17.45	+2600
212C	14A/4861	1	Intervalometer, F96, Mk.1, c/w wedge	2.75	-21.82	- 60
			plate adaptor			
213C	14A/4862	1	Control, image movement, F96, Mk.1	0.50	-22.75	- 11
214C	14A/4849	1	Magazine, F96, Mk.1, 500 ft.	63.00	- 7.00	- 441
214C	14A/4849	2	Magazine, F96, Mk.1, 500 ft.	126.00	+17.45	+2198
215C	EB8-83-989	1	Mounting for F96 camera	23.50	- 7.00	- 165
218C/9C	EB8-83-993/5	2	Mounting for F96 camera	44.00	+17.45	+ 768
92D	27C/2379	2	Allowance for aircraft survival packs	60.00	+25.73	+1544
Total - Role 7 with 200 exposures loaded in F49 camera				895.2	◀ +10.27 ▶	+9194
Total - Role 7 with 250 ft. mag. loaded in F49 camera				913.2	◀ +10.52 ▶	+9608

TABLE 12 ROLE B1 EQUIPMENT

DAY SURVEY

◀ F49 CAMERA (12 in lens) or F96 CAMERA (12 in lens)

APPENDIX 'A' ITEM	REF. NO. OR PART NO.	QTY	DESCRIPTION	WEIGHT LB.	ARM FT.	MOMENT LB. FT.
173C	14A/198978	1	Camera Type F49 Mk.3 (12 in lens)	65.00	+23.00	+1495
175C	14A/5853	1	Adapter for F49 Mk.3 camera (12 in lens)	5.00	+23.00	+ 115
176C	14A/4331	1	Magazine Type F49 Mk.2 (200 exp.)	22.00	+23.00	+ 506
or	or		or			
177C	14A/1985642	1	Magazine Type F49 Mk.2 (250 ft.)	40.00	+23.00	+ 920
178C	14A/5851	1	Mounting Type 125	21.50	+23.00	+ 495
			Alternatively:-			
	14A/1935061)	1	Camera Type F96 (12 in lens)			
	14A/1935154)	1	Complete with:-	96.00	+23.00	+2208
	14A/1938529	1	Magazine Type F96 (250 ft.)			
	or					
	14A/1935061)	1	Camera Type F96 (12 in. lens)	113.00	+23.00	+2599
	14A/1935154)	1	Complete with:-			
	14A/1938527	1	Magazine Type F96 (500 ft.)			
	14A/4862	1	Control image movement F96	0.50	-22.75	- 11
	CAN/0491/STC(Part)	1	Adapter structure for F96 camera	19.00	+23.00	+ 437
92D	27C/2379	2	Allowance for aircraft survival packs	60.00	+25.73	+1544
TOTAL ROLE B1 with 200 exposures loaded in F49 camera				173.50	+23.95	+4155
TOTAL ROLE B1 with 250 ft. loaded in F49 camera				191.50	+23.86	+4569
TOTAL ROLE B1 with 250 ft. loaded in F96 camera				175.50	+23.81	+4178
TOTAL ROLE B1 with 500 ft. loaded in F96 camera				192.50	+23.74	+4569 ▶

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TABLE 13 ROLE B2 EQUIPMENT
DAY SURVEY

◀ F49 CAMERA (6 in. lens) or F96 CAMERA (6 in. lens)

APPENDIX 'A' ITEM	REF. NO. or PART NO.	QTY.	DESCRIPTION	WEIGHT LB.	ARM FT.	MOMENT LB. FT.
171C	14A/1989727)			53.00	+23.00	+1219
172C	or 14A/1989732)	1	Camera Type F49 Mk.2 (6 in. lens)			
174C	14A/5852	1	Adapter for F49 Mk.2 (6 in. lens) camera	2.50	+23.00	+ 58
176C	14A/4331	1	Magazine Type F49 Mk.2 (200 exp.)	22.00	+23.00	+ 506
or	or		or			
177C	14A/1985642	1	Magazine Type F49 Mk.2. (250 ft.)	40.00	+23.00	+ 920
178C	14A/5851	1	Mounting Type 125	21.50	+23.00	+ 495
			Alternatively:-			
	14A/193507)		Camera Type F96 (6 in. lens)			
	14A/193154)	1	Complete with:-	89.00	+23.00	+2047
	14A/1938529	1	Magazine Type F96 (250 ft.)			
	or		or			
	14A/1935051)	1	Camera Type F96 (6 in. lens)	106.00	+23.00	+2438
	14A/1935154)		Complete with:-			
	14A/1938527	1	Magazine Type F96 (500 ft.)			
213C	14A/4862	1	Control image movement F96	0.50	-22.75	- 11
	CAN/0491/STC(Part)		Adapter structure for F96	19.00	+23.00	+ 437
	27C/2379	2	Allowance for aircraft survival packs	60.00	+25.73	+1544
TOTAL ROLE B2 with 200 exposures loaded in F49 camera				159.00	+24.04	+3822
TOTAL ROLE B2 with 250 ft. loaded in F49 camera				177.00	+23.93	+4236
TOTAL ROLE B2 with 250 ft. loaded in F96 camera				168.50	+23.84	+4017
TOTAL ROLE B2 with 500 ft. loaded in F96 camera				185.50	+23.76	+4408 ▶

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TABLE 14-ROLE B3 EQUIPMENT
DAY SURVEY (F49 MK.4 CAMERA PACK)

APPENDIX 'A' ITEM	REF. NO. OR PART NO.	QTY	DESCRIPTION	WEIGHT LB.	ARM FT.	MOMENT LB. FT.
183C	EB8-83-2401	1	G.A. of F49 Mk.4 camera pack	269.57	+ 8.60	+2318
19aA	EB8-83-2403	1	G.A. of adaptor beam	26.83	+ 8.68	+ 233
185C	EB8-81-6193	1	G.A. of camera control box c/w wiring	11.55	-20.17	- 233
184C	14A/6463	1	Mounting, Type 133	43.00	+ 8.38	+ 360
181C	14A/1062902	1)	Camera, F49, Mk.4, c/w magazine	174.00	+ 8.39	+1460
182C	14A/1062904	1)				
	◀ EA2-97-5003	1	Auxiliary beam	185.00	+ 9.21	+1704
			MOD 4254			
			Part 'B' Modified flare doors	11.67	+12.42	+ 145
			MOD 4254			
			Part 'C' Aperture fairings (To be fitted when part 'C' remains on the aircraft and the above equipment is removed)	60.20	+ 9.47	+ 570
	27C/2379	2	Allowance for aircraft survival packs	60.00	+25.73	+1544
	ROLE B3	WITH	MOD 4254 Part B fitted	781.62	+ 9.64	+7531 ▶



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TABLE 15 ROLE D EQUIPMENT
NIGHT LOW ALTITUDE
F97 CAMERAS

APPENDIX 'A' ITEM	REF. NO. or PART NO.	QTY.	DESCRIPTION	WEIGHT LB.	ARM FT.	MOMENT LB. FT.
1A	EA2-97-5003	1	Auxiliary beam	185.00	+9.21	+1704
22A	11A/4715	1	Release unit No. 3	11.25	+9.63	+ 108
27A-31A	EA2-97-5001	1	Crate, discharger container	817.50	+10.12	+8273
			or			
		◀ 1	Crate, discharger container - lightweight.	200.00	+10.12	+2024 ▶
223C	14A/4276	1	Control, camera, Type F97 Mk.2	4.00	+21.08	- 84
227C	26FZ/14093	1	Cradle (Port) Assy Drg. No. EB8-83-581	4.44	- 7.05	- 31
228C	26FZ/14094	1	Cradle (Starbd) Assy Drg. No. EB8-83-583	4.44	- 7.05	- 31
228aC	14A/4592	2	Camera F97 Mk. 2	28.00	- 6.81	- 191
228bC	14A/3468	1	Drive flexible	1.17	- 6.81	- 8
92D	14A/4594	2	Magazine, Type F97 Mk. 2.	22.00	- 6.81	- 150
	27C/2379	2	Allowance for aircraft survival packs	60.00	+25.73	+1544
◀ TOTAL - ROLE D			With crate, discharger container (Excluding photo flashes)	1137.8	+ 9.78	+11134
TOTAL - ROLE D			With crate, discharger - lightweight (Excluding photoflashes)	.520.3	+ 9.39	+4885 ▶

◀ TABLE 16 ▶ - REMOVABLE EQUIPMENT INTRODUCED UNDER MOD. 4839 Pt A

Appendix 'A' Ref.	Ref. No. or Part No.	Quantity	Description	Weight lb.	Arm ft.	Moment lb. ft.
	EB8-84-501	1	Front fairing assembly	27.00	+ 5.45	+ 146
	EB8-84-401	1	Rear fairing assembly	38.00	+13.75	+ 523
	EB8-84-107	1	Equipment container (less unit)	◀ 550.00	+ 9.80	+5390 ▶
	EB8-84-805	1	Camera F95 Mk. 4	15.00	+ 6.98	- 105
	EB8-84-645	1	Control unit	9.79	-20.42	- 200
		1	◀ Removable unit (typical) ▶	465.00	+ 8.59	+3994
		2	Flare doors etc.	240.00	+10.40	+2496
ASSOCIATED ROLE EQUIPMENT:-						
92D	27C/2379	2	Allowance for Survival Packs	60.00	+25.73	◀ +1544 ▶

TABLE 17 - REMOVABLE EQUIPMENT INTRODUCED UNDER MOD. 4839 Pt. B - SERIAL No. XH134 ONLY

Appendix 'A' Ref.	Ref. No. or Part No.	Quantity	Description	Weight lb.	Arm ft.	Moment lb. ft.
	EB8-92-3537	1	Conditioning unit	19.50	- 7.40	- 144
	EB8-92-3537	1	Recorder unit	15.50	- 6.50	- 101
	EB8-92-3537	1	Oscillograph (Std. Mag)	145.00	- 7.00	-1015
	EB8-92-3537	1	Hygrometer control	5.75	- 4.75	- 27
	EB8-92-3537	1	Multiplexing unit	9.00	-20.42	- 200

Chapter 3B PROCEDURE FOR WEIGHING

LIST OF CONTENTS

	<i>Para.</i>		<i>Para.</i>		<i>Para.</i>
<i>General</i>	1	<i>Equipment</i>	2	<i>Procedure</i>	3
General		Adapter (jack to unit), 4G/5050		(2) Place locally-made wooden blocks under the nose and main wheels, one block under each wheel. The blocks must be of sufficient height to give the necessary clearance for positioning the weighing equipment.	
1. Detailed information on aircraft weighing is given in A.P.4747A, Sect. 1, Chap. 1. Hydrostatic weighing units and ancillary equipment are dealt with in A.P.4747A, Sect. 1, Chap. 2.		Adapter (unit to aircraft), 4G/4902		(3) Remove the lifting jacks.	
Equipment		<i>At nose undercarriage</i>		(4) Position the equipment (<i>para.</i> 2). Use the normal jacking points at the main wheels, and the axle between the wheels at the nose wheels.	
2. The following hydrostatic weighing equipment is required in addition to the normal jacking equipment called for in Sect. 2, Chap. 4.		10-ton hydrostatic unit, 4G/4894		(5) Proceed with the weighing operation as in A.P.4747A.	
<i>At each main wheel</i>		8-ton jack, 4Q/2667			
25-ton hydrostatic unit, 4G/4895		Adapter (jack to unit), 4G/5063			
15-ton jack, 4Q/2657		Adapter (unit to aircraft), 4G/5065			
		Procedure			
		3. To weigh the aircraft using hydrostatic units:—			
		(1) Lift the aircraft by jacking at each main plane and at the front fuselage (<i>Sect. 2, Chap. 4</i>).			

Chapter 3C FATIGUE INDEX DATA

(New chapter introduced)

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Aircraft without fatigue meters	6		
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Changes in recording to be made on fitment of a fatigue meter	8		

INTRODUCTION

General

1. The fatigue index is defined as a figure indicating the fatigue consumption of an aircraft as obtained from the application to the fatigue formula of fatigue-meter readings or other assessments. It follows that the fatigue index figure will be inaccurate if recording is slovenly or should the fatigue meter be unserviceable. It is imperative that all personnel are aware of these two vital aspects to the conservation and safety of aircraft.

Assessing consumption of fatigue index

2. The most accurate method of determining the fatigue index consumed is by using a fatigue meter. This instruction includes a number of counters which indicate when 'g' thresholds are exceeded.

The substitution of the 'g' counts in a formula gives the fatigue index consumed for the period concerned. There may be several formulae for one type of aircraft to correspond with different all-up weights, different weight distribution or different marks of fatigue meter fitted.

Unmetered flying

3. Unless a fatigue meter is fitted to the aircraft, or when an installed fatigue meter is unserviceable, fatigue consumption is assessed from details of the flying carried out. Different types of manoeuvre impose varying loads on the aircraft and it is necessary to break down the flying carried out into the various sortie patterns expected in service. The particular theatre of operations may also affect the fatigue consumption of an aircraft and, in such cases, a separate factor of formula will be quoted

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for each theatre. It is then possible for the design authority to estimate a fatigue index consumption rate for each sortie pattern. Because fatigue damage estimates based on sortie patterns are derived from the average expected loadings, the rates are factored to allow for 'worst case' situations. Thus, fatigue consumption assessed on a sortie pattern basis is extravagant when compared with the more accurate fatigue meter based index. Hence, it is essential that priority is always given to the replacement of defective fatigue meters.

Recording fatigue consumption data

4. The consumption of fatigue index is recorded on Form 700 and Form 4832A or B, as appropriate. Instructions for compilation in the Form 700 are contained in the General Instructions for that form; the Forms 4832A and B are to be kept in the Form 4832, a manilla folder expressly designed for the purpose. All personnel responsible for the collection and compilation of fatigue data should appreciate the need for accuracy, neatness and legibility of the entries. Careless or incomplete recording is dangerous if it causes a less damaging sortie to be assumed and it is wasteful if, in the interests of safety, the worst case has to be assumed. In extreme cases, continued careless or incomplete recording can result in the expensive premature removal of an aircraft from service because of doubt regarding the true situation. Examples of correct and bad recording are shown on A.D.101A-1200-D1 - Aircraft Fatigue Recording.

Aircraft with fatigue meters

5. The fatigue data for aircraft fitted with fatigue meters is to be recorded on Form 4832A or Form 700. In respect of Form 4832A, the aircraft captain is responsible for action in the columns (a) to (1). The responsibility for reading the meter and

completing columns (n) to (ad) may rest with either a crew member or servicing personnel depending on the type of aircraft. The Unit Engineering Records Section is responsible for calculating the fatigue index consumed. The attention of all personnel responsible for reading fatigue meters is to be drawn to the serviceability checks described in A.P.112G-0203-1, Chap.2 - Fatigue Meters.

Aircraft without fatigue meters

6. The captain of the aircraft is responsible for the accuracy of columns (a) to (1) in Form 4832B or Form 700 and the Unit Engineering Records Section is responsible for completing the cumulative totals, factorizing the flying hours and expressing the life used as the fatigue index.

Refining of fatigue index

7. When the fatigue records for an aircraft show that its fatigue index is 80, action is to be taken in accordance with A.P.3158, Vol.2, Leaflet C6.

Changes in recording to be made on fitment of a fatigue meter

8. On fitment of a fatigue meter it will be necessary to obtain the fatigue index already consumed from the last Form 4832B and carry it forward to the first Form 4832A which will be brought into use on fitment of the meter.

APPLICATION

Critical component

9. The component governing the fatigue life of the Canberra aircraft is the centre section forging and the basic design requirement for the mainplanes is such that they shall have a fatigue life at least

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equal to that of the forging. When an aircraft is fitted with a new centre section forging the fatigue life data is to carry on as if the original forging had been retained because the max fatigue life of an aircraft with a new centre section forging has not been tested.

Fatigue life consumption

10. The method of expressing, calculating and recording the fatigue life consumption will depend on whether or not the aircraft is fitted with a fatigue meter.

Aircraft without fatigue meters

11. The datum fatigue index for Canberra aircraft is 20 000 hours but a role factor must be applied to the hours flown. The factors by which hours flown in each role must be multiplied to give the measure of the fatigue index consumed, as compared to the datum fatigue index are:-

Role	Factor
High altitude flying	1.0
Squadron training	3.4
Low-level reconnaissance	9.8
High/low/high sorties	2.1

Aircraft with fatigue meters

12. The fatigue meter formulae are based on the wing integral fuel tanks being full at take-off and the fuel used as instructed in Pilot's Notes. The formulae for determining the percentage of fatigue index consumed for aircraft fitted with Mk. 3C, Mk. 13 or Mk. 16 fatigue meters are as follows:-

Mk. 3C fatigue meter

$$\frac{\text{Fatigue life index - } 45(F)+19(E)+2.35(D)+0.0(C)+0.33(B)+7.7(A)}{1000}$$

Where:-

- A is number of counts recorded in meter window marked 0.0
- B is number of counts recorded in meter window marked 0.6
- C is number of counts recorded in meter window marked 1.4
- D is number of counts recorded in meter window marked 2.0
- E is number of counts recorded in meter window marked 3.0
- F is number of counts recorded in meter window marked 4.0

Mk. 3C fatigue meter

Fatigue life index -

$$\frac{61.0(H)+29.5(G)+7.6(F)+0.98(E)+0.0(D)+1.15(C) + 4.1(B)+10.17(A)}{1000}$$

Where:-

- A is number of counts recorded in meter window marked -0.5
- B is number of counts recorded in meter window marked +0.1
- C is number of counts recorded in meter window marked +0.5
- D is number of counts recorded in meter window marked +1.5
- E is number of counts recorded in meter window marked +1.9
- F is number of counts recorded in meter window marked +2.5
- G is number of counts recorded in meter window marked +3.5
- H is number of counts recorded in meter window marked +4.5

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Mk.16 fatigue meter

Fatigue life index -

$$\frac{54.0(H)+54.0(G)+29.5(F)+7.8(E)+0.86(D)+0.0(C)+1.15(B)+5.2(A)}{1000}$$

Where:-

- A is number of counts recorded in meter window marked +0.1
- B is number of counts recorded in meter window marked +0.5
- C is number of counts recorded in meter window marked +1.5
- D is number of counts recorded in meter window marked +1.9
- E is number of counts recorded in meter window marked +2.5
- F is number of counts recorded in meter window marked +3.5
- G is number of counts recorded in meter window marked +4.5
- H is number of counts recorded in meter window marked +5.1

Recording

13. Fatigue index consumption is to be recorded in accordance with the Introduction, with the following additional requirements:-

- (1) When a Mk.13 or Mk.16 fatigue meter is fitted a new FDS 2, amended to provided for the 8 acceleration thresholds, is to be opened. If a Mk.3C meter is subsequently fitted in its place, the 8-column FDS 2 should be closed and a new 6-column form opened.
- (2) Fatigue data record sheets are to be submitted to Ministry of defence (Air), DD Mech. Eng.1 (R.A.F.) for a refined assessment of residual life when fatigue index 50 for the aircraft has been reached, as well as at the fatigue index 80 point.

Chapter 4 GENERAL SERVICING

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	Table		Table
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1. This chapter provides information which is of general use in servicing the aircraft. Servicing instructions for the individual systems and components are given in the appropriate Sections of this volume. The information whether given in this chapter or elsewhere, does not cover all the servicing operations that may be involved. It is only intended to implement the Servicing Schedule.

Ground equipment

2. Listed in Table 1 and 2 are tools and ground equipment for use when handling and servicing this aircraft. The list does not include items listed in Appendix A, nor items of standard equipment normally supplied to all R. A. F. units.

Aircraft compartments and fuselage servicing entrances.

3. The various compartments into which the aircraft is divided are shown in fig. 1; the names given to the compartments in this illustrations are used throughout this publication to facilitate location of components. Entry to the pressurised cabin and the pilot's station is described in the appropriate chapters of Section 1, and access to the engine installation and fuel tanks is dealt with in Section 4. Entry to other fuselage compartments is described in the following paragraphs.

Main equipment compartment

4. Entry to this compartment is obtained by removing a door in the starboard side of the fuselage. The door is secured at the base by two-draw bolts operated by a standard flush fitting lock and at the top by two fixed pegs. To remove the door, release and turn the lock handle to withdraw the lower bolts and then pull the door outwards to disengage the pegs at the top.

Port and starboard equipment compartments

5. Access to each of these compartments is obtained by opening a door hinged at its lower edge to the fuselage side. The door is secured in the closed position by two draw-bolts operated by a standard flush-fitting lock.

Forward camera compartment

6. Access to this compartment for servicing and inspection is obtained by removing the door fitted centrally in the base of the fuselage between port and starboard hinged fairings. The door is secured by six draw-bolts operated by two flush-fitting locks. The fairings may also be opened by releasing the Custodian type fasteners and countersunk bolts along the forward and aft edges of the fairings. Before opening the port fairing beyond the vertical position the flexible hydraulic piping must be broken at the Avery couplings. For camera installation and removal the starboard fairing must be swung fully back and held in this position by inserting the ball end of the fairing retaining cable in the socket on the fuselage side.

Flare bay

7. To open the flare bay doors when the engines are stopped, the procedure is as follows: ensure that an electrical supply is available, select OPEN on the flare bay doors selector switch and operate the hand pump in the pilot's station until the doors are fully open. To prevent injury to personnel during servicing operations in the flare bay, the flare bay door switch must be locked in the open position, by means of the spring-loaded catch provided (Sect. 2, Chap. 1), immediately after opening the flare bay doors and before commencing any servicing operations in the flare bay.

Rear fuselage access hatch

8. This hatch provides access to the mid camera and radar compartments in the centre fuselage and to the rear fuselage compartment which includes the rear camera compartment. The hatch cover is hinged about its port edge and opens outward, the cover being secured in the closed position by seventeen Fairey-type fasteners. A safety strap attached to the cover and to the fuselage structure prevents the edge of the cover from making contact with the ground when the aircraft is heavily loaded.

Access panels (fig. 2 and 3)

9. Certain panels are secured by screws having concave slots in their heads and a specially ground screwdriver having a convex blade, must be used to remove and insert these screws. When securing the panels, ensure that the correct type of screw is used, as in certain comparatively thin skin areas 120 deg. csk/hd. screws are used. Where fasteners are used to secure a panel, a black line is painted on the aircraft adjacent to each fastener to indicate the locked position.

Drainage holes (fig. 4)

10. These holes must always be kept free from obstruction, especially those in the jet pipe cowlings.

Jacking

Jacking procedure (fig. 5)

11. The aircraft may be raised by three jacks, positioned one under each main plane in line with the engine nacelles (item No. 17 of fig. 2) and one on the port side of the fuselage nose (item No. 53 of fig. 3) as indicated on fig. 5. At the main plane positions the jack adapter heads fit into sockets permanently fitted to the main spar, and at the fuselage nose position a

removable spigot is screwed into a socket in the structure, below the pilot's canopy, to which the adapter head of the jack fits.

- ◀ Before jacking the aircraft in the open, consideration must be given to the effect of wind velocity and direction relative to the aircraft position angle. A graph of the limitations imposed is given in fig. 5A. ▶

12. The jacking sequence is as follows:-

- (1) Using the special spanner, remove the plug from the jacking socket in the front fuselage port side and fit the nose jacking spigot tightening it with a tommy bar through the hole provided in the ball end of the spigot.
- (2) Unfasten the hinged panels in the jet pipe cowlings to expose the main plane jacking sockets.
- (3) Prepare the main plane jacks and fit the adapter heads; position the jacks under each main jacking socket.

Note...

The main plane jacks must be positioned with the jack body vertical and with the adjustable legs parallel to the lateral axis of the aircraft.

- (4) Prepare the front fuselage jack and fit the adapter head; position the jack at the nose jacking spigot and extend the jack sufficiently to enable the adapter head to be secured to the spigot.

Note...

The front fuselage jack must be positioned with the jack body vertical and adjustable legs parallel to the longitudinal axis of the aircraft.

- (5) Operate the jacks to raise the aircraft, jacking at the main plane slightly in advance of the front fuselage jack.
- (6) Level the aircraft as described in para. 18 or 19.
- (7) When the aircraft has been raised sufficiently,

the rear fuselage must be supported, if called for, at the rear fuselage rear trestling position, as shown in Sect. 3, Chap. 1.

Note. . .

When the aircraft has been lowered to the ground after jacking it should be rocked to allow the shock absorbers to settle.

Stores loading (fig. 6)

13. The method of jacking the aircraft for loading stores in the flare bay is as follows :-

- (1) Ensure that the aircraft is positioned on level ground with a firm foundation.
- (2) Position chocks fore-and-aft of the nose-wheel.
- (3) Position jacks (Ref. No. 4Q/2657) and adapters (Ref. No. 26FZ/95449) at the main wheel lifting points.
- (4) Raise the aircraft to the minimum height required to allow the loaded trolley to be positioned under the flare bay.

Main wheel changing (fig. 6)

14. The method of jacking for main wheel changing is as follows:-

- (1) Ensure that the aircraft is positioned on level ground with a firm foundation.
- (2) Place chocks fore-and-aft of each wheel.
- (3) Place the jack (Ref. No. 4Q/2657) with its adapter head (Ref. No. 4Q/2321) and main wheel changing bracket (Ref. No. 26FZ/95413) in position.
- (4) Raise the aircraft just clear of the ground.

Nose wheel changing (fig. 6)

15. To jack the aircraft for nose wheel changing:-

- (1) Ensure that the aircraft is positioned on level ground with a firm foundation.
- (2) Using a spanner (Ref. No. 26FZ/95065) remove the plug from the socket in the nose fuselage, and insert and tighten the jacking spigot (Ref. No. 26FZ/95004).
- (3) Place chocks fore-and-aft of the main wheels and release the brakes.
- (4) Place a jack (Ref. No. 4Q/2232) and adapter (Ref. No. 4Q/2627) under the nose spigot, and raise until the nose wheels are just clear of the ground.
- (5) Support the fuselage at the rear fuselage rear trestling position as shown in Sect. 3, Chap. 1.

Dismantling the aircraft

16 The sequence of dismantling an aircraft is given below; detailed information on the removal of individual components is given in the appropriate chapters of Sections 3 and 4.

- (1) Remove the engines and jet pipe from the main plane (Sect. 4, Chap. 1).
- (2) Remove the tail plane from the rear fuselage (Sect. 3, Chap. 3).
- (3) Remove the rudder and fin from the rear fuselage (Sect. 3, Chap. 3).
- (4) Jack the aircraft as described in para. 11.
- (5) Remove the ailerons (Sect. 3, Chap. 2).
- (7) Remove the main and nose undercarriage units (Sect. 3, Chap. 5).

- (8) Remove the rear fuselage (Sect. 3, Chap. 1).
- (9) Position the adjustable trestles under the centre fuselage and the trolley under the front fuselage (Sect. 3, Chap. 1); adjust the main jacks until the fuselage is resting on the trestles and trolley.
- (10) Remove the main planes (Sect. 3, Chap. 2).
- (11) Remove the front fuselage (Sect. 3, Chap. 1).

The sequence of assembly is the reversal of that given for dismantling.

► Checking aircraft alignment (fig. 7)

17. The main plane, fin and tail plane are fixed cantilever structures and it is only possible to check their alignment.

Levelling

18. To level the aircraft for secondary pressure head and roll damper rigging checks, proceed as follows:-

- (1) Jack the aircraft as described in para. 11 and 12.
- (2) Place the gauge on the datum blocks X and W and, using an inclinometer on the levelling pad, level the aircraft laterally to 0 deg. \pm 10 min.
- (3) Place the gauge on the datum blocks V and U and, using an inclinometer on the levelling pad, level the aircraft longitudinally to 0 deg. \pm 10 min.

19. To level the aircraft for all main aerofoil rigging checks, proceed as described in Sect. 3, Chap. 4. para. 155.

Symmetry check

20. Check the aircraft symmetry by measuring the diagonals given in fig. 7.

Incidence and dihedral check - main planes

21. The incidence and dihedral of the main planes may be checked by using the special gauge as follows:-

- (1) With the aircraft in the rigging position, place the gauge on the main plane with the feet on the gauge points at each of the three gauge positions (fig. 7). in turn.
- (2) An inclinometer on the gauge levelling plates should read as follows:-

Dihedral: 2 deg. \pm 10 min. at each position.

Incidence:

At rib 3 inner wing: 4 deg. 49 min. \pm 15 min.

At rib 6 outer wing: 5 deg. 8 min. \pm 15 min.

At rib 6 outer wing: 5 deg. 50 min. \pm 15 min.

Incidence and dihedral check - tail plane

22. The incidence and dihedral of the tail plane may be checked by using the special gauge as follows:-

Note...

It is important that the aircraft is levelled as instructed in para. 19. ►

- (1) The dihedral is checked at the inboard gauge positions, port and starboard, with the tail plane at maximum incidence. Place the gauge on the tail plane with its feet on the gauge points; an inclinometer on the appropriate levelling plate should read 7 deg. 38 min. \pm 15 min.

(2) The incidence is checked at the inboard gauge position on the starboard side only, with the tail-plane at maximum and minimum positions. Place the gauge with the feet on the gauge points at the inboard position on the starboard side, first with the tail plane at minimum incidence and then with the tail plane at maximum incidence. An inclinometer on the levelling plate should read as follows:

Minimum incidence 2 deg. 4 min. \pm 13 min.

Corresponding true angle of incidence at the fuselage 1 deg. 12 min. \pm 13 min.

Maximum incidence 4 deg. 7 min. \pm 13 min.

Corresponding true angle of incidence at the fuselage +0 deg. 59 min. \pm 13 min.

When the tail plane is in the neutral position the gauge should read 3 deg. 56 min. representing a true angle of incidence at the centre line of the fuselage of 0 deg. 44 min.

Dimensions and weights of components

- ◀ 23. The dimensions and weights of the principal components of the aircraft are given in fig. 8. ▶

KEY TO FIG. 1

- 1 STARBOARD EQUIPMENT COMPARTMENT
- 2 MAIN EQUIPMENT COMPARTMENT
- 3 TANK BAY NUMBER 1
- 4 TANK BAY NUMBER 2
- 5 TANK BAY NUMBER 3
- 6 TANK BAY NUMBER 4
- 7 TANK BAY NUMBER 5—REAR TANK
- 8 RADAR COMPARTMENT
- 9 MID CAMERA COMPARTMENT
- 10 REAR CAMERA COMPARTMENT
- 11 REAR FAIRING

} TOP TANKS

- 12 FUSELAGE EXTENSION PIECE
- 13 REAR FUSELAGE
- 14 FLARE BAY
- 15 TANK BAY NUMBER 6—BELLY TANK
- 16 FRONT CAMERA COMPARTMENT
- 17 PORT EQUIPMENT COMPARTMENT
- 18 NOSE UNDERCARRIAGE BAY
- 19 PILOT'S STATION
- 20 PRESSURISED CABIN
- 21 HINGED NOSE

- 22 INNER WING LEADING EDGE COMPARTMENT—P & S
- 23 MAIN UNDERCARRIAGE BAY—P & S
- 24 INNER WING TRAILING EDGE COMPARTMENT—P & S
- 25 INTEGRAL TANK P & S
- 26 OUTER WING TRAILING EDGE IN WAY OF FLAP P & S
- 27 OUTER WING TRAILING EDGE IN WAY OFAILERON P & S
- 28 WING TIP

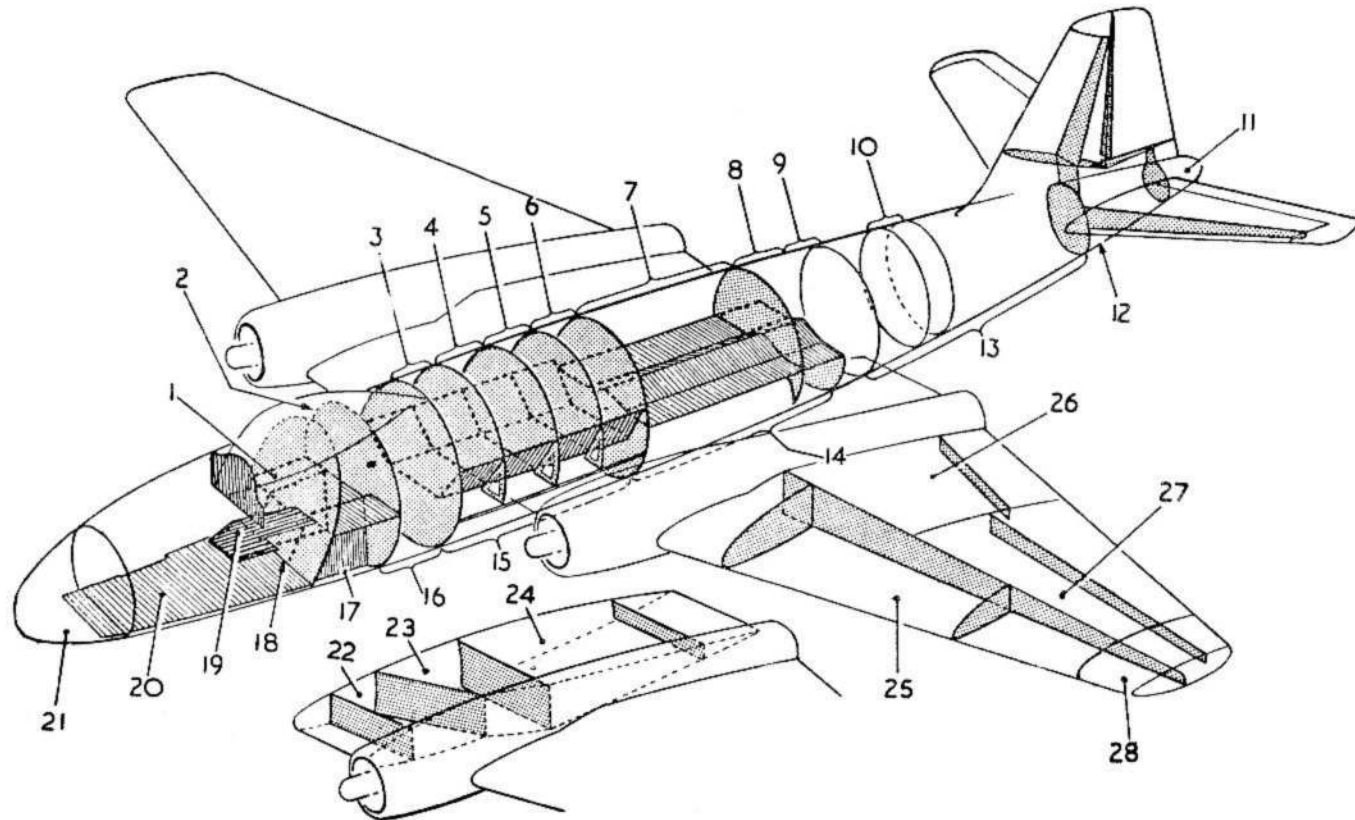


Fig. 1. Fuselage compartments

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KEY TO FIG. 2 (ACCESS PANELS (1))

- | | | | | | |
|----|---|----|--|-----|--|
| 1 | RADAR HEAD OR DUMMY RADOME | 28 | NAVIGATION AND TAXYING LAMPS | 51 | INVERTER COOLING INLET |
| 2 | CONNECTIONS TO RADAR HEAD | 29 | WING TIP TANK FUEL AND AIR PIPES | 52 | NOSE UNDERCARRIAGE BAY |
| 3 | DOWNWARD IDENTIFICATION LAMP | 30 | WING TIP TANK EXPLOSIVE ATTACHMENT BOLTS | 53 | FRONT CAMERA COMPARTMENT HINGED FAIRING (P AND S) |
| 4 | REAR FAIRING—TAIL PLANE ACTUATOR
TAIL PLANE REMOVAL
ELEVATOR CONTROLS | 31 | GLIDE PATH AERIAL—I.L.S. | 54 | CAMERA ACCESS PANEL |
| 5 | PICKETING POINT | 32 | GLIDE PATH AERIAL CONNECTOR | 55 | BELLY TANK (TANK NUMBER 6) ATTACHMENT (P AND S) |
| 6 | AERIAL—RADIO ALTIMETER | 33 | ELECTRICAL CONNECTIONS | 56 | BELLY TANK FILLER |
| 7 | AERIAL—I.F.F. | 34 | PICKETING POINT | 57 | BELLY TANK REMOVED FOR GENERAL ACCESS TO TOP FUEL TANKS AND SERVICES FORWARD OF SPAR FRAME |
| 8 | AERIAL—RADIO ALTIMETER | 35 | INTEGRAL TANK COLLECTOR BOX AND FUEL PUMP | 58 | BELLY TANK ATTACHMENT (P AND S) |
| 9 | REAR FUSELAGE ENTRANCE HATCH | 36 | FIRE EXTINGUISHER MECHANICAL INDICATOR | 58A | ACCESS PANEL, PORT WING UNDERSURFACE, FOR SERVICING HOT AIR MIXING VALVE |
| 10 | MAIN PLANE ATTACHMENTS, REAR SPAR | 37 | FIRE EXTINGUISHER, INTEGRAL WING TANK L.P. AND TRANSFER FUEL COCKS AND FUEL RECUPERATOR | 59 | TURBO-STARTER EXHAUST |
| 11 | OXYGEN CYLINDERS AND RADAR EQUIPMENT | 38 | FUEL RECUPERATOR AND RECUPERATOR SHUT-OFF COCK | 60 | HYDRAULIC SYSTEM ACCUMULATORS AND FILTER; FUEL SYSTEM COLLECTOR BOX |
| 12 | JET PIPE REAR COWLING
—JET PIPE ADJUSTMENT
—THERMOCOUPLES | 39 | COWLING FASTENERS | 61 | FLARE BAY |
| 13 | MAIN PLANE ATTACHMENTS, MAIN SPAR | 40 | LOW PRESSURE FILTERS AND DIFFERENTIAL SWITCH | 62 | EXHAUST UNIT, JET PIPE TRANSITION JOINT AND FUEL DRAINS |
| 14 | AILERON CONTROL TUBES AND LEVER, FUEL AND HYDRAULIC PIPES | 41 | LOW PRESSURE FILTERS AND DIFFERENTIAL SWITCH | 63 | FIRE POINT |
| 15 | AILERON CONTROL TUBES AND LEVERS, FUEL PIPE CONNECTIONS | 42 | BLEED VALVE CONTROL UNIT, BLEED VALVE, ANTI-ICING ACTUATORS AND STARTER L.P. IGNITION SWITCH | 64 | UNDERCARRIAGE COWLING FLAP ACTUATING LINK |
| 16 | AILERON CONTROL TUBES AND LEVERS | 43 | H.P. FUEL PUMPS
P.V. RAMS
RANGE TEMPERATURE CONTROL UNIT
OIL SUMP AND FILTERS
H.E. IGNITORS
OIL COOLER
EXTERNAL WHEELCASE
ACCESSORIES GEARBOX DRIVE | 65 | UNDERCARRIAGE PIVOT PIN |
| 17 | JACKING POINT | 44 | ACCESSORIES GEARBOX DRAIN | 66 | LANDING LAMP, PORT ONLY |
| 18 | NITROGEN BOTTLES (IF FITTED) | 45 | MARKER AERIAL—I.L.S. STARBOARD ONLY | 67 | LOCALISER AERIAL—I.L.S. |
| 19 | AIR BRAKES POSITION INDICATOR TRANSMITTER, PORT
AIR BRAKES MID-POSITION DRUM SWITCH, STBD. | 46 | GENERATOR MOUNTING | 68 | LOCALISER AERIAL CONNECTOR |
| 20 | AILERON CONTROL TUBES AND LEVER | 47 | GROUND COLD AIR UNIT COUPLING | 69 | UNDERCARRIAGE JACKING POINT |
| 21 | FUEL CONTENTS GAUGE AMPLIFIER | 48 | MAIN EQUIPMENT—COMPARTMENT | 70 | PICKETING POINT |
| 22 | PYLON MOUNTING | 49 | NOSE FUSELAGE SLINGING POINT | 71 | OXYGEN CHARGING VALVE |
| 23 | AIR BRAKES JACK | 50 | STARBOARD EQUIPMENT—COMPARTMENT | 72 | STARTER FUEL TANK DRAIN COCK |
| 24 | AIR BRAKES MECHANISM | | | 73 | ATTACHMENTS (Post Mod. 483B) ▶ |
| 25 | AILERON CONTROL TUBES AND LEVER | | | | |
| 26 | AILERON SHROUD SCREENS | | | | |
| 27 | NAVIGATION AND TAXYING LAMP ELECTRICAL CONNECTIONS | | | | |

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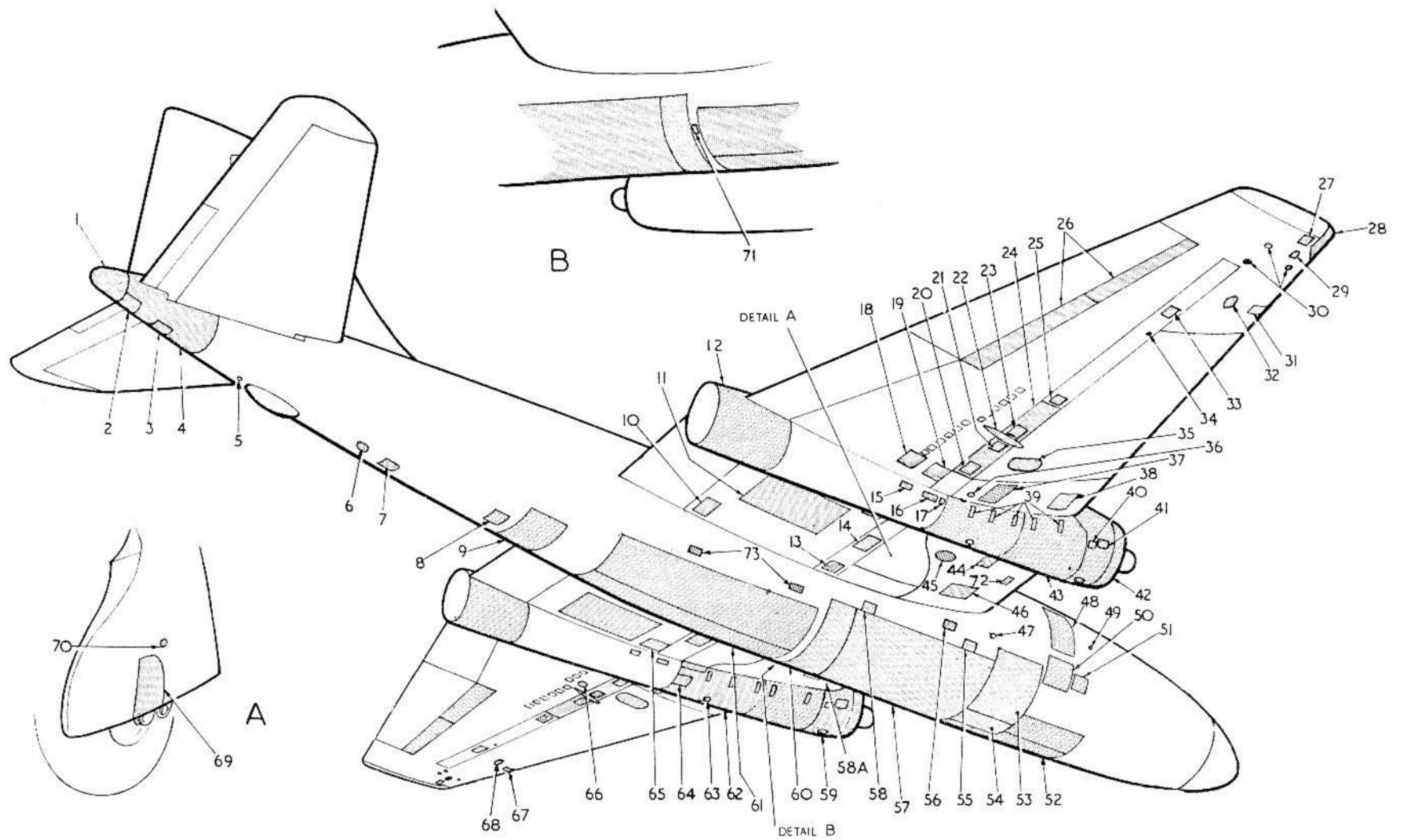


Fig. 2 Access panels (1)
◀(ITEM 73 ADDED)▶

KEY TO FIG. 3 (ACCESS PANELS (2))

- | | | |
|---|---|--|
| 1 HOOD LOCKING PIN ACTUATOR MICRO-SWITCHES | 23 BOX FAIRING ATTACHMENT BOLTS | 43 FUEL RECUPERATOR |
| 2 FULL CONTENTS GAUGE UNITS | 24 BOX FAIRING | 44 COWLING FASTENERS |
| 3 G-M4B COMPASS DETECTOR UNIT--STARBOARD ONLY | 25 RUDDER POWER CONTROL UNIT | 45 EXHAUST UNIT AND JET PIPE TRANSITION JOINT |
| 4 FILLER, TANK NUMBER 1 | 26 FIN ATTACHMENTS | 46 FIRE PANEL |
| 5 MAIN SPAR ATTACHMENT | 27 AUTOSTABILISER SERVO UNIT | 47 TURBO STARTER FUEL TANK AND PUMP |
| 6 FILLER, TANK NUMBER 2 | 28 FLAP ADJUSTMENT POINTS | 48 AIR COOLER, CABIN AIR SYSTEM |
| 7 FILLER, TANK NUMBER 3 | 29 FLAP ADJUSTMENT POINTS | 49 CAMERA HOISTING POINTS |
| 8 FILLER, TANK NUMBER 4 | 30 AILERON SHROUD SCREENS | 50 HOOD SPRING BOX ADJUSTMENT |
| 9 FUEL TANK VENTING GALLERY | 31 AILERON CENTRE HINGE AND JACK ATTACHMENTS | 51 HOOD SPRING BOX AND HINGE RELEASE MECHANISM |
| 10 AERIAL, I.I.F. | 32 AILERON OUTBOARD HINGE | 52 PORT EQUIPMENT COMPARTMENT |
| 11 FILLER, TANK NUMBER 5 | 33 WING TIP TANK ADJUSTABLE BOLT | 53 FRONT FUSELAGE JACKING AND SLINGING POINT |
| 12 RADAR EQUIPMENT | 34 WING TIP TANK FUEL PIPES | 54 PILOT'S ENTRANCE LADDER ATTACHMENT POINTS |
| 13 FIN ATTACHMENTS | 35 WING TIP TANK EXPLOSIVE ATTACHMENT BOLTS | 55 FRANGIBLE HATCH |
| 14 AERIAL SWITCH | 36 AILERON JACK HYDRAULIC PIPING | 56 HINGED NOSE |
| 15 SLINGING POINT | 37 INTEGRAL TANK VENT VALVE, OUTBOARD COMPARTMENT | 57 COLD AIR UNIT AND CABIN AIR SYSTEM PIPING |
| 16 AERIAL CONNECTOR | 38 INTEGRAL TANK FILLER, OUTBOARD COMPARTMENT | 58 TURBO STARTER FUEL TANK FILLER |
| 17 SLINGING POINT | 39 PYLON ATTACHMENTS | 59 COLD AIR UNIT OIL FILLER |
| 18 HYDRAULIC PIPES, RUDDER POWER CONTROL UNIT | 40 INTEGRAL TANK VENT VALVE, INBOARD COMPARTMENT | 60 ACCESSORIES GEARBOX, HYDRAULIC EXTERNAL PUMP CONNECTIONS AND CABIN AIR SYSTEM PIPING AND COMPONENTS |
| 19 RUDDER POWER CONTROL UNIT ATTACHMENT | 41 INTEGRAL TANK FILLER, INBOARD COMPARTMENT | 61 ACCESSORIES GEARBOX FILLER |
| 20 RUDDER HINGE BEARING | 42 JET PIPE ATTACHMENTS | 62 MAIN PLANE ATTACHMENTS, MAIN SPAR |
| 21 RADAR HEAD CONNECTIONS | | 63 UNDERCARRIAGE UP-LOCK HOOK |
| 22 SLINGING POINTS | | |

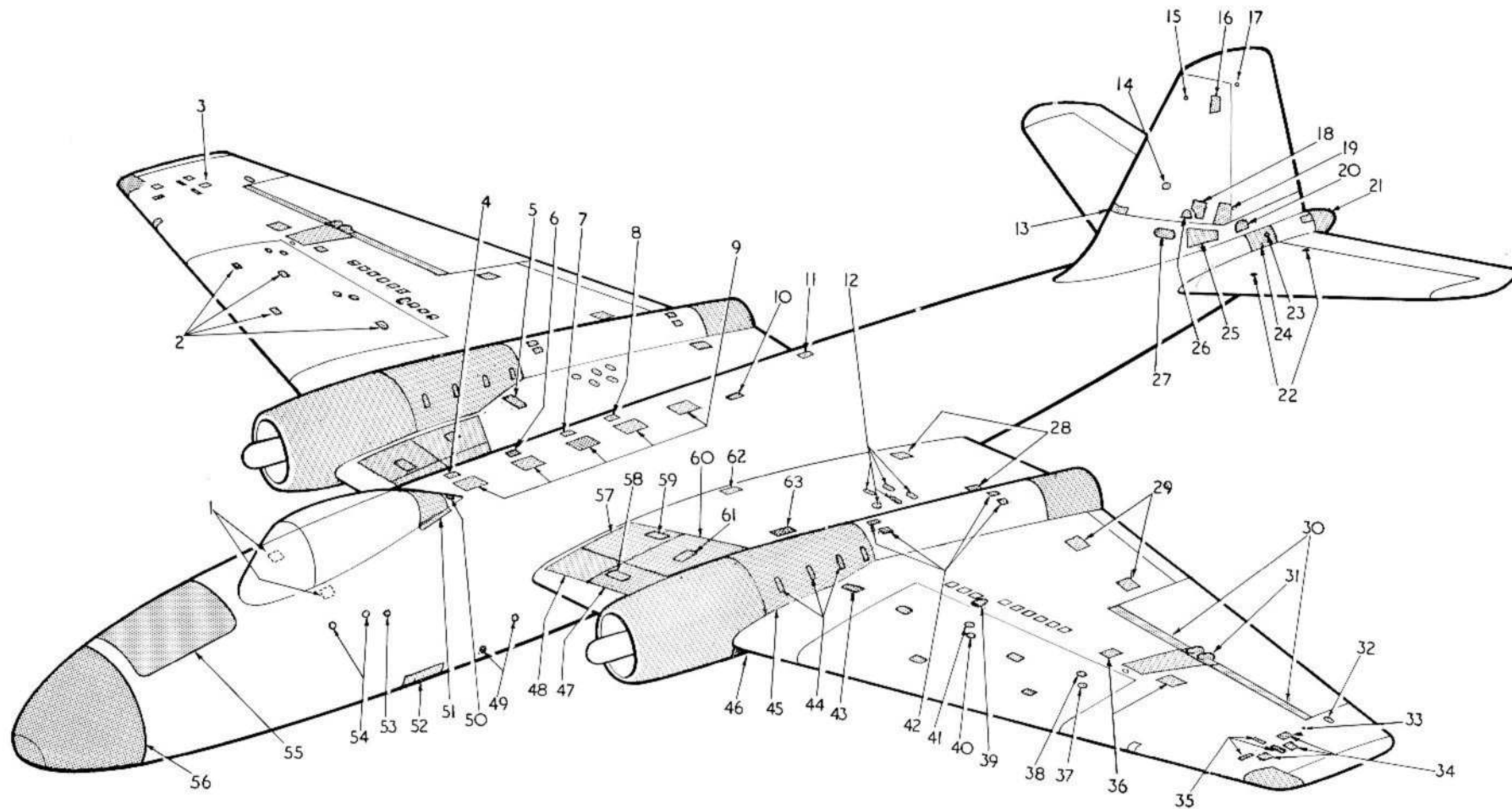


Fig. 3 Access panels (2)
◀ (ITEM 63 ADDED) ▶

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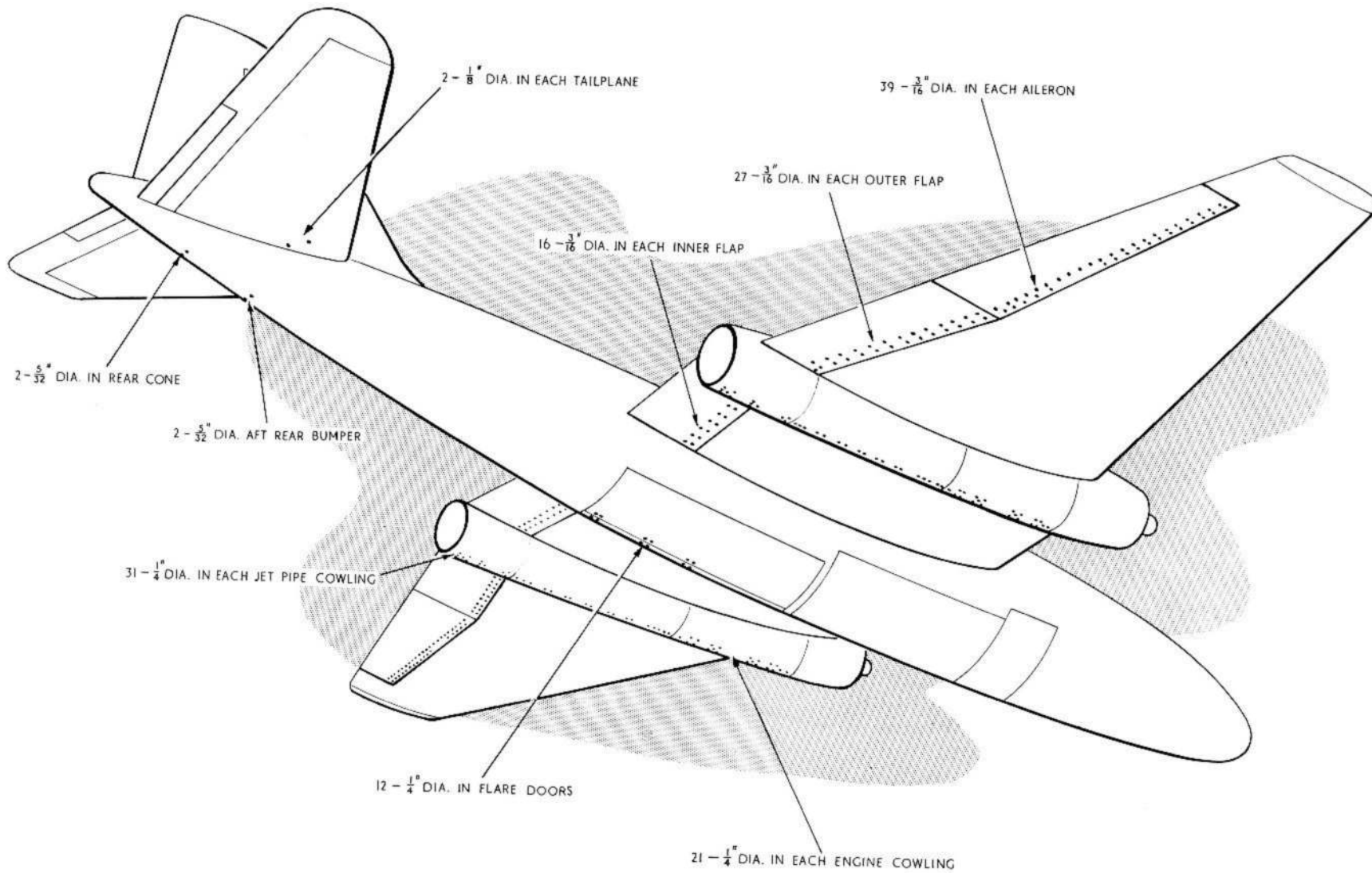


Fig. 4 Drainage holes

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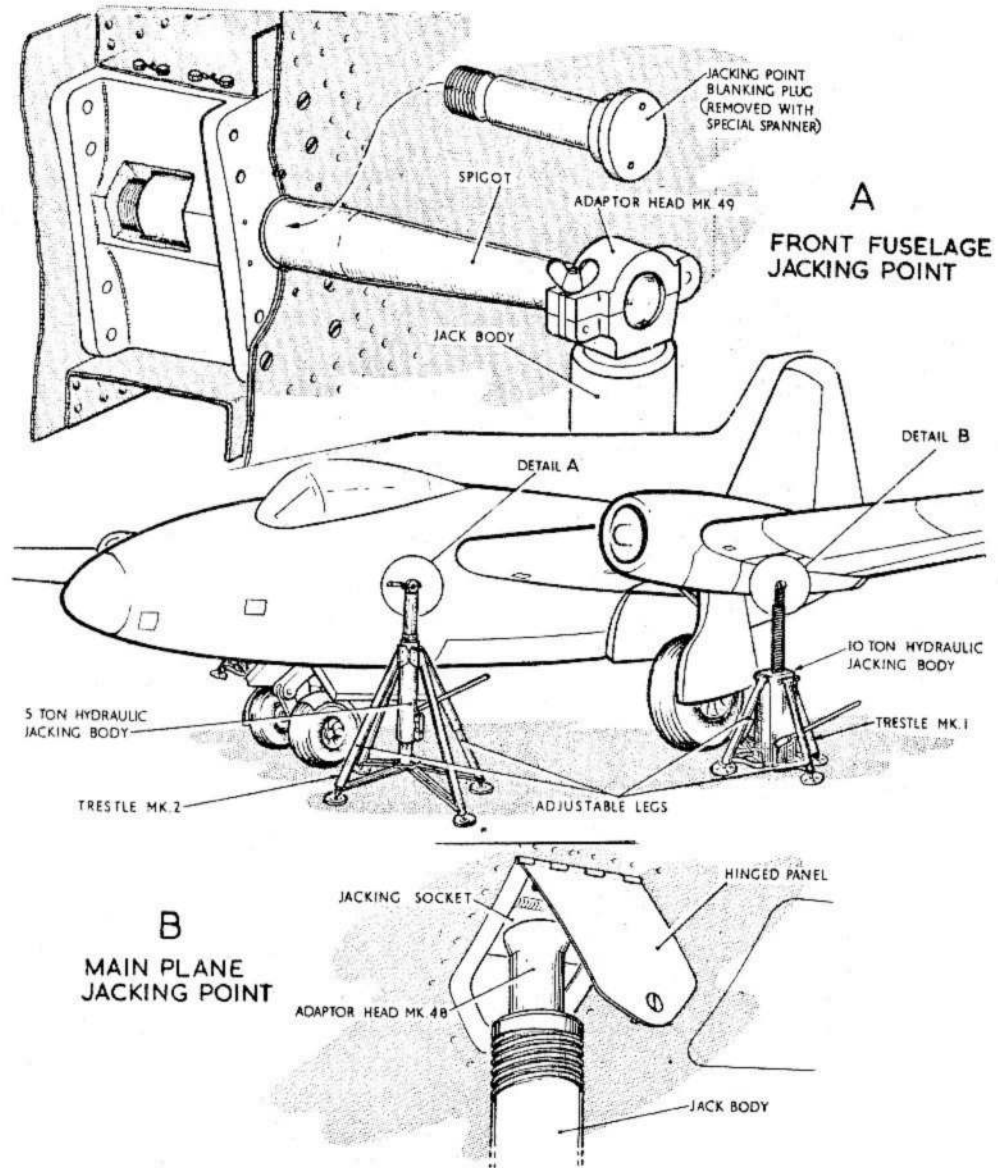


Fig. 5 Jacking and trestling

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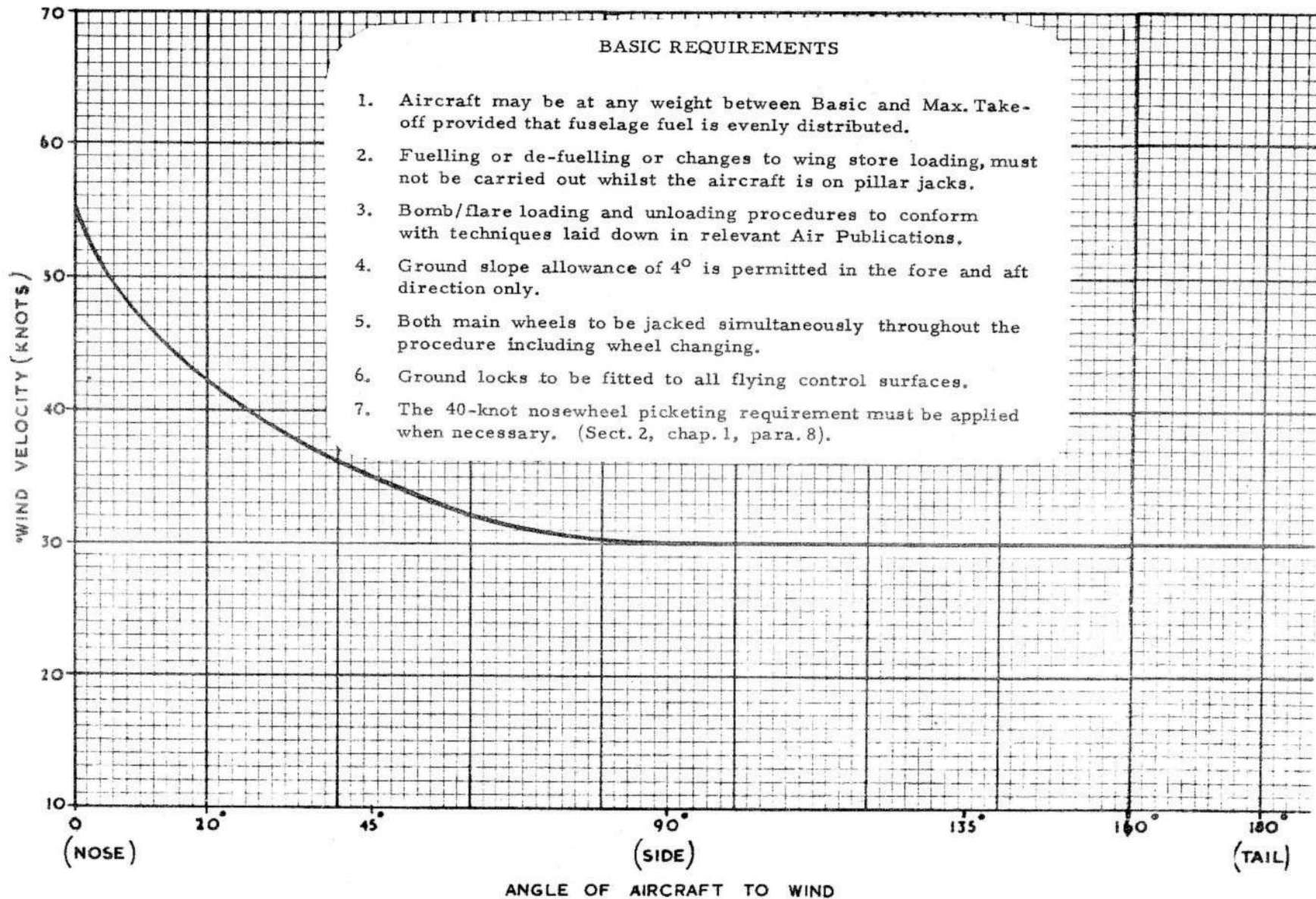


Fig. 5A Permissible wind velocity for jacking in the open
◀(Note 7 added and curve changed)▶

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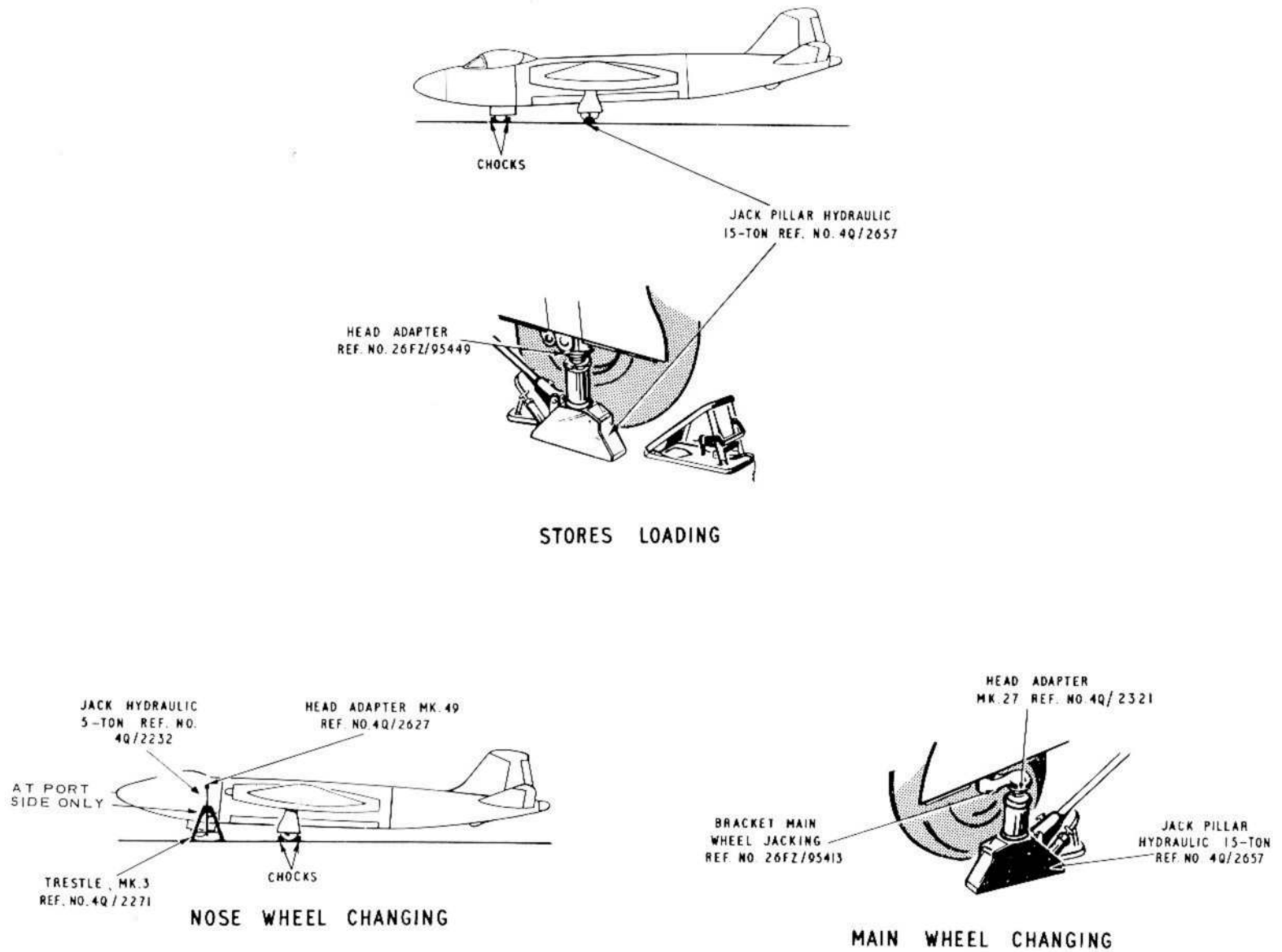
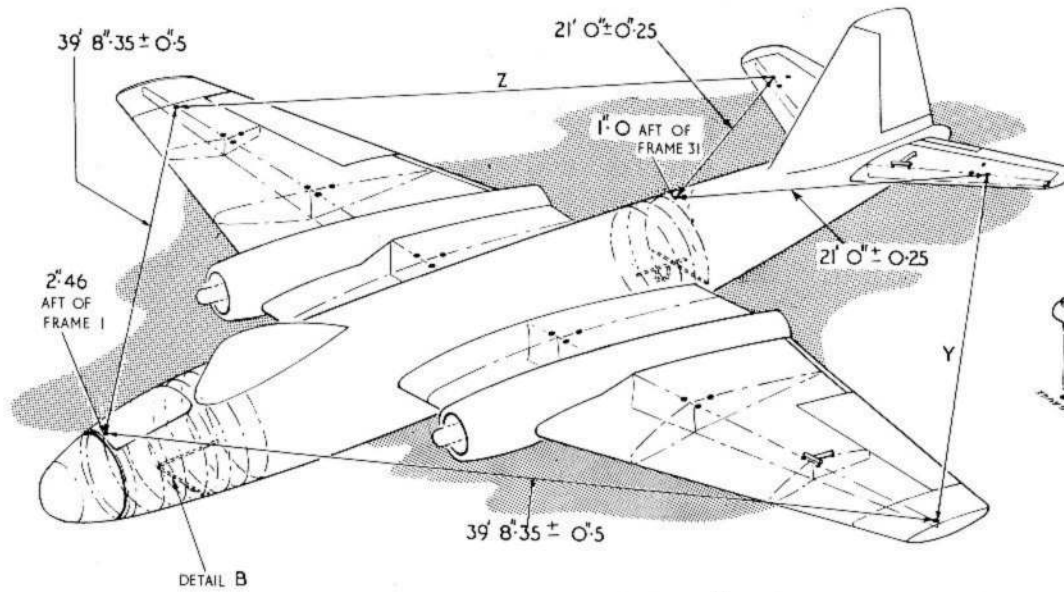
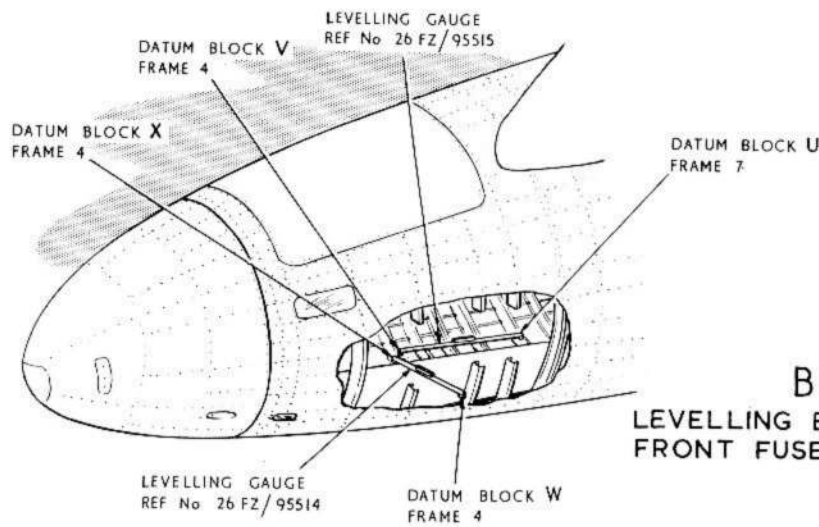
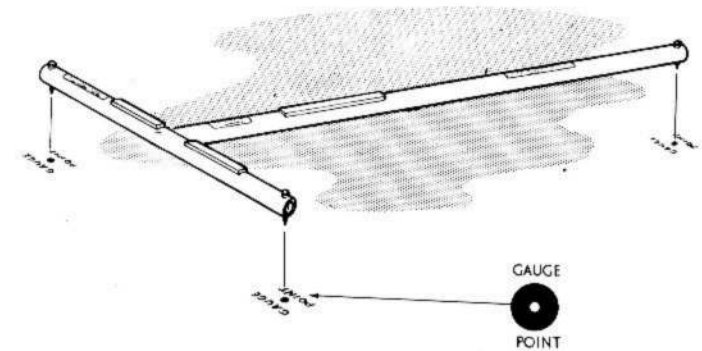


Fig. 6 Jacking - wheel change / stores loading



DIMENSIONS Y AND Z TO BE EQUAL WITHIN $\pm 1' 0''$ WITH TAILPLANE AT MINIMUM INCIDENCE

A
INCIDENCE AND DIHEDRAL
CHECK GAUGE
TYPICAL



B
LEVELLING EQUIPMENT
FRONT FUSELAGE

Fig. 7 Checking alignment

◀(STN/CAN/72 DELETED)▶

R E S T R I C T E D

KEY TO FIG. 8 (COMPONENT WEIGHTS AND DIMENSIONS)

No.	Component	Length	Width	Height	Tare Weight (lb.)
1	HINGED NOSE	5 ft. 0 in.	4 ft. 2 in.	4 ft. 2 in.	192
2	NAVIGATOR'S FRANGIBLE HATCH	4 ft. 3 in.	3 ft. 7 in.	0 ft. 8 in.	40
3	FRONT FUSELAGE	12 ft. 6 in.	6 ft. 6 in.	8 ft. 6 in.	1010
4	CANOPY HOOD	5 ft. 7 in.	2 ft. 10 in.	2 ft. 1 in.	204
5	INTEGRAL FUEL TANK	11 ft. 4 in.	7 ft. 1 in.	2 ft. 3 in.	428
6	MAIN PLANE	31 ft. 0 in.	22 ft. 3 in.	4 ft. 3 in.	2352
7	CENTRE FUSELAGE	27 ft. 6 in.	7 ft. 8 in.	7 ft. 0 in.	2190
8	REAR FUSELAGE	19 ft. 1 in.	6 ft. 0 in.	8 ft. 0 in.	645
9	TAIL PLANE	26 ft. 6 in.	8 ft. 0 in.	1 ft. 9 in.	522
10	ELEVATOR	14 ft. 0 in.	4 ft. 9 in.	1 ft. 6 in.	114
11	FIN	6 ft. 4 in.	7 ft. 3 in.	1 ft. 6 in.	96
12	RUDDER	7 ft. 1 in.	7 ft. 1 in.	1 ft. 4 in.	142
13	ELEVATOR TAB	5 ft. 7 in.	0 ft. 9 in.	0 ft. 3 in.	7
14	REAR FAIRING	5 ft. 0 in.	2 ft. 6 in.	3 ft. 0 in.	22
15	INBOARD FLAP	5 ft. 8 in.	2 ft. 6 in.	0 ft. 6 in.	21
16	OUTBOARD FLAP	9 ft. 0 in.	2 ft. 9 in.	0 ft. 6 in.	31
17	AILERON	12 ft. 8 in.	4 ft. 2 in.	0 ft. 9 in.	72
18	WING TIP	5 ft. 1 in.	0 ft. 8 in.	0 ft. 6 in.	4
19	WING TIP TANK	14 ft. 7 in.	1 ft. 11 in.	1 ft. 10 in.	122
20	MAIN UNDERCARRIAGE WHEEL AND LEG	3 ft. 11 in.	2 ft. 1 in.	6 ft. 3 in.	694
21	MAIN UNDERCARRIAGE SIDE STAY	2 ft. 9 in.	0 ft. 8 in.	0 ft. 8 in.	36
22	MAIN UNDERCARRIAGE JACK	2 ft. 0 in.	0 ft. 5 in.	0 ft. 7 in.	16
23	FLARE BAY DOOR	11 ft. 4 in.	3 ft. 3 in.	2 ft. 2 in.	103
24	BELLY TANK	9 ft. 6 in.	6 ft. 0 in.	2 ft. 6 in.	410
25	NOSE UNDERCARRIAGE JACK	2 ft. 2 in.	0 ft. 5 in.	0 ft. 5 in.	8
26	NOSE UNDERCARRIAGE RADIUS ROD	3 ft. 11 in.	0 ft. 4 in.	0 ft. 8 in.	29
27	NOSE UNDERCARRIAGE WHEEL AND LEG	2 ft. 2 in.	1 ft. 7 in.	3 ft. 7 in.	260
28	NOSE UNDERCARRIAGE DOOR	4 ft. 2 in.	0 ft. 3 in.	1 ft. 5 in.	12
29	ENGINE FRONT COWLING	5 ft. 7 in.	4 ft. 0 in.	3 ft. 11 in.	120
30	ENGINE CHANGE UNIT	11 ft. 0 in.	3 ft. 6 in.	3 ft. 6 in.	2827
31	ENGINE TOP REAR COWLING	5 ft. 5 in.	4 ft. 0 in.	1 ft. 4 in.	29
32	JET PIPE	13 ft. 3 in.	2 ft. 9 in.	2 ft. 9 in.	247
33	JET PIPE COWLING	3 ft. 8 in.	2 ft. 8 in.	2 ft. 8 in.	29
34	ENGINE BOTTOM REAR COWLING	5 ft. 10 in.	4 ft. 0 in.	1 ft. 4 in.	45
35	SERVICE PANEL	2 ft. 2 in.	4 ft. 2 in.	1 ft. 9 in.	18

R E S T R I C T E D

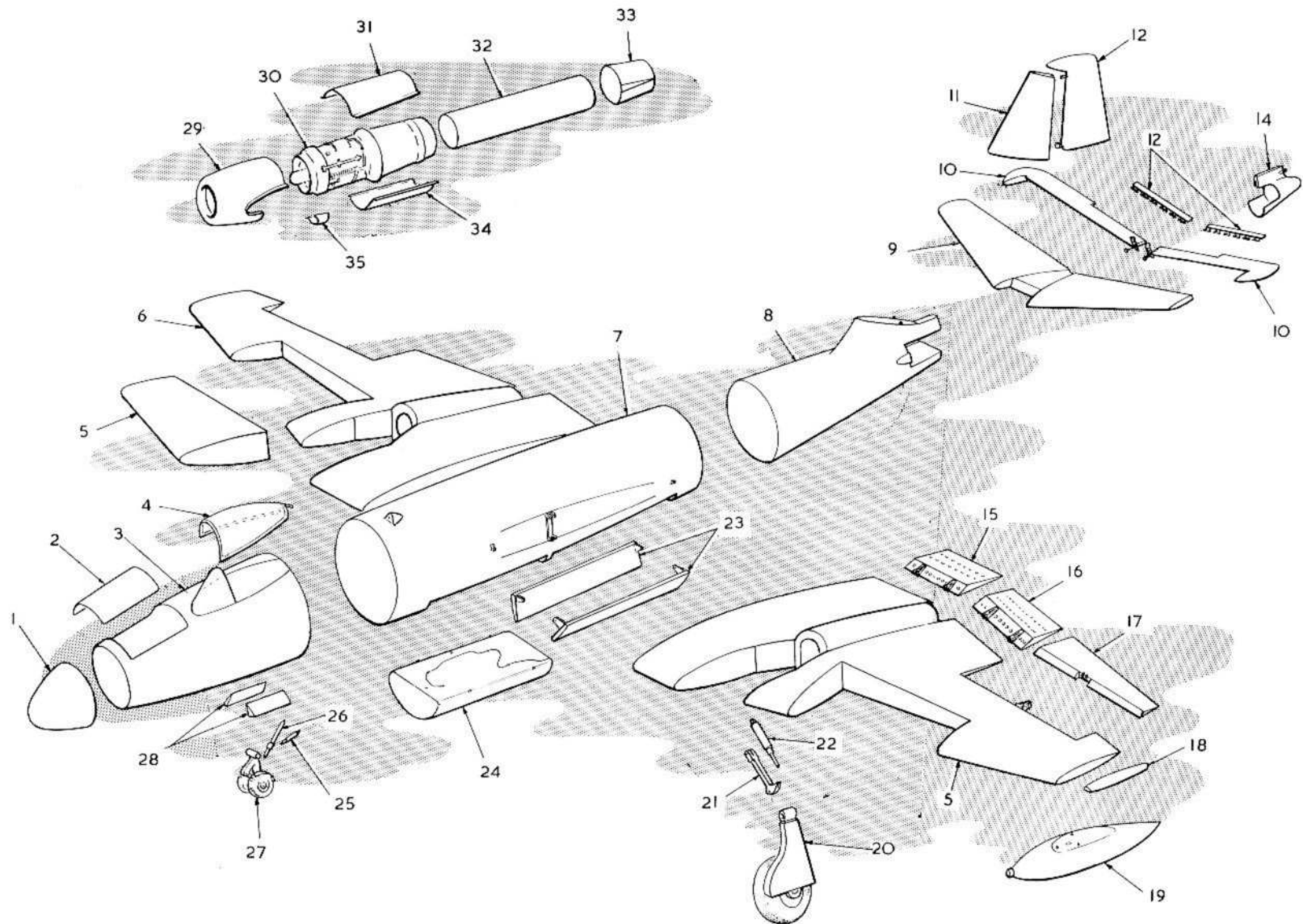


Fig.8 Component weights and dimensions

◀ (FIG. No. CHANGED) ▶

R E S T R I C T E D

TABLE 1

Special ground equipment

Ref. No.	Part No.	Description	No. off per set	Remarks
TOWING AND STEERING EQUIPMENT				
26FZ/95022	E.A3.88.15	Adapter, nose towing	1	Used with towing arm 4GB/4792
26FZ/95087	E.A3.88.157	Arm nose steering	1	
JACKING EQUIPMENT				
26FZ/95413	E.A3.88.307	Bracket, jacking	1	Main wheel changing
26FZ/95449	E.A9.88.39	Jacking head	2	Used with jack 4Q/2657 for stores loading
26FZ/95004	E.A1.88.23	Spigot	1	Nose jacking
SLINGING EQUIPMENT				
26FZ/95006	E.A1.88.61	Sling, centre fuselage	1	
26FZ/95007	E.A1.88.65	Sling, rear fuselage	1	
26FZ/95008	E.A1.88.11	Sling, main plane	1	
26FZ/95009	E.A1.88.59	Sling, tail plane	1	
26FZ/95084	E.A1.88.601	Sling, fin and rudder	1	
26FZ/95273	E.A1.88.785	Sling, complete aircraft	2	Crash case
26FZ/95457	E.A9.88.83	Sling, front fuselage	1	
26FZ/95516	E.B8.88.247	Sling, front and centre fuselage combined	1	Crash case
26FZ/95480	E.B8.88.179	Sling, generator	1	
26FZ/95443	E.B6.88.39	Sling, integral tank	1	
26FZ/95444	E.B6.88.81	Strap, inner, integral tank	1	
26FZ/95445	E.B6.88.83	Strap, outer, integral tank	1	
26FZ/95517	E.B8.88.249	Strap	1	For use with sling Pt. No. E.B8.88.247
TRESTLING EQUIPMENT				
26FZ/95543	E.B8.88.397	Beam, gantry—4Q/2310 modified	2	
26FZ/95109	E.A3.88.211	Cradle, wing tip tank		
26FZ/95017	E.A1.88.87A	Former, rear fuselage, front		
26FZ/95018	E.A1.88.87B	Former, rear fuselage, rear		
26FZ/95518	E.B8.88.251A	Former, wing, forward, rib 4 port		
26FZ/95518	E.B8.88.251B	Former, wing, centre, rib 4 port—identical to 26FZ/95026	1	Used with gantry beam
26FZ/95518	E.B8.88.251C	Former, wing, aft, rib 4 port—identical to 26FZ/95027	1	
26FZ/95518	E.B8.88.251D	Former, wing, forward, rib 5 port—identical to 26FZ/95028	1	
26FZ/95518	E.B8.88.251E	Former, wing, centre, rib 5 port—identical to 26FZ/95029	1	
26FZ/95518	E.B8.88.251F	Former, wing, aft, rib 5 port—identical to 26FZ/95030	1	
26FZ/95519	E.B8.88.252A	Former, wing, forward, rib 4 starboard	1	
26FZ/95519	E.B8.88.252B	Former, wing, centre, rib 4 starboard—identical to 26FZ/95032	1	
26FZ/95519	E.B8.88.252C	Former, wing, aft, rib 4 starboard—identical to 26FZ/95033	1	
26FZ/95519	E.B8.88.252D	Former, wing, forward, rib 5 starboard—identical to 26FZ/95034	1	
26FZ/95519	E.B8.88.252E	Former, wing, centre, rib 5 starboard—identical to 26FZ/95035	1	
26FZ/95519	E.B8.88.252F	Former, wing, aft, rib 5 starboard—identical to 26FZ/95036	1	
26FZ/95521	E.B8.88.241	Stand, hinged nose	1	
26FZ/95037	E.A1.88.417	Trestle, adjustable, centre fuselage, front	1	
26FZ/95038	E.A1.88.419	Trestle, adjustable, centre fuselage, rear	1	
26FZ/95016	E.A1.88.85	Trolley, front fuselage	1	Pressure cabin ground maintenance
26FZ/95083	E.A2.88.35	Trolley, No. 6 fuel tank	1	

R E S T R I C T E D

Ref. No.	Part No.	Description	No. off per set	Remarks
RIGGING EQUIPMENT				
26FZ/95010	E.A1.88.93	Gauge, incidence and dihedral, main plane	1	
26FZ/95115	E.A3.88.179	Gauge, incidence and dihedral, tail plane	1	
26FZ/95535	E.B8.88.340	Gauge, levelling, centre fuselage, lateral	1	
26FZ/95470	E.A9.88.63	Gauge, levelling, centre fuselage, longitudinal	1	
26FZ/95514	E.B8.88.243	Gauge, levelling, front fuselage, lateral	1	
26FZ/95515	E.B8.88.245	Gauge, levelling, front fuselage, longitudinal	1	
◀ 26FZ/95447	E.A9.88.527	Combined rudder and control column neutral rigging jig	1	
26FZ/95448	E.A9.88.529	Aileron rigging template	1 ▶	
26FZ/95555	E.B8.88.333	Indicator plate, engine	1	} Throttle setting
26FZ/95556	E.B8.88.423	Setting plate, starboard engine	1	
26FZ/95558	E.B8.88.425	Setting plate, port engine	1	
26FZ/95554	E.B8.88.421	Setting plate	1	
26FZ/95557	E.B8.88.335	Setting plate, throttle box	1	
CAMERA AND RADAR INSTALLATION EQUIPMENT				
26FZ/95563	E.A9.88.481	Container	}	A.R.I.5851 and aerial alignment
26FZ/95561	E.A9.88.477	Sighting rod, forward		
26FZ/95562	E.A9.88.479	Sighting rod, aft		
26FZ/95432	E.B7.88.183	Sling, front		
26FZ/95433	E.B7.88.143	Sling, rear		
26FZ/95434	E.B7.88.135	Sling, tracking unit		
26FZ/95551	E.B8.88.383	Trolleys and connecting rod, mono rails			1	Camera A.R.I.5851 installation
26FZ/95474	E.B8.88.37	Extension tube for 'Minilift' hoist	1	} Camera installation
26FZ/95475	E.B8.88.113	Lifting cradle, port	1	
26FZ/95436	E.B7.88.129	▶ ◀ Straps, sling	1	
26FZ/95498	E.B8.88.5005	▶ ◀ Spreader, sling	1	
26FZ/95477	E.B8.88.359	▶ ◀ Trolley, mid camera compartment	1	
MISCELLANEOUS EQUIPMENT				
26FZ/95270	E.A3.88.281	▶ ◀ Blanking plug, cabin pressure, control valve	1	Pressure testing
26FZ/45522	E.B8.88.253	▶ ◀ Detachable bridge piece, wing	2	Used with 26FZ/95008 for main plane slinging
26FZ/95473	E.B8.88.13	Guard, safety, air intake	2	
26FZ/95090	E.A1.88.799	Jury strut, tail plane	1	
26FZ/13142	E.A1.88.873	Locking clamp, elevator, port	1	
26FZ/1867	E.A1.88.73	Locking clamp, elevator, starboard	1	
26FZ/2468	E.A3.88.153	Locking clamp, rudder	1	
26FZ/	E.A3.88.1971	Locking clamp, aileron, port	1	
26FZ/	E.A3.88.1972	Locking clamp, aileron, starboard	1	
26FZ/95089	E.A1.88.743	Locking sleeve, main undercarriage	2	
26FZ/95015	E.A1.88.255	Locking pin, nose wheel	1	
26FZ/95485	E.B8.88.207	Ladder, cockpit access	1	
26FZ/95472	E.B8.88.1	Plate, blanking, air intake	2	
26FZ/1970	E.A1.40.169	Ring, picketing	2	

TABLE 1—continued

Ref. No.	Part No.	Description	No. off per set	Remarks
SPECIAL TOOLS				
27VA/3303	A.C.O.5928	Clamp, pressure relay	1	For priming hydraulic gauges
26FZ/95061	E.A1.88.351	Centralizing tool, piston, main leg	1	} Alighting gear
26FZ/95062	E.A1.88.361	Combination tool, main undercarriage bearing bush	1	
26FZ/95047	E.A1.88.359	Extractor	1	
26FZ/95044	E.A1.88.375	Extractor	1	Main undercarriage pick up points
26FZ/95104	E.A1.88.825	Extractor	1	Tab torque tube lever
26FZ/95292	A.6300	Extractor, main wheels	1	Aileron hinge pins
	A.10056	Fixture, brake alignment	1	
26FZ/95051	E.A1.88.349	Insertor, piston ring, main leg	1	
26FZ/95053	E.A1.88.391	Insertor, and extractor, sealing ring, main leg	1	
26FZ/95088	E.A1.88.733	Insertor, main undercarriage pick up bolt	1	
26FZ/95052	E.A1.88.383	Insertor, main leg pivot bushes	1	
26FZ/95050	E.A1.88.389	Insertor, main leg torque link bushes	1	
26FZ/95048	E.A1.88.363	Insertor, main plane pick up points	1	
26FZ/95082	A/MBEU/70/EE	Rig. re-setting	1	Control column snatch unit
26FZ/95553	E.B8.88.373	Retainer, control column	1	
26FZ/95086	E.A3.88.135	Spanner, axle clamp	1	
26FZ/95325	E.A3.88.303	Spanner, bearing ring, main leg	1	
26FZ/95493	E.A1.88.877	Spanner, nose undercarriage up-lock	1	
26FZ/95057	E.A1.88.353	Spanner, piston, main leg	1	
26FZ/95046	E.A1.88.379	Spanner, universal	1	Aileron centre hinge pin
26FZ/95064	E.A1.88.263	Spanner, drain plug, integral and wing tip tanks	1	Pre Mod. 733
26FZ/95079	E.A1.88.531	Spanner	1	Wing tip tank, explosive bolts
26FZ/95269	E.A3.88.293	Spanner, drain plug, integral tanks	1	Post Mod. 733
26FZ/95264	A.S.130	Spanner	1	Wing tip tank, filler cap
26FZ/95488	E.B8.88.57	Spanner, box	1	Fuel filler neck, No. 6 Tank
26FZ/95466	E.B7.88.203	Spanner	1	Pipe to fuel pump, integral tank
26FZ/95065	E.A1.88.365	Spanner	1	Blanking plug, front fuselage jacking point
26FZ/95095	E.A1.88.749	Spanner, crutch 5,000 lb.	1	Front and rear crutches, flare bay
IL/45		Spanner, socket $\frac{3}{4}$ in.	1	Attachment bolts, main plane
IC/3226		Spanner	1	Main fuel feed
26FZ/95054	E.A1.88.345	Spanner, torque link, main leg	1	
26FZ/95056	E.A1.88.347	Spanner, stop nut, main leg	1	
26FZ/95059	E.A1.88.385	Spanner, pivot nut, main undercarriage	1	
26FZ/95060	E.A1.88.387	Spanner, pivot nut, main undercarriage	1	
IL/67		Socket, 1 in. B.S.F.	1	Attachment bolts, main plane
IC/2161		Screwdriver	1	Generator cooling duct
	M.A.758	Spring compressor	1	
IC/6239		Wrench, torque, 150 lb/ft.	1	For hood spring-box attachment bolts

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TABLE 2
Standard ground equipment

Ref. No.	Part No.	Description	No. off per Set	Remarks
TOWING EQUIPMENT				
4GB/2792		Arm, towing	1	Used with adapter Ref. 26FZ/95022
4G/4139		Bridle, towing 50 ft.	1	
JACKING EQUIPMENT				
4Q/2626	E.A1.88.257	Adapter head, Mk. 48	1	Aircraft jacking at mainplane
4Q/2625		Body, jacking, hydraulic, 10 ton	1	
4Q/2652		Trestle, Mk. 1	1	
4Q/2659		Trolley, transporting, Mk. 4	1	
4Q/2627		Adapter, head, Mk. 49	1	Aircraft jacking at front fuselage
4Q/2232		Body, jacking, hydraulic, 5 ton	1	
4Q/2266		Trestle, Mk. 2	1	
4Q/2288		Trolley, transporting, Type A	1	
4Q/2321		Adapter head Mk. 27	1	Main wheel changing—jack also used for stores loading
4Q/2657		Jack, pillar, hydraulic, 15 ton	1	
4Q/2666	Trolley, transporting	1		
TRESTLING EQUIPMENT				
4G		Trestle, U.J. No. 1 (c/w Type A brackets)	1	Rear Fuselage trestling
4G		Trestle, U.J. No. 7 (c/w Type A brackets)	1	
4Q/2309		Upright, gantry, type A	4	
ENGINE CHANGING EQUIPMENT				
40B/1168		Adapter, engine stand	As required	Used with engine stand 40B/1166
4G/4353		Adapter sets, engine stand	1	Used with engine stand 40B/1030
40B/1032		Adapter, engine stand	As required	Used with engine stand 40B/1030
40B/1147		Bolts, trunnion	As required	Used with engine stand 40B/1030
4G/5377		Sling, Avon engines, universal Mk. 2	As required	
40B/1166 or 1030		Sling, transit/servicing stand, c/w E.C.U.	As required	
4G/4858		Stand, Avon universal	As required	
		Trolley, servicing Mk. 2	As required	For 40B/1030
MISCELLANEOUS EQUIPMENT				
4F/4131		Adapter, inflation	1	Camera and radar installation
4G/5433		Ball end	1	
4G/5431		Extension tube, 4½ in.	1	
4G/5430		Handle, 6 in. with clutch	1	
4G/5425		Hoist, 250 lb.	1	Nose undercarriage shock absorber charging
4G/5432		Top sheath (special)	1	
1B/4467		Gun, lubricating	1	For inflation of cabin seals
27Q/11743		Nozzle, flexible, c/w gauge	1	
4F/1812		Inflator	1	
6A/768		Pressure gauge (−4 to +12 lb. per sq. in.)	1	

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TABLE 2—*continued*

Ref. No.	Part No.	Description	No. off per set	Remarks
<i>MISCELLANEOUS EQUIPMENT— continued</i>				
4G/4864		Fluid replenishing can, with self-sealing coupling Lockheed AVX.502	1	
4G/2169		Footstep, Crew entrance to hinged nose (Navigators compartment)	1	
6A/2679		Plug, static vent	1	
4F/2764		Pump, Type F		
4F/1685		Trolley, hydraulic servicing, Mk. 2	2	
4G/4220		Trolley, oxygen charging, Mk. 2	1	
4F/1714		Trolley, pressure cabin testing Mk. 1C	1	

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Chapter 6

PROCEDURES FOLLOWING HAZARDOUS INCIDENTS

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General information

1. This chapter deals with the special checks to be made—in addition to any normal servicing which may be due—following the report on Form 700E of a 'hazardous incident'.

Hazardous incidents

2. A hazardous incident is one which could result in damage to the aircraft, the effects of which may not be immediately apparent. This class of damage can arise from:—

- (1) A heavy landing.
- (2) Flight in excessive 'g' conditions.

(3) Flight through turbulent air.

(4) Violent braking.

Safety precautions

3. The following general safety precautions apply throughout the chapter. Safety precautions peculiar to the different items of equipment will be found immediately preceding the relevant servicing instructions.

- (1) All personnel must refer to the LETHAL WARNING marker card before entering the cabin or commencing any operation on the aircraft.
- (2) The N.C.O. immediately in charge of the airframe servicing is the only

person allowed to authorise the following:—

- (a) Work by armament tradesmen on such equipment.
 - (b) Entry by any person into a cockpit or compartment containing ejection seats and/or cartridge and detonator-operated jettison equipment.
 - (c) The fitting, removal, or re-positioning of any safety device.
- (3) Upon completion of authorised servicing, all tradesmen concerned must report to the N.C.O. immediately in charge of the airframe servicing.

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- (4) Before any servicing by any trade is commenced, the armament safety break must be disconnected.
- (5) The bomb door operating switch lock must be fitted before any work is commenced in the bomb bay.
- (6) Functional tests of electrical equipment must not be carried out during refuelling and defuelling operations.
- (7) Before connecting an external electrical power supply, the pressure-head heater switch must be 'OFF'.

Servicing notes

- 4. (1) The examination and checks detailed in this chapter are to be carried out by a Senior N.C.O., assisted by tradesmen as required.
- (2) Unless otherwise stated, damage found during this servicing is to be categorised and repaired in accordance with Vol. 6.
- (3) The appendices list renewals and adjustments which may be made. Renewals are not to be commenced until all examinations have been completed and the overall damage assessed.

(4) These instructions have been compiled to cover any possible damage resulting from any type of hazardous incidents reported by the captain or pilot on Form 700E. Discretion is to be used in regard to the extent to which the relevant instructions are applied.

(5) Details of new or serviced components fitted during the servicing must be entered in the relevant columns of Form 700E.

(6) The tradesmen responsible must sign for the completed servicing in the relevant columns of Form 700E.

Definitions

5. The following definitions apply throughout this chapter:—

- (a) **DAMAGE** — 'Examine for damage' means an examination to ascertain that the value of usefulness of the item has not been impaired by:
 - (i) Insecurity of attachments.
 - (ii) Cracks in, or fractures of, structure and components.

- (iii) Corrosion or contamination.
- (iv) Structure distortion or skin wrinkling.
- (v) Defective or missing rivets.
- (vi) Chafing, scoring, or fraying.
- (vii) Broken locking devices.

(b) **REPLENISH**—when applied to liquids in this chapter, incorporates the following operations where necessary:—

- (i) Remove cap(s), or cover(s) from filler orifices and/or drains.
- (ii) Clear orifices.
- (iii) Fill container as directed in the relevant operation.
- (iv) Ensure drains are free from obstructions.
- (v) Ensure gasket(s), and cap(s) or cover(s) are free from damage.
- (vi) Refit cap(s), or cover(s).
- (vii) Fit locking devices as necessary.

Appendix 1 HEAVY LANDING

LIST OF TABLES

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Table 1

Airframe

(This table details the examination and checks to be carried out)

WARNING

Refer to the general safety precautions listed in para. 3

Item No.	Item	Operation	A. P. Reference	Rectification	A. P. Reference
		ALIGHTING GEAR			
		Jack and trestle the aircraft. Support the rear fuselage with No. 7 universal jacking trestle and former, at frame 42.	Sect. 2, Chap. 4		
	MAIN UNDERCARRIAGE				
(a)	Shock-absorber struts	(i) Examine for normal and equal extension (ii) Examine for oil leaks	Sect. 2, Chap. 2 1803P. Vol. 1, Sect. 6	(i) Adjust air pressure (ii) Slight leaks - recharge strut (iii) Serious leaks - indicate gland failure - renew strut	Sect. 3, Chap. 5 Sect. 3, Chap. 5 Sect. 3, Chap. 5
(b)	Torque links	(i) Examine for wear and damage (ii) Check clearance at centre pivot pin ◀ Permissible clearance between 0.001 in. and 0.010 in. ▶ (iii) Remove centre pivot pin and examine for bowing, cracks, and shear.		(i) Renew torque links ◀ (ii) Clearance in excess of limit to be rectified by fitting new bearing washer (Ref. No. 26FZ/715) with the thickness adjusted to provide the original tolerance of 0-001 in. to 0.004 in.	Sect. 3, Chap. 5
				Note... Serious deviation indicates torque link twisted - renew torque link. (iii) Renew pivot pin. ▶	

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Item No.	Item	Operation	A. P. Reference	Rectification	A. P. Reference
(c)	Torque links, side stay, and main attachment lugs	Examine for damage	1803P, Vol. 2 Pt. 3, Sect. 6	Renew if necessary	Sect. 3, Chap. 5
(d)	Side stays and stay links	Examine for damage			
(e)	Side stay upper attachment brackets	(i) Examine for damage (ii) Examine securing nuts for movement, and bolts for shearing (iii) Examine spar web in vicinity of brackets for damage				Vol. 6, Pt. 1, Chap. 3	(i) Renew if necessary (ii) Renew if necessary
(f)	Retraction jacks	(i) Examine attachment fittings for damage (ii) Examine rams for damage	1803P, Vol. 2 Pt. 3, Sect. 6	Renew jacks	
(g)	Shock-absorber strut attachment brackets	(i) Examine for damage (ii) Examine for cracks in web and flanges, and in vicinity of bolt holes. Note... Access to internal parts of brackets can be obtained through lightening holes in web of inboard plate. (iii) Examine bolts attaching top and bottom plates for shearing and signs of movement. (v) Examine all bracket-to-spar attachment bolts for shearing and signs of movement.	Vol. 6, Pt. 1, Chap. 3	Renew bolts Renew bolts	

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Item No.	Item	Operation	A. P. Reference	Rectification	A. P. Reference
(h)	Main wheels	Note... When removing or refitting a wheel, it must be fully supported to prevent damage to the oil seal housing Remove, and examine:- (i) Tyres for casing fracture (ii) Wheels for symmetry-spin wheel casting on dummy axle (iii) Brake unit Note... Damage to wheel and brake unit is to be suspected if brake unit is difficult to remove from wheel	A. P. 2337 A. P. 2337	(i) Fit serviced wheels and check tyre pressures. Secure valve caps (ii) Renew wheel casting (iii) Fit serviced brake units	Vol. 4, Part 2
2	NOSE UNDERCARRIAGE				
(a)	Shock-absorber strut	(i) Examine for normal extension (ii) Examine for oil leaks Note... The white line painted on the shock-absorber strut will be obscured if the pressure is low	Sect. 2, Chap. 2 1803E, Vol. 1 Sect. 6	(i) Recharge strut (ii) Slight leaks - recharge strut (iii) Serious leaks - indicates gland failure - renew strut	Sect. 3, Chap. 5 Sect. 3, Chap. 5 Sect. 3, Chap. 5
(b)	Torque links	Examine for damage	) ) )	If defects exist, change complete strut	
(c)	Stay link attachment lugs	Examine for damage			
(d)	Main attachment lug	Examine for damage			
(e)	Retraction jack	(i) Examine attachment fittings for damage (ii) Examine ram for damage	1803E, Vol. 2, Pt. 3	(i) Renew jack (ii) Renew jack	Sect. 3, Chap. 5 Sect. 3, Chap. 5
(f)	Shock-absorber strut attachment bracket	(i) Examine for damage	Vol. 6, Pt. 1, Chap. 2		
(g)	Attachment bracket top securing bolt	(ii) Examine for signs of shearing Note... Damage is more likely to occur to top bolts but, if damage is suspected, all four bolts must be removed for examination		(i) Renew as necessary	
	Note...				
	The following two items are applicable if damage has been found elsewhere in nose undercarriage or surrounding structure.				
(h)	Main pivot bolt	Remove and examine for damage	1803E, Vol. 2, Pt. 3	Fit new bolt	Sect. 3, Chap. 5
(j)	Radius rod top and bottom attachment bolts	Remove and examine for damage		Fit new bolts	Sect. 3, Chap. 5
(k)	Radius rod stay link	Examine for damage		Fit new bolts	Sect. 3, Chap. 5
(l)	Nose wheels	Remove, and examine tyres for casing fractures	A. P. 2337	(i) Renew tyres (ii) Check tyre pressure-secure valve caps	Vol. 4, Part 2

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Table 1 (Continued)

Item No.	Item	Operation	A. P. Reference	Rectification	A. P. Reference
3	ALIGHTING GEAR FUNCTIONING TEST				
(a)	Hydraulic fluid reservoir	Replenish with oil OM-15	Sect. 3, Chap. 6		
(b)	Functional test	Refer to Sect. 3, Chap. 6, and:-			
		(i) Check the accumulator pressure	Leading Particulars		
		(ii) Check cut-out valve operation	Leading Particulars		
		(iii) Raise and lower the alighting gear five times, and ensure that mechanical up and down locks function correctly	Sect. 3, Chap. 5		
		(iv) Check operating times			
		UP 14 sec.			
		DOWN 8 sec.			
		(v) Check warning device	Sect. 5, Chap. 1		
		(vi) Examine fairings and doors for correct fitting	Sect. 3, Chap. 5		
		(vii) Operate undercarriage emergency control, then reset	Sect. 3, Chap. 11		
		(viii) Check UP and DOWN locks	Sect. 3, Chap. 5		
		(ix) Fit undercarriage down locks	Sect. 2, Chap. 1		
		(x) Prime and bleed the system	Sect. 3, Chap. 6		
		Lower the aircraft to the ground, and remove the jacks and trestle.			
4	MAIN PLANE	Remove the following access panels:-			
		1. Main spar attachment	Sect. 2, Chap. 4		
		2. Aileron control tubes			
		3. Undercarriage pivot pin			
		4. Engine upper and lower rear cowls			
		5. Uplock hook			
		6. Hydraulic pipes self-sealing couplings			
		7. Main plane rear attachment fitting			
		8. Main plane front attachment fitting			
		◀ Note... Examine as required by SI/CAN/158 and centre section forging - examine for damage - SI CAN 107A ▶			
(a)	Main spar in vicinity of under carriage attachment bracket	Examine for:- (i) Buckling, distortion and wrinkling (ii) Pulled or sheared rivets	}	}	}
(b)	Skin in vicinity of attachment brackets, and ribs No. 6 and 7				
(c)	No. 6 and 7 ribs				
		(i) Examine for damage.	}	}	}
		(ii) Examine cleat fittings each side of ribs immediately behind main spar for damage.			
		(iii) Examine bolt heads and nuts securing cleat fittings for shearing and signs of movement.			
(d)	Main plane attachment fittings	(i) Examine for damage.	}	}	}
		(ii) Examine bolts for shearing and signs of movement.			
(e)	Spar web and fuselage skin in vicinity of attachment fittings	Examine for damage.	}	}	}
(f)	Main plane rear attachment fittings (frame 27)	Examine for cracks, and signs of movement or shearing of attachment bolts			
(g)	Main plane forward attachment fittings	Examine for cracks, and signs of movement or shearing of attachment bolts			

If damage to rib 7 is found, engine jet pipe must be removed to permit a thorough examination of rib and surrounding structure. Remove bolts for further examination if damage is found at, or in vicinity of cleat.

Vol. 6, Pt. 1, Chap. 3

Table 1 (Continued)

Item No.	Item	Operation	A.P. Reference	Rectification	A.P. Reference
	(h) Leading-edge diaphragm	Examine for damage	} Vol. 6, Pt. 1, Chap. 3		
	(i) Skin covering	Examine for damage			
	(k) Engine attachment fittings and pivots	(i) Examine fittings for damage (ii) Examine engine mounting front outer brackets for damage (iii) Examine engine mounting bolts for tightness			
5	FUSELAGE				
	(a) Short longitudinal beams immediately forward of nose shock-absorber strut attachment	(i) Examine double row of rivets visible on fuselage skin for damage (ii) Examine fuselage skin in vicinity of beams for damage If strut attachment bracket bolts, or bulkhead carrying the bracket are damaged, or if defects found in (i) and (ii) above, then:— (iii) Cut 3 in. dia. hole in cabin floor at mid point between the two beams (starboard side of navigator's seat) (iv) Examine beams for damage (v) Carry out repairs.	Vol. 6, Pt. 1, Chap. 2		
	(b) Nose-wheel well:—	Examine for damage			
	(i) Vertical beam carrying radius rod rear attachments		Vol. 6, Pt. 1, Chap. 2		
	(ii) Rear bulkhead				
	(iii) Side walls				
	(iv) Roof				
	(v) Horizontal beam on roof				
	(c) Fuselage skin immediately aft of wheel well at bottom curve of transport joint	Examine for damage. Small wrinkles may have existed before the heavy landing occurred and, as skin in this area is unstressed, they are to be ignored	Vol. 6, Pt. 1, Chap. 2		
	(d) Fuselage skin at frame 17 (Main plane forward attachment point)	Examine for damage	Vol. 6, Pt. 1, Chap. 2		
	(e) Tail plane attachment bolts	Examine for damage	Vol. 6, Pt. 1, Chap. 4		
	(f) Tail plane attachment fittings	Examine for damage	Vol. 6, Pt. 1, Chap. 4		
	(g) Tail protecting pad	Examine pad and fuselage in vicinity for buckling and damage			
	(h) Fire extinguishers	Examine for signs of discharge	Sect. 4, Chap. 5	Discharge indicated by plunger protruding through cap	
6	AIRCRAFT GENERALLY				
	Carry out rigging check	Note . . . <i>If rigging dimensions are found to be correct, this cannot be assumed to indicate that no defects exist.</i>	Sect. 2, Chap. 4		

Fit all components removed, using new or serviceable items, and carry out necessary adjustments and repairs. Refit all access panels, and remove all tools, rags and other materials used during the servicing of the aircraft.

Enter details of new or serviced components fitted, and sign for completed servicing on Form 700E.

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Table 2**Engines***(This table details the examination and checks to be carried out)***WARNING**

Refer to the general safety precautions listed in para. 3

SAFETY PRECAUTIONS

- (1) The high-energy unit is not to be operated with the H.T. lead disconnected.
- (2) Synthetic oil has a deleterious effect on aircraft finishes and electrical cables, and any spilled oil must be cleaned off immediately. Synthetic oils are also injurious to the skin and a prophylactic ointment must be applied to the hands before commencing work.
- (3) The battery isolation switch must be set to 'OFF' before connecting an external electrical supply.

Item No.	Item	Operation	A.P. Reference	Rectification	A.P. Reference
1	ENGINE MOUNTINGS	Fit sling, and take weight			
	(a) Forward outboard mounting bracket	(i) Remove (ii) Examine for cracks (iii) Examine bolts for damage	Sect. 4, Chap. 1 Vol. 6, Pt. 1, Chap. 3	Renew if necessary	
	(b) Forward outboard mounting support diaphragm brackets	Examine for cracks with the aid of torch probe and mirror attachment through the forward lightening hole in rib 1A in the outer wing. (iv) Refit the forward outboard mounting bracket			
	(c) Inner mounting brackets	Examine for damage	Vol. 6, Pt. 1,	Renew if necessary	
	(d) Rear mounting brackets	Examine for damage	Chap. 3	Renew if necessary	

If engine damage is suspected, refer to A.P.4481F,
Vol. 1, Part 2, Sect. 3.

Fit all components removed, using new or serviceable items, and carry out necessary adjustments and repairs. Refit all access panels and remove all rags, tools, and other materials used during the servicing of the engine installation.
Sign for completed servicing on Form 700E.

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Table 3

Electrical System

*(This table details the examination and checks to be made to the electrical system)***WARNING**

Refer to the general safety precautions listed in para. 3

SAFETY PRECAUTIONS

- (1) Before any servicing of the high-energy ignition units or the H.T. wiring is commenced, refer to the LETHAL WARNING marker card, and remove the fuses.
- (2) The high-energy ignition units must not be operated with the H.T. cable disconnected.
- (3) When using silicone compound, care must be taken to prevent compound making contact with the eyes.
- (4) When removing lead acid batteries disconnect the negative cable first. When refitting batteries, connect the positive cable first.
- (5) When the engines are running, the battery isolation switch must be set to 'ON' before disconnecting external electrical supply.
- (6) Functional tests of electrical equipment must not be carried out during refuelling or defuelling operations, and all electrical power must be OFF.
- (7) Both internal and external electrical power supplies must be disconnected before any Breeze plug connections are broken. Electrical power supplies must not be re-connected until Breeze plugs have been refitted. All electrical circuits affected by disconnection of Breeze plugs, must be functionally tested when the plugs have been refitted.
- (8) Dummy fuses must be fitted to all unused fuse positions.
- (9) When components are removed for bay servicing, the appropriate circuit fuses must be removed, and dummy fuses fitted.
- (10) When circuit fuses are removed to facilitate servicing, dummy fuses must be fitted.
- (11) When servicing is completed, ensure that all dummy fuses, except those in unused fuse positions, are removed and the correct rating live fuses fitted.

Item No.	Item	Operation	A.P. Reference	Rectification	A.P. Reference
		Before carrying out functional tests plug in external electrical supply and switch 'ON'. On completion of tests, switch 'OFF,' and disconnect external supply.			
Battery					
(a)	Main lead acid battery stowage and adjacent structure	Examine for spilled electrolyte, and corrosion	4343 series	If found, neutralize affected areas and inform airframe N.C.O. Paint with anti-sulphuric paint when requested by airframe N.C.O.	
(b)	Emergency lead acid battery stowage and adjacent structure				
(c)	Fire extinguisher circuit				
		Examine inertia switches. If switches have been tripped, all fire extinguishers will have been discharged. Disconnect extinguishers and inform engine N.C.O.	Sect. 5, Chap. 1	Reset inertia switches, and carry out full functional test of circuit. Connect serviced fire extinguishers after fitting.	
(d)	Undercarriage microswitches	Examine for damage		Renew if necessary	
Refit all access panels, and remove all tools and other materials used during the servicing of the electrical systems. Sign for completed servicing on Form 700E.					

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Table 4

Instrument Installation

(To be issued later)

TABLE 5

RADAR INSTALLATIONS

(This table details the examination and checks to be made to the radar installations)

WARNING ...

Refer to the general safety precautions listed in para. 3

SAFETY PRECAUTIONS

- (1) Ensure that the battery isolation switch is set to OFF before connecting external supply.
- (2) Before disconnecting any plug and socket connections both internal and external supplies must be disconnected. Electrical supplies must not be re-connected before plugs and sockets have been refitted.
- (3) All electrical circuits affected by the disconnection of plugs and sockets are to be functionally tested after the plugs and sockets have been refitted.

Item No.	Item	Operation	AP Reference	Rectification
		Examine the bonding of all components for service-ability and good connecting during the course of this servicing.		
1	AIRCRAFT generally			Rectify any defects already reported.
2	COCKPIT			
	Type 9547 repeater indicator	Examine for damage	116B-0304-1	Renew as necessary
3	NAVIGATOR'S STATION			
	(a) ◀ Groundspeed and drift indicator ▶		◀ 114E-1600-16 ▶	
	▶ ◀)	
	(d) Type 7921 indicating unit)		116B-0206-1)	
	(e) Type 16929 control)		114J-0101-16)	Renew items as necessary
	transponder))	
	(f) Type 9273 control unit)	Examine for damage	116B-0304-1)	
	or Type 7750))	
	(g) Type 9547 indicator)		116B-0304-1)	
	(h) ADF/TACAN relay unit)		116B-0304-1)	
	(j) Mountings and trays)			
4	RADAR COMPARTMENT			
	▶ ◀		▶ ◀	
	(b) Type 100 tracking unit)	Examine for damage	114E-0300-1)	Renew items as necessary
	(c) T. R. 7923)		116B-0206-1)	
	(d) Mountings and trays)			

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TABLE 5 (continued)

Item No.	Item	Operation	A. P. Reference	Rectification
5	REAR FUSELAGE			
	(a) Type 19628 transponder)		114J-0101-16)	
	(b) Type 16941 aerial switch unit)		114J-0101-16)	
	(c) Type E182 inverter)	Examine for damage	114J-0101-16)	Renew items as necessary
	(d) T. R. unit Type RT220C)		116B-0304-1)	
	(e) Type 9546 coupling unit)		116B-0304-1)	
	or Type 11)		116B-0304-1)	
	(f) Mountings and Trays)			
6	I. F. F. /S. S. R. AERIALS	Examine for damage	114J-0101-16	Renew as necessary
7	TACAN AERIALS	Examine for damage	116B-0304-1	Renew as necessary
8	◀ DOPPLER AERIAL	Examine for damage	114E-1600-16 ▶	Renew as necessary
9	RADIO ALTIMETER MK 6A AERIALS	Examine for damage	116B-0206-1	Renew as necessary
10	I. F. F. /S. S. R. installation	Carry out functioning test	114J-0101-16	
11	TACAN installation	Carry out functioning test	116B-0304-1	
12	◀ DOPPLER installation	Carry out functioning test	114E-1600-16 ▶	
13	RADIO ALTIMETER MK 6A installation	Carry out functioning test	116B-0206-1	

Fit all components removed during servicing, using new or serviced items, and carry out necessary adjustments and repairs. Remove all tools, rags and other materials used during servicing. Refit access panels. Sign for completed servicing on Form 700E.

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TABLE 6
(Completely revised)
RADIO INSTALLATIONS

(This table details the examination and checks to be made to the radio installations)

WARNING ...

Refer to the general safety precautions listed in para. 3.

SAFETY PRECAUTIONS

- (1) Ensure that the battery isolation switch is set to OFF before connecting external supply.
- (2) Before disconnecting any plug and socket connections both internal and external supplies must be disconnected. Electrical supplies must not be re-connected before plugs and sockets have been refitted.
- (3) All electrical circuits affected by the disconnection of plugs and sockets are to be functionally tested after the plugs and sockets have been refitted.

Item No.	Item	Operation	AP Reference	Rectification
		NOTE (1) The bonding of all components is to be examined for serviceability and good connections.		
		(2) The sealed pre-set controls (DEFL.SENS. and SET ZERO) must NOT be adjusted while the ILS equipment is installed in the aircraft.		
1	AIRCRAFT GENERALLY			
2	AERIALS	Examine for damage		Rectify defects already reported.
3	COCKPIT			
	(a) Type 7 indicator)		116B-0408-1)	
	(b) Type 164 junction box)		116B-0408-1)	
	(c) Marker warning lamp)		116B-0408-1)	
	(d) Type 705 control unit)		116B-0408-1)	
	(e) HF control unit)		2535F)	
	(f) Type 7230 indicator lights)	Examine for damage	116B-0203-1)	Renew items as necessary
	(g) Type 16094 indicator)		116B-0203-1)	
	(h) Type 16095 control unit)		116B-0203-1)	
	(j) Push switch (control column))		116D-0105-1)	
	(k) Communication selector switch)		116D-0105-1)	
	(l) Type C16074/4 U/VHF control unit.)		116D-0105-1)	
4	UPPER EQUIPMENT BAY			
	(a) Type 1741 magnetic relay)		116D-0105-1)	
	(b) Type PTR175 TR unit)		116D-0105-1)	
	(c) Type 9693 junction box)	Examine for damage	116B-0301-1)	Renew items as necessary
	(d) Type 9635 A.F. unit)		116B-0301-1)	

TABLE 6 (continued)

Item No.	Item	Operation	AP Reference	Rectification
5	NAVIGATORS STATION			
	(a) Type 8281 amplifier	)	116B-0102-1)
	(b) Type 8283 control unit	)	116B-0102-1)
	(c) Type 8720 indicator bearing repeater	)	116B-0102-1)
	(d) Push switch (starbd. console)	)	116D-0105-1)
	(e) Type C1607/7 U/VHF control unit	) Examine for damage	116D-0105-1	) Renew items as necessary
	(f) Type 154 junction box	)	2876E)
	(g) Type 7372 junction box	)	116B-0301-1)
	(h) ILS/VP meter junction box	)	116B-0301-1)
	(j) Type 7 indicator	)	116B-0408-1)
6	REAR FUSELAGE			
	(a) TR16098	)	116B-0203-1)
	(b) Type 16119 delay unit	)	116B-0203-1)
	(c) Type 16057 junction box/amplifier	) Examine for damage	116B-0203-1	) Renew items as necessary
	(d) Type 16107 junction box	)	116B-0203-1)
7	BELOW PILOT'S FLOOR			
	(a) Type 60 voltage regulator	)	4343B)
	(b) Type 157 junction box	)	116B-0408-1)
	(c) R1964	)	116B-0408-1)
	(d) R1965	)	116B-0408-1)
	(e) Type 8282 amplifier	) Examine for damage	116B-0102-1	) Renew items as necessary
	(f) HF junction box	)	2535F)
	(g) Type UA. pre-amplifier	)	2535F)
	(h) HF transceiver	)	2535F)
	(j) HF tuner unit	)	2535F)
	(k) Type M6 TR unit	)	116B-0102-1)
8	EXTERNAL I/C socket (starboard-wheel well)	Examine for damage		
9	Q. E. corrector unit (below pilots canopy)	Examine for damage	116B-0102-1	
10	I. L. S. installation		116B-0408-1	
11	RADIO COMPASS installation	)	116B-0102-1)
12	RADIO ALTIMETER Mk. 7B installation	)	116B-0203-1)
13	HF installation	)	2535F)
14	U/V. H. F. installation	) Carry out functioning	116D-0105-1)
15	U. H. F. STANDBY installation	) test	116B-0102-1)
16	U. H. F. HOMER installation	)	116B-0301-1)

Fit all components removed during servicing, using new or serviced items, and carry out necessary adjustments and repairs. Remove all tools rags and other materials used during servicing of the radio systems and refit all access panels. Sign for completed servicing on form 700E.

TABLE 1

Airframe

(The table details the examination and checks to be carried out)

WARNING

Refer to the general safety precautions listed in para. 3.

Item No.	Item	Operation	A. P. Reference	Rectification
Note...				
Maximum 'g' loading varies according to the type of fatigue meter fitted - 4.0g for Mk. 3 fatigue meters, 4.5g for Mk. 13 and 5.0g for Mk. 16.				
Carry out rigging check. Correct rigging dimensions cannot be assumed to indicate that no defects exist.				
1	MAIN PLANES			
	(a) Main spar root fittings	Examine for cracks, and signs of movement or shearing of attachment bolts	Vol. 6, Pt. 1, Chap. 2 and 3	Renew as necessary
	(b) Rear spot root fittings at frame 27			
	(c) Skin covering	Examine for damage	Vol. 6, Pt. 1, Chap. 3	Repair as required
	(d) Body side pick-up at frame 17	Examine for damage	Vol. 6, Pt. 1, Chap. 2 and 3	Repair or renew as necessary
	(e) Forward diaphragm			
	(f) Boundary angles	Examine for damage	Vol. 6, Pt. 1, Chap. 3	Repair as necessary
	(i) Steady the aircraft on wing jacks			
	(ii) Refer to Sect. 3, Chap. 2, fig. 2.			
	Support the leading edge by a plank located under the forward diaphragm supporting it by trestles and packing or by jacks as found most convenient, making sure that it is just contacting the leading edge before release of closing plates, but not exerting any upward force.			
	(iii) Remove the cover plates, commencing at the top surfaces.			
	(iv) Remove the leading edge closing panels (Sect. 3, Chap. 2, para. 21)			
	(v) Remove paint from the boundary angles (3 off per wing) and inspect them for signs of cracking, using ARDROX crack detection method (A. P. 880C, Vol. 1, Sect. 6).			
Note...				
Examine as required by SI/CAN/158				
Centre section forging - examine for damage - SI/CAN/107A				

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Table 1 (Continued)

Item No.	Item	Operation	A. P. Reference	Rectification
	(vi) If any cracks are found, their nature and location are to be reported immediately through the usual channels, and the aircraft retained unserviceable.			
	(vii) Repaint the boundary angles and refit the cover plates.			
	(viii) Clean and grease the spools and slots, refit the closing panels and remove the nip of the guide block screws as in Sect. 3, Chap. 2, para. 22(8)			
	(ix) Remove the jacking			
2	FUSELAGE			
	(a) Skin at frame 17	Examine for damage	Vol. 6, Pt. 1, Chap. 2	Repair as necessary
	(b) Tail plane attachment fittings	Examine for damage	Vol. 6, Pt. 1, Chap. 4	Renew as necessary
3	TAIL PLANE			
	(a) Attachment bolts	Examine for damage	Vol. 6, Pt. 1, Chap. 4	Renew as necessary
	(b) Attachment fittings			
	◆ (c) Rib 3 attachment cleats P & S.	Examine for damage	SI/CAN/141A	Renew as necessary ▶
4	SERVICES			
	(a) Wing root services	Examine all wing root services, i. e. fuel cabin air, hydraulics, engine controls and generator controls, for looseness of joints and chafing.	Vol. 6, Pt. 1, Chap. 7 Sect. 4, Chap. 1 Sect. 4, Chap. 1	Repair or renew as necessary
5	UNDERCARRIAGE			
		Jack and trestle the aircraft and carry out undercarriage retraction checks. Examine for alignment and locking of the main leg and 'D' doors, and check that the projecting skin tongue on the forward outboard end of the 'D' door is undamaged and fits correctly into the wing skin recess	Vol. 6, Pt. 1, Chap. 5	Repair or renew as necessary

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Appendix 3 FLIGHT THROUGH TURBULENT AIR

TABLE 1

Airframe

*(This table details the examination and checks to be carried out)***WARNING**

Refer to the general safety precautions listed in para. 3

Item No.	Item	Operation	A.P. Reference	Rectification
1	MAIN PLANES			
	(a) Body side pick-up at frame 17	Examine for damage	Vol. 6, Pt. 1, Chap. 2 and 3	Repair and renew as necessary
	(b) Forward diaphragm	Examine for damage	Vol. 6, Pt. 1, Chap. 3	Repair as necessary
	(c) Boundary angles			
	(i) Steady the aircraft on wing jacks			
	(ii) Refer to Sect. 3, Chap. 2, fig. 2. Support the leading edge by a plank located under the forward diaphragm, supporting it by trestles and packing or by jacks as found most convenient, making sure that it is just contacting the leading edge before release of closing plates, but not exerting any upward force			
	(iii) Remove the cover plates, commencing at the top surfaces			
	(iv) Remove the leading edge closing panels (Sect. 3, Chap. 2, para. 21)			
	(v) Remove paint from the boundary angles (3 off per wing) and inspect them for signs of cracking, using ARDROX crack detection method (A.P.880C, Vol. 1, Sect. 6)			
	(vi) If any cracks are found, their nature and location are to be reported immediately through the usual channels and the aircraft retained un-serviceable			
	(vii) Repaint the boundary angles and refit the cover plates			
	(viii) Clean and grease the spools and slots, refit the closing panels, and remove the nip of the guide block screws as in Sec. 3, Chap. 2, para. 22(8)			
	(ix) Remove the jacking			

Remove all tools, rags, and other materials used during this servicing.
Enter details of new or serviced components fitted, and sign for completed servicing on Form 700E.

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APPENDIX 4 LIGHTNING STRIKES

(New Appendix introduced)

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<i>Comprehensive examination</i>	2

General information

1. Lightning strikes usually result in two types of damage, that caused by the actual strikes, and that caused by the discharge of static electricity which follows the strike. It is also possible that heavy static discharges may occur without the aircraft having been struck by lightning. Further, it is possible that certain aircraft components may become strongly magnetized, it being probable that during the lightning discharge heavy electrical currents flow in the metal airframe structure. The magnetic field produced by such electric current is the cause of magnetization, this being an undesirable factor in the vicinity of a compass.

2. A lightning strike usually causes burning of small circular holes of approximately 1/8 inch diameter, which may be clustered in one locality or scattered over a large area, results may also be indicated by burnt or discoloured skin, or rivets.

Evidence of lightning strikes usually appears more prevalent in the fuselage nose section, and outer leading edges.

3. The effects of static discharge may occur as localized pitting or burning and may even result in circular holes of approximately 1/4 inch diameter. Evidence of static discharge usually appears more prevalent on trailing edges, in the lower aft fuselage area, radio aerials and the main-plane extremities, also on the fin and tail-plane tips and trailing edges.

Examination procedure

4. Whenever a lightning strike or static electricity discharge is reported, or if it is suspected that these conditions may have been encountered, the aircraft must be examined for evidence of such, as tabulated subsequently, at the first opportunity following the incident. It is emphasised, however, that where the term 'Examine' is used, the signs of damage

being primarily sought are those of lightning strikes and static discharge as defined in para.2 and 3 respectively. The examination is divided into the following two categories:-

Table 1 — *Preliminary examination* — intended only for en-route aircraft landing away from base, to be followed upon return to base by:-

Table 2 — *Comprehensive examination* — the normal procedure to be carried out at base on termination of flight.

Note...

Categorization does not of itself determine repair deferment policy. A decision to defer the rectification of ascertained damage must be related to the effect of the damage upon the airworthiness of the aircraft.

TABLE 1 PRELIMINARY EXAMINATION (En-route aircraft only)

ITEM NO.	ITEM	OPERATION
1	(a) Ejection seats (b) Canopy and hatch jettisoning systems	Ensure rendered safe.
2	Fuselage exterior	Examine, paying particular attention to nose section, perspex transparencies for crazing, and fuselage underside and tail fairing.
3	(a) Tail-plane surfaces (b) Elevator surfaces (c) Elevator tab surfaces	Examine, paying particular attention to trailing edges, tips and hinge areas.
4	(a) Fin (b) Rudder (c) Rudder tab	Examine, paying particular attention to trailing edges.
5	Main-plane surfaces	Examine, paying particular attention to outer leading edges, trailing edges, root-ends, air intakes and hinge areas of the control surfaces.
6	(a) Aileron surfaces (b) Aileron tab surfaces (c) Flap surfaces (d) Air brakes	Examine, paying particular attention to trailing edges and hinge areas.
7	Tip tanks	Examine.
8	(a) Main-wheel units (b) Nose-wheel unit	If extended at time of incident:— Examine, paying particular attention to lower portions.
9	(a) Main flying controls (b) Flaps (c) Air brakes	Operate each system through full range and check for smooth freedom of movement.
10	Fire extinguisher discharged indicator	Examine and check by feel the indicator pin at the base of the extinguishers for protrusion; if the pin protrudes the extinguisher must be renewed. Examine the tell-tale windows in the discharge adapter of Type 4 AX extinguishers for colour change.
11	Navigation lamps	Operate, and check for correct functioning.
12	All aerials	Examine.
13	(a) Radio equipment (b) Navigation equipment	Operate, and check for correct functioning.
14	Pressure head	Examine.
15	Compass	Carry out a check swing.
16.	Static dischargers	Examine

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TABLE 2 **COMPREHENSIVE EXAMINATION (Normal procedure)**

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
1	(a) Ejection seats (b) Canopy and hatch jettisoning systems	Ensure rendered safe.	109B-0101-1.	
2	Front fuselage	Examine, paying particular attention to (a) the perspex transparencies, (b) nose-wheel doors and underside.	101B-0400-6, Pt.1, Chap.2.	(a) Polish or renew as necessary. (b) Repair as necessary.
3	Rear fuselage	Examine, paying particular attention to the underside and rear fairing. Static discharge is usually indicated by a series of small holes along the underside at approximately the centre line.	101B-0400-6, Pt.1, Chap.2.	Repair as necessary.
4	(a) Tail plane (b) Fin	Examine, paying particular attention to the trailing edges, tips and hinge areas of control surfaces.	101B-0400-6, Pt.1, Chap.4.	Repair or renew as necessary.
5	(a) Elevators (b) Elevator tabs	(1) Examine, paying particular attention to the trailing edges. (2) Examine hinge assemblies, as far as practicable. If signs of static discharge or pitting are found, extend examination to include all bearing points in the control system. (3) Move the elevator and tabs through the full range of travel and check for freedom of movement and smooth operation.	101B-0400-6, Pt.1, Chap.4. Sect.3, Chap.4.	Repair or renew as necessary.
6	(a) Rudder (b) Rudder tab	(1) Examine, paying particular attention to the trailing edges. (2) Examine hinge assemblies and tab-operating mechanism as far as practicable. If signs of static discharge or pitting are found, the examination must be extended to include all bearing points in the control system. (3) Move the rudder and tab through the full range of travel and check for freedom of movement and smooth operation.	101B-0400-6, Pt.1, Chap.4. Sect.3, Chap.4.	Repair or renew as necessary.
7	Main planes	Examine, paying particular attention to the outer leading edges, inboard undersurfaces, air intakes, trailing edges and hinge areas of flying controls, and skin joints.	101B-0400-6, Pt.1, Chap.3.	Repair as necessary.
8	Tip tanks	Examine.	101B-0400-6, Pt.2, Leaflet C5/1.	Repair as necessary.

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TABLE 2

COMPREHENSIVE EXAMINATION (Normal procedure) - *continued*

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
9	Ailerons	<ol style="list-style-type: none"> (1) Examine, paying particular attention to the trailing edges. (2) Examine hinge assemblies, as far as practicable. If signs of static discharge or pitting are found, the examination must be extended to include all bearing points in the control system. (3) Move the ailerons through the full range of travel and check for freedom of movement and smooth operation. 	<p>101B-0400-6, Pt.1, Chap.3.</p> <p>Sect.3, Chap.4.</p>	Repair or renew as necessary.
10	Aileron tabs	<ol style="list-style-type: none"> (1) Examine, paying particular attention to the trailing edges. (2) Examine hinge assemblies and tab-operating mechanisms. (3) Operate the aileron tabs through the full range of travel and check for freedom of movement and smooth operation. 	<p>101B-0400-6, Pt.1, Chap.3.</p> <p>Sect.3, Chap.4.</p>	Repair or renew as necessary.
11	Flaps	<ol style="list-style-type: none"> (1) Examine, paying particular attention to the trailing edges. (2) Examine hinge assemblies. If signs of static discharge or pitting are found, extend the examination to include all bearing points in the flap control system. (3) Disconnect flap-operating rods at the rear ends. (4) Move the flaps through the full range of travel and check for freedom and smooth operation. (5) Reconnect flap-operating rods. (6) Operate flap system through full range of travel and check for smooth operation. 	<p>101B-0400-6, Pt.1, Chap.3.</p> <p>Sect.3, Chap.4.</p>	Repair or renew as necessary.
12	Air-brake assemblies	<ol style="list-style-type: none"> (1) Extend and examine. (2) Examine all hinge assemblies. If signs of static discharge or pitting are found, extend the examination to the operation jack bearings. (3) Operate the air brakes and check for full and free movement and smooth operation. 	<p>Sect.3, Chap.2.</p> <p>Sect.3, Chap.4.</p>	Renew as necessary.
13	(a) Main-wheel units (b) Nose-wheel unit	<p>If extended at time of incident:- Examine, paying particular attention to the lower parts of the shock-absorber struts and wheels.</p>	<p>2337, Vol.1 and 1803E, Vol.1.</p>	Renew as necessary.

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TABLE 2 COMPREHENSIVE EXAMINATION (Normal procedure) - continued

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
14	Aircraft generally	If any aerials (or other protuberances) have broken away during incident, examine for incidental damage.		Renew aerials and repair damage as necessary.
15	ELECTRICAL (a) External lighting (b) Cockpit lighting	Operate, and check for correct functioning.	Sect.5, Chap.1, Group L.	
16	ENGINES Fire extinguisher indicator	Check by feel, mechanical indicator pin at base of extinguisher for protrusion. If pin protrudes renew extinguisher. On Type 4AX extinguishers examine the tell-tale windows in the discharge adapter for colour change.	Sect.4, Chap.5.	Renew as necessary.
17	INSTRUMENTS Compasses	Test and carry out check swing.	1275B, Vol.1.	Renew as necessary.
	Note...	Refer also to A.M.O. 'A' 188/1959 and A.P.3158, Vol.2, Leaflet B.22 for the effect of lightning strikes on aircraft flight instruments compass systems.		
18	Aerials	Examine.	Sect.6, Chap.2.	Renew as necessary.
19	All connectors (aerials to trans/rec.)	(1) Disconnect. (2) Examine, particularly end connections. (3) Check for continuity and leakage from conductor to outer screen.	Sect.6, Chap.2.	Renew as necessary.
20	Aerial switch units	(1) Examine, particularly connections and contacts. (2) Check for continuity and leakage from conductor to outer screen in both energized and de-energized conditions.	Sect.6, Chap.2.	Renew as necessary.
21	All connectors	Reconnect		
22	Installation	Operate, and check for correct functioning.	Sect.6, Chap.2.	
23	RADIO Aerials	Examine.	Sect.6, Chap.1.	Renew as necessary.

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TABLE 2

COMPREHENSIVE EXAMINATION (Normal procedure) — *continued*

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
24	All connectors (aerials to trans/rec.)	(1) Disconnect. (2) Examine, particularly end connections. (3) Check for continuity and leakage from conductor to outer screen.	Sect.6, Chap.1.	Renew as necessary.
25	Aerial switch unit	(1) Examine, particularly connections and contacts. (2) Check for continuity and leakage from conductor to outer screen in both energized and de-energized conditions.	Sect.6, Chap.1.	Renew as necessary.
26	All connectors	Reconnect.		
27	Installation	Operate and, using test equipment, check for correct functioning.	Sect.6, Chap.1.	
28.	Static dischargers	Examine		Renew as necessary.

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APPENDIX 5 - VIOLENT BRAKING

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General information	1

General information

1. In cases of heavy braking loads, the brakes, tyres and wheels must undergo full Bay Servicing.



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