

SECTION 2

GROUND HANDLING AND PREPARATION FOR FLIGHT

LIST OF CHAPTERS

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

1. Ground handling
2. Preparation for flight
- 3A. Loading and C.G. Data – B Mk.6 Aircraft
- 3B. Loading and C.G. Data – B(I) Mk.6 Aircraft
4. General servicing
5. Change of role
6. Procedures following hazardous incidents

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SECTION 2

**GROUND HANDLING AND
PREPARATION FOR FLIGHT**

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- 1 Ground handling
- 2 Preparation for flight
- 3A Loading and C.G. data - B Mk.6 aircraft
- 3B Loading and C.G. data - B(1) Mk.6 aircraft
- ◀ 3C Fatigue index data ▶
- 4 General servicing
- 5 Change of role
- 6 Procedures following hazardous incidents

Chapter 1 GROUND HANDLING

(Completely revised)

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WARNING

The relevant safety precautions detailed on the **LETHAL WARNING** marker card must always be observed before entering the cabin or performing any operations on the aircraft.

Introduction

1. Information on the general handling of the aircraft on the ground is given in this chapter. The equipment necessary for ground handling is listed in Chapter 4 of this section.

Armament safety plug break (B(1) Mk.6 aircraft).

2. The armament safety plug break must be disconnected from its mating socket in the cabin just aft of the entrance door as soon as practicable after the aircraft has landed.

Towing (fig.3)

3. Normal towing is from the nose-wheel axle, the towing gear consisting of a towing arm (Ref. No.4G/2792) adapted to suit the axle by fitting an 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 during towing. With the locking pin inserted at the correct position A, on the load index plate on the towing arm, the release mechanism operates at a pull-off load of 9200 lb. The towing equipment is fully described in A.P.2817A, Vol.1, and 6, Sect. 9, Chap.3. The aircraft may, if necessary, be towed either forward or backward from the main wheel axles by attaching a 50 ft. towing bridle (Ref. No.4G/4139) to the towing eyes on the axles; when towing from the main wheels the aircraft is steered with a steering arm (Ref. No.26FZ/95087) at-

tached to the nose-wheel axle. When towing, a mechanic should be in the cockpit to operate the brakes as necessary.

Note...

The wheel brake system hydraulic pressure must not be allowed to fall below 2200 lb/in² during aircraft towing.

Picketing (fig.4)

4. The aircraft must, where possible, be picketed facing into wind with locks applied to all control surfaces (para.9, 10 and 11), and chocks positioned fore-and-aft of each wheel. When picketing the aircraft, the following safety precautions must be observed:—

(1) For winds from any direction, up to 50 knots, control locks must be fitted and chocks placed fore-and-aft of each wheel.

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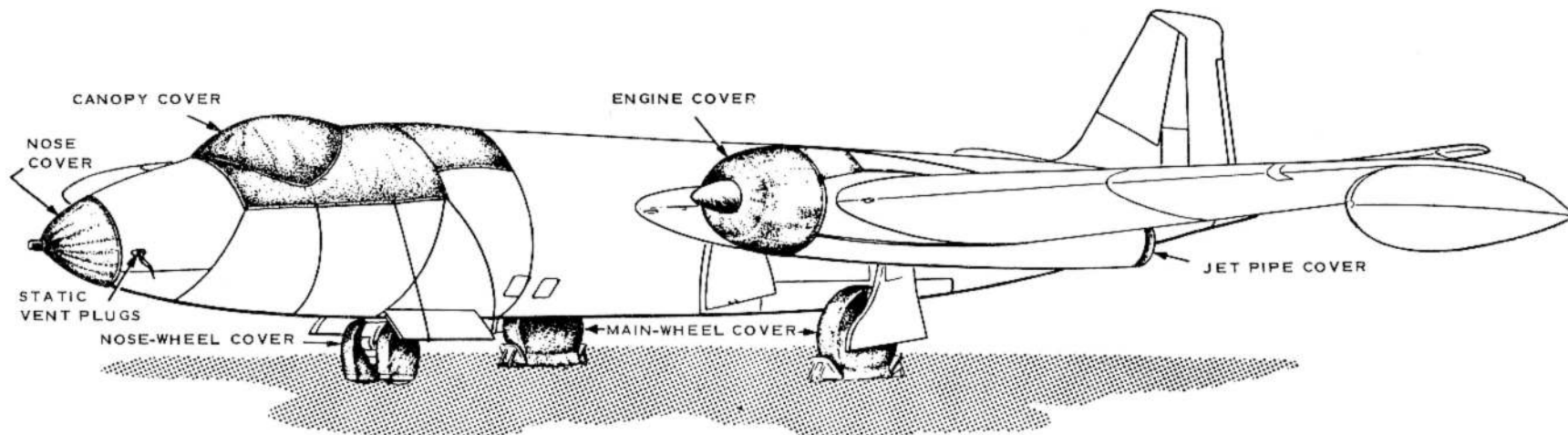


Fig.1. Aircraft covers

(2) For winds between 50 to 80 knots, the nose undercarriage only need be picketed, control locks fitted and wheels chocked fore-and-aft.

(3) For winds exceeding 80 knots, the aircraft must be secured at all picketing points, control locks fitted, and chocks placed fore-and-aft of each wheel.

5. The main points of anchorage are at the nose undercarriage, where a lashing is placed over the stay-link lugs on the shock-absorber strut, and at each main undercarriage unit, where a lashing is coupled to 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 also provided, one in the underside of each main plane, where screwed holes for detachable ring-bolts are provided in the main spars, a third screwed hole is provided at frame 42 in the lower surface of the rear fuselage; when not in use these holes are closed by screwed

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...

(1) Whenever the aircraft is parked out in the open for any long period, e.g. overnight, the tail plane should be left in the fully nose down trim position. This will prevent condensation forming on the exposed part of the actuator jack with the consequent risk of icing on a subsequent flight.

(2) Whenever the aircraft is likely to be subjected to an accumulation of snow on the main and tail planes, it must be picketed at the nose wheel.

Alighting gear safety devices

External locks

6. The alighting gear safety locks must always be fitted before any ground handling is commenced and must only be removed immediately prior to flight. The alighting gear locking arrangements are illustrated in fig.5 and consist of two U-shaped sleeves

which are fitted, one to each main undercarriage jack piston-rod, between the jack body and the piston-rod end-fitting; they are secured by quick-release pins which, with the sleeves, encircle the jack piston-rods. The nose undercarriage 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.

Master safety switch

7. A guarded two-position switch, marked LIVE and SAFE, is fitted adjacent to the alighting gear selector push-switches. When in the SAFE position, the switch breaks the electrical supply to the selector and prevents inadvertent retraction of the alighting gear. The switch must be in the SAFE position at all times whilst the aircraft is on the ground, except during alighting gear retraction tests with the aircraft jacked and trestled.

Control surface locks (fig.6)

Internal locking

8. The flaps are locked in the UP position

by 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.

Ailerons

9. The procedure for locking the ailerons is as follows. Ensure that the flaps are up, raise the aileron until it is level with the flap and insert the web of the lock, wide end foremost and the securing strap at the bottom, between the aileron and the flap. Push the lock forward until its upper and lower flanges bear on the aileron and the skin of the main plane, and secure it by attaching the hook at the end of the strap to the leading edge of the flap. Repeat this procedure on the opposite aileron.

Note...

The lower flange of the aileron lock fouls the flap, therefore, on no account may the flaps be lowered whilst the locks are in position. The flap switch lock must always be in position when the aileron locks are fitted.

Rudder

10. The procedure for locking the rudder is as follows. Centralise the rudder and insert the web of the lock, wide end foremost and with the securing pin on the starboard side, between the bottom of the rudder and the top of the rudder stub. Push the lock forward, until its flanges bear on both sides of the rudder and the stub, and secure it by inserting the pip-pin at the end of the extension spring into the hole in the starboard side of the rudder.

Elevator

11. Set the elevator in its neutral position, fit the lock 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.

Bomb doors switch lock

12. To prevent accidental operation of the bomb doors switch during servicing operations in the bomb bay, provision is made for locking the switch to retain the doors in the open position. The bomb door switch lock consists of a quick-release pip-pin, which is inserted in holes in both side-plates of the switch and locks the switch lever in the doors open position. A warning disc is attached to the pip-pin. A stowage for the lock is provided on the port side of the cockpit.

Covers (fig.1)

13. The canopy, wheels, nose and pressure head covers and the static vent plugs must always be fitted whenever 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 them.

External intercommunication socket

14. Contact can be made with personnel inside the cabin of the aircraft during towing or engine-running operations by means of an external intercommunication socket located in the starboard wheel well, on the fuselage side.

Crashed aircraft

◀ **WARNING**

Before attempting to cut away the hatch of aircraft having single-lever ejection facilities for the rear crew members, it is essential to look through the navigator's window to see if either crew member has

attempted to eject. If the sear has been withdrawn from the ejection gun ensure that the secondary firing cable, connecting the safety catch in the restrictor of the breech firing unit to the hatch, is not disturbed otherwise the seat will be ejected. ▶

Entry into aircraft

15. In the event of normal entry being impossible, the aircraft may be entered by cutting away, with an axe or other suitable implement, the navigator's escape hatch or the pilot's canopy; these areas are marked by yellow-painted broken lines.

Lifting and removal

16. The exact method of lifting and removing the aircraft, and the equipment to be used will depend entirely upon local conditions and requirements. General information, a description of equipment, and suggested methods are given in A.P.119Q-0200-16. ▶

WARNING

Before the commencement of lifting operations, refer to the current regulations relating to crashed aircraft, and take the following precautions:—

- (1) The ejection seat cartridges must be removed or the firing mechanism made safe as detailed in A.P.109A-0001-1. ▶
- (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 a hose inserted through the filler-cap orifices.

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Lifting the aircraft (fig. 7)

17. Should it be possible to lift the aircraft by cranes or gantries, the following methods may be adopted. 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 limitation, 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 of each outer wing leading edge immediately outboard of the engines. 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 fire wall until the cable ends protrude beneath the engine cowlings.

(7) Attach the lifting arms to the cables with the shoulder bolts Part No. EA3.88.317, $\frac{3}{4}$ in Whitworth hexagon nuts and special washers Part No. EA3.88.319 and raise the slings until the spherical head on the lifting arm engages in the main spar jacking point.

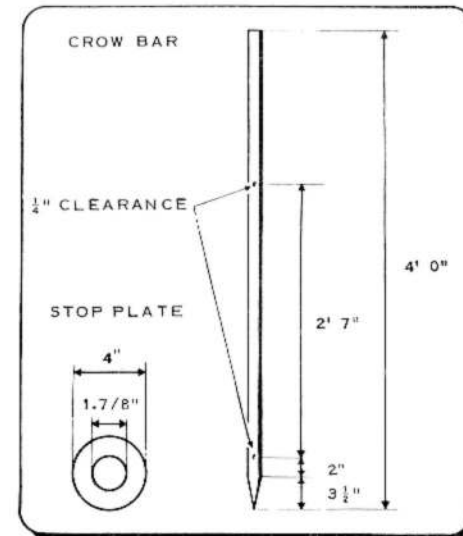
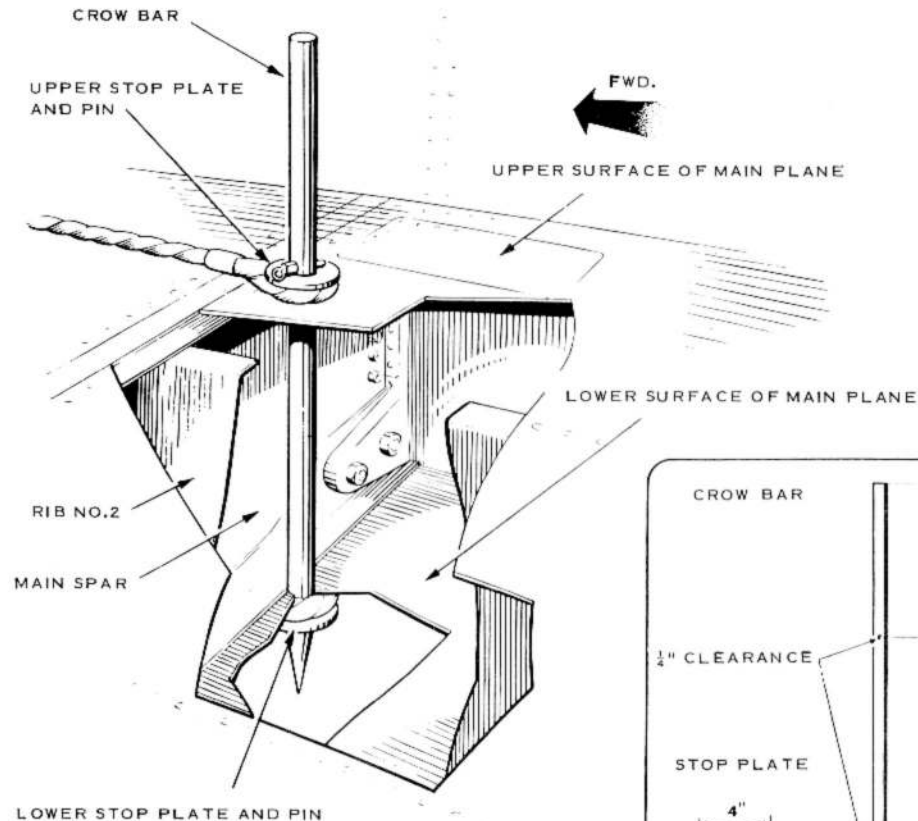


Fig.2. Emergency towing equipment

(8) Raise the aircraft and position a 10-ton hydraulic jack Ref. No. 4Q/2625 and trestle Ref. No 4Q/2652 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 tension on the slings, trestle the fuselage as instructed in Sect.2, Chap.4, para.4.

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Emergency removal (fig.2)

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

Equipment required

- (1) Two crow bars (*local manufacture*); make from steel bar, 1½ in dia Ref. No. 30A/3048.
- (2) Four stop plates (*local manufacture*); make from 6 S.W.G. steel sheet Ref. No. 30A/1988.
- (3) Four pip-pins Ref. No. 27FT/8.
- (4) Two 50-ft towing bridles Ref. No.

4G/4139, fitted with one ¾ in shackle Ref. No. 28Y/6051 on each end.

- (5) Sledge hammer Ref. No. 1B/1375.
- (6) Suitable towing/winch vehicles.

Recommended method

- (1) Place the point of a bridle attachment bar on the inboard front corner of the main spar access panel and, using a sledge hammer, drive through the top panel.
- (2) When the bridle attachment bar has penetrated the upper access panel and entered the main plane, thread a towing bridle shackle and stop plate over it, and

fit a pip-pin.

- (3) Locate the point of the bridle attachment bar on the lower access panel and force the bar through the main plane **until** the upper pip-pin prevents further penetration.
- (4) Thread the other shackle end of the towing bridle, and the stop plate over the protruding lower end of the bar, and secure with a pip-pin.
- (5) Repeat this operation on the opposite plane.
- (6) Connect the towing bridles to a suitable vehicle and tow/winch clear.

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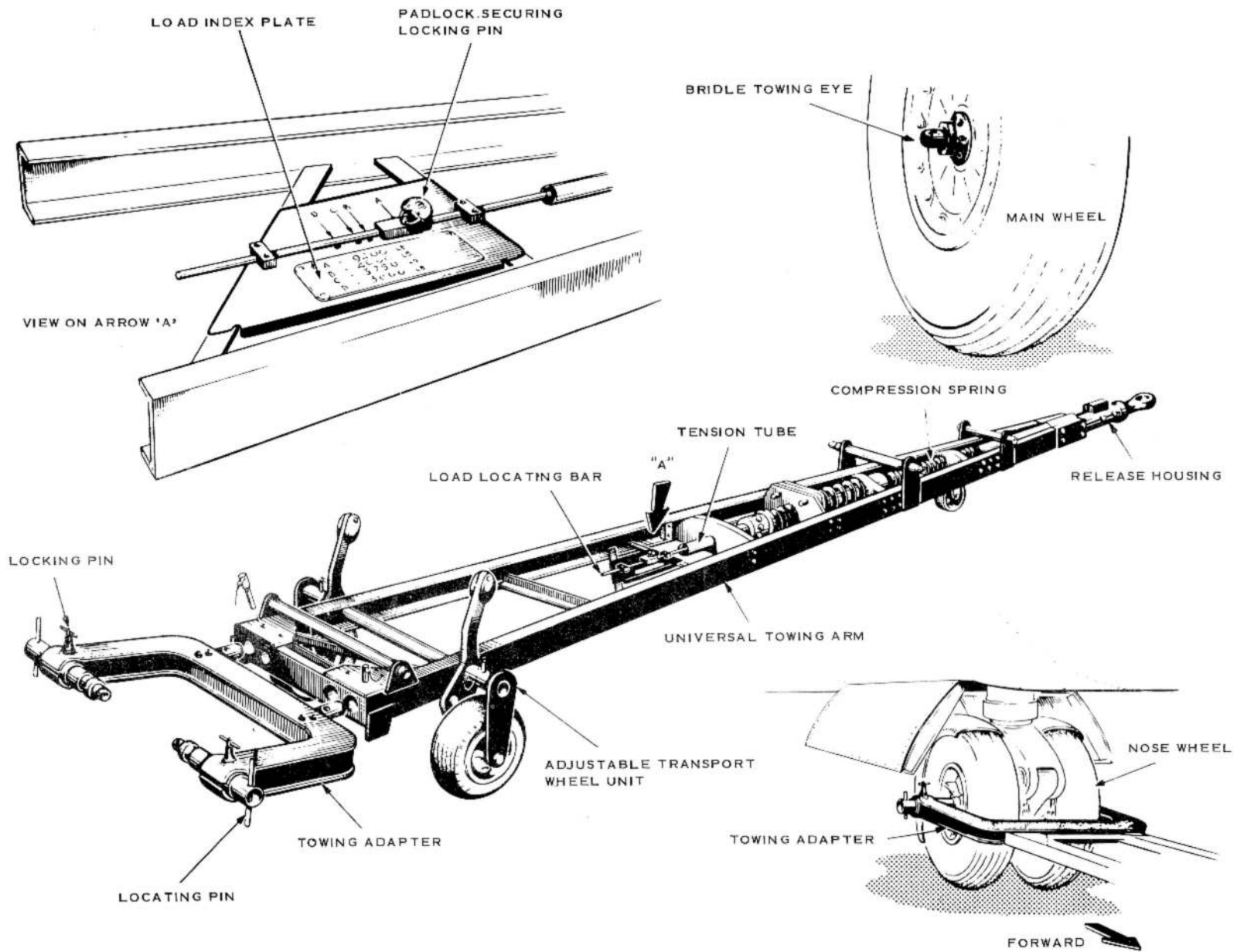


Fig. 3. Towing equipment

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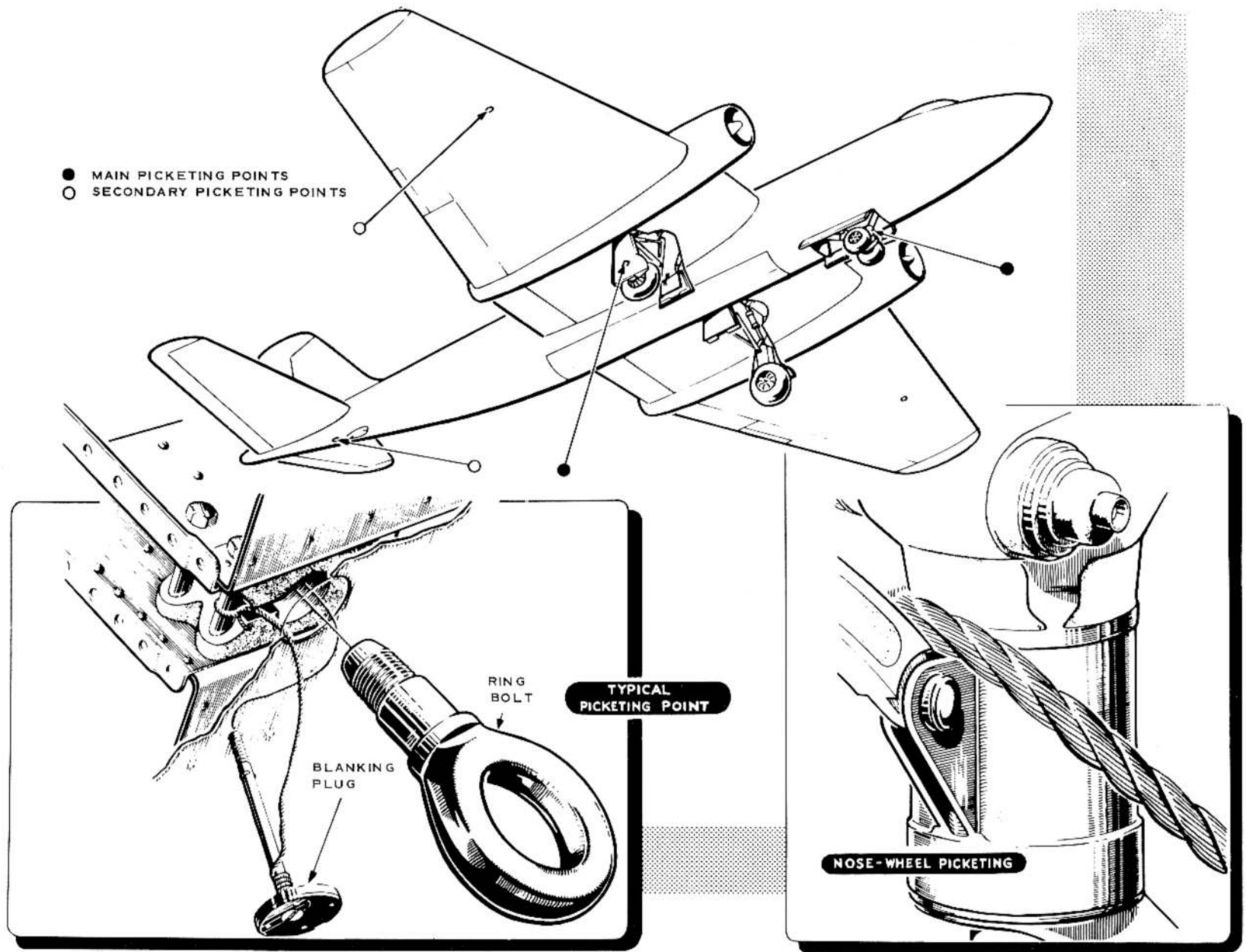


Fig. 4. Picketing points

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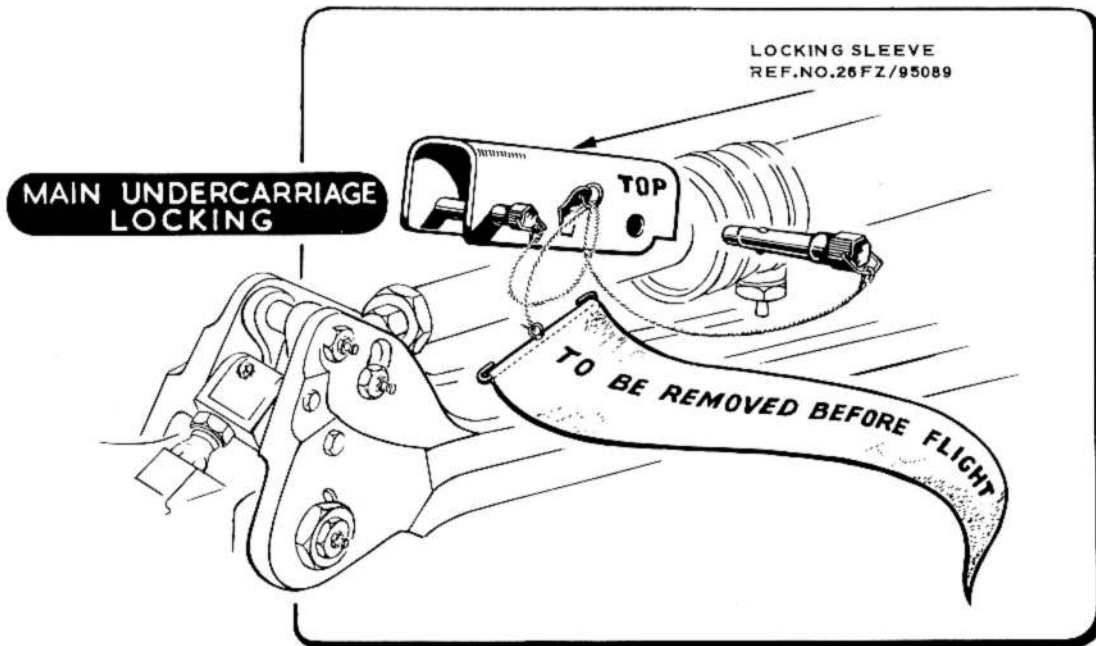
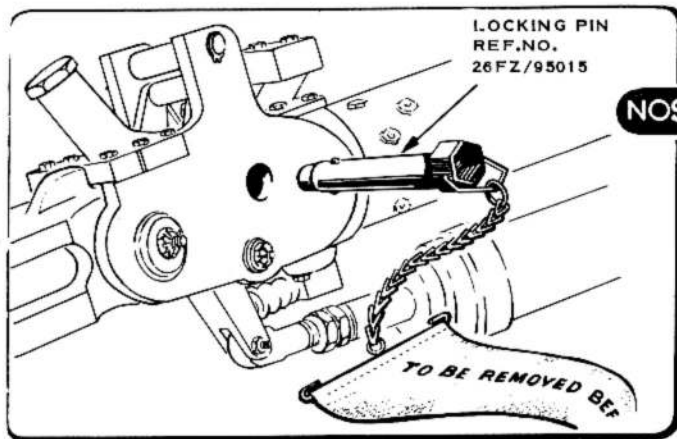


Fig. 5. Alighting gear locks

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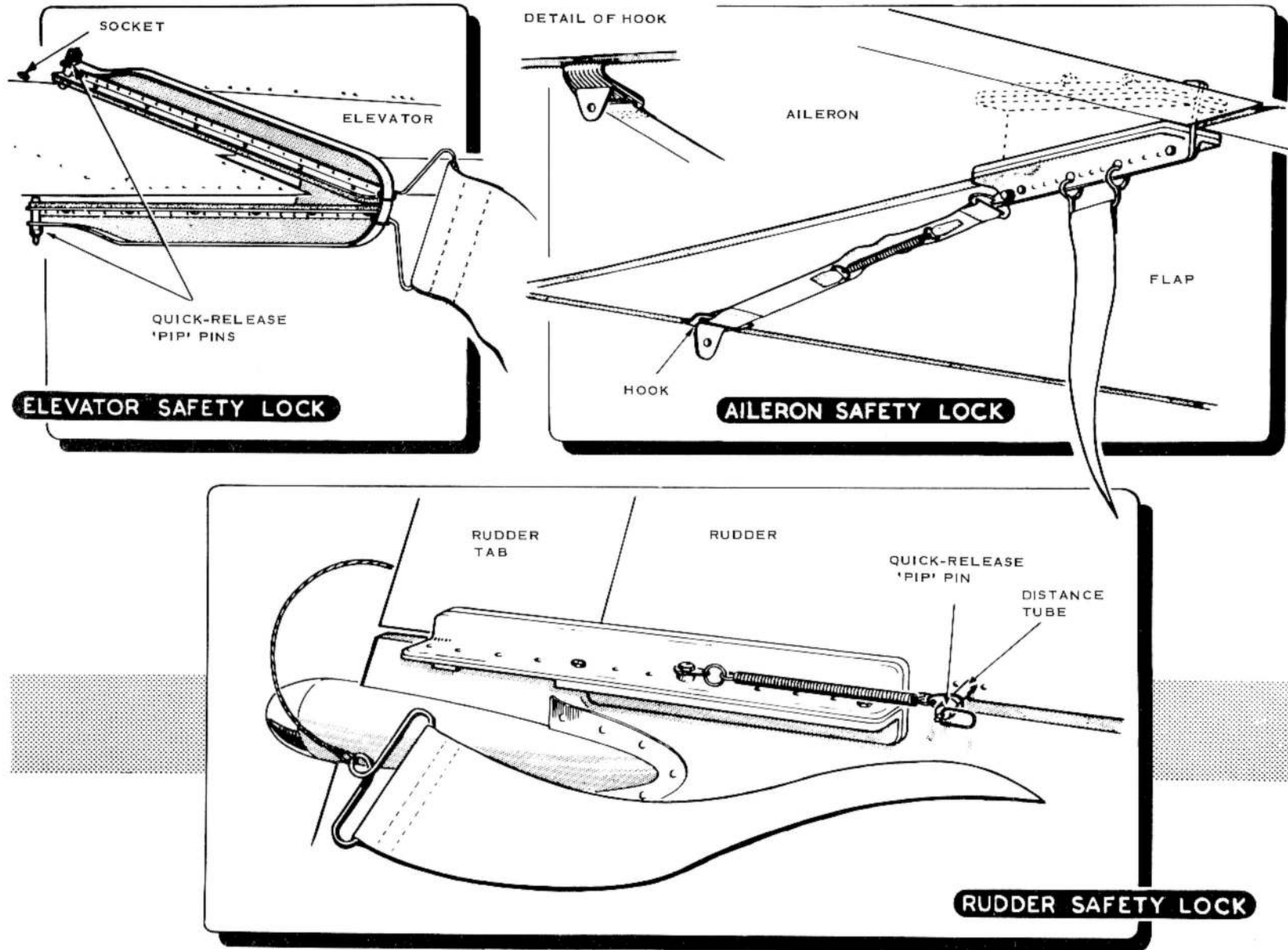


Fig. 6. Control surface locks

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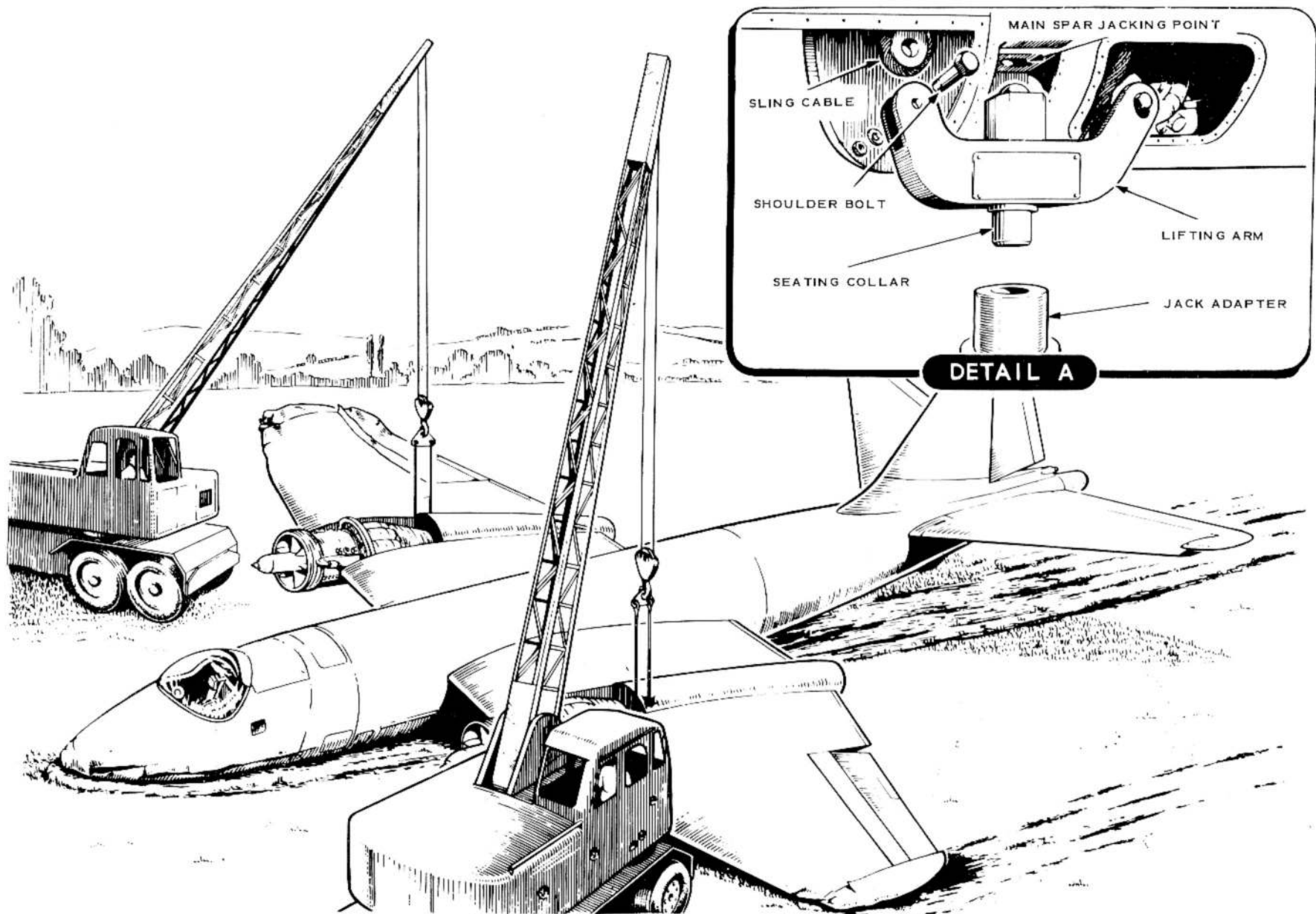


Fig. 7. Lifting a crashed aircraft

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Chapter 2 PREPARATION FOR FLIGHT

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WARNING

The relevant safety precautions detailed on the **LETHAL WARNING** marker card must always be observed before entering the cabin or performing any operations upon the aircraft.

Introduction

1. This chapter gives information on the general preparation of the aircraft for flight. Access to the fuel tank and other replenishing points is illustrated in fig.2.

Refuelling

2. Fuel tank filler caps are located in the top surface of the fuselage and main plane; the wing-tip tanks have filler caps in their upper surface and the filler cap for the auxiliary fuel tank is on the top, front end, of the tank. Observe the precautions in para.3.

Refuelling/defuelling precautions

3. It is essential that the following precautions are observed when refuelling or defuelling the aircraft:

- (1) Verify the correct type of fuel to be used.
- (2) Prior to removing the filler caps, ensure that the fuel hose and refueller are correctly earthed.
- (3) On no account should No.1 tank be drained whilst fuel remains in No.2 and/or

No.3 tanks, without supporting the fuselage at frame 42. During refuelling operations fill No.1 tank first; during defuelling No.1 tank must always be drained last.

(4) When refuelling the main plane integral tanks, the inboard compartment of each tank must be filled first and the filler cap secured before attempting to fill the outboard compartment.

(5) The tanks must be filled only from a refueller fitted with a Streamline filter (Ref.No.4K/2371).

(6) In the event of partial refuelling where a full fuel load is not required, the integral tanks are to be filled to capacity. Any further adjustment to the fuel load must be made to the fuselage and wing-tip tanks.

Checking the tank contents

4. The main fuel tanks are fitted with capacitor-type fuel contents gauges which indicate correct readings irrespective of the attitude of the aircraft; dipsticks are not required. The gauge indicators register the tank contents when the battery isolating switch on the pilot's 'take-off' panel is switched on or when the batteries are connected to the external electrical supply socket (para. 12).

Checking the accessory gearbox oil level

5. The accessory gearbox oil dipstick is located on the top of the gearbox, and is accessible after removing a panel in the main plane (Sect. 2, Chap. 4). If the oil level is lower than the FULL mark on the dipstick, the gearbox should be replenished through the filler-cap adjacent to the dipstick.

◀ **Re-filling the oil sumps**

6. The oil sump filler caps (fig. 2) are accessible through removable panels (Chap. 4). To refill or top-up.

After the system has been emptied.

(1) *Port engine*

(a) With the aircraft standing on level ground, fill the sump to approximately 1½ inches below the seal face of the sump filler neck.

(b) Run the engine for 2 minutes at idling rev/min to circulate the oil.

(c) After stopping the engine, allow sufficient time to elapse for the oil in the system to drain back into the sump (approximately 10 minutes), after which,

top up to the level as in (2) (a).

(2) *Starboard engine*

(a) With the aircraft standing on level ground, fill the sump to approximately ½ inch below the seal face of the sump filler neck.

(b) Repeat (1) (b).

(c) After stopping the engine, allow sufficient time to elapse for the oil in the system to drain back into the sump (approximately 10 minutes), after which, top up to the level as in (2) (a).

Intermediate topping up

(3) The levels referred to in (1) (a) and (2) (a) are to be rigidly observed. ▶

Topping up the hydraulic fluid reservoir

7. An elliptical panel in the upper surface of the fuselage, aft of the navigator's escape hatch, provides access to the hydraulic reservoir filler cap. The reservoir should be topped up to the maximum possible level with fluid as specified in Leading Particulars, a drain pipe is provided for fluid spilt through overfilling. It is important that all hydraulic pressure is exhausted from the hydraulic accumulators and that their inflation pressures are checked (para. 8 and 9) before topping up the reservoir. To exhaust the hydraulic pressure, open the bomb doors and operate the flaps selector and wheel brakes until no further movement can be obtained.

WARNING

Before operating the flap selector, ensure that aileron locks are not fitted. See note in Chap. 1 of this Section.

Hydraulic accumulator inflation

8. The hydraulic accumulator inflation

point is adjacent to the hydraulic accumulator in the starboard undercarriage well, together with its pressure gauge. The inflation pressure is given in Leading Particulars.

Brakes accumulator inflation

9. The brakes accumulator inflation point is at the forward end of the bomb bay, together with the pressure gauge. The inflation pressure is given in Leading Particulars.

Oxygen system

10. The oxygen charging valve is located on the rear face of frame 12. It is accessible through the battery access door on the port side of the fuselage. The procedure for charging the system is fully described in A.P.1275G, Vol. 1, Sect. 1, Chap. 2.

Battery isolating switch

11. As a number of electrical circuits are without switches and fed directly from the main positive supply, an isolating switch is fitted to prevent battery drain when the aircraft is on the ground with the engines stopped. The switch is located on the pilot's 'take-off' panel, and must be switched OFF immediately after stopping the engines.

External electrical supply socket

12. The external electrical supply socket is located on the main electrical panel on the starboard side of the fuselage, access is through a door in the lower side of the fuselage, aft of the entrance door.

Pilot's 'take-off' panel

13. The 'take-off' panel is located on the port wall of the pilot's cabin. All the switches mounted on this panel must be UP prior to flight.

Canopy de-misting

14. Windows provided in the air-drier tubes

fitted to the canopy, the plastic nose and the air bomber's observation window, permit visual inspection of the contents of the 'tell-tale' compartments. The desiccant used in the air-driers is silica gel, which should be changed when it becomes pink.

Note...

Silica gel is blue when dry.

Lighting gear inflation

15. The inflation pressure of the main undercarriage shock-absorber struts may be checked by measuring the strut extensions and checking these measurements against the graph in fig.4. The graph may be used for aircraft all-up weights from 30000 to 60000 lb. The initial inflation pressures with the strut fully extended, for various all-up weights, are:—

All-up weight 30000 to 42500 lb.,	450 ± 25 lb/in ²
All-up weight 42500 to 51000 lb.,	545 ± 25 lb/in ²
All-up weight 51000 to 60000 lb.,	640 ± 25 lb/in ²

16. 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 (*dimension X in fig.1*), together with the relevant nose undercarriage unit and shock absorber, is given in Table 1.

Tyre pressures

17. The Tyre pressures are given in A.P. 4326F, Vol.5, Part 2.

Positioning the aircraft for ground running

18. The aircraft must be headed into wind for all ground running, to prevent the hot

gases entering the air-intakes and causing overheating. Before starting an engine, care must be taken to 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 by loose objects thrown up

Table 1

Nose undercarriage shock-absorber extension

Nose undercarriage unit type	Shock-absorber unit type	Leg extension (dimension X)
A3590Y	A7305Y	6.70 in.
A3590Y	A3634Y	6.70 in.
A3900Y	A7306Y	7.50 in.
A3900Y	A4094Y	7.50 in.
A5965Y	A7307Y	6.70 in.
A6821Y	A7306Y	7.50 in.
A7806Y	A7307Y	6.70 in.
A7807Y	A7306Y	7.50 in.
O7906Y.A.O.1.	A7307Y	6.70 in.
O7907Y.A.O.1.	A7306Y	7.50 in.

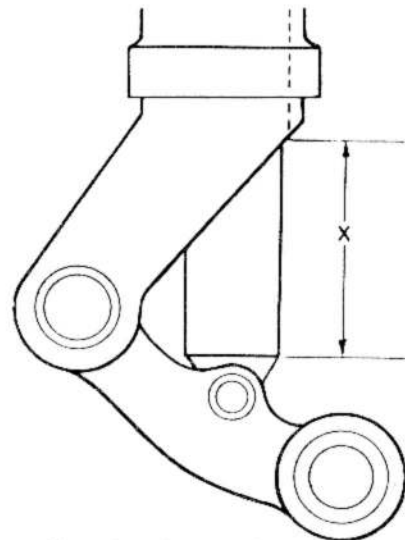


Fig. 1. Nose undercarriage shock-absorber extension

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 otherwise be drawn into the engine. All personnel should keep well clear of the air-intakes, at least five yards, and safety guards (*Ref. No.26FZ/95276*) 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 it may be positioned on grass.

Re-loading the engine starter

19. The engines are started by triple-breech turbo-starters positioned in the air-intakes of both engines; the procedure for re-loading the starter is given in fig.3.

WARNING

The starter may be re-loaded only when the engine is stationary.

Cartridge failure

20. If any cartridge fails to fire allow one minute to elapse before making another attempt to start. If the second and third cartridges fail to fire, wait one minute and check the electrical circuit.

WARNING

A period of ten minutes must elapse between the third attempt and re-loading the starter.

21. Should the engine-starting button fail to remain depressed immediately the operator releases pressure, an interval of at least one minute must elapse before making another attempt in case a start may have been initiated. If the button fails to remain depressed on the second attempt, the aircraft must be considered unserviceable and the cause investigated.

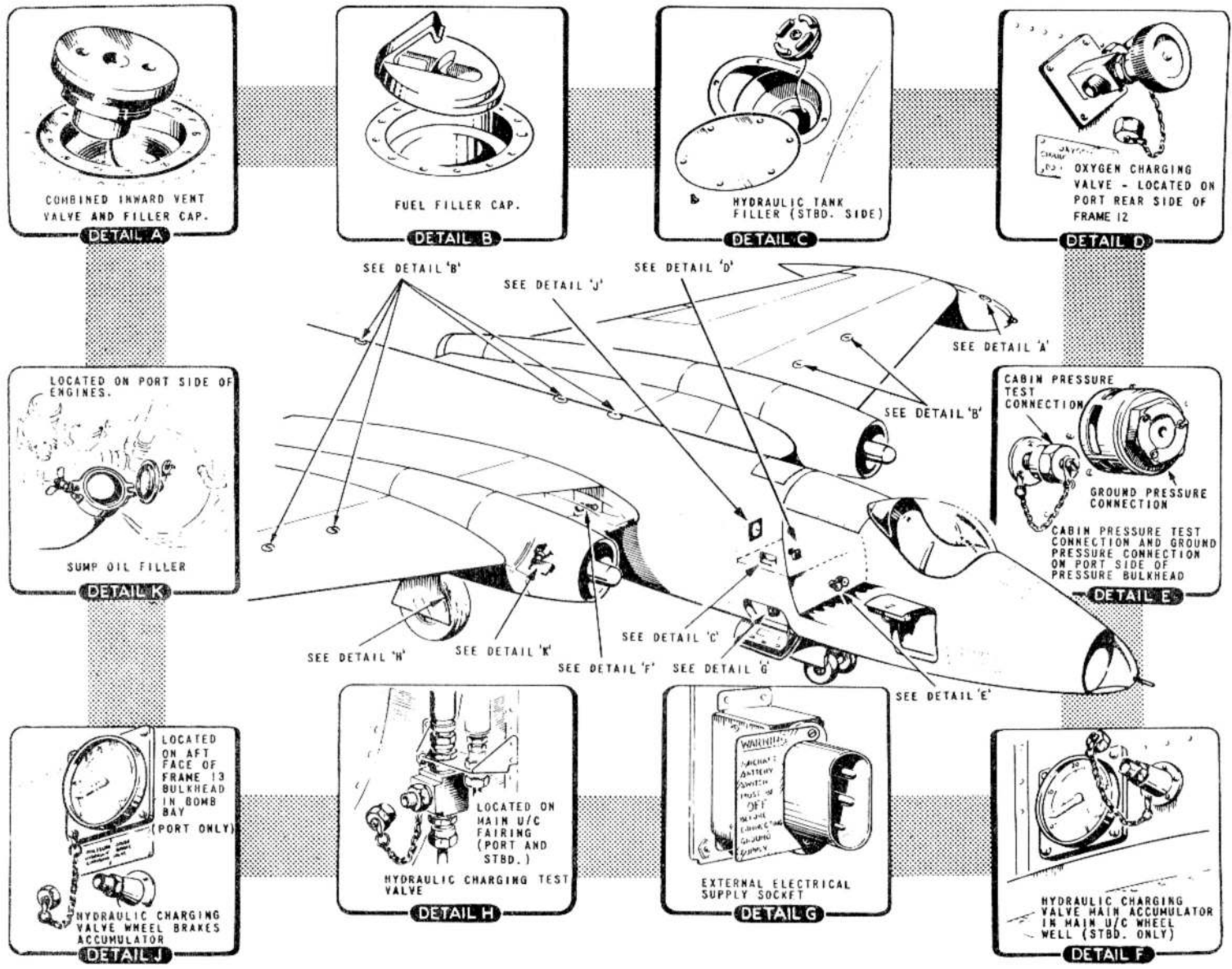
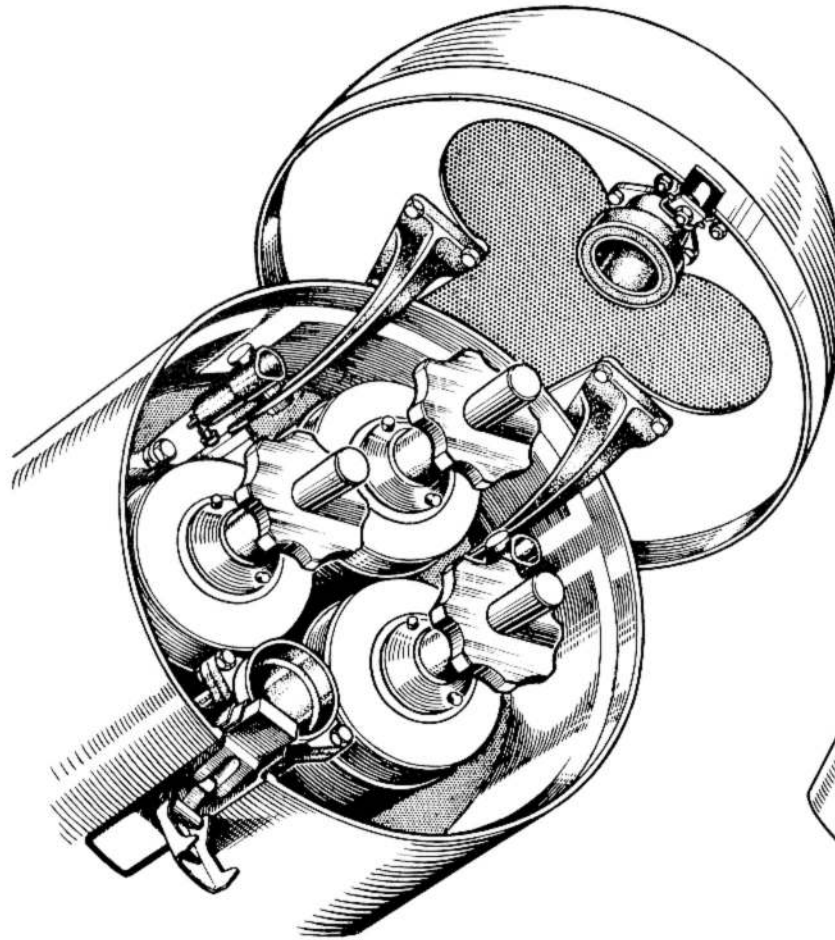


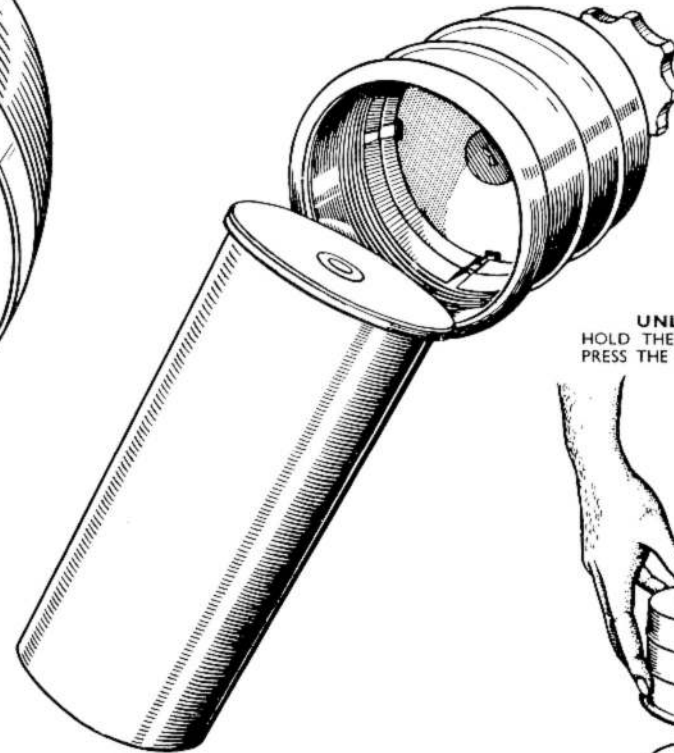
Fig. 2. Servicing points

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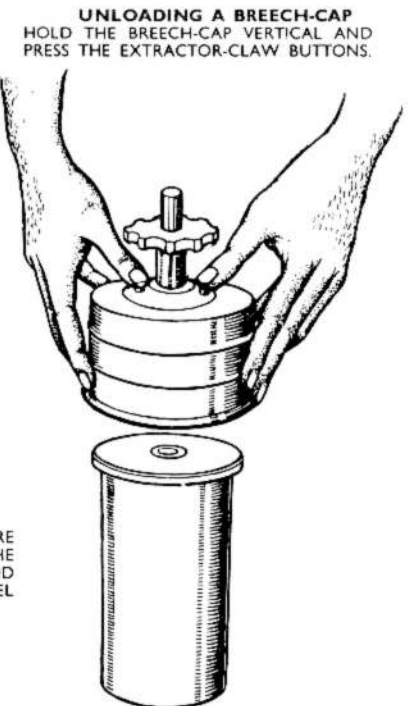
REMOVING A BREECH-CAP

RELEASE THE TOGGLE FASTENER AND RAISE THE DOME-HEAD OF THE STARTER FAIRING. PRESS THE CENTRAL BUTTON OF THE BREECH-CAP TO BE REMOVED AND UNSCREW THE BREECH-CAP BY THE STARWHEEL UNTIL THE RATCHET DISENGAGES. RELEASE THE BUTTON AND CONTINUE TO UNSCREW UNTIL FREE



LOADING A BREECH

PUSH THE CARTRIDGE INTO THE BREECH-CAP AND ENSURE THAT THE EXTRACTOR CLAWS ENGAGE OVER THE RIM OF THE CARTRIDGE. INSERT THE CARTRIDGE INTO THE BREECH AND SCREW THE BREECH-CAP INTO PLACE WITH THE STARWHEEL UNTIL FINGER TIGHT.
NOTE.—DO NOT OVERTIGHTEN THE BREECH-CAP.



UNLOADING A BREECH-CAP
HOLD THE BREECH-CAP VERTICAL AND PRESS THE EXTRACTOR-CLAW BUTTONS.

Fig. 3. Turbo-starter reloading

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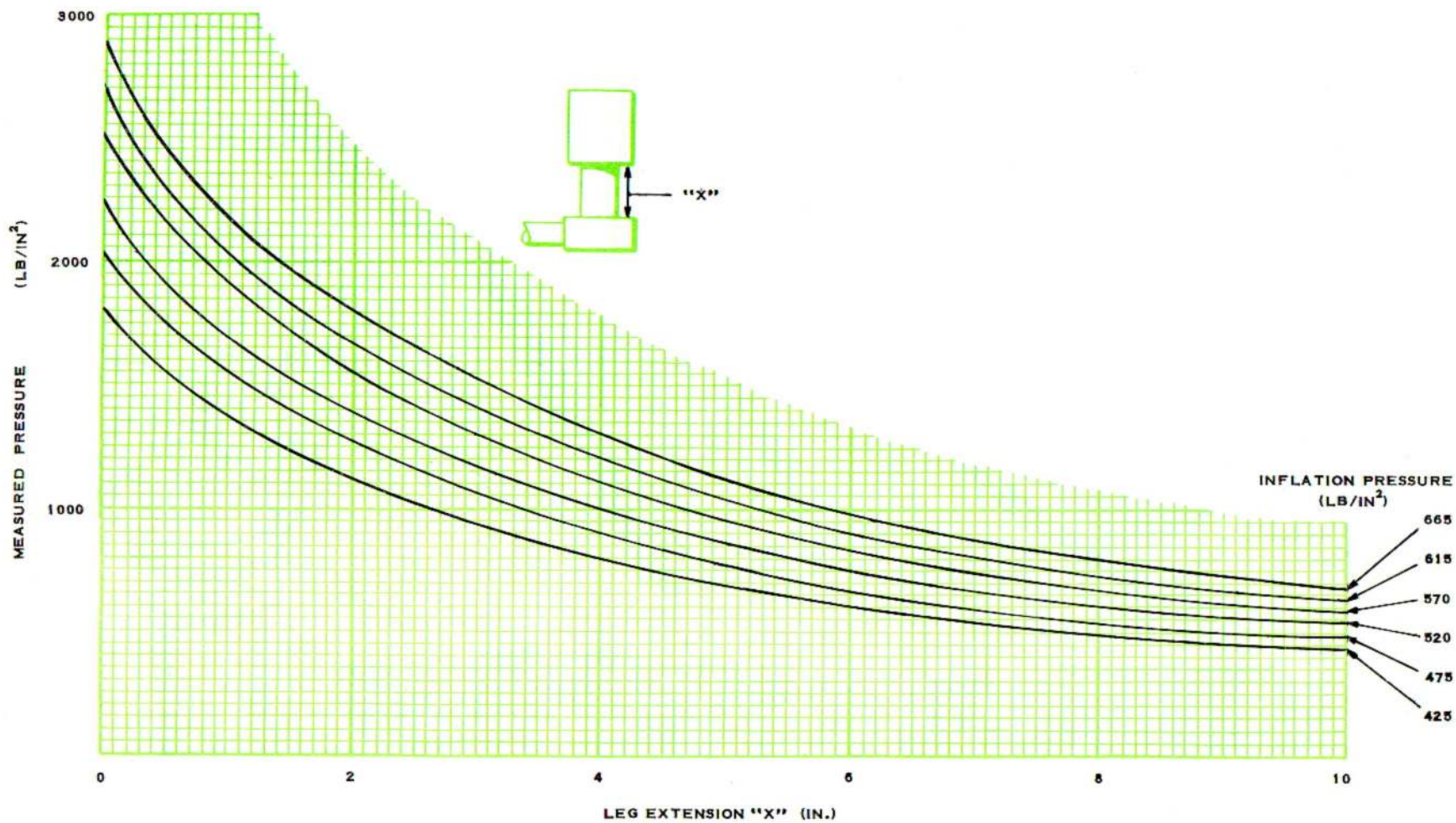


Fig. 4. Main undercarriage inflation chart

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Chapter 3A

LOADING AND C.G. DATA—B Mk. 6 AIRCRAFT

Note...

This chapter deals exclusively with B.Mk.6 aircraft. For B(1)Mk.6 aircraft, refer to Chap. 3B.

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General information

1. This chapter deals with the effect of different and varying loads upon the c.g. position. All data has been calculated with the fuselage horizontal datum level and the

alighting gear down.

C.G. datum

2. The c.g. datum is 4.695 ft forward of the spar datum and 0.455 ft below the fuse-

lage horizontal datum. It is indicated by a screw marked C.G. DATUM, on the port side of the fuselage. This screw can be used to suspend a plumb line during weighing operations.

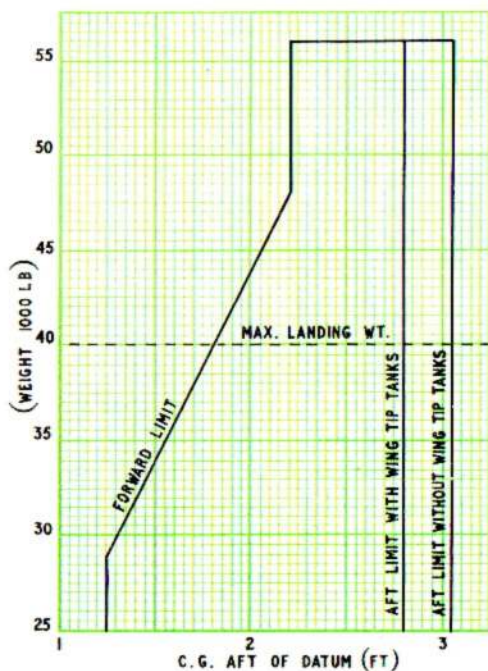


Fig. 1. C.G. limits

C.G. limits (fig.1)

3. Fig.1 shows the approved c.g. limits measured from the c.g. datum.

Forward limit

This is dependent upon the weight of the aircraft. At weights below 29000 lb the permissible forward limit is 1.235 ft aft. At weights in excess of 48000 lb the permissible forward limit is 2.200 ft aft.

Aft limit

'Clean' aircraft	3.058 ft aft
With wing-tip tanks fitted	2.810 ft aft

Note...

If the aircraft is to be taxied over rough

ground, the aft limit must not exceed 2.885 ft aft.

Effect of alighting gear retraction

4. Retraction of the alighting gear introduces a moment of -1454 lb ft, which must be taken into account when making calculations which assume that the alighting gear is retracted.

Crew movement

5. Movement of the air-bomber, from his ejection seat to the mapreader's seat, introduces a moment of -680 lb ft: further forward movement, to the prone position, introduces an additional moment of -894 lb ft (a total moment change of -1574 lb ft).

Basic weight and c.g.

6. Tables 1, 5 and 6 refer to a basic weight of 23095 lb and a basic c.g. position of 2.557 ft aft of the datum. These figures are based on the weighed weight of aircraft Serial No. XK.641 incorporating all fixed equipment detailed in Appendix A, Serial No. 2155, including amendments No.1 to 8. A definition of the term 'basic weight' may be found in A.P.1464D, Vol.1, Part 2, Sect.1, Chap.3.

Ballast weights

7. Ballast weights are provided to help maintain the initial basic c.g. position. Removal, or addition, of approximately 80 lb of ballast gives 0.075 ft of movement forward or aft respectively (Sect.3, Chap.1).

Maximum all-up weights (fig.1)

8. The aircraft is cleared for operational flying at the following maximum weights:—

◀ Take-off	56000 lb ▶
Landing	40000 lb

Note...

Emergency landings only are permissible at weights in excess of this figure.

Weighing the aircraft

Normal method

9. If the aircraft is to be weighed by normal methods, refer to A.P.1464D, Vol.1, Part 2, Sect.1, Chap.3. If hydrostatic methods are to be used, refer to para.10, and to A.P.1464G, Vol.1.

Hydrostatic method

10. A.P.1464G, Vol.1, Part 2, Sect.5, Chap.7, gives general information on hydrostatic units and their use. The following instructions amplify this:—

(1) Jack the aircraft at the main, and front, fuselage jacking points (Sect.2, Chap.4).

(2) Place locally-manufactured wood blocks, of sufficient thickness to provide the necessary clearance for the hydrostatic units and jacks, under the nose and main wheels. Lower the aircraft on to the blocks, and remove the lifting jacks.

(3) Assemble:—

(a) A 25-ton hydrostatic unit, a 15-ton jack, and jack-to-unit and unit-to-aircraft pad adapters at each main wheel jacking point.

(b) A 10-ton hydrostatic unit, an 8-ton jack, and jack-to-unit and unit-to-nose undercarriage adapters, under the nose undercarriage axle between the twin wheels.

(4) Weigh the aircraft as instructed in A.P.1464G, Vol.1, Part 2, Sect.5, Chap.7.

(5) Lower the aircraft on to the wood

blocks, and remove the weighing equipment.

(6) Jack the aircraft (op.(1)), and remove the blocks.

(7) Lower the aircraft to the ground, and remove the jacks.

Modifications

11. The basic weight given in para.6 includes the following modifications: (*Mod.701 introduces the Canberra B Mk.6 fuselage and includes the following modifications as incorporated in the basic design*):-

1 to 4, 6, 8 to 16, 18, 19, 51 to 57, 62, 63, 65 to 69, 71, 73 to 87, 89, 90, 95 to 99, 150, 152 to 157, 159, 161 to 165, 167 to 171, 174 to 178, 180 to 190, 195 to 199, 250, 251, 255 to 272, 275 to 286, 291 to 296, 299 to 303, 305 to 316, 318 to 326, 328, 329, 330, 332 to 335, 337, 339, 340, 341, 343 to 347, 349, 400 to 405, 407, 409 to 412, 414, 415, 418 to 422, 424, 426 to 430, 433, 434, 437 to 447, 449, 450, 501 to 509, 511 to 514, 523, 528, 530, 531, 533, 535 to 538, 540 to 543, 545 to 548, 550, 603, 606, 607, 611, 612, 616, 617, 618, 620, 621, 622, 626, 628, 631, 632, 636, 640 to 644, 648, 649, 650, 701, 706, 710, 711, 713, 714, 716, 717, 720, 721, 724, 730, 731, 733, 735, 739, 740, 741, 745, 749, 750, 851, 852, 853, 856, 857, 859, 862, 863, 864, 869, 872, 874, 877, 878, 886, 887, 890, 894, 895, 896, 899, 1001, 1002, 1004, 1007, 1009, 1011 to 1014, 1016, 1021 to 1023, 1027, 1029, 1036, 1040, 1045, 1047, 1048, 1168, 1171, 1176, 1189, 1272.

Modifications embodied in aircraft Serial No. XK.641 (*para.6*) which are not included in Mod. 701:-

304, 519, 704, 715, 729, 738, 860, 868, 875, 880, 885, 1008, 1018, 1024, 1030, 1033, 1050,

1151, 1152, 1155, 1160, 1163, 1165, 1170, 1196, 1198, 1199, 1254, 1255, 1258, 1259, 1265, 1266, 1268, 1270, 1271, 1276, 1280, 1282, 1290, 1291, 1293, 1294, 1295, 1296, 1299, 1402, 1403, 1405, 1407, 1421, 1425, 1426, 1430, 1432, 1433, 1434, 1438, 1450, 1452, 1454, 1459, 1460, 1463, 1464, 1465, 1466, 1471, 1473, 1477, 1478, 1484, 1487, 1491, 1493, 1497, 1498, 1499, 1701, 1702, 1705, 1707, 1713, 1716, 1722, 1724, 1726, 1728, 1738, 1739, 1740, 1751, 1771, 1778, 1784, 1928, 1929, 1954.

12. The following is a list of modifications approved up to the 30th November, 1959. These modifications, if fitted and if not already included in the second list in para.11, will affect the basic weight given in para.6.

MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
290	To intro. long range bomb bay fuel tank installation (500 gal) (removable)	+365.0	+1004.0
432	Fuel system. To intro. 300 gal fuel tank for bomb bay (removable)	+233.0	+2445.0
519	To intro. canopy with glass-cloth reinforced edge	+ 0.64	- 9.12
704	To intro. temp. setting potentiometer in D/V panel heater control box	NIL	- 1.06
715	Intro. fixed fittings for 300 gal fuel tank	+ 17.4	+ 35.45
722	Intro. A.Y.F. aircraft fitted with A.R.I.5856		
	FIXED	+ 27.5	+ 457.0
	REMOVABLE	-233.03	+2914.0

MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
723	Intro. A.R.I.5856	+170.99	-1867.115
860	To provide access panels to facilitate rigging of flaps	+ 8.06	+ 108.10
868	To strengthen tail-plane detachable fairing	+ 0.19	+ 7.23
880	To re-route jettisonable tank feed pipe in centre fuselage	+ 1.34	+ 17.69
1008	To introduce coiled metal pipes in lieu of Neoprene hose for the air brake system	+ 0.34	+ 2.00
1030	Demand oxygen system. To intro. magnetic flag indicators 5CZ/5003, at the pilot's position and moving crew member's position	+ 0.66	- 9.64
1043	Radio. To facilitate fitment of A.R.I.5856	- 87.9	+1387.0
1050	Main plane, outer wing trailing edge. To improve skin to rib attachments	+ 3.90	+ 31.85
1163	Camera bay. To intro. temp. control valve Pt. No. EA2.75.465	+ 1.23	+ 28.80
1165	Main wheel brake control system To intro. larger dia. pulley and improve cable run	+ 1.00	- 19.40
1171	F/controls - to change material of rudder-tab control rod adjuster from light alloy to steel	NIL	+ 1.30

MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
1175	Cold air unit. To intro. a relief valve in lieu of restrictor between cold-air unit compressor outlet and turbine inlet	+ 2.92	- 2.50
1199	Bomb bay. To provide means for visual inspection from rear bulkhead	+ 1.18	+ 19.27
1253	Interdictor role. To provide removable conversion sets	+1464.0	+10209.0
1255	Flying panel. To intro. new panel to cater for A.Y.F., I.L.S., and Zero Reader	+ 1.67	- 34.63
1262	Interdictor role. To make provision for gunsight	+ 1.55	- 26.91
1266	Hydraulic system. To intro. thermal relief valve. Dowty C.4603Y. Mk.E in lieu of U.M.C.632	- 2.39	- 3.18
1268	Tail plane. To improve the attachment of stringers to ribs by replacing rivets by bolts	+ 2.35	- 3.18
1270	Engine installation. To re-route engine wheel case breather pipe further aft	+ 8.00	+ 42.86
1271	Instruments. To intro. fuel gauges to record fuel contents in terms of mass units	+ 0.15	+ 2.83
1277	Rear fuselage. To intro. sealing between tail plane and fuselage	+ 10.08	+ 346.0

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MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
1280	Radio. To intro. A.Y.F. equipment	+ 59.5	+ 697.0
1282	Radio. To facilitate servicing of Gee-H strobe unit	+ 0.70	- 10.75
1293	Engine de-icing system. To delete 3-position switch, and intro. ON/OFF switch and pilot's indicator	- 2.53	+ 38.5
1297	Fuselage, interdictor role. To intro. improved occasional seat	+ 30.68	- 470.74
1402	Fuel system. To intro. flexible metallic pipes in lieu of Avica flexible rubber pipes in pressure feed lines to wing-tip tanks	- 1.34	+ 1.64
1403	Fire protection system. To intro. additional methyl bromide bottle and spraying in Zone 2 of engine bay	+ 34.8	+ 57.15
1405	Wings. To mod. jet pipe core to cater for increased dia. of thermocouple compensating leads	+ 0.4	+ 9.83
1407	Flying controls. To intro. protection against ingress of foreign objects for pressure box	+ 0.53	- 5.92
1420	Electrical. To intro. inverter 103 in lieu of R.C. 8A, and 100A in lieu of 100B	+ 49.71	- 460.35
1425	Misc. equipment. To move fuselage fire extinguisher bottle from frame 29 to rear tank bulkhead	- 0.74	- 43.18

MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
1433	Hydraulic system. To intro. hydraulic restrictor for main u/c 'D' doors	+ 0.16	NIL
1434	Alighting gear. To intro. strengthened check link for main u/c doors	+ 0.46	+ 1.57
1435	Radio installation. To intro. I.F.F. Mk. 10 and delete I.F.F. Mk. 3	+ 74.25	+ 1413.0
1442	Centre fuselage. To improve serviceability of bomb bay fore and aft sealing	+ 0.85	+ 9.30
1444	To intro. I.L.S. equipment	+ 46.82	- 341.0
1447	Instrument installation. To intro. Zero Reader equipment	+ 46.23	- 916.0
1459	Electrical. To intro. cockpit lamp to illuminate oxygen contents gauge	+ 0.10	- 1.60
1460	Electrical equipment. Intro. of Helvin cap, sea grey, for single and double dolly switches	+ 0.18	- 2.90
1463	Fuel system. To improve integral tank sealing	+ 1.33	+ 4.87
1464	Alighting gear. To intro. slave mechanism for u/c 'D' door sequence valves	+ 1.17	+ 4.03
1466	Fuselage. Front portion to remove floor insulation at pilot's position	- 0.97	+ 17.57

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MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
1469	Power unit. To intro. access doors in the cowling for adjustment of P.V. ram	+ 0.90	+ 11.75
1471	Misc. equip. To reinforce ends of non-metallic pipes aft of pressure bulkhead in cockpit heating system	+ 0.28	- 2.39
1474	Power unit. To provide improved accessibility to dipstick on P.3 generator two-speed gearbox	- 0.16	- 0.24
1478	Fuel system. To intro. fuel recuperators	+ 49.93	+ 139.89
1482	Instrument panel. To intro. new starboard instrument panel	+ 1.20	- 20.20
1484	Misc. equip. To reinforce ends of non-metallic pipes in cockpit heating system forward of pressure bulkhead	+ 0.27	- 4.54
1487	Hydraulic system. To change dia. of hand pump suction pipe from $\frac{3}{8}$ in to $\frac{1}{2}$ in	+ 0.70	- 9.02
1491	Fuel tanks. To intro. additional fairleads for rigid connections to tank units in integral tanks	+ 0.25	+ 0.4
1497	Electrical. To replace all Dupren 6 cables in main and nose u/c warning systems with Dupren-sheath 6 (circular) (u/c down)	+ 0.76	+ 0.90
	(u/c up)	+ 0.76	+ 0.88
1500	Cockpit heating. To intro. flexible metal hose in lieu of rigid pipes in main plane leading edges	+ 2.99	+ 5.91

MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
1702	Electrical. To intro. fairlead to obviate damage to cable assemblies C.31 and C.32 at rib A on aft face of leading edge	+ 0.15	. NIL
1704	Radio. To facilitate servicing of Gee-H transmitter	- 0.85	+ 12.22
1705	Fuel system, wing-tip tanks. To intro. earthing socket	+ 0.11	NIL
1713	Front fuselage. To intro. attachment screws EEAS/1/2 with reduced length for navigator's hatch	- 0.10	+ 1.04
1716	Flying controls. To paint all control rods externally	+ 0.96	+ 3.83
1721	Electrical. To intro. dive-brake operating switch, 5CW/4612, in lieu of 5C/4197, to reverse direction of switch operation and to intro. guard	+ 0.25	- 4.33
1722	Pressure cabin. To intro. stowages for pressure cabin leak stoppers	+ 3.02	- 34.35
1724	Alighting gear. To intro. safety lock and stowage for u/c up selector switch	+ 0.10	- 1.80
1726	Integral tanks. To change matl. of drain pipe from D.T.D.310 (light alloy) to D.T.D.323 (tungum)	- 0.13	NIL
1728	Fuel system. To move fuselage fuel tank vent outlet further aft	- 1.32	+ 108.0

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MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
1734	Hydraulic system. To intro. revised filler cap seating on hydraulic reservoir	+ 0.20	- 1.81
1735	To intro. a periscope	+ 7.38	- 83.38
1740	Alighting gear. To intro. nose u/c jack, A.8214Y, with revised attachment in lieu of jack A.7771Y		
	(u/c down)	+ 0.41	- 3.49
	(u/c up)	+ 0.41	- 2.84
1743	Fire protection system. To intro. piston-type inertia switch (27N/93) in lieu of existing type inertia switch	- 0.28	+ 2.82
1747	Pyrotechnics. To intro. pistol pressure cabin 1½ in and mounting, Mk.2 in lieu of Mk.1	+ 1.29	- 15.82
1777	Radio, Gee-H equipment. To intro. second warning point	+ 11.49	- 159.7
1778	Fire protection system. To intro. fire warning push switch, 5C/5763 and test switch, 5CW/5057, in lieu of 5CW/4514	NIL	+ 1.47
1781	Integral tanks. To intro. access doors to facilitate replacement of fuel contents units	+ 11.81	+ 57.38
1782	Electrical. To delete engine pump isolating switches	- 1.39	+ 21.60
1928	Electrical. To re-route tail plane actuator wiring outside general service conduits	+ 7.94	+ 34.49

MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
1929	Flying controls. To intro. cut-in switch for tail plane trim	+ 12.57	+ 142.85
1932	Wing-tip tanks. To intro. redesigned filler cap	+ 0.18	NIL
1940	Hydraulic system. To re-route Maxaret unit return line	- 1.15	- 1.58
1944	Radio - To intro. I.L.S. removable equipment and mounting tray	- 38.9	+ 309.0
1945	Radio, A.R.I.5800. To intro. connector, 10HA/16699 in lieu of 10HA/8807	+ 0.19	- 1.58
1960	Air-brakes. To improve operating slide block assy. on actuating jack	+ 0.20	+ 1.08
1992	Electrical. To transfer the press-to-transmit switch from handwheel to throttle lever	+ 0.51	- 8.92
1993	Main plane; inner and outer engine ribs; to change material of cleat fittings from D.T.D.683, to steel	+ 29.39	+ 142.85
1995	Main plane, inner and outer engine ribs. Intro. of reinforcing steel clamps to the engine rib cleat arms	+ 9.38	+ 45.19
1999	Alighting gear. To intro. clearance groove in axle clamp for main u/c wheel	- 0.13	NIL
2114	Engine installation. To intro. reinforced engine cowl extractor ducts	+ 2.91	- 9.08

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MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
2121	Hydraulics - To replace rubber flexible pipes to the bomb-door jacks by coiled rigid pipes	- 0.70	- 2.03
2127	Engine cowling - To intro. stronger ventilating duct to service panel replacing duct EA6.50.283	+ 1.759	- 3.837
2132	Hydraulics. To replace E.D.P. pressure line flex. pipe, D.C. 102C/40, with D.C. 202C/40	+ 0.74	NIL
2147	Fire detector system. To cover exposed cable between conduit and flames switch with Helsyn plus tube	+ 0.55	NIL
2148	Tail plane - To intro. a stringer to rib attachment of increased strength	+ 43.36	+1513.00
2151	Main undercarriage. To intro. the main u/c down lock switch lever, EA3.40.195/6 in lieu of EA1.40.231/2	+ 0.20	NIL
2156	Flying controls - To intro. control wheel A.C.13648 in lieu of EB6.45.53	- 1.58	+ 5.91
2176	Main plane, inner and outer engine ribs. To intro. reinforcing steel clamps to engine rib cleat arms	+ 9.37	+ 45.14
2182	Flying controls - To intro. stiffer blow-back rod and re-arrange mass balance on tab	+ 1.38	+ 53.48
2186	Survival equipment. To provide stowages (3 off) for survival packs	FIXED + 16.83	+ 389.8
	REMOVABLE	+ 90.00	+2130.0

MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
2193	Flying controls - To intro. independent double pole switching, and provide separate loom for rudder trim	+ 2.040	+ 10.032
2197	L.A.B.S. - To provide fixed fittings incorporating full facilities		
	PRE-MOD 723	+296.32	+ 407.28
	POST-MOD 723	+286.96	+ 997.04
2198	L.A.B.S. To provide removable fittings with full facilities	+150.2	+2061.0
2199	L.A.B.S. To provide practice bomb facilities	+ 0.22	- 2.81
2200	Bomb-gear. To delete electric-mechanical release at 5,000 lb bomb station	- 1.75	- 2.96
2316	Cabin air system - To intro. a revised cold air unit breather	+ 0.439	+ 0.073
2320	Oxygen - To make provision for Mk. 17D regulator	+ 0.27	- 4.44
2329	Instruments - To intro. fatigue meter Mk. 3C	+ 5.445	+ 8.137
2334	Tail plane - To intro. a strengthened rib 2 to the tail plane leading edge		
	RETROSPECTIVE	+ 0.963	+ 31.122
	PRODUCTION	+ 1.206	+ 38.007
2355	Electrical. To intro. Type 519 generators in lieu of Type 512	+ 1.5	+ 2.49
2358	Electrical. To intro. high intensity anti-dazzle cockpit lamps	+ 2.976	- 50.297
2361	Main undercarriage. To intro. low temperature seals to main u/c oleo assembly	- 0.346	- 0.315

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MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)	MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
2364	Electrics. To intro. master switch to prevent inadvertent retraction of the undercarriage with the aircraft on the ground	+ 0.38	- 6.84	2532	Electrical. L.A.B.S. To make provision for a 2-way pressure switch, and Dowty 3-position indicator	+ 1.168	- 8.526
2379	Hydraulics. Main and nose u/c door jacks. To intro. jack 0.8246Y.C.O.1. in lieu of 0.8246Y.B.O.1.	+ 6.98	- 6.785	2533	Electrical. L.A.B.S. To intro. a Dowty 3-position indicator on the T.145 panel	+ 0.203	- 2.386
2380	Hydraulics. Main undercarriage to intro. jack 0.7017Y.C.O.1. in lieu of 0.7017Y.B.O.1., nose u/c jack 0.8214Y.C.O.1. in lieu of 0.8214Y.B.O.1., and flap jack 0.7016Y.C.O.1. in lieu of 0.7016Y.B.O.1.	+ 24.02	+ 117.70	2534	Electrical. L.A.B.S. To intro. a safety relay in the L.A.B.S. start circuit	+ 0.43	+ 6.52
2394	Main planes. To intro. vortex generators on outer wing bottom skin	+ 0.1	+ 0.35	2538	Fuel system. To intro. an additional non-return valve	+ 0.897	+ 4.117
2395	Fuel tanks. To intro. vortex generators to inboard side of wing-tip fuel tanks	+ 0.177	+ 0.586	2540	Electrical. L.A.B.S. To intro. a rectifier in the T.M.B. emergency jettison circuit	+ 0.68	- 0.81
2502	Pressure cabin. To intro. stowages for leak stoppers	+ 2.71	- 47.3	2541	Seating. To intro. Mk.1C(N) ejection seat in lieu of Mk.1C	+ 17.0	- 188.071
2517	Fin leading edge. To intro. protective finish	+ 0.06	+ 1.73	2542	Radio. To re-position orange putter G-scope for aircraft with Mod.723 embodied	+ 2.514	+ 21.907
2530	Radio. To re-position orange putter 'G'-scope to the port side of the Rebecca indicator Type 208	+ 3.82	+ 53.344	2544	Radio. To intro. additional switching facilities to the I.F.F. Mk.10 installation	+ 0.3171	- 34.912
2531	Fuel system. To intro. vent duct - EA3.57.525 in lieu of EA3.57.107 at No.3 tank	+ 0.06	+ 0.54	2659	Instruments. To make provision for and intro. a combined heading selector and control panel, Type A	- 0.927	+ 15.831
				2682	Electrical. To amend the relay switching for instrument standby inverter	+ 0.019	- 0.184

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MOD. NO.	DESCRIPTION OF MODIFICATION	WEIGHT (LB)	MOMENT (LB FT)
2693	L.A.B.S. To revise the wiring to the Type Q relay, mounted on the L.A.B.S. junction box	+ 0.008	+ 0.116
3185	Electrical. To make provision for Type 201B inverter when fitted in lieu of Type 201	+ 0.045	- 0.450
ARM 16	To transfer fuzing unit 5D/1478, from rear bomb beam to rear of front bomb beam	+ 0.1	- 1.65
ARM 19	To re-position lanyard retraction unit at Stn. 2 on forward bomb beam	NIL	+ 6.53

13. The following modifications have a negligible effect upon the basic weight and c.g. position:-

729, 738, 884, 885, 888, 897, 898, 1024, 1033, 1151, 1152, 1155, 1157, 1160, 1170, 1173, 1176, 1188, 1189, 1196, 1198, 1254, 1258, 1259, 1260, 1265, 1276, 1290, 1291, 1294, 1295, 1296, 1299, 1421, 1426, 1430, 1432, 1438, 1450, 1452, 1454, 1465, 1473, 1477, 1493, 1498, 1499, 1703, 1706, 1712, 1714, 1715, 1720, 1738, 1739, 1748, 1751, 1771, 1784, 1919, 1954, 1958, 1973, 1985, 1990, 2125, 2126, 2129, 2154, 2158, 2189, 2301, 2306, 2308, 2315, 2323, 2335, 2353, 2386, 2398, 2561, 2585, 2587, 2588, 2595, 2599, 2670.

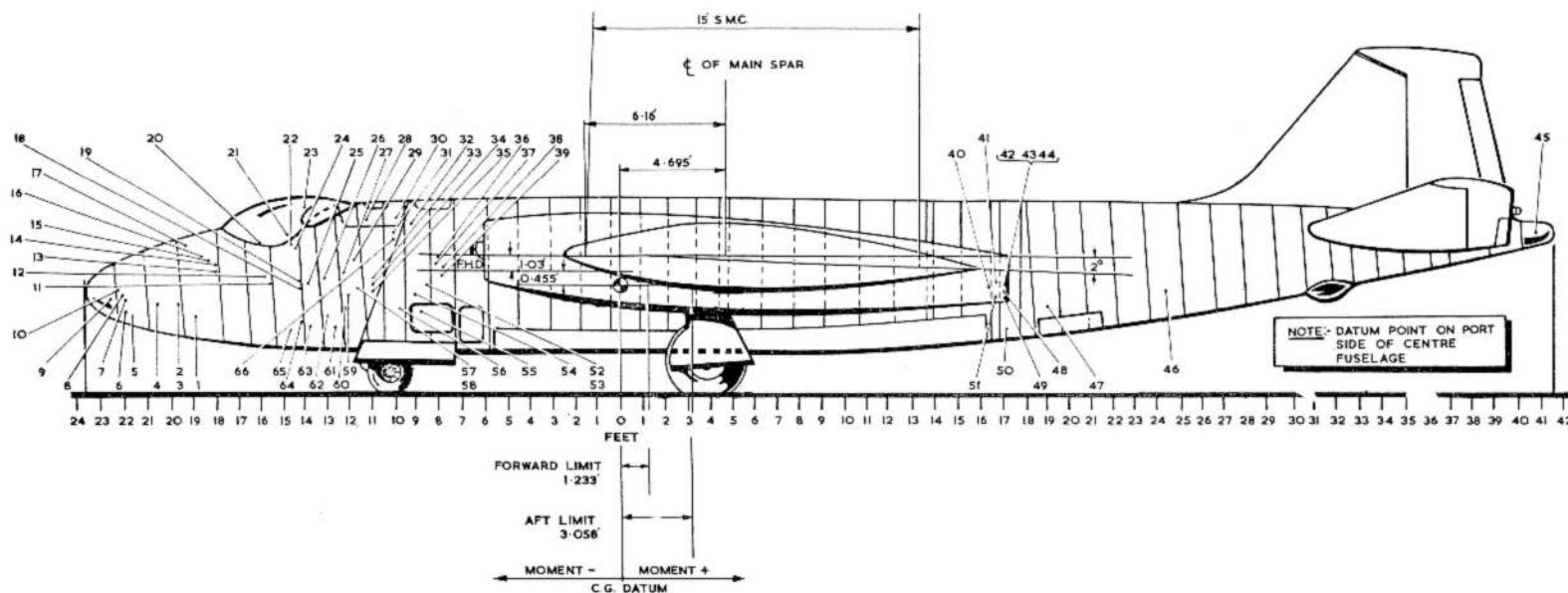


Fig. 2. Loading and c.g. diagram, removable load items

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TABLE 1 REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT (fig. 2)

Fig. 2 Item No.	Ref. or Part No.	Qty.	Description	Arm (ft)	Weight (lb)	Moment (lb ft)
			A.1961			
62	10U/16596	1	Amplifier	- 12.78	6.250	- 79.880
			T.R.1985-1986 (V.H.F.)			
15	10L/1246	2	Control unit, Type 382	- 18.23	1.188	- 21.660
54	10D/17937	1	T.R.1985... ..	- 9.17	27.000	- 247.600
56	10D/17938	1	T.R.1986... ..	- 9.41	27.000	- 245.100
			A.R.I.5829 (GEE-H)			
25	10LB/6299	1	Control unit, Type 426A	- 13.98	16.500	- 230.700
65	10DB/16461	1	Drive unit, Type 114	- 14.49	21.000	- 304.300
19	10P/16051	1	Filter unit, Type 504	- 14.15	1.560	- 22.070
24	10QB/6370	1	Indicating unit, Type 166A	- 14.32	29.000	- 415.300
35	10DB/8620	1	R.F. unit, Type 139B	- 11.12	7.250	- 80.620
60	10DB/8373	1	Receiver R.3582A	- 11.92	26.250	- 312.900
61	10QB/8807	1	Strobe unit, Type 61A	- 12.64	44.500	- 562.500
18	10D/16595	1	Transmitter T.1629A	- 14.28	78.500	-1121.000
19	10DB/8652	1	R.F. unit, Type 25B	- 12.31	7.250	- 89.250
			A.R.I.5284 (A.Y.F.)			
46	110DB/25	1	Transmitter - receiver, RT.7/APN.1... ..	+ 24.51	18.500	+ 453.400
13	110QB/6	1	Altitude indicator, 1D.14/APN.1.. ..	- 17.94	1.813	+ 32.530
14	110FB/19	1	Switch, altitude limit, NA.1/ARN.1	- 17.94	0.938	- 16.830
			A.R.I.5610 (REBECCA)			
27	10AB/6239	1	Control unit, Type 526	- 12.35	2.250	- 27.790
26	10AT/41	1	Visor, Type 43	- 13.17	1.250	- 16.460
22	10QB/6130	1	Indicating unit, Type 208 c/w valves.. ..	- 14.44	2.313	- 33.400
38	10AB/5819	1	Mounting, Type 814	- 8.05	6.000	- 48.300
39	37DB/8118	1	Transmitter-receiver, TR.3624 c/w valves.. ..	- 8.05	32.000	- 257.600
			A.R.I.5800 (REAR WARNING)			
17	10Q/16073	1	Indicating unit, Type 27	- 19.24	3.093	- 59.510
45	10D/8501	1	Radar head, Type 1	+ 40.63	65.000	+2641.000

(Continued)

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TABLE 1 (continued)

REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT (fig. 2)

Fig. 2 Item No.	Ref. or Part No.	Qty.	Description	Arm (ft)	Weight (lb)	Moment (lb ft)
52	10U/16057	1	Waveform generator, Type 76	- 8.34	22.895	- 190.600
53	10AJ/92	1	Mounting, Type 907	- 8.34	3.000	- 25.020
MISCELLANEOUS ITEMS						
11, 21, 23	12D/1170, 1171, 1183	1 set	Ejection cartridge, No.1 Mk.1 (pilot)	- 14.88	0.891	- 13.260
66, 34, 32	12D/1170, 1171, 1183	1 set	Ejection cartridge, No.1 Mk.1 (air-bomber)	- 10.337	0.891	- 9.210
30, 31, 33	12D/1170, 1171, 1183	1 set	Ejection cartridge, No.1 Mk.1 (navigator)	- 10.292	0.891	- 9.170
47	12D/1199	6	Engine starter cartridge	+ 18.14	18.000	+ 326.500
57	12D/	6	Signal cartridge 1½ in	- 11.89	2.064	- 24.540
20	12G/1278	32	Detonators, electric, No.108 Mk.1 (canopy)	- 15.70	0.736	- 11.560
28	12G/1278	34	Detonators, electric, No.108 Mk.1 (hatch)	- 11.20	0.782	- 8.760
12	12G/1279	1	Detonators, electric, No.109 Mk.1 (controls)	- 16.19	0.022	- 0.360
55	12L/203	1	Destructor, aircraft, No.1 Mk.1	- 8.73	3.250	- 28.370
58	12D/1211	6	Cartridge, Radar/echo 1½ in Mk.1	- 11.89	2.064	- 24.540
7	6D/1644	1	Oxygen set, emergency, Mk.2A	- 21.43	2.000	- 42.860
36	6D/1398J	2	Cylinders, oxygen, 2250-litre	- 8.08	14.062	- 113.600
37	6D/1383J	5	Cylinders, oxygen, 750-litre	- 8.21	11.720	- 96.220
16	6A/2197	1	Clock, fluorescent Mk.4	- 18.57	0.437	- 8.120
63	9A/C.2430	1	First-aid outfit.	- 13.66	3.000	- 40.980
64	22G/404	2	Gloves, asbestos	- 14.12	0.876	- 12.370
1	EA3.83.95	6	Ballast, under ramp.	- 18.79	285.000	-5355.000
TOTAL REMOVABLE EQUIPMENT INCLUDED IN BASIC WEIGHT					910.700	-7489.000
BASIC WEIGHT LESS REMOVABLE EQUIPMENT				+ 3.00	22184.000	+66553.000
BASIC WEIGHT				+ 2.557	23095.000	+59064.000

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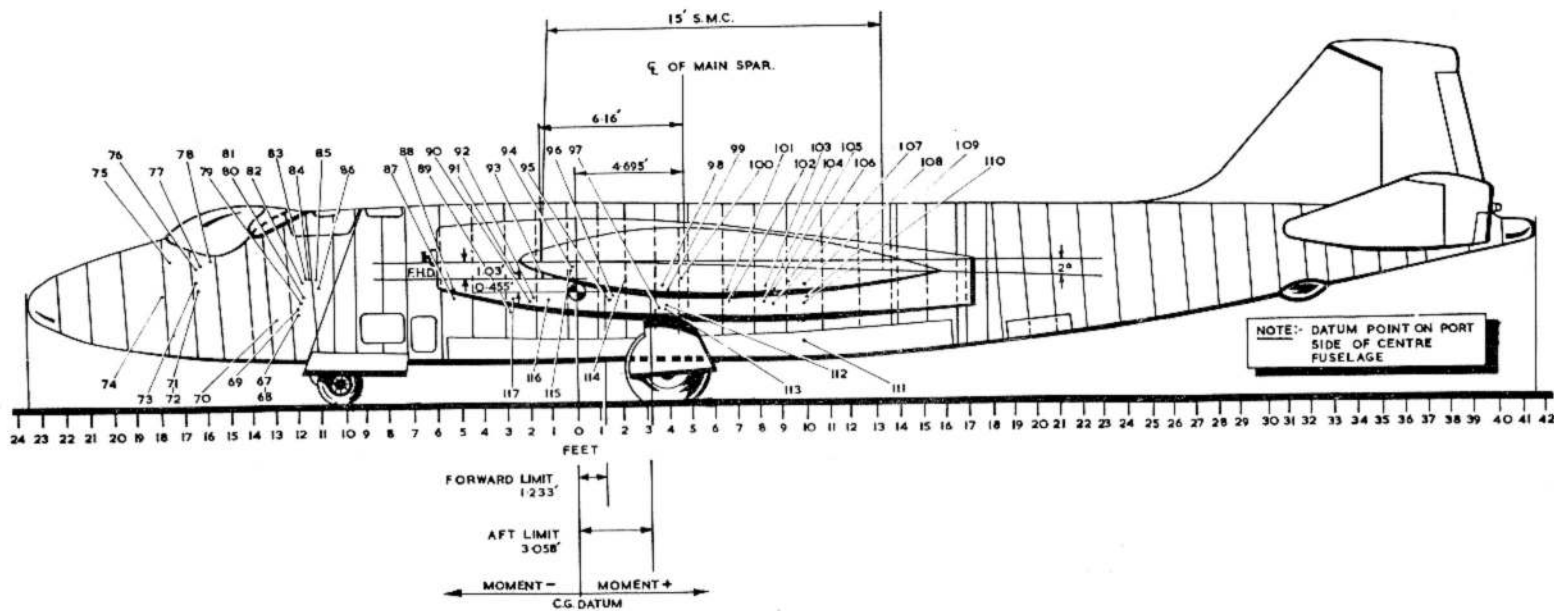


Fig. 3. Loading and c.g. diagram, alternative load items

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TABLE 2 CREW AND CREW REMOVABLE OPERATING LOAD ITEMS COMMON TO ALL ROLES (fig. 3)

Fig. 3 Item No.	Ref. or Part No.	Qty.	Description	Arm (ft)	Weight (lb)	Moment (lb ft)
PILOT AND EQUIPMENT						
77		1	Pilot	- 16.44	180.000	-2959.00
78	22C/1349	1	Jackets, life-saving Mk.3	- 15.78	0.92	- 14.55
73	27C/2311	1	Dinghy, aircraft, Type SS	- 16.40	22.00	- 360.80
72	15A/657	1	Parachute, seat type Mk.7	- 16.40	27.00	- 442.80
74	A.P.4326F.PN	1	Pilot's notes for Canberra B Mk.6 aircraft..	- 17.96	0.20	- 3.66
76	5A/3391	1	Torch, electric, Type O c/w cells	- 16.44	0.72	- 11.82
75	6F/171	1	Writing pad, pilot's knee type	- 17.23	1.38	- 23.69
71	6D/1188	1	Oxygen emergency set, Mk.4A	- 16.40	4.00	- 65.60
NAVIGATOR AND EQUIPMENT						
82		1	Navigator..	- 11.88	180.00	-2138.00
86	22C/1349	1	Jackets, life-saving Mk.3	- 11.31	0.92	- 10.43
79	27C/2311	1	Dinghy, aircraft, Type SS	- 11.85	22.00	- 260.70
68	15A/657	1	Parachute, seat type Mk.7	- 11.92	27.00	- 321.80
70	6B/469	1	Case carrying navigator's equipment, containing:-	- 13.04	1.00	- 13.00
	5A/3391	1	Torch, electric, Type c/w cells	- 13.04	0.72	- 9.38
	6B/539	1	Watch, stop	- 13.04	0.25	- 3.26
	6E/293	1	Binoculars, mag. 6 diams. 30 mm	- 13.04	2.00	- 26.08
	6E/392	1	Binoculars, 40 mm Mk.5 c/w rubber face piece	- 13.04	2.25	- 29.34
	6B/490	1	Computer, dead reckoning, Mk.4	- 13.04	0.75	- 9.78
	6B/471	1	Protractors, Douglas 5 in... ..	- 13.04	0.14	- 1.84
	6B/260	1	Rule, navigation Mk.1	- 13.04	0.13	- 1.63
	13/94	2	Sets, compass	- 13.04	0.25	- 3.26
	6B/349	1	Straight edge, 20 in	- 13.04	0.30	- 3.91
67	6D/1188	1	Oxygen emergency set, Mk.4A	- 11.92	4.00	- 47.68
AIR-BOMBER AND EQUIPMENT						
84		1	Air-bomber	- 11.83	180.00	-2129.00
85	22C/1349	1	Jackets, life-saving Mk.3	- 11.27	0.92	- 10.39
69	27C/2311	1	Dinghy, aircraft, Type SS	- 11.80	22.00	- 259.60
81	15A/657	1	Parachute, seat type Mk.7	- 11.87	27.00	- 320.49
80	6D/1188	1	Oxygen emergency set, Mk.4A	- 11.87	4.00	- 47.48
83	5A/3391	1	Torch, electric, Type O c/w cells	- 11.83	0.72	- 8.51
TOTAL CREW AND REMOVABLE LOAD ITEMS					713.00	-9527.48

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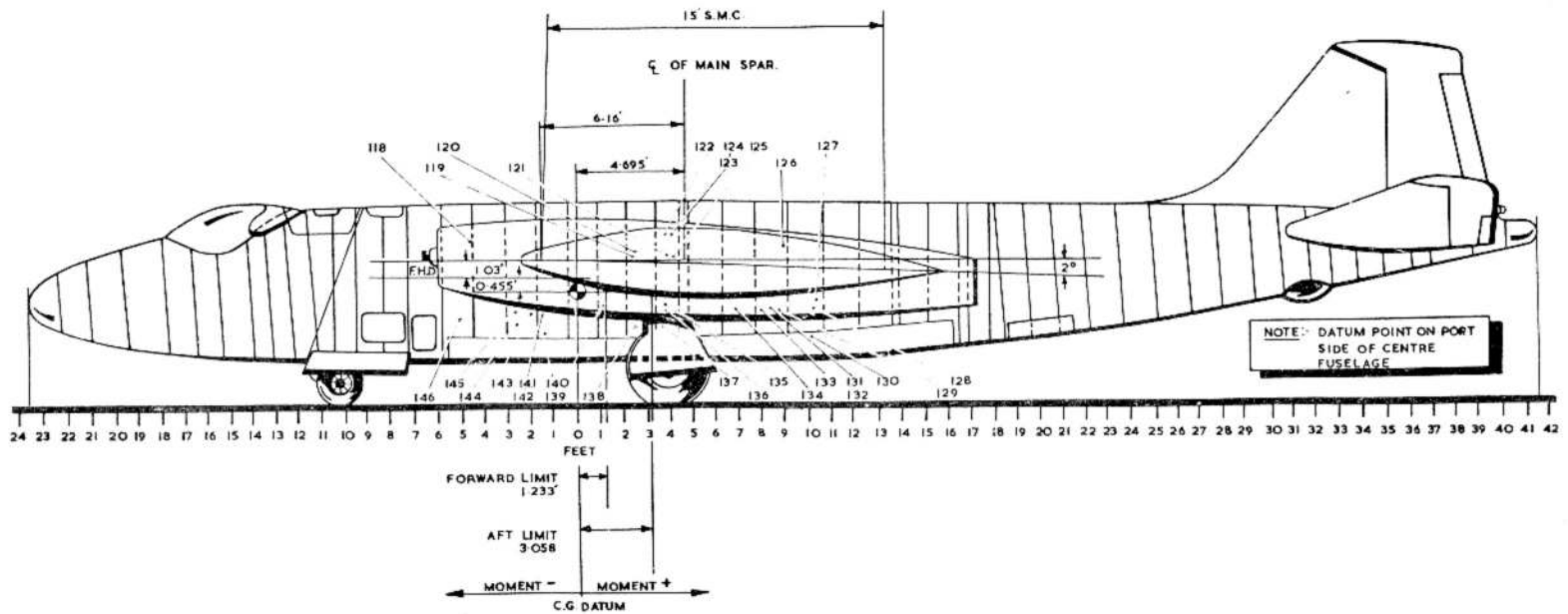


Fig. 4. Loading and c.g. diagram, expendable load items

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TABLE 3 REMOVABLE OPERATING LOAD ITEMS COMMON TO ALL BOMBER ROLE CASES (fig. 2)

Fig. 2 Item No.	Ref. or Part No.	Qty.	Description	Arm (lb)	Weight (lb)	Moment (lb ft)
T.2 BOMBSIGHT						
9	9/4472	1	Bombsight, head sighting T.2	- 22.30	14.00	- 312.20
6	109/82	1	Bombsight panel control T.1	- 21.70	1.00	- 21.70
5	9/4482	1	Bombing angle computer Mk.1	- 21.35	0.19	- 4.06
4	9/4471	1	Bombsight computer T.2	- 20.68	44.38	- 917.70
10	109/94	2	Shafts, flexible, No.2, length 32½ in... ..	- 22.05	1.50	- 33.07
3	109JB/295	1	Hose, flexible, air pressure and exhaust, 12 in x ¼ in I/D	- 19.68	0.94	- 18.46
2	109JB/271	2	Hose, flexible, pitot and static 12 in x ⅜ in I/D	- 19.68	1.88	- 36.92
8	9/4380	2	Gearbox, right angle c/w locknut..	- 21.86	0.38	- 8.20
F.24 CAMERA						
42	14A/2602	1	Camera, aircraft, F.24 c/w 20 in lens and cone	- 17.28	28.06	- 484.90
40	14A/988	1	Motor, camera driving, Type B	+ 16.44	3.70	+ 60.75
43	14A/2615	1	Filter, Type 4..	+ 17.28	0.03	+ 0.54
44	14A/745	1	Covers, body	+ 17.28	0.69	+ 11.89
41	14A/862	1	Leads, electrical, camera control No.4 2 ft 6 in..	+ 16.68	0.44	+ 7.31
48	14A/4004	1	Mounting, Type 25 Mk.2..	+ 17.28	6.25	+ 108.00
49	EA3.83.131	1	Camera cover	+ 17.28	2.60	+ 44.29
50	EA1.11.547	1	Camera cover removable.	+ 17.28	0.71	+ 12.18
51	14A/3568	1	Drive, camera 2 ft 6 in	+ 16.65	0.79	+ 13.00
TOTAL REMOVABLE OPERATING LOAD ITEMS COMMON TO ALL BOMBER ROLES					108.00	- 1580.00

TABLE 4 FUEL LOAD ITEMS (fig. 4)

Fig. 4 Item No.	Ref. or Part No.	Qty.	Description	Arm (lb)	Weight (lb)	Moment (lb ft)
FUEL IN WINGS AND FUSELAGE (AT 8 LB/GAL)						
118			Fuel, No.1 tank, 520 gal	- 3.863	4160.00	-16070.00
119			Fuel, No.2 tank, 317 gal	+ 2.213	2536.00	+ 5612.00
120			Fuel, No.3 tank, 540 gal	+ 9.127	4320.00	+39429.00
126			Fuel, integral tanks, 900 gal	+ 2.183	7200.00	+15718.00
TOTAL OF FUEL IN WINGS AND FUSELAGE					18216.00	+44689.00
WING-TIP TANKS AND WING-TIP TANKS FUEL (AT 8 LB/GAL)						
123	12G/1279	6	Detonators electric, No.109 Mk.1..	+ 4.153	0.13	+ 1.00
122	EA1.00.81-2	2	Wing-tip tank attachment	+ 4.103	0.73	+ 3.00
124	26FZ/1577	6	Bolts, explosive, EA1.20.2031	+ 4.156	2.75	+ 11.00
125	EA3.62.1-2	2	Wing-tip tanks	+ 4.252	238.00	+ 1012.00
121			Fuel, 488 gal	+ 3.878	3904.00	+15140.00
TOTAL OF WING-TIP TANKS AND WING-TIP TANKS FUEL					4146.00	+16167.00

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TABLE 5 ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig. 3 & 4)

Fig. 3 Item No.	Ref. or Part No.	Qty.	Description	Arm (ft)	CASE A 3 x 2 1000-LB S/T MK.7 BOMBS		CASE B 2 x 3 1000-LB H/A MK.6 BOMBS		CASE C 3 x 1000-LB TARGET INDICATORS	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
91&117	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn 1) ...	- 2.6	50.00	- 130.00	-	-	-	-
93&116	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn 2) ...	- 1.19	-	-	50.00	- 59.50	-	-
98&112	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn 3) ...	+ 3.82	50.00	+ 191.00	-	-	-	-
103&104	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn 5) ...	+ 8.42	-	-	50.00	+ 421.00	50.00	+ 421.00
108&109	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn 6) ...	+10.17	50.00	+ 508.50	-	-	-	-
115	11A/3680	1	Beam, auxiliary, forward EA3.97.343... ..	+ 0.19	164.00	+ 31.20	164.00	+ 31.20	164.00	+ 31.20
106	11A/4321	1	Beam, auxiliary, aft EA3.97.559... ..	+ 9.05	189.00	+ 1710.50	189.00	+ 1710.50	189.00	+ 1710.50
TOTAL ALTERNATIVE ITEMS FOR BOMBER ROLE					503.00	+ 2311.00	453.00	+ 2103.00	403.00	+ 2163.00
TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 2)					713.00	- 9527.00	713.00	- 9527.00	713.00	- 9527.00
TOTAL COMMON REMOVABLE ITEMS FOR BOMBER ROLE (TABLE 3)					108.00	- 1580.00	108.00	- 1580.00	108.00	- 1580.00
BASIC WEIGHT					23095.00	+59064.00	23095.00	+59064.00	23095.00	+59064.00
OPERATING WEIGHT					24419.00	+50268.00	24369.00	+50060.00	24319.00	+50120.00
ITEMS OF EXPENDABLE LOAD										
TOTAL FOR FUEL IN WINGS AND FUSELAGE					18216.00	+44689.00	18216.00	+44689.00	18216.00	+44689.00
127	12A/2067	2	Bombs, aircraft, 1000 lb S/T Mk.7 (Stn 1)... ..	- 2.597	2160.00	- 5610.00	-	-	-	-
135	12A/2067	2	Bombs, aircraft, 1000 lb S/T Mk.7 (Stn 3)... ..	+ 3.816	2160.00	+ 8243.00	-	-	-	-
145	12A/2067	2	Bombs, aircraft, 1000 lb S/T Mk.7 (Stn 6)... ..	+10.170	2160.00	+21967.00	-	-	-	-
141	12A/2072	3	Bombs, aircraft, 1000 lb H/A Mk.6 (Stn 2)... ..	- 1.188	-	-	3000.00	- 3564.00	-	-
131	12A/2072	3	Bombs, aircraft, 1000 lb H/A Mk.6 (Stn 5).. ..	+ 8.422	-	-	3000.00	+25266.00	-	-
	12D/	3	Target indicators, 1000 lb No.1 Mk.1 (Stn 5)	+ 8.422	-	-	-	-	3000.00	+25260.00
TOTAL EXPENDABLE LOADS FOR BOMBER ROLE					24696.00	+69289.00	24216.00	+66391.00	21216.00	+69949.00
ALL-UP WEIGHT					49115.00	+119557.00	48585.00	+116451.00	45535.00	+120069.00
C.G. POSITION (WHEELS DOWN)					+2.434		+2.397		+2.637	
TOTAL OF WING-TIP TANKS AND WING-TIP TANKS FUEL (TABLE 4)					4146.00	+16167.00	4146.00	+16167.00	4146.00	+16167.00
ALL-UP WEIGHT WITH WING-TIP TANKS					53261.00	+135724.00	52731.00	+132618.00	49681.00	+136236.00
					+2.548		+2.514		+2.742	
EFFECT OF RETRACTING UNDERCARRIAGE -1454 lb ft										

(Continued)

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TABLE 5 (continued)

ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig. 3 & 4)

Fig. 3 Item No.	Ref. or Part No.	Qty.	Description	Arm (ft)	CASE D 12 x 100-LB PRACTICE BOMBS		CASE E 24 x 25-LB PRACTICE BOMBS		CASE F 2 x 2000-LB MINES	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
91&117	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn 1) ...	- 2.6	50.00	- 130.00	-	-	-	-
98&112	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn 3) ...	- 3.82	50.00	+ 191.00	-	-	-	-
108&109	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn 6) ...	+ 10.17	50.00	+ 508.50	-	-	-	-
115	11A/3680	1	Beam, auxiliary, forward EA3.97.343... ..	+ 0.19	164.00	+ 31.20	164.00	+ 31.20	-	-
106	11A/4321	1	Beam, auxiliary, aft EA3.97.559... ..	+ 9.05	189.00	+ 1710.50	189.00	+ 1710.50	-	-
87-90-95	11A/572	6	Carriers, bomb, light series Mk.3 or Mk.12..	+ 2.796	-	-	103.50	+ 289.39	-	-
102-107-113										
88-92	11A/3688	4	Adapters, beam, EA3.97.115 (forward)	- 3.310	-	-	5.10	- 16.90	-	-
96-99	11A/3689	4	Adapters, beam, EA3.97.117 (forward)	+ 2.520	-	-	5.10	+ 12.85	-	-
105	11A/3691	2	Adapters, beam, EA3.97.113 (aft)	+ 8.830	-	-	2.6	+ 22.52	-	-
101	11A/3696	2	Adapters, beam, EA3.97.111 (aft)	+ 6.750	-	-	2.6	+ 17.21	-	-
89	11A/3677	2	Attachments, practice bomb, 100 lb Mk.1 (Stn 1) ...	- 2.6	52.00	- 135.00	-	-	-	-
97	11A/3677	2	Attachments, practice bomb, 100 lb Mk.1 (Stn 3) ...	+ 3.82	52.00	+ 198.60	-	-	-	-
110	11A/3677	2	Attachments, practice bomb, 100 lb Mk.1 (Stn 6) ...	+ 10.17	52.00	+ 528.90	-	-	-	-
	11A/4220	1	Carriers, mine, 2000 lb, twin, Type A (Stn 7) ...	+ 2.280	-	-	-	-	217.00	+ 494.00
	11A/4715	1	Release unit No.3 Mk.1 (Stn 7)	+ 2.280	-	-	-	-	10.00	- 22.80
	11A/3652	2	Crutches, front EA1.97.313	+ 0.200	-	-	-	-	5.30	+ 1.05
	11A/3683	2	Crutches, rear EA1.97.321	+ 4.700	-	-	-	-	4.70	+ 22.30
TOTAL ALTERNATIVE LOAD ITEMS					659.00	+ 2904.00	472.00	+ 2067.00	237.00	+ 494.60
TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 2)					713.00	- 9527.00	713.00	- 9527.00	713.00	- 9527.00
TOTAL FOR BOMBER ROLE COMMON REMOVABLE ITEMS					108.00	- 1580.00	108.00	- 1580.00	108.00	- 1580.00
BASIC WEIGHT					23095.00	+ 59064.00	23095.00	+ 59064.00	23095.00	+ 59064.00
OPERATING WEIGHT					24575.00	+ 50861.00	24388.00	+ 50024.00	24153.00	+ 48452.00

(continued)

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TABLE 5 (continued)

ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig. 3 & 4)

Fig. 4 Item No.	Ref. or Part No.	Qty.	Description	Arm (ft)	CASE D 12 x 100-LB PRACTICE BOMBS		CASE E 24 x 25-LB PRACTICE BOMBS		CASE F 2 x 2000-LB MINES	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
ITEMS OF EXPENDABLE LOAD										
			TOTAL FOR FUEL IN WINGS AND FUSELAGE		18216.00	+ 44689.00	18216.00	+ 44689.00	18216.00	+ 44689.00
129	12B/555	4	Bombs, practice, 25 lb No.1 Mk.1	+ 8.831	-	-	100.00	+ 883.10	-	-
134	12B/555	4	Bombs, practice, 25 lb No.1 Mk.1	+ 6.747	-	-	100.00	+ 674.70	-	-
136	12B/555	4	Bombs, practice, 25 lb No.1 Mk.1	+ 3.975	-	-	100.00	+ 397.50	-	-
139	12B/555	4	Bombs, practice, 25 lb No.1 Mk.1	+ 1.058	-	-	100.00	+ 105.80	-	-
143	12B/555	4	Bombs, practice, 25 lb No.1 Mk.1	- 1.860	-	-	100.00	- 186.00	-	-
146	12B/555	4	Bombs, practice, 25 lb No.1 Mk.1	- 4.775	-	-	100.00	- 477.50	-	-
144	12B/	4	Bombs, practice, 100 lb (Stn. 1)	- 2.597	400.00	- 1039.00	-	-	-	-
137	12B/	4	Bombs, practice, 100 lb (Stn. 3)	+ 3.816	400.00	+ 1526.00	-	-	-	-
128	12B/	4	Bombs, practice, 100 lb (Stn. 6)	+ 10.170	400.00	+ 4068.00	-	-	-	-
138	12D/	2	Mines, 2000 lb Mk.12 (Stn. 7)	+ 2.28	-	-	-	-	4000.00	+ 9120.00
			TOTAL EXPENDABLE LOADS FOR BOMBER ROLE		19416.00	+ 49244.00	18816.00	+ 46088.00	22216.00	+ 53809.00
			ALL-UP WEIGHT		43991.00	+ 100105.00	43204.00	+ 96110.00	46369.00	+ 102261.00
			C.G. POSITION (WHEELS DOWN)			+ 2.276		+ 2.225		+ 2.205
			TOTAL OF WING-TIP TANKS AND WING-TIP TANK							
			FUEL		4146.00	+ 16167.00	4146.00	+ 16167.00	4146.00	+ 16167.00
			ALL-UP WEIGHT WITH WING-TIP TANKS		48137.00	+ 116272.00	4735.00	+ 112277.00	50515.00	+ 118428.00
			C.G. POSITION (WHEELS DOWN)			+ 2.415		+ 2.371		+ 2.344
			EFFECT OF RETRACTING UNDERCARRIAGE - 1454 lb ft							

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TABLE 6 ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES WITH 300-GAL AUXILIARY FUEL TANK
(fig.3 & 4)

Fig. 3 Item No.	Ref. or Part No.	Qty.	Description	Arm (ft)	CASE F 3 x 1000-LB H/A MK.6 BOMBS		CASE G 2 x 1000-LB S/T MK.7 BOMBS		
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	
91&117	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn. 1) ...	- 2.60	-	-	50.00	- 130.00	
93&116	11A/3676-73	1-1	Triple carrier Mk.2, and release unit Mk.1 (Stn. 2) ...	- 1.19	50.00	- 59.50	-	-	
111	EA3.56.221	1	300-gallon auxiliary fuel tank (bomb bay) ...	+ 10.49	233.30	+ 2445.00	233.30	+ 2445.00	
115	11A/3680	1	Beam, auxiliary, forward, EA3.97.343 ...	+ 0.19	164.00	+ 31.20	164.00	+ 31.20	
106	11A/4381	1	Beam, auxiliary, aft, EA3.97.559.. ...	+ 9.05	189.00	+ 1710.50	189.00	+ 1710.50	
TOTAL ALTERNATIVE LOAD ITEMS						636.00	+ 4127.00	636.00	+ 4057.00
CREW AND CREW OPERATING LOAD ITEMS						713.00	- 9527.00	713.00	- 9527.00
TOTAL BOMBER ROLE COMMON REMOVABLE ITEMS						108.00	- 1580.00	108.00	- 1580.00
BASIC WEIGHT						23095.00	+ 59064.00	23095.00	+ 59064.00
OPERATING WEIGHT						24552.00	+ 52084.00	24552.00	+ 52014.00
ITEMS OF EXPENDABLE LOAD									
TOTAL FOR FUEL IN WINGS AND FUSELAGE						18216.00	+ 44689.00	18216.00	+ 44689.00
141	12A/2072	3	Bombs, aircraft, 1000 lb H/A Mk.6 (Stn. 2).. ...	- 1.19	3564.00	- 4241.00	-	-	
145	12A/2067	2	Bombs, aircraft, 1000 lb S/T Mk.7 (Stn. 1).. ...	- 2.60	-	-	2160.00	- 5610.00	
Fuel, auxiliary tank, 300-gal at 8 lb/gal ...					+ 10.26	2400.00	+ 24612.00	2400.00	+ 24612.00
All-up weight ...						48732.00	+ 117144.00	47328.00	+ 115705.00
C.G. position (wheels down).. ...							+ 2.404		+ 2.445
TOTAL OF WING-TIP TANKS AND WING-TIP TANKS FUEL						4146.00	+ 16167.00	4146.00	+ 16167.00
ALL-UP WEIGHT WITH WING-TIP TANKS						52878.00	+ 133311.00	51474.00	+ 131872.00
C.G. POSITION (WHEELS DOWN)							+ 2.521		+ 2.562
EFFECT OF UNDERCARRIAGE RETRACTION					-1454 lb ft				

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Chapter 3B LOADING AND C.G. DATA—B(I) Mk. 6 AIRCRAFT

Note...

This chapter deals exclusively with B(I)Mk.6 aircraft. For B.Mk.6 aircraft, refer to Chapter 3A.

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Loading and C.G. diagram removable load items	3				

General information

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

C.G. position

2. The aircraft C.G. position is determined

with the fuselage datum horizontal (*i.e. in the rigging attitude*) and with the undercarriage down. 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. datum

3. The C.G. datum is 4.695 ft forward of the spar datum and 0.455 ft below the fuselage horizontal datum. It is indicated by a screw marked C.G. datum on the port side of the fuselage. This screw can be used to suspend a plumb line during weighing operations.

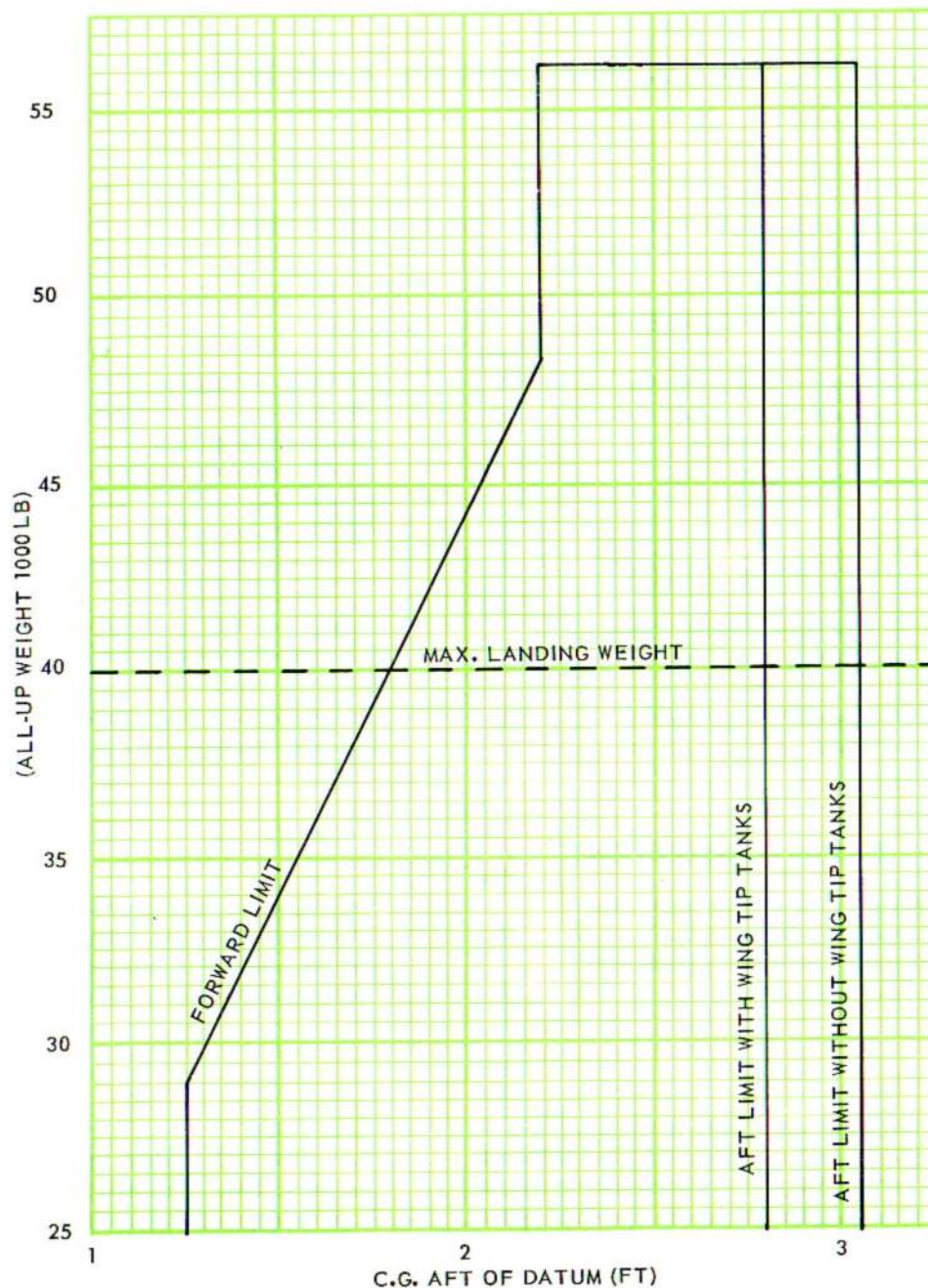


Fig.1. Flight C.G. limits

Flight C.G. limits (fig.1)

4. Fig.1 prescribes the approved handling limits, at any given weight, for C.G. movement measured from the C.G. datum.

Forward limit

This is dependent upon the weight of the aircraft. At weights below 29000lb the permissible forward limit is 1.235ft aft. At weights in excess of 48000lb the permissible forward limit is 2.200 ft aft.

Aft limit

'Clean' aircraft	3.058 ft aft
With wing tip tanks fitted	2.810 ft aft

Note...

If the aircraft is to be taxied over rough ground the aft limit must not exceed 2.885 ft aft.

Effect of alighting gear retraction

5. Retraction of the alighting gear introduces a moment of -1394lb ft which must be taken into account when making calculations which assume that the alighting gear is retracted.

Crew movement

6. Movement of the air bomber from his ejection seat to the map reader's seat introduces a moment of -680lb ft. Further forward movement to the prone position introduces an additional moment of -894lb ft (a total moment change of -1574lb ft).

Basic weight and moment

7. Table 6 refers to a basic weight of 24450lb and a basic moment of +64575 lb ft. These figures are based on the weight of the aircraft Serial No.WT.307 incorporating all basic equipment detailed in Appendix A, Serial No.2155 up to and including A.L.231

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less A.L.175, 202, 208, 209, 229. A definition of the term 'basic weight' may be found in A.P.4747A. The basic weight and C.G. will vary between aircraft depending on their modification standard.

Maximum all-up weights (fig.1)

8. The aircraft is cleared for operational

flying at the following maximum weights:

Take off	56000 lb
Landing	40000 lb

Note...

Emergency landings only are permissible at weights in excess of this figure.

Alternative load items

9. If stores other than those given are to be carried, their disposition should be similar to that of stores given in the all-up weight summary of approximately the same weight. This will ensure that the aircraft C.G. will at all times remain within the C.G. handling limits, providing that normal fuel drill and the correct sequence for dropping stores are adhered to.

Ballast

10. Ballast weights totalling 402 lb (Sect.3, Chap.1) are provided to help maintain the C.G. position within the C.G. range. Adjustment may be made necessary due to removal or non-fittment of equipment, introduction of modifications etc. In order to ensure that the C.G. for individual aircraft will remain within the handling limits at all times, when carrying and releasing any of the permissible loads, the C.G. of the aircraft at the basic weight plus ballast i.e. without fuel, crew and alternative load equipment must always be maintained at +2.42 ft (± 0.02 ft).

Note...

The basic weight may be determined from the basic weight of the aircraft as given in Form 4908 corrected for any additions or deletions of equipment etc.

Method of determining amount of ballast required

From the vertical axis of the graph (fig.2) select the appropriate value of the aircraft moment and extend from this value a horizontal line to intersect the aircraft weight value on, or between the weight lines, a vertical line is then dropped from this intersection to the horizontal axis of the graph to indicate the amount of adjustable ballast required to give a C.G. position of +2.42 ft.

<i>Example:-</i>	Weight (lb)	Arm (ft)	Moment (lb ft)
Basic weight from Form 4908	+24522		+65321
Less items not fitted to a/c (see Table 2)			
Item 39, 10D/18501 Radar head, Type 1	- 65		- 2641
Item 38, 10D/20334 Rec/trans. TR.4585	- 38		- 929
Item 54, Repeater unit type 55/31	- 34		+ 482
Basic weight	+24385		+62233
Therefore, referring to fig.2, amount of ballast required to obtain C.G. position of +2.42 ft is:	+ 144	-20.010	- 2881
Basic weight plus ballast	+24529	+ 2.420	+59352

Note...

◀ *A calculated amount of ballast greater than the allowable value for fuselage bending strength (i.e. above the allowable ballast line on the graph) is unacceptable.* ▶

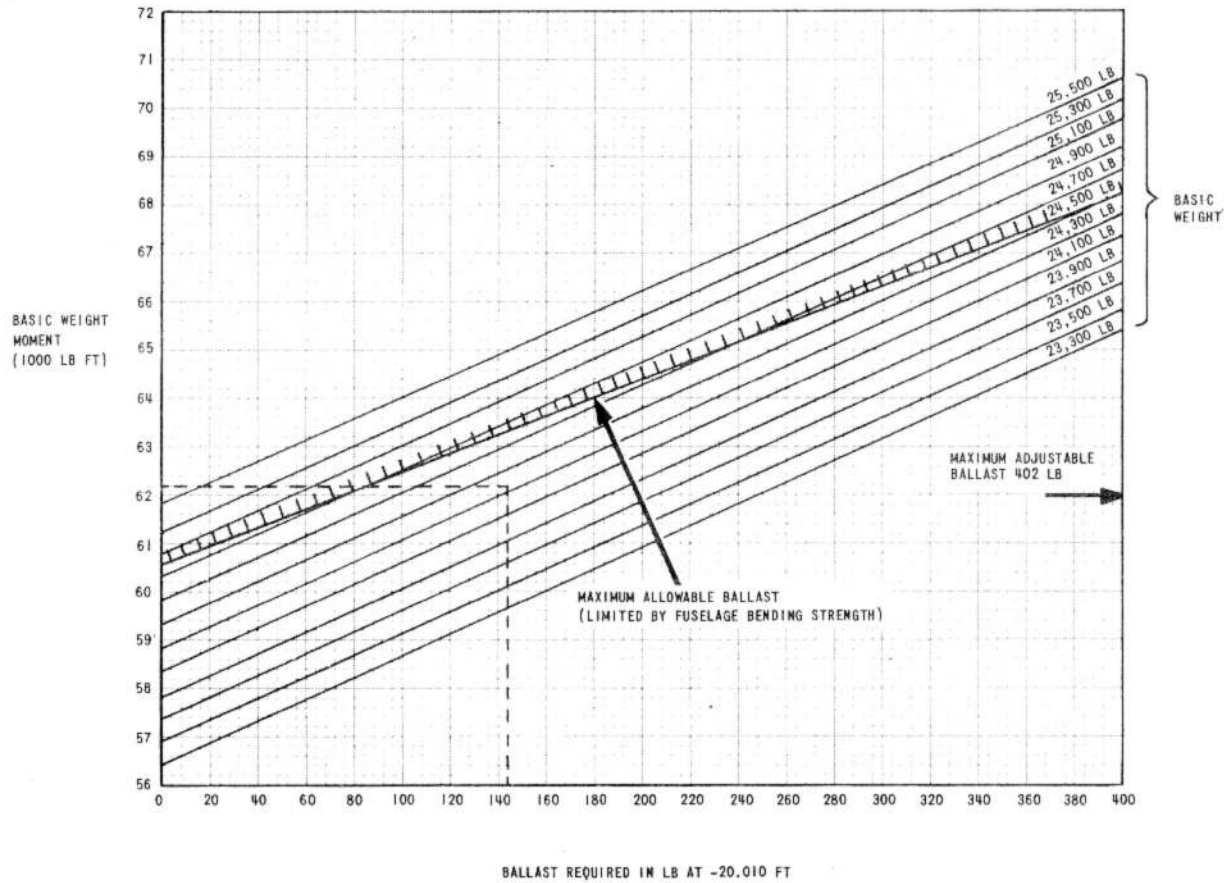


FIG. 2. DETERMINATION OF BALLAST REQUIRED TO ESTABLISH C.G. AT +2.42 FT. IN BASIC WEIGHT CONDITION

◀ (Illustration amended) ▶

Weighing the aircraft*Preparation*

11. (1) With the aircraft in the rigging position drain the fuselage and wing fuel tanks (*Sect.4, Chap.2*). (*For details of undrainable fuel see Table 1*). Remove all expendable load items and all possible alternative load items.

Non-hydrostatic method of weighing

(2) Information of a general nature concerning the practical measurement of basic weight and moment is contained in A.P. 4747A.

Hydrostatic method

(3) The equipment required for weighing the aircraft using the hydrostatic method is listed in Sect.2, Chap.4, Table 2. A.P. 4747A, Sect.1 gives general information on hydrostatic units and their use; the following instructions amplify this:-

(a) Jack the aircraft at the main and front fuselage jacking points (*Sect.2, Chap.4*).

(b) Place locally manufactured wood blocks of sufficient thickness to provide the necessary clearance for the hydrostatic unit and jacks, under the nose and main wheels. Lower the aircraft on to the blocks and remove the lifting jacks.

(c) Assemble:

(i) A 25-ton hydrostatic unit, a 15-ton jack and jack to unit and unit to aircraft pad adapters at each main wheel jacking point.

(ii) A 10-ton hydrostatic unit, an 8-ton jack and jack to unit and unit to nose undercarriage adapters, under the nose

undercarriage axle between the twin wheels.

(d) Weigh the aircraft as instructed in A.P.4747A, Sect.1.

(e) Lower the aircraft on to the wood blocks and remove the weighing equipment.

(f) Jack the aircraft (*op. (a)*) and remove the blocks.

(g) Lower the aircraft to the ground and remove the jacks.

Basic weight determination

12. To the weight and moment obtained from weighing, add:

(1) The weight and moment of drainable unusable fuel in the pipe lines (*Note 2 of Table 1*).

(2) The weight and moment of Table 2 items not fitted at weighing but required for flight.

Deduct the weight and moment of all items from Table 3, 4, 5 and 6 which were fitted at weighing.

The resultant figures are the basic weight and moment.

Note...

The total amount of adjustable ballast fitted at the time of weighing must be deducted. ►

Engine data

13. In the event of an engine change, Form 4908 must be amended to account for any changes in the engine weight and moment in accordance with the values quoted for the

individual engine on the engine log card. The C.G. position as quoted on the log card will be to an engine datum and it will be necessary to correct this value to the aircraft C.G. datum (*para.3*). The following data will affect this correction.

(1) The C.G. of the engine is quoted by the manufacturers in inches aft of the front suspension centre line.

(2) This engine datum is 33.270 inches forward of the aircraft C.G. datum point.

(3) Hence if X_e is the C.G. position of the engine, as quoted on the log card, then the C.G. of the engine in relation to the aircraft datum in feet:

$$\frac{X_e - 33.27}{12} = \text{ft forward of aircraft C.G. datum.}$$

This result will be negative denoting that the engine C.G. is forward of the aircraft C.G.

Modifications

14. The basic weight given in para.7 include the following modifications:

1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 51, 53, 54, 55, 56, 57, 62, 63, 65, 66, 67, 68, 69, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 89, 90, 95, 96, 97, 98, 99, 150, 152, 153, 154, 155, 156, 157, 159, 161, 162, 163, 164, 165, 167, 168, 169, 170, 171, 174, 175, 176, 177, 178, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 195, 196, 197, 198, 199, 250, 251, 252, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 291, 292, 293, 294, 295, 296, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314,

315, 316, 318, 319, 320, 321, 322, 323, 324,
325, 326, 328, 329, 330, 332, 333, 334, 335,
337, 339, 340, 341, 343, 344, 345, 346, 347,
349, 400, 401, 402, 403, 404, 405, 407, 409,
410, 411, 412, 414, 415, 418, 419, 420, 421,
422, 424, 426, 427, 428, 429, 430, 433, 434,
437, 438, 439, 440, 441, 442, 443, 444, 445,
446, 447, 449, 450, 501, 502, 503, 504, 505,
506, 507, 508, 509, 511, 512, 513, 514, 519,
523, 528, 530, 531, 533, 535, 536, 537, 538,
540, 541, 542, 543, 545, 546, 547, 548, 550,
603, 606, 607, 611, 612, 616, 617, 618, 620,
621, 622, 626, 628, 631, 632, 636, 640, 641,
642, 643, 644, 648, 649, 650, 701, 704, 706,
710, 711, 713, 714, 715, 716, 717, 720, 721,
724, 729, 730, 731, 733, 735, 738, 739, 740,
741, 745, 749, 750, 851, 852, 853, 856, 857,
859, 860, 862, 863, 864, 868, 869, 872, 874,
875, 877, 878, 880, 885, 886, 887, 890, 894,
895, 896, 899, 1001, 1002, 1004, 1007, 1008,
1009, 1011, 1012, 1013, 1014, 1016, 1018,
1021, 1022, 1023, 1024, 1027, 1029, 1030,

1033, 1036, 1040, 1045, 1047, 1048, 1050,
1151, 1152, 1155, 1159, 1160, 1163, 1165,
1169, 1170, 1171, 1175, 1176, 1189, 1196,
1198, 1199, 1252, 1253, 1254, 1255, 1258,
1259, 1262, 1263, 1264, 1265, 1266, 1268,
1270, 1271, 1272, 1276, 1277, 1280, 1282,
1290, 1291, 1293, 1294, 1295, 1296, 1297,
1299, 1402, 1403, 1405, 1407, 1413, 1420,
1421, 1425, 1426, 1430, 1432, 1433, 1434,
1435, 1438, 1441, 1442, 1444, 1447, 1450,
1452, 1453, 1454, 1459, 1460, 1463, 1464,
1465, 1466, 1469, 1471, 1473, 1474, 1477,
1478, 1482, 1484, 1487, 1491, 1493, 1497,
1498, 1499, 1500, 1701, 1702, 1703, 1704,
1705, 1706, 1712, 1713, 1714, 1716, 1720,
1721, 1722, 1724, 1726, 1728, 1734, 1735,
1738, 1739, 1740, 1743, 1748, 1751, 1752,
1753, 1754, 1755, 1756, 1757, 1758, 1759,
1760, 1761, 1762, 1763, 1764, 1765, 1766,
1767, 1771, 1777, 1778, 1782, 1784, 1902,
1913, 1917, 1919, 1922, 1923, 1932, 1933,
1940, 1944, 1945, 1946, 1947, 1948, 1954,

1958, 1960, 1961, 1962, 1963, 1970, 1973,
1985, 1995, 1999, 2109, 2125, 2126, 2134,
2147, 2150, 2151, 2154, 2155, 2158, 2181,
2182, 2186, 2189, 2193, 2197, 2198, 2199,
2200, 2302, 2306, 2308, 2309, 2315, 2320,
2323, 2329, 2331, 2340, 2355, 2358, 2364,
2369, 2372, 2379, 2380, 2386, 2391, 2398,
2502, 2504, 2512, 2517, 2530, 2532, 2533,
2534, 2535, 2538, 2540, 2544, 2545, 2550,
2561, 2564, 2572, 2580, 2585, 2587, 2588,
2590, 2593, 2595, 2599, 2605, 2615, 2622,
2623, 2626, 2630, 2633, 2634, 2643, 2645,
2659, 2670, 2677, 2682, 2689, 2692, 2693,
2694, 2695, 2704, 2720, 2721, 2740, 3154,
3156, 3158, 3185, 3211, 3221, 3245, 3262,
3293, 3325, 3355, 3369, 3380, 3391, 3394,
3402, 3403, 3421, 3423, 3426, 3442, 3444,
3448, 3453, 3482, 3483, 3484, 3487, 3521,
3562, 3597, 3701, 3703, 3740, 3743, 3747,
3749, 3750, 3759, 3761, 3764, 3773, 3800,
3807, 3836, 3841, 3849, 3857, 3881, 3883,
3921, 3949, 3957, 3971,

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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	10.00	+0.980	+ 9.80
Fuel, pipes in fuselage	5.00	+0.349	+ 1.75
Fuel, recuperators	64.00	+1.323	+84.67
◀ TOTAL TRAPPED (undrainable) FUEL ▶	79.00		+96.22

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 pipe lines	15.00	-	+14.33
Drainable but unusable fuel in integral tanks... ..	32.00	+2.183	+69.86

TABLE 2 REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT (fig.3)

Fig.3 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
MISCELLANEOUS ITEMS						
76			Ballast - non-adjustable	148.88	-19.02	-2831.08
58	12L/203	1	Destructor, H.E. No.1, Mk.1	3.25	- 8.73	- 28.37
38			Oxygen charge	25.78	- 8.14	- 209.82
66	9A/02430	1	First-aid outfit	3.00	-13.66	- 40.98
68	22G/108081	1	Gauntlets, fire-fighting, asbestos (1 pair)... ..	0.88	-14.12	- 12.43
10	6A/2197	1	Clock, fluorescent, Mk.4	0.44	-18.57	- 8.17
30	12K/1314	3	Ejection cartridges, seat, No.3, Mk.3	4.75	-11.46	- 54.39
5	6D/2429	1	Emergency oxygen set, Mk.3E	0.94	-21.43	- 20.14
44	12K/1223	6	Cartridges, engine starting, No.10, Mk.2	18.00	+18.14	+ 326.52
73	12G/1339	1	Charge, H.E., emergency control severing	0.37	-16.19	- 5.99
31	12G/1278	32	Detonators, electric, No.108, Mk.1 } Hatch	0.78	-11.20	- 8.74
	12G/1438	2				
14	12G/1279	1	Detonator, electric, No.109, Mk.1, controls	0.02	-16.19	- 0.92
16	12G/1278	32	Detonators, electric, No.108, Mk.1, canopy	0.74	-15.70	- 11.62
20	6B/2649	1	G.P.I. Indicator, Mk.4A	26.00	-14.52	- 377.52
27	6B/653	1	G.P.I. amplifier	3.00	-13.20	- 39.60
24	6B/3178	1	Map display unit, Type 9033 (navigator's stn.)... ..	5.00	-14.019	- 70.09
(See Note at end of Table 2)						
64	6B/3179	1	Coupling unit, Type 9233	9.66	-12.755	- 123.21
3	6B/3122	1	Zero reader flight computer, Type A	19.63	-20.39	- 400.26
29	6B/2764	1	Periscope, rear viewing	4.53	-12.62	- 57.17
28	6B/3469	1	Periscope, mounting, Mk.1F... ..	5.75	-12.44	- 71.53
1	5J/9101808	1	Battery, secondary, alkaline, 2.4 volt, 3 amp hours	1.25	-19.75	- 24.69
74	5J/9101543	2	Batteries, lead acid, 12 volt, 4 amp hours... ..	9.88	-18.07	- 178.53
57	5J/9101534	4	Batteries, lead acid, 12 volt, 40 amp hours, Type C	198.76	- 6.65	-1321.75
40	6B/554	1	Air mileage unit, Mk.4A	10.50	+ 1.49	+ 15.65
62	6B/562	1	Amplifier unit, Type B	10.00	-11.89	- 118.90
9	6B/561	1	Gyro unit, Type B	6.00	-18.70	- 112.20
21	6B/634	1	Indicator, master, Type B } G.4B compass	6.63	-14.40	- 95.47
67	6B/408	1	Panel, control, Type A	1.28	-13.72	- 17.56
75	27KD/375	5	Stoppers, leak, cabin pressure	1.25	-17.50	- 21.88
8	6A/5798	1	Horizon, gyro, Mk.4A	6.63	-18.55	- 122.99
12	6A/3119	1	Indicator, cross pointer	1.50	-18.45	- 27.68
11	6A/4417	1	Combined control/course selector } Zero reader	2.88	-18.58	- 53.51
72	27N/1	1	Axe, fire	2.42	-15.31	- 37.05
42	27N/100	1	Extinguisher, fire, Methyl Bromide, automatic, Type 12A, 6 lb	10.63	+13.96	+ 148.39

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TABLE 2 (continued) REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT (fig.3)

Fig.3 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
41	27N/100	2	Extinguishers, fire, Methyl Bromide, automatic, Type 12A, 6 lb (wing)...	21.25	+ 2.00	+ 42.50
39	27N/102	2	Extinguishers, fire, Methyl Bromide, automatic, Type 14A, 12 lb (wing) ...	38.62	+ 1.01	+ 39.01
15	27N/299	1	Extinguisher, fire, hand-operated, Type 34H ...	5.19	-14.92	- 77.40
65	27H/3224	1	Container, urine, Mk.2 & funnel...	1.09	-13.94	- 15.19
17	EA3.80.1989	1	Handle for emergency hydraulic hand pump (stowed) ...	0.85	-14.22	- 12.09
A.R.I. 5284 - AYF						
51	110DB/25	1	Transmitter/receiver, RT-7/APN-1 ...	18.50	+24.51	+ 453.44
4	10F/18745	1	Switch, altitude limit, Type SA.1/ARN.1 ...	0.97	-17.94	- 17.40
2	110QB/6	1	Altitude indicator, 1D.14/APN.1 ...	1.81	-17.94	- 32.47
A.R.I.5800 - REAR WARNING						
25	10Q/16073	1	Indicator unit, Type 27 ...	3.09	-14.38	- 44.43
50	10D/18501	1	Radar head, Type 1 ...	65.00	+40.63	+2640.95
55	10V/16057	1	Waveform generator, Type 76 ...	22.86	- 8.34	- 190.65
56	10AJ/92	1	Mounting, Type 907 ...	3.00	- 8.34	- 25.02
34	10AE/690	1	Suppressor, false warning ...	2.75	-10.79	- 29.67
32	10L/16043	1	Control unit, Type 611 ...	2.69	-11.14	- 29.96
A.R.I. 5848 - I.F.F. Mk.10						
49	10D/20334	1	Receiver/transmitter, T.R 4585 ...	38.40	+24.20	+ 929.28
35	10L/16192	1	Control unit, Type 927 ...	0.75	-11.81	- 8.86
52	10D/21270	1	Coder unit, Type 6466 ...	10.44	+23.04	+ 240.54
33	10L/16478	1	Control unit, Type 6465 ...	1.19	-11.77	- 14.01
A.R.I. 5885 - BLUE SILK						
45	10Q/16248	1	Tracking unit amplifier, Type 4356 ...	23.50	+20.21	+ 474.94
46	10K/18356	1	Power unit, Type 4358 ...	17.00	+20.21	+ 343.57
47	10Q/16247	1	Tracking unit, discriminator, Type 4357 ...	24.00	+20.21	+ 485.04
43	10D/19653	1	Transmitter/receiver, Type 4364 ...	85.00	+14.93	+1269.05
23	10Q/16249	1	Impulse counter, Type 4355 ...	1.50	-14.00	- 21.00
22	10Q/16402	1	Indicator, Type 4403 ...	6.00	-14.07	- 14.42

TABLE 2 (continued) REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT (fig.3)

Fig.3 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
A.R.I. 18011 I.L.S.						
61	10L/263	1	Control unit, Type 705... ..	1.75	-12.13	- 21.23
7	10Q/61	1	Indicator, Type 7	1.35	-18.52	- 25.00
37	10D/17818	1	Receiver-localiser/Marker R 1964	17.62	- 9.56	- 168.45
36	10D/17819	1	Receiver-glide path R 1965... ..	16.75	-10.47	- 175.37
A.1961						
63	10U/16596	1	Amplifier... ..	6.25	- 12.78	- 79.88
A.R.I. 18064 - V.H.F.						
60	10D/17937	1	Transmitter/receiver TR 1985	26.55	- 9.17	- 243.36
59	10D/17938	1	Transmitter/receiver TR 1986	26.34	- 9.41	- 247.86
6	10L/246	2	Control unit, Type 382... ..	1.19	-18.23	- 21.69
DECCA MK.8						
71		1	Receiver, Type 351	36.00	-14.35	- 516.60
70		1	Power unit, Type 813	22.81	-14.27	- 325.50
69		1	Repeater unit, Type 55/31	34.00	-14.18	- 482.12
26		1	Control box Type 356B	1.09	-13.97	- 15.23
18		1	Lane identification meter, Type 275B	1.60	-14.17	- 22.67
19		3	Decometers, Type 274B	3.60	-14.17	- 51.01
54		1	Aerial amplifier, Type 308	1.10	- 5.73	- 6.30
A.R.I. 18124/1 - U.H.F.						
48	10D/942-8542	1	Transmitter/receiver, Type 5	48.50	+22.57	+1094.65
53	10L/943-3247	1	Control, receiver, muting	1.25	+21.84	+ 27.30
13	10L/999-0839	1	Control unit, Type C 1607/2	3.00	-17.33	- 51.99

Note... Map display unit (Item 24) may be fitted in an alternative position in the nose of the aircraft, this introduces an additional moment of -40.86 lb ft

TABLE 3 CREW & CREW REMOVABLE OPERATING LOAD ITEMS COMMON TO ALL ROLES - (fig. 4 & 6)

Fig.4 & 6 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
PILOT AND EQUIPMENT						
92		1	Pilot	180.00	-16.44	-2969.20
94	22C/1479	1	Jacket, life saving Mk.4	6.50	-15.78	- 102.57
87	27C/2229	1	Pack, personal survival, Type M	22.00	-16.40	- 360.80
85	15A/683	1	Parachute seat, Type Mk.11	27.00	-16.40	- 442.80
84		1	Pilot's notes for Canberra B (I) Mk.6 aircraft	0.20	-17.96	- 3.59
89	6F/171	1	Writing pad pilot's knee type	1.38	-17.23	- 23.78
93	5A/9105033	1	Torch, electric, Type 'Y' c/w cells	0.72	-16.44	- 11.84
86	6D/1646	1	Emergency oxygen set Mk.4A	4.00	-16.40	- 65.60
NAVIGATOR AND EQUIPMENT						
96		1	Navigator	180.00	-11.88	-2138.40
154	22C/1479	1	Jacket, life saving Mk.4	6.50	-11.31	- 73.52
155	27C/2229	1	Pack, personal survival, Type M	22.00	-11.85	- 260.70
156	15A/683	1	Parachute seat, Type Mk.11	27.00	-11.92	- 321.84
157	6D/1646	1	Emergency oxygen seat Mk.4A	4.00	-11.92	- 47.68
161	6B/469	1	Case, carrying navigators equipment, containing:-	1.00	-13.04	- 13.04
	5A/9105033	1	Torch, electric, Type 'Y' c/w cells	0.72	-13.04	- 9.39
	6B/9101001	1	Watches, stop	0.25	-13.04	- 3.26
	6E/293	1	Binoculars, mag. 6 diams. 30 mm	2.00	-13.04	- 26.08
	6E/392	1	Binoculars, 40 mm Mk.5 c/w rubber face piece	2.25	-13.04	- 29.34
	6B/2645	1	Compuator, dead reckoning Mk.4A	0.25	-13.04	- 3.26
	6B/47	1	Protractors, Douglas 5 in	0.14	-13.04	- 1.83
	6B/3208	1	Ruler, flight planning -21" x 2" x 3/16"	0.19	-13.04	- 2.48
	13/94	1	Compass set	0.25	-13.04	- 3.26
AIR BOMBER AND EQUIPMENT						
162		1	Air bomber	180.00	-11.83	-2129.40
101	22C/1479	1	Jacket, life saving Mk.4	6.50	-11.27	- 73.26
158	27C/2229	1	Pack, personal survival, Type M	22.00	-11.80	- 259.60
159	15A/683	1	Parachute seat, Type Mk.11	27.00	-11.87	- 320.49
99	5A/9105033	1	Torch, electric, Type 'Y' c/w cells	0.72	-11.83	- 8.52
160	6D/1646	1	Emergency oxygen set Mk.4A	4.00	-11.87	- 47.48
TOTAL CREW AND CREW REMOVABLE LOAD ITEMS				728.57		-9743.01

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TABLE 4 ALTERNATIVE OPERATING LOAD ITEMS - (fig.4 & 6)

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lbft)
T2 BOMBSIGHT						
82	9/4472	1	Bombsight head sighting T2	14.00	-22.30	- 312.20
78	109/82	1	Control, panel assy.	1.00	-21.70	- 21.70
83	109/94	2	Shafts, flexible, No.2 length 32½ in	1.50	-22.05	- 33.08
166	9/4471	1	Bombsight computer T2	44.38	-20.68	- 917.78
163	109JB/271	2	Hose, flexible, pitot and static, 12 in. x 3/16 in. i/d .	1.88	-19.68	- 37.00
164	109JB/295	1	Hose, flexible, air pressure and exhaust, 12 in. x 1/4 in. i/d	0.94	-19.68	- 18.50
77	9/4482	1	Bombing angle computer Mk.1	0.19	-21.35	- 4.06
79	9/4380	2	Gearbox, right angle c/w locknut	0.38	-21.86	- 8.31
TOTAL T2 BOMBSIGHT				64.27		-1352.63
F24 CAMERA						
128	14A/2602 & 4119	1 & 1	Camera, F24 c/w 20" lens and cone	28.06	+17.28	+ 484.88
129	14A/2615	1	Filter, Type 4	0.03	+17.28	+ 0.52
130	14A/745	1	Covers, body	0.69	+17.28	+ 11.92
131	14A/4004	1	Mounting, camera Type 25 Mk.2	6.25	+17.28	+ 108.00
134	26FZ/265	1	Cover, removable (EA1.11.547)	0.71	+17.28	+ 12.27
132	14A/3568	1	Camera drive, 2 ft 6 in, Type C	0.79	+16.65	+ 13.15
95	14A/2206	1	Control camera, remote, Type 35 No.8	4.25	-12.12	- 51.51
125	14A/988	1	Motor, camera driving, Type B	3.70	+16.44	+ 60.83
126	14A/862	1	Leads, electrical, camera control, No.4 2 ft 6 in ...	0.44	+16.68	+ 7.34
TOTAL F24 CAMERA				44.92		+ 647.40
L.A.B.S. EQUIPMENT						
123	9/4609	1	Gyro, vertical	5.75	+15.65	+ 89.99
124	9/4610	1	Gyro, yaw roll	6.25	+15.69	+ 98.06
122	9/4866	1	Calibrator unit, Mk.2	1.75	+14.13	+ 24.73
103	9/4612	1	Accelerometer	0.75	- 7.69	- 5.77
121	9/4873	1	Box, relay	5.00	+14.71	+ 73.55
88	9/4614	1	Indicator	0.45	-17.63	- 7.93

continued

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TABLE 4 - (continued) ALTERNATIVE OPERATING LOAD ITEMS - (fig. 4 & 6)

Fig. 4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
97	9/4718	1	Timer, remote	1.25	-12.45	- 15.56
133	EA9.81.3627	1	Mounting frame and inverters	91.63	+16.28	+1491.74
98	EB6.81.1543	1	Control panel	7.96	-11.94	- 95.04
(including 11A/4510)						
102	EB6.81.1467	1	Crate assembly	32.41	- 7.90	- 256.04
(including EB6.81.1407)						
100	EG4.81.625	1	Control box	3.77	- 11.83	- 44.60
TOTAL L.A.B.S. EQUIPMENT				156.97		+1353.13
Fig. 6						
Item No. G45B CAMERA						
191	14A/4960	1	Camera, aircraft G45B Mk.5 complete	5.25	- 2.31	- 12.13
190	14A/1423	1	Adapter, Type 32	0.63	- 2.31	- 1.46
192	14A/4963	1	Covers, protective, rear connection	0.25	- 2.31	- 0.58
189	14A/1420	1	Flange, front	0.07	- 2.84	- 0.20
TOTAL G45B CAMERA				6.20		- 14.37
Fig. 4						
Item No. F95 CAMERA						
81	14A/4984	1	Camera, aircraft F95, Mk.2 4 in complete	16.00	-22.32	- 357.12
80	14A/4611	1	Control unit, Type 95	2.75	-21.55	- 59.26
TOTAL F95 CAMERA				18.75		- 416.38
Fig. 4 & 6						
Item No. GUNSIGHT						
91	8B/4732	1	Sight, machine gun, reflector, free-gun Mk.3N Type 2	1.78	-17.57	- 31.27
90	EB6.97.475	1	Carrier, gunsight	0.78	-17.63	- 13.76
TOTAL GUNSIGHT				2.56		- 45.03

TABLE 5 FUEL LOAD ITEMS (fig.5 & 7)

Fig.5&7 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
FUEL IN WINGS AND FUSELAGE (AT 8 LB/GAL)						
168			Fuel, No.1 Tank, 520 gal	4160.00	- 3.86	-16057.60
171			Fuel, No.2 Tank, 317 gal	2536.00	+ 2.21	+ 5604.56
177			Fuel, No.3 Tank, 540 gal	4320.00	+ 9.13	+39441.60
170			Fuel, Integral Tanks, 856 gal	6848.00	+ 2.18	+14928.64
TOTAL FOR FUEL IN WINGS AND FUSELAGE				17864.00		+43917.20
WING-TIP TANKS AND WING-TIP TANK FUEL (AT 8 LB/GAL)						
173	12G/1279	6	Detonators, electric No.109 Mk.1	0.13	+ 4.15	+ 0.54
172	EA1.00.81-2	2	Wing-tip tank attachment	0.73	+ 4.10	+ 2.99
174	26FZ/1577	6	Bolts, explosive, EA1.20.2031	2.75	+ 4.16	+ 11.44
176	EA3.62.217-8	2	Wing-tip tanks	238.00	+ 4.25	+ 1011.50
175			Fuel, 488 gal	3904.00	+ 3.88	+15147.52
TOTAL FOR WING-TIP TANKS AND WING-TIP TANK FUEL				4145.61		+16173.99

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TABLE 6 ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4 & 5)

CASE A
2 x 3 1000-LB
MK.6 OR 9 MC BOMBS

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
152	11A/3684	1	Dust cover (Stn.1)	1.56	- 2.58	- 4.02
112	11A/3684	1	Dust cover (Stn.3)	1.56	+ 3.84	+ 5.99
113	11A/3684	1	Dust cover (Stn.4)	1.56	+ 6.87	+ 10.72
118	11A/3684	1	Dust cover (Stn.6)	1.56	+10.22	+ 15.94
116	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 (Stn.5) ...	62.69	+ 8.43	+ 528.48
144	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 (Stn.2) ...	62.69	- 1.19	- 74.60
107	11A/3680	1	Bomb beam, auxiliary forward	168.00	+ 0.25	+ 42.00
117	11A/4221	1	Bomb beam, auxiliary, aft	178.00	+ 9.20	+1637.60
165			Adjustable ballast... ..	241.00		-4822.00
127	27C/2379	3	Survival packs, desert (see note for tropical or arctic type)	132.00	+23.86	+3149.00
147	EA9.11.2051/2	2	Bomb doors	581.00	+ 6.10	+3544.10
TOTAL ALTERNATIVE LOAD ITEMS				1431.62		+4033.21
TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 3)				728.57		-9743.01
ALTERNATIVE OPERATING LOAD ITEMS(TABLE 4)						
T2 BOMBSIGHT				64.27		-1352.63
F24 CAMERA				44.92		+ 647.40
COVERS, PYLON APERTURE				2.80		+ 14.28
BASIC WEIGHT				24450.00		+64575.00
OPERATING WEIGHT				26722.18		+58174.25

continued

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4&5)

CASE A 2 x 3 1000-LB MK.6 OR 9 MC BOMBS						
Fig.5 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
ITEMS OF EXPENDABLE LOAD						
TOTAL FOR FUEL IN FUSELAGE AND WINGS (TABLE 5)						
				17864.00		+43917.20
169	12A/2072	3	Bombs, aircraft, 1000 lb Mk.6 (Strn.2)	3168.00	-1.19	- 3769.92
178	12A/2072	3	Bombs, aircraft, 1000 lb Mk.6 (Strn.5)	3168.00	+8.42	+26674.56
TOTAL EXPENDABLE LOAD				24200.00		+66821.84
ALL-UP WEIGHT				50922.00		+124996.09
C.G. POSITION (WHEELS DOWN)					+2.455	
TOTAL WING-TIP TANKS AND WING-TIP TANK FUEL (TABLE 5)						
				4146.00		+ 16174.00
ALL-UP WEIGHT WITH WING-TIP TANKS				55068.00		+141170.09
C.G. POSITION (WHEELS DOWN)					+2.564	
EFFECT OF RETRACTING UNDERCARRIAGE - 1394 lb ft						

Note:- Alternative type survival packs may be fitted in lieu of desert type i.e. Arctic - 34 lb; tropical - 11 lb each.

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4& 5)

CASE C
3 x 4 4.5 INCH
RECCE FLARES

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
149	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 (Stn.1) ...	62.69	- 2.59	- 162.37
142	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 (Stn.3) ...	62.69	+ 3.82	+ 239.48
116	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 (Stn.5) ...	62.69	+ 8.43	+ 528.48
151	11A/4397	1	Carrier, bomb, light series Mk.15 (Stn.1)	45.00	- 2.60	- 117.00
141	11A/4397	1	Carrier, bomb, light series Mk.15 (Stn.3)	45.00	+ 3.82	+ 171.90
114	11A/4397	1	Carrier, bomb, light series Mk.15 (Stn.5)	45.00	+ 8.42	+ 378.90
107	11A/3680	1	Bomb beam, auxiliary, forward	168.00	+ 0.25	+ 42.00
117	11A/4221	1	Bomb beam, auxiliary, aft.	178.00	+ 9.20	+1637.60
106	11A/3684	1	Dust cover (Stn.2)	1.56	- 1.18	- 1.84
113	11A/3684	1	Dust cover (Stn.4)	1.56	+ 6.87	+ 10.72
118	11A/3684	1	Dust cover (Stn.6)	1.56	+10.22	+ 15.94
150		1	Adapter Mk.3 (Stn.1)	9.25	- 2.60	- 24.05
143		1	Adapter, Mk.3 (Stn.3)	9.25	+ 3.82	+ 35.34
138		1	Adapter, Mk.3 (Stn.5)	9.25	+ 8.42	+ 77.89
147	EA9.11.2051/2	2	Bomb doors	581.00	+ 0.10	+3544.10
165			Adjustable ballast	241.00		-4822.00
127	27C/2379	3	Survival packs, desert (see note for tropical or arctic)	132.00	+23.86	+3149.00
TOTAL ALTERNATIVE LOAD ITEMS				1655.50		+4704.09
TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 3)				728.57		-9743.01
ALTERNATIVE OPERATING LOAD ITEMS (TABLE 4)						
T2 BOMBSIGHT				64.27		-1352.63
F24 CAMERA				44.92		+ 647.40
COVERS, PYLON APERTURE				2.80		+ 14.28
BASIC WEIGHT				24450.00		+64575.00
OPERATING WEIGHT				26946.06		+58845.13

continued

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4& 5)

					CASE C 3 x 44.5 INCH RECCE FLARES		
Fig.5 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)	
ITEMS OF EXPENDABLE LOAD							
TOTAL FOR FUEL IN FUSELAGE AND WINGS (TABLE 5)				17864.00		+ 43917.20	
187	12D/1053	4	Flares, aircraft reconnaissance 4.5" (Stn.1) ...	100.00	- 2.60	- 260.00	
183	12D/1053	4	Flares, aircraft reconnaissance 4.5" (Stn.3) ...	100.00	+ 3.82	+ 382.00	
182	12D/1053	4	Flares, aircraft reconnaissance 4.5" (Stn.5) ...	100.00	+ 8.48	+ 848.00	
TOTAL EXPENDABLE LOAD				18164.00		+ 44887.20	
ALL-UP WEIGHT				45110.00		+ 103732.33	
C.G. POSITION (WHEELS DOWN)					+ 2.300		
TOTAL WING-TIP TANKS AND WING-TIP TANK FUEL (TABLE 5)				4146.00		+ 16174.00	
ALL-UP WEIGHT WITH WING-TIP TANKS				49256.00		+ 119906.33	
C.G. POSITION (WHEELS DOWN)					+ 2.434		
EFFECT OF RETRACTING UNDERCARRIAGE - 1394 lb ft							

Note:- Alternative type survival packs may be fitted in lieu of desert type i.e. arctic - 34lb, tropical - 11lb, each.

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4 & 5)

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	CASE G 4 x 4 25 LB PRACTICE BOMBS			CASE H MIXED LOAD 2 x 4 4.5 INCH RECCE FLARES No.2 Mk.1&2 25 LB PRACTICE BOMBS		
				Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
149	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 (Stn.1) ...	-	-	-	62.69	- 2.59	- 162.37
142	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 (Stn.3) ...	-	-	-	62.69	+ 3.82	+ 239.48
119	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 (Stn.6) ...	-	-	-	62.69	+10.18	+ 638.18
107	11A/3680	1	Bomb beam, auxiliary, forward	168.00	+ 0.25	+ 42.00	168.00	+ 0.25	+ 42.00
117	11A/4221	1	Bomb beam, auxiliary, aft.	178.00	+ 9.20	+1637.60	178.00	+ 9.20	+ 1637.60
139	11A/4397	1	Carriers, bomb, light series Mk.15 (Practice Stn.1)...	45.00	+ 8.86	+ 398.70	-	-	-
109	11A/4397	1	Carriers, bomb, light series Mk.15 (Practice Stn.4)...	45.00	+ 1.11	+ 49.95	-	-	-
148	11A/4397	1	Carriers, bomb, light series Mk.15 (Practice Stn.5)...	45.00	- 1.77	- 79.65	-	-	-
105	11A/4397	1	Carriers, bomb, light series Mk.15 (Practice Stn.6)...	45.00	- 4.65	- 209.25	-	-	-
151	11A/4397	1	Carriers, bomb, light series Mk.15 (Stn.1)	-	-	-	45.00	- 2.60	- 117.00
141	11A/4397	1	Carriers, bomb, light series Mk.15 (Stn.3)	-	-	-	45.00	+ 3.82	+ 171.90
120	11A/4397	1	Carriers, bomb, light series Mk.15 (Stn.6)	-	-	-	45.00	+10.17	+ 457.65
108	EA3.97.115	1	Adapter, beam, fwd, (Practice Stn.4)	1.28	+ 0.67	+ 0.86	-	-	-
146	EA3.97.115	1	Adapter, beam, fwd, (Practice Stn.5)	1.28	- 2.20	- 2.82	-	-	-
104	EA3.97.115	1	Adapter, beam, fwd, (Practice Stn.6)	1.28	- 5.10	- 6.53	-	-	-
110	EA3.97.117	1	Adapter, beam, fwd, (Practice Stn.4)	1.28	+ 1.42	+ 1.82	-	-	-
145	EA3.97.117	1	Adapter, beam, fwd, (Practice Stn.5)	1.28	- 1.41	- 1.80	-	-	-
153	EA3.97.117	1	Adapter, beam, fwd, (Practice Stn.6)	1.28	- 4.27	- 5.47	-	-	-
136	EA3.97.111	1	Adapter, beam, rear, (Practice Stn.1)	1.30	+ 8.40	+ 10.92	-	-	-
135	EA3.97.113	1	Adapter, beam, rear, (Practice Stn.1)	1.30	+ 9.22	+ 11.99	-	-	-
106	11A/3684	1	Dust cover, (Stn.2)	1.56	- 1.18	- 1.84	1.56	- 1.18	- 1.84
113	11A/3684	1	Dust cover, (Stn.4)	1.56	+ 6.87	+ 10.72	1.56	+ 6.87	+ 10.72
115	11A/3684	1	Dust cover, (Stn.5)	1.56	+ 8.48	+ 13.23	1.56	+ 8.48	+ 13.23
152	11A/3684	1	Dust cover, (Stn.1)	1.56	- 2.58	- 4.02	-	-	-
112	11A/3684	1	Dust cover, (Stn.3)	1.56	+ 3.84	+ 5.99	-	-	-
118	11A/3684	1	Dust cover, (Stn.6)	1.56	+10.22	+ 15.94	-	-	-
150		1	Adapter, Mk.3 (Stn.1)	-	-	-	9.25	- 2.60	- 24.05
143		1	Adapter, Mk.3 (Stn.3)	-	-	-	9.25	+ 3.82	+ 35.34
137		1	Adapter, Mk.3 (Stn.6)	-	-	-	9.25	+10.17	+ 94.07
147	EA9.11.2051/2	2	Bomb boors	581.00	+ 6.10	+3544.10	581.00	+ 6.10	+ 3544.10
165			Adjustable ballast	241.00		-4822.00	241.00		- 4822.00
127	27C/2379	3	Survival packs, desert (see note for tropical or arctic type	132.00	+23.86	+3149.00	132.00	+23.86	+ 3149.00

continued

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4&5)

Fig.5 Item No.	Ref or Part No.	Qty.	Description	CASE G 4 x 4 25 LB PRACTICE BOMBS			CASE H MIXED LOAD 2 x 4 4.5 INCH RECCE FLARES No.2 Mk.1 & 2 25 LB PRACTICE BOMBS		
				Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
			TOTAL ALTERNATIVE LOAD ITEMS	1499.64		+3759.44	1655.50		+ 4906.01
			TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 3)	728.57		-9743.01	728.57		- 9743.01
			ALTERNATIVE OPERATING LOAD ITEMS (TABLE 4)						
			T2 BOMBSIGHT	64.27		-1352.63	64.27		- 1352.63
			F24 CAMERA	44.92		+ 647.40	44.92		+ 647.40
			COVERS, PYLON APERTURE	2.80		+ 14.28	2.80		+ 14.28
			BASIC WEIGHT	24450.00		+64575.00	24450.00		+64575.00
			OPERATING WEIGHT	26790.20		+ 57900.48	26946.06		+ 59047.05
			ITEMS OF EXPENDABLE LOAD						
			TOTAL FOR FUEL IN FUSELAGE AND WINGS (TABLE 5)	17864.00		+43917.20	17814.00		+ 43917.20
179		4	Bombs, practice, 25 lb (Practice Stn.1)	100.00	+ 8.86	+ 886.00	-	-	-
184		4	Bombs, practice, 25 lb (Practice Stn.4)	100.00	+ 1.11	+ 111.00	-	-	-
188		4	Bombs, practice, 25 lb (Practice Stn.5)	100.00	- 1.77	- 177.00	-	-	-
167		4	Bombs, practice, 25 lb (Practice Stn.6)	100.00	- 4.65	- 465.00	-	-	-
180		2	Bombs, practice, 25 lb (Stn.6)	-	-	-	50.00	+10.17	+ 508.50
187		4	Flares, recce 4.5 in, No.2 Mk.1 (Stn.1)	-	-	-	100.00	- 2.60	- 260.00
183		4	Flares, recce 4.5 in, No.2 Mk.1 (Stn.3)	-	-	-	100.00	+ 3.82	+ 382.00
			TOTAL EXPENDABLE LOAD	18264.00		+44272.20	18114.00		+44547.70
			ALL-UP WEIGHT	45054.00		+102172.68	45060.00		+ 103594.75
			C.G. POSITION (WHEELS DOWN)		+ 2.268			+ 2.299	
			TOTAL WING-TIP TANKS AND WING-TIP TANK FUEL (TABLE 5)	4146.00		+ 16174.00	4146.00		+ 16174.00
			ALL-UP WEIGHT WITH WING-TIP TANKS	49200.00		+ 118346.68	49206.00		+ 119768.75
			C.G.POSITION WHEELS DOWN		+2.405			+2.434	
			EFFECT OF RETRACTING UNDERCARRIAGE - 1394 lb ft						

Note:- Alternative type survival packs may be fitted in lieu of desert type i.e. arctic - 34lb, tropical - 11 lb each

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TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4 & 5)

CASE I
2-1000 LB MC Mk.7 BOMBS
& 300 GAL L/R B/BAY
FUEL TANK

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
144	11A/4228-4715	1-1	Triple carrier, Mk.2 and release unit No.3 (Stn.2) ...	62.69	- 1.19	- 74.60
107	11A/3680	1	Bomb beam, auxiliary, forward	168.00	+ 0.25	+ 42.00
117	11A/4221	1	Bomb beam, auxiliary, aft	178.00	+ 9.20	+ 1637.60
140	EA3.56.221	1	300 gal auxiliary fuel tank in bomb bay	235.39	+10.57	+ 2488.07
152	11A/3684	1	Dust cover (Stn.1)	1.56	- 2.58	- 4.02
112	11A/3684	1	Dust cover (Stn.3)	1.56	+ 3.84	+ 5.99
113	11A/3684	1	Dust cover (Stn.4)	1.56	+ 6.87	+ 10.72
115	11A/3684	1	Dust cover (Stn.5)	1.56	+ 8.48	+ 13.23
118	11A/3684	1	Dust cover (Stn.6)	1.56	+10.22	+ 15.94
147	EA9.11.2051/2	2	Bomb doors	581.00	+ 6.10	+ 3544.10
165			Adjustable ballast	241.00		- 4822.00
127	27C/2379	3	Survival packs, desert (see note for tropical or arctic type)	132.00	+23.86	+ 3149.00
TOTAL ALTERNATIVE LOAD ITEMS				1605.88		+ 6006.03
TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 3)				728.57		- 9743.01
ALTERNATIVE OPERATING LOAD ITEMS (TABLE 4)						
T2 BOMBSIGHT				64.27		- 1352.63
F24 CAMERA				44.92		+ 647.40
COVERS, PYLON APERTURE				2.80		+ 14.28
BASIC WEIGHT				24450.00		+64575.00
OPERATING WEIGHT				26896.44		+ 60147.07

continued

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4 & 5)

			CASE I 2-1000 LB MC Mk.7 BOMBS & 300 GAL L/R B/BAY FUEL TANK			
Fig. 5 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
ITEMS OF EXPENDABLE LOAD						
TOTAL FOR FUEL IN FUSELAGE AND WINGS (TABLE 5)				17864.00		+ 43917.20
186	12A/2072	2	Bombs, aircraft, 1000 lb MC Mk.7 (Stn.2)	2058.00	- 1.19	- 2449.02
181			Fuel, auxiliary tank, 300 gal (at 8 lb/gal)	2400.00	+ 10.10	+ 24240.00
TOTAL EXPENDABLE LOAD				22322.00		+ 65708.18
ALL-UP WEIGHT				49218.00		+ 125855.25
C.G. POSITION (WHEELS DOWN)					+ 2.557	
TOTAL WING-TIP TANKS AND WING-TIP TANK FUEL (TABLE 5)				4146.00		+ 16174.00
ALL-UP WEIGHT WITH WING-TIP TANKS				53364.00		+ 142029.25
C.G. POSITION (WHEELS DOWN)					+ 2.661	
EFFECT OF RETRACTING UNDERCARRIAGE - 1394 lb ft						

Note: - Alternative type survival packs may be fitted in lieu of desert type i.e. arctic - 34 lb, tropical - 11 lb each

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4 & 5)

CASE K
 3 x 4 - 25 LB No.1 Mk.1
 & No.2 Mk.1 PRAC. BOMBS
 & 300 GAL L/R B/BAY
 FUEL TANK

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
107	11A/3680	1	Bomb beam, auxiliary, forward	168.00	+ 0.25	+ 42.00
117	11A/4221	1	Bomb beam, auxiliary, aft	178.00	+ 9.20	+ 1637.60
109	11A/4397	1	Carrier, bomb, light series Mk.15 (Practice bomb Stn.4)	45.00	+ 1.11	+ 49.95
148	11A/4397	1	Carrier, bomb, light series Mk.15 (Practice bomb Stn.5)	45.00	- 1.77	- 79.65
105	11A/4397	1	Carrier, bomb, light series Mk.15 (Practice bomb Stn.6)	45.00	- 4.65	- 209.25
140	EA3.56.221	1	300 gal auxiliary fuel tank in bomb bay	235.39	+10.57	+ 2488.07
108	EA3.97.115	1	Adapter, beam, fwd (Practice Stn.4)	1.28	+ 0.67	+ 0.86
146	EA3.97.115	1	Adapter, beam, fwd (Practice Stn.5)	1.28	- 2.20	- 2.82
104	EA3.97.115	1	Adapter, beam, fwd (Practice Stn.6)	1.28	- 5.10	- 6.53
110	EA3.97.117	1	Adapter, beam, fwd (Practice Stn.4)	1.28	+ 1.42	+ 1.82
145	EA3.97.117	1	Adapter, beam, fwd (Practice Stn.5)	1.28	- 1.41	- 1.80
153	EA3.97.117	1	Adapter, beam, fwd (Practice Stn.6)	1.28	- 4.27	- 5.47
106	11A/3684	1	Dust cover (Stn.2)	1.56	- 1.18	- 1.84
113	11A/3684	1	Dust cover (Stn.4)	1.56	+ 6.87	+ 10.72
118	11A/3684	1	Dust cover (Stn.6)	1.56	+10.22	+ 15.94
152	11A/3684	1	Dust cover (Stn.1)	1.56	- 2.58	- 4.02
112	11A/3684	1	Dust cover (Stn.3)	1.56	+ 3.84	+ 5.99
115	11A/3684	1	Dust cover (Stn.5)	1.56	+ 8.48	+ 13.23
147	EA9.11.2051/2	2	Bomb doors	581.00	+ 6.10	+ 3544.10
165			Adjustable ballast	241.00		- 4822.00
127	27C/2379	3	Survival packs, desert (see note for tropical or arctic type)	132.00	+23.86	+ 3149.00
			TOTAL ALTERNATIVE LOAD ITEMS	1687.43		+ 5825.90
			TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 3)	728.57		- 9743.01
			ALTERNATIVE OPERATING LOAD ITEMS (TABLE 4)			
			T2 BOMBSIGHT	64.27		- 1352.63
			F24 CAMERA	44.92		+ 647.40
			COVERS, PYLON APERTURE	2.80		+ 14.28
			BASIC WEIGHT	24450.00		+64575.00
			OPERATING WEIGHT	26977.99		+59966.94

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4&5)

CASE K						
3 x 4 - 25 LB No.1 Mk.1						
& No.2 Mk.1 PRAC. BOMBS						
& 300 GAL L/R B/BAY						
FUEL TANK						
Fig.5 Item No.	Ref. No. Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
ITEMS OF EXPENDABLE LOAD						
TOTAL FOR FUEL IN FUSELAGE AND WINGS (TABLE 5)						
				17864.00		+ 43917.20
184		4	Bombs, practice, 25 lb (Practice Stn.4)	100.00	+ 1.11	+ 111.00
188		4	Bombs, practice, 25 lb (Practice Stn.5)	100.00	- 1.77	- 177.00
167		4	Bombs, practice, 25 lb (Practice Stn.6)	100.00	- 4.65	- 465.00
181			Fuel, auxiliary tank, 300 gal (at 8 lb/gal)	2400.00	+10.10	+ 24240.00
TOTAL EXPENDABLE LOAD				20564.00		+ 67626.20
ALL-UP WEIGHT				47542.00		+127593.14
C.G. POSITION (WHEELS DOWN)					+ 2.684	
TOTAL WING-TIP TANKS AND WING-TIP TANK FUEL (TABLE 5)				4146.00		+ 16174.00
ALL-UP WEIGHT WITH WING-TIP TANKS				51688.00		+143767.14
C.G. POSITION (WHEELS DOWN)					+2.781	
EFFECT OF RETRACTING UNDERCARRIAGE - 1394 lb ft						

Note:- Alternative type survival packs may be fitted in lieu of desert type i.e. arctic - 34 lb, tropical - 11 lb each

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4 & 5)

							CASE L		
							1 x 1650 LB H.E. M.C. BOMB		
Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)			
111	11A/4569	1	Bomb carrier No.1 Mk.1..	270.00	+ 2.12	+ 572.40			
165			Adjustable ballast	241.00		- 4822.00			
127	27C/2379	3	Survival packs, desert (see note for tropical or arctic)	132.00	+23.86	+ 3149.00			
147	EA3.11.2051/2	2	Bomb doors	581.00	+ 6.10	+ 3544.10			
			TOTAL ALTERNATIVE LOAD ITEMS	1224.00		+ 2443.50			
			TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 3)	728.57		- 9743.01			
			ALTERNATIVE OPERATING LOAD ITEMS (TABLE 4)						
			L.A.B.S. EQUIPMENT	156.97		+ 1353.13			
			BOMB BAY DEFLECTOR PLATE	37.17		+ 524.00			
			F95 CAMERA	18.75		- 416.38			
			COVERS, PYLON APERTURE	2.80		+ 14.28			
			GUNSIGHT	2.56		- 45.03			
			BASIC WEIGHT	24450.00		+ 64575.00			
			OPERATING WEIGHT	26620.82		+ 58705.49			

continued

TABLE 6 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR BOMBER ROLE CASES (fig.4 & 5)

					CASE L		
					1 x 1650 LB H.E. M.C. BOMB		
Fig.5 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)	
ITEMS OF EXPENDABLE LOAD							
TOTAL FOR FUEL IN FUSELAGE AND WINGS (TABLE 5)				17864.00		+ 43917.20	
185			Bomb, HE M.C. 1650 lb... ..	1630.00	+ 0.62	+ 1010.60	
TOTAL EXPENDABLE LOAD				19494.00		+ 44927.80	
ALL-UP WEIGHT				46115.00		+103633.29	
C.G. POSITION (WHEELS DOWN)					+ 2.247		
TOTAL WING-TIP TANKS AND WING-TIP TANK FUEL (TABLE 5)				4146.00		+ 16174.00	
ALL-UP WEIGHT WITH WING-TIP TANKS				50261.00		+119807.29	
C.G. POSITION (WHEELS DOWN)					+ 2.384		
EFFECT OF RETRACTING UNDERCARRIAGE - 1394 LB FT							

Note:- Alternative type survival packs may be fitted in lieu of desert type i.e. arctic - 34lb, tropical - 11 lb each

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TABLE 7 ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR INTERDICTOR ROLE CASES (fig.6 & 7)

Fig.6 Item No.	Ref. or Part No.	Qty.	Description	CASE M GUN PACK - INTERDICTOR BOMB BEAM 2-1000 LB BOMBS ON PYLONS & 2-1000 LB BOMBS IN BOMB BAY			CASE N GUN PACK - INTERDICTOR FLARE BEAM, 2-1000 LB BOMBS ON PYLONS & 16 x 4.5 IN FLARES IN BOMB BAY		
				Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
196	EA9.97.51	1	Gun pack and superstructure c/w 4 x 20 MM Hispano guns	1336.00	+ 8.62	+ 11516.32	1336.00	+ 8.62	+ 11516.32
199	11A/4295	1	Bomb beam, auxiliary forward Mk.2	73.00	- 2.47	- 180.31			
194	11A/5825/6	2	Pylon, bomb type 'B' Mk.3 c/w ejector unit ...	98.00	+ 5.42	+ 531.20	98.00	+ 5.42	+ 531.20
195	EA9.11.87/8	1-1	Doors, flare	430.00	+ 3.75	+ 1612.50	430.00	+ 3.75	+ 1612.50
197	11A/4228-4715	1-1	Triple carrier, Mk.2 and release unit No.3 ...	62.69	- 2.58	- 161.74			
198	EA9.97.201	1	Flare support structure for 4.5 in flares				285.00	- 2.01	- 572.85
134	EA1.11.547	1	Cover removable	0.70	+17.28	+ 12.10	0.70	+17.28	+ 12.10
165			Adjustable ballast	241.00		- 4822.00	241.00		- 4822.00
127	27C/2379	3	Survival packs, desert (see note for tropical or arctic type)	132.00	+23.86	+ 3149.00	132.00	+23.86	+ 3149.00
			TOTAL ALTERNATIVE LOAD ITEMS	2373.39		+ 11657.07	2522.70		+ 11426.27
			TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 3)	728.57		- 9743.01	728.57		- 9743.01
			ALTERNATIVE OPERATING LOAD I TEMS (TABLE 4)						
			F24 CAMERA	44.92		+ 647.40	44.92		+ 647.40
			G45B CAMERA	6.20		- 14.37	6.20		- 14.37
			GUNSIGHT	2.56		- 47.32	2.56		- 47.32
			BASIC WEIGHT	24450.00		+ 64575.00	24450.00		+ 64575.00
			OPERATING WEIGHT	27605.64		+ 67074.77	27754.95		+ 66843.97

continued

TABLE 7 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR INTERDICTOR ROLE CASES (fig.6 & 7)

Fig.7 Item No.	Ref. or Part No.	Qty.	Description	CASE M GUN PACK - INTERDICTOR BOMB BEAM 2-1000 LB BOMBS ON PYLONS & 2-1000 LB BOMBS IN BOMB BAY			CASE N GUN PACK - INTERDICTOR FLARE BEAM, 2-1000 LB BOMBS ON PYLONS & 16 x 4.5 IN FLARES IN BOMB BAY		
				Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
ITEMS OF EXPENDABLE LOAD									
TOTAL FOR FUEL IN FUSELAGE AND WINGS (TABLE 5)				17864.00		+ 43917.20	17864.00		+ 43917.20
204		2	Bombs, aircraft 1000 lb MC Mk.7 (Bomb bay) ...	2058.00	- 2.58	+ 5309.64			
200		2	Bombs, aircraft 1000 lb MC Mk.6 (Wing) ...	2100.00	+ 5.42	+ 11382.00	2100.00	+ 5.42	+ 11382.00
203		16	Flares, aircraft reconnaissance, 4.5 in ...				400.00	- 1.73	- 692.00
202		525/Gun	Cartridges, 20MM hispano, 2100 rounds ...	1394.00	+ 9.28	+ 12936.32	1394.00	+ 9.28	+ 12936.32
TOTAL EXPENDABLE LOAD				23416.00		+ 62925.88	21758.00		+ 67543.52
ALL-UP WEIGHT				51022.00		+130000.65	49513.00		+134387.49
C.G. POSITION (WHEELS DOWN)					+ 2.548			+ 2.714	
TOTAL WING-TIP TANKS AND WING-TIP TANK FUEL (TABLE 5)				4146.00		+ 16174.00	4146.00		+ 16174.00
ALL-UP WEIGHT WITH WING-TIP TANKS				55168.00		+146174.65	53659.00		+150561.49
C.G. POSITION (WHEELS DOWN)					+ 2.650			+ 2.806	
EFFECT OF RETRACTING UNDERCARRIAGE - 1394 LB FT									

Note: - Alternative type survival packs may be fitted in lieu of desert type i.e. arctic - 34lb, tropical - 11 lb each.

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TABLE 7 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR INTERDICTOR ROLE CASES (fig.6 & 7)

Fig.6 Item No.	Ref. or Part No.	Qty.	Description	CASE O			CASE P		
				Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
				GUN PACK - INTERDICTOR BOMB BEAM, 2 x 2 - 25 LB PRACTICE BOMBS ON PYLONS & 2 x 1000 LB BOMBS IN BOMB BAY			GUN PACK - INTERDICTOR FLARE BEAM, 2 x 2 - 25 LB PRACTICE BOMBS ON PYLONS & 16 x 4.5 IN FLARES IN BOMB BAY		
196	EA9.97.51	1	Gun pack and superstructure c/w 4 x 20 MM Hispano guns	1336.00	+ 8.62	+ 11516.32	1336.00	+ 8.62	+ 11516.32
199	11A/4295	1	Bomb beam, auxiliary forward Mk.2	73.00	- 2.47	- 180.31			
194	11A/5825/6	2	Pylon, bomb type 'B' Mk.3 c/w ejector unit ...	98.00	+ 5.42	+ 531.20	98.00	+ 5.42	+ 531.20
195	EA9.11.87/8	1-1	Doors, flare	430.00	+ 3.75	+ 1612.50	430.00	+ 3.75	+ 1612.50
193	11A/3844	2	Carriers, external Mk.2, 25 lb practice bomb ...	48.00	+ 5.42	+ 260.16	48.00	+ 5.42	+ 260.16
197	11A/4228-4715	1-1	Triple carrier Mk.2 and release unit No.3 ...	62.69	- 2.58	- 161.74	-	-	-
198	EA9.97.201	1	Flare support structure for 4.5 in flares	-	-	-	285.00	- 2.01	- 572.85
134	EA1.11.547	1	Cover, removable	0.70	+17.28	+ 12.10	0.70	+17.28	+ 12.10
165			Adjustable ballast	241.00		- 4822.00	241.00		- 4822.00
127	27C/2379	3	Survival packs, desert (see note for tropical or arctic type)	132.00	+23.86	+ 3149.00	132.00	+23.86	+ 3149.00
			TOTAL ALTERNATIVE LOAD ITEMS	2421.39		+ 11917.23	2570.70		+ 11686.43
			TOTAL FOR CREW AND CREW OPERATING LOAD (TABLE 3)	728.57		- 9743.01	728.57		- 9743.01
			ALTERNATIVE OPERATING LOAD ITEMS (TABLE 4)						
			F24 CAMERA	44.92		+ 647.40	44.92		+ 647.40
			G45B CAMERA	6.20		- 14.37	6.20		- 14.37
			GUNSIGHT	2.56		- 45.03	2.56		- 45.03
			BASIC WEIGHT	24450.00		+ 64575.00	24450.00		+ 64575.00
			OPERATING WEIGHT	27653.64		+ 67337.22	27802.95		+ 67106.42

continued

TABLE 7 (continued) ALTERNATIVE LOAD ITEMS AND ALL-UP WEIGHT SUMMARY FOR INTERDICTOR ROLE CASES (fig. 6 & 7)

Fig. 7 Item No.	Ref. or Part No.	Qty.	Description	CASE O GUN PACK - INTERDICTOR BOMB BEAM, 2 x 2 - 25 LB PRACTICE BOMBS ON PYLONS & 2 x 1000 LB BOMBS IN BOMB BAY			CASE P GUN PACK - INTERDICTOR FLARE BEAM, 2 x 2 - 25 LB PRACTICE BOMBS ON PYLONS & 16 x 4.5 IN FLARES IN BOMB BAY		
				Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
ITEMS OF EXPENDABLE LOAD									
TOTAL FOR FUEL IN FUSELAGE AND WINGS (TABLE 5)									
				17864.00		+ 43917.20	17864.00		+ 43917.20
201		2	Bombs, practice 25 lb (wing)	50.00	+ 5.42	+ 271.00	50.00	+ 5.42	+ 271.00
201		2	Bombs, practice 25 lb (wing)	50.00	+ 5.42	+ 271.00	50.00	+ 5.42	+ 271.00
202	525/Gun		Cartridges, 20 MM Hispano, 2100 rounds	1394.00	+ 9.28	+ 12936.32	1394.00	+ 9.28	+ 12936.32
204		2	Bombs, aircraft 1000 lb MC Mk.7 (Bomb bay)	2058.00	- 2.58	- 5309.64	-	-	-
203		16	Flares, aircraft reconnaissance, 4.5 in	-	-	-	400.00	- 1.73	- 692.00
TOTAL EXPENDABLE LOAD				21416.00		+ 52085.88	19758.00		+ 56703.52
ALL-UP WEIGHT				49070.00		+ 119423.10	47561.00		+ 123809.94
C.G. POSITION (WHEELS DOWN)					+ 2.434			+ 2.603	
TOTAL WING-TIP TANKS AND WING-TIP TANKS FUEL (TABLE 5)				4146.00		+ 16174.00	4146.00		+ 16174.00
ALL-UP WEIGHT WITH WING-TIP TANKS				53216.00		+ 135597.10	51707.00		+ 139983.94
C.G. POSITION (WHEELS DOWN)					+ 2.548			+ 2.707	
EFFECT OF RETRACTING UNDERCARRIAGE - 1394 LB FT									

Note: - Alternative type survival packs may be fitted in lieu of desert type i.e. arctic - 34 lb tropical - 11 lb each.

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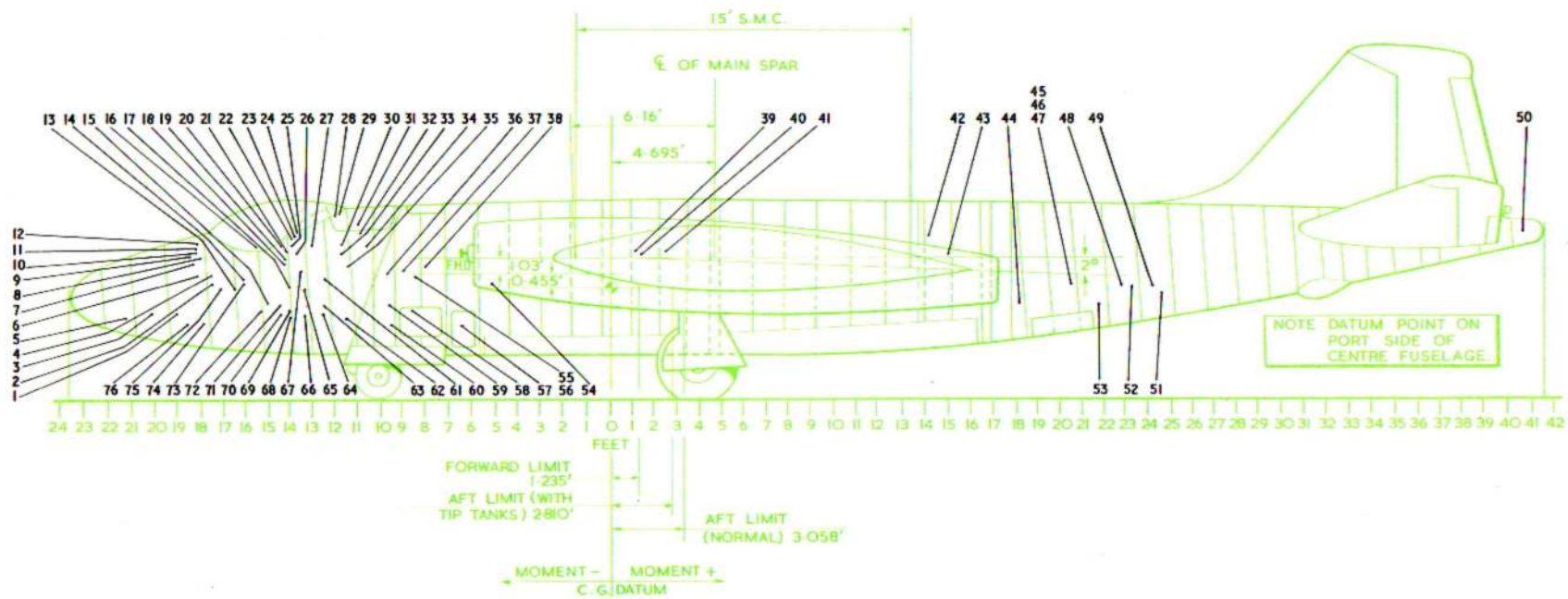


Fig.3. Loading and C.G. diagram removable load items

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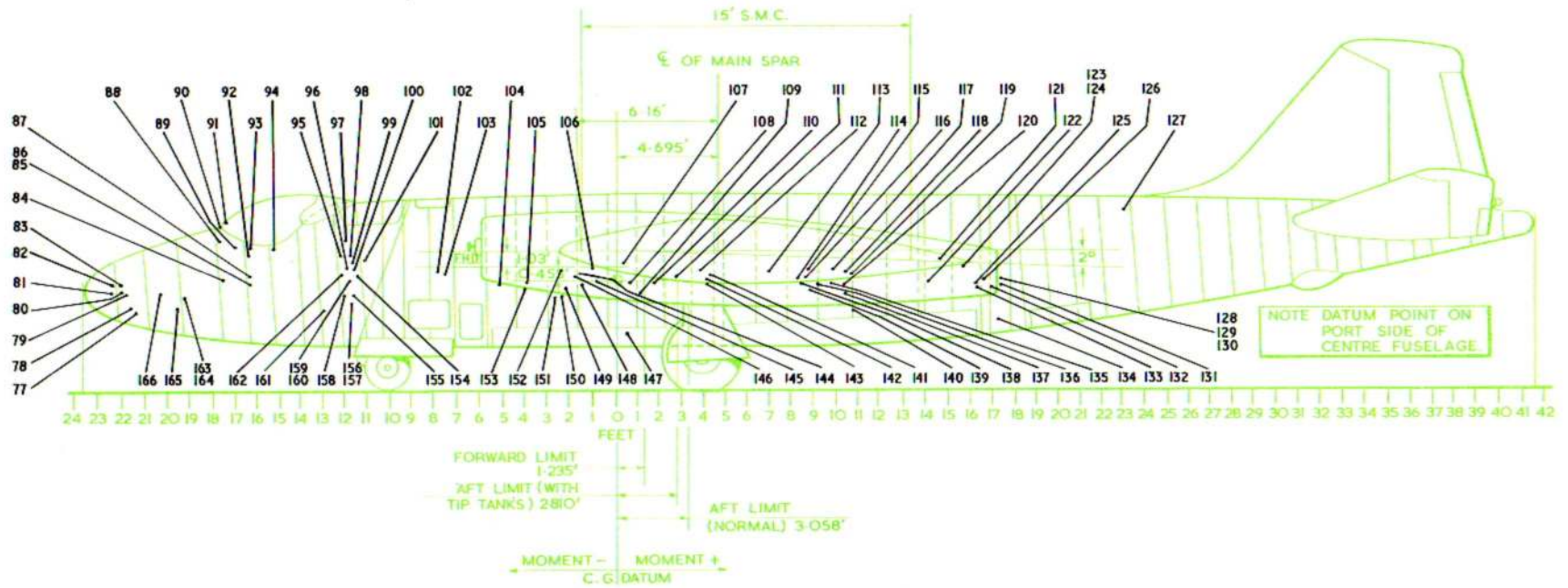


Fig.4. Loading and C.G. diagram alternative load items (Bomber role)

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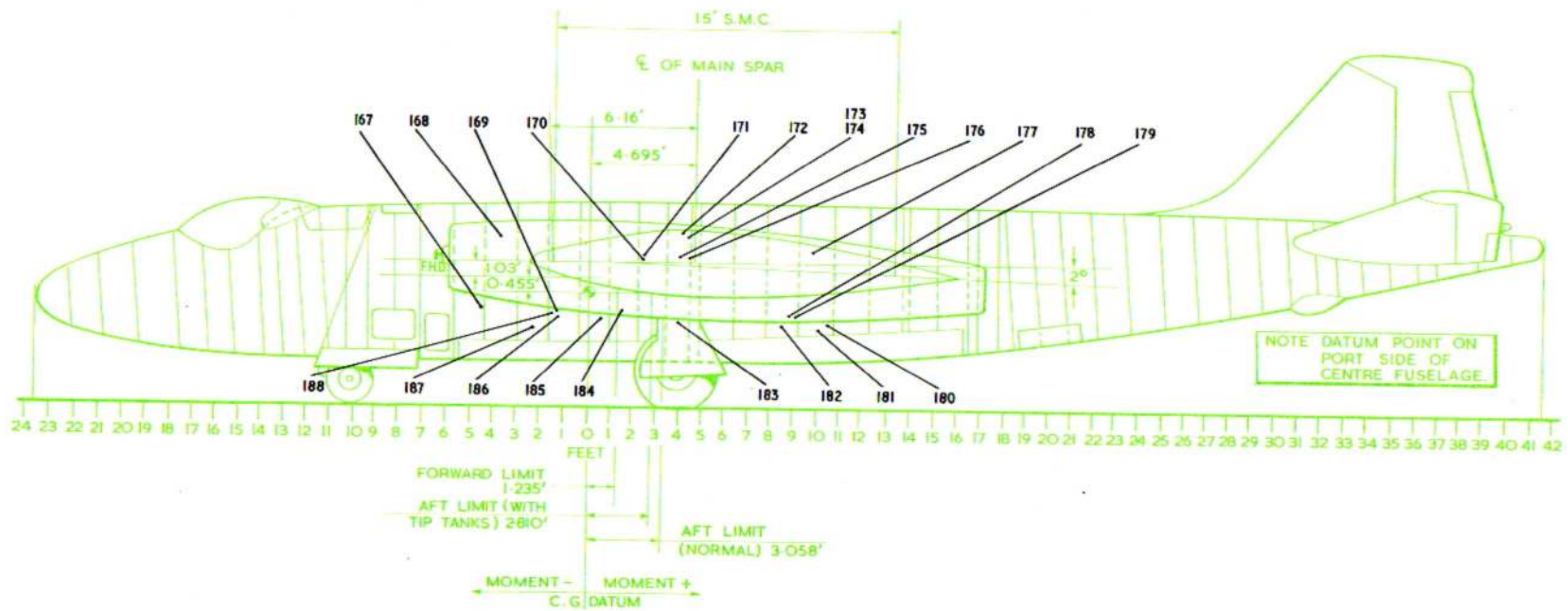


Fig.5. Loading and C.G. diagram expendable load items (Bomber role)

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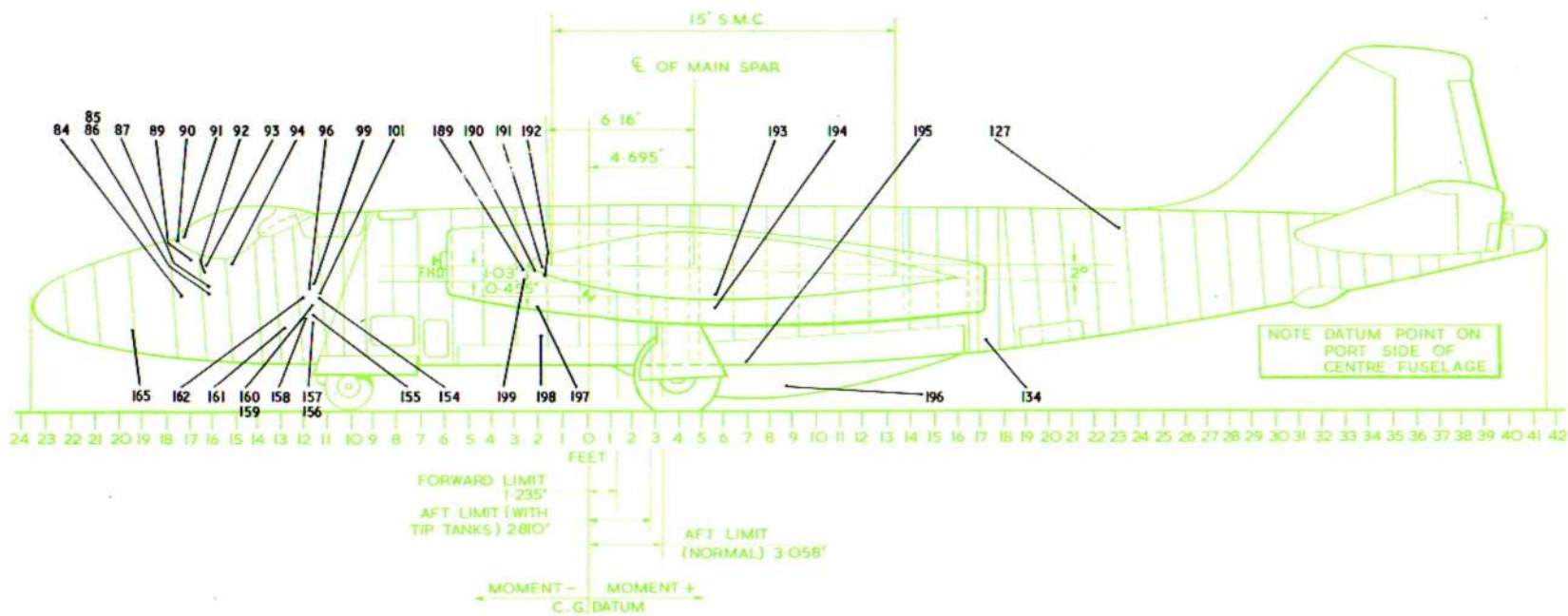


Fig.6. Loading and C.G. diagram alternative load items (Interdicator role)

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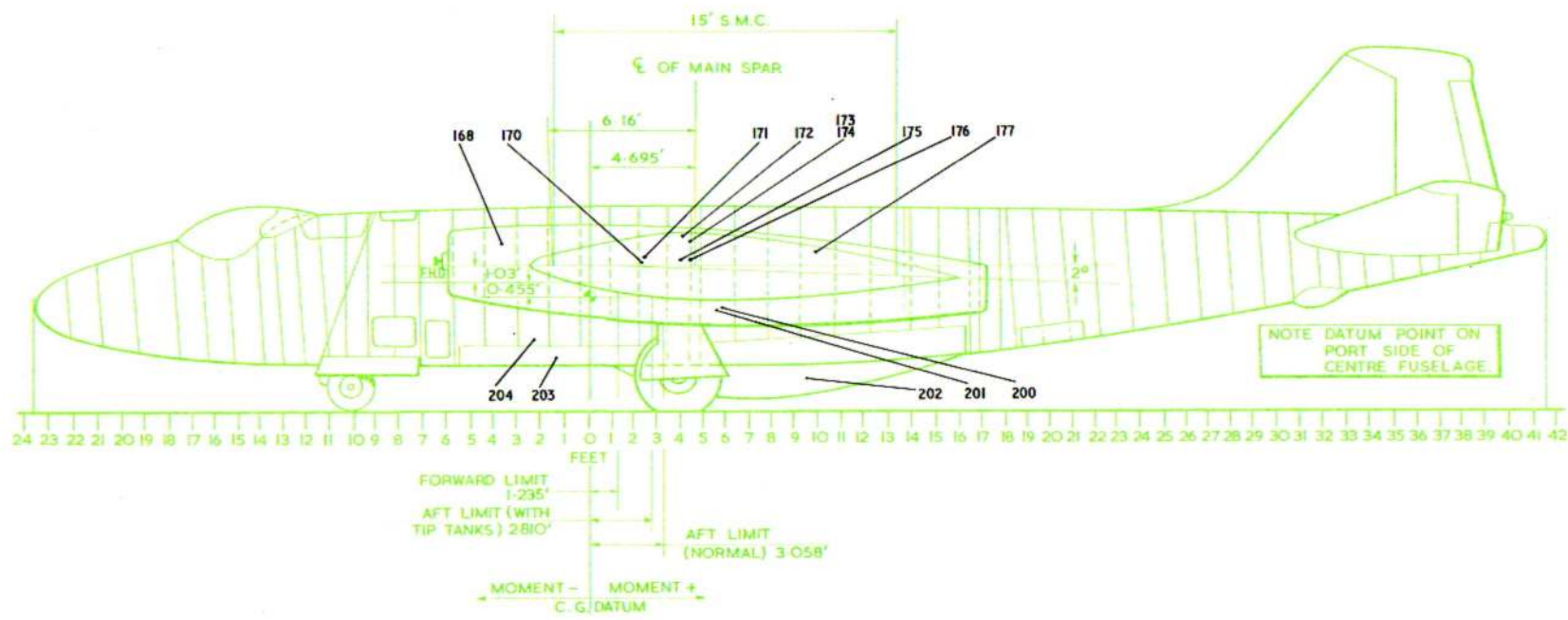


Fig.7. Loading and C.G. diagram expendable load items (Interdictor role)

Chapter 3C FATIGUE INDEX DATA

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INTRODUCTION**General**

- ◀ 1. The following information was prepared as Issue 4 of Leaflet No.12 in the Aircraft Fatigue Life Handbook and superseded issues 1 to 3. The old method of expressing fatigue index data as a percentage of fatigue life has been replaced by a new method and formulae which gives a Fatigue Life Index. The new term was introduced to clarify an anomaly whereby, because of an extension of the fatigue life of a type of aircraft (made possible by reassessment of the many factors involved), an aircraft could be flying with its fatigue life apparently over-consumed. The fatigue life for some types of aircraft can safely exceed 100 but the fatigue life of the Canberra aircraft will be fully-consumed at a fatigue index of 100. 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 instrument 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 or formula will be quoted 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

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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 (l). 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 (l) 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

◀ Cabin life

9. The datum fatigue life of the pressure cabin for Canberra aircraft is 3000 pressurizations. The accumulative total of the current Form 4832A or Form 725 and previous fatigue data sheets is to be compared with this figure. ▶

Critical component

10. The component governing the fatigue life of Canberra aircraft is the centre section forging. The following lives and fatigue meter formulae are based on the results of a fatigue test on a sample aircraft in which this component was tested to destruction. To ensure that the fatigue life of the main planes is at least equal to that of the centre section forging, Mod.2545 is to be embodied as soon as possible and in any case before the aircraft ▶
▶ has passed fatigue index 50. When an aircraft is fitted with a new centre section forging, the fatigue life data ▶

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◀ is to carry on as if the original forging had been retained. This is because the maximum life of an aircraft with a new centre-forging has not been tested. ▶

Fatigue life consumption

11. 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

◀ or meter unserviceable ▶

12. 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	1.00
Continuation training	1.67
Low-level and ground attack	20.70
High/low/high sorties	4.00

◀ The Fatigue Index Consumed is obtained by calculating the percentage relationship between factored flying hours and the datum life of 20,000 hrs. Using the appropriate role factor.

$$\text{Fatigue Index Consumed} = \frac{(\text{Hrs flown} \times \text{role factor}) \times 100}{20,000}$$

The result of these calculations is then to be added to the result of calculations from the meter formulae.

Aircraft with fatigue meters

13. 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

Fatigue life index =

$$\frac{25.35(C6) + 8.04(C5) + 0.80(C4) + 0.0(C3) + 0.131(C2) + 3.874(C1)}{1000}$$

Where:-

C1 is number of counts recorded in meter window marked	0.0
C2	0.6
C3	1.4
C4	2.0
C5	3.0
C6	4.0

Mk.13 fatigue meter

Fatigue life index =

$$\frac{33.29(C8) + 14.77(C7) + 2.79(C6) + 0.352(C5) + 0.0(C4) + 0.46(C3) + 1.777(C2) + 7.324(C1)}{1000}$$

Where:-

C1 is number of counts recorded in meter window marked	-0.5
C2	+0.1
C3	+0.5
C4	+1.5
C5	+1.9
C6	+2.5
C7	+3.5
C8	+4.5

Mk.16 fatigue meter

Fatigue life index =

$$\frac{25.92(C8) + 20.31(C7) + 14.68(C6) + 2.947(C5) + 0.291(C4) + 0.0(C3) + 0.46(C2) + 2.45(C1)}{1000}$$

Where:-

C1 is number of counts recorded in meter window marked	+0.1
C2	+0.5
C3	+1.5
C4	+1.9
C5	+2.5
C6	+3.5
C7	+4.5
C8	+5.1

Recording

14. 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 provide 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 for Canberra B Mk.6 aircraft are to be submitted to Ministry of Defence (Air), DD Mech, Eng.1 (RAF), 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. Fatigue records for B(I) Mk.6 aircraft need only be submitted at the fatigue index 80 point.

◀ (3) Zero Coefficients. A record is to be entered on Form 4832A of the window counts appropriate to any zero coefficients. The zero coefficient is a simplification of a very small number which is compensated for by adjustments to adjacent coefficients. The record is important at the Firm's reassessments of the fatigue index at 50 and 80 fatigue index points. To assist the Firm's Stress Office to make reassessments of the fatigue index, the Remarks Column of Forms 4382/725 are to be annotated with the following data:-

(a) The date and fatigue index point of change-over to recording with Leaflet No.12 Issue 3 formulae (also for all later issue changes).

(b) The date and fatigue point at which a change of meter type occurs. ▶

Chapter 4 GENERAL SERVICING

(Completely revised)

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WARNING

The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cabin or performing any operations on the aircraft.

Introduction

1. This chapter contains information on the general servicing of the complete aircraft; servicing of the individual components and systems is given in the appropriate chapters of Section 3 and 4.

Ground equipment

2. The items of ground equipment provided for handling and servicing the aircraft are listed at the end of this chapter. The items are arranged in two tables, Table 1 — Special Ground Equipment (*handling and*

servicing equipment peculiar to this aircraft), and Table 2 — Standard Ground Equipment. These tables contain no items that are normally included in the relevant Appendix A, nor standard equipment normally provided for purposes not confined to aircraft servicing.

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Access panels

3. Removable access panels and inspection doors are provided throughout the structure, for access to the controls, services, etc., the positions are illustrated in fig.5 and 6. 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; these panels are indicated on the illustration. When securing the panels, ensure that in all cases the correct type of screw is used, as in certain comparatively thin skin areas 120 deg. counter-sunk-headed screws are used.

Note...

In addition, to facilitate inspection of the attachment angles on the fuselage, access apertures and panels are provided between fuselage frames 17 and 18 at both sides; these panels are accessible through the undercarriage wheel well.

Jacking

Jacking procedure

4. The aircraft may be jacked by three jacks, positioned one under each main plane in line with the engine nacelles and one on the port side of the fuselage nose. 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 aft end of the crew escape hatch, to which the adapter head of the jack fits. All jacking positions are marked on the aircraft and the methods of jacking are illustrated in fig.1.

5. The jacking sequence is:

- (1) Using a spanner (Ref.No.26FZ/95065)

remove the plug from the socket in the front fuselage and fit the nose jacking spigot (Ref.No.26FZ/95004). Unfasten the hinged panels in the jet pipe cowlings to expose the main plane jacking points.

- (2) Place a jack under each main plane jacking point and at the nose jacking spigot; the types of jacks and adapter heads to be used at these points are listed in Table 2.

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. The nose jack must be positioned with the jack body vertical and with the adjustable legs parallel to the longitudinal axis.

- (3) Operate the jacks to raise the aircraft, jacking the main planes slightly in advance of the fuselage nose.

- (4) When the aircraft is sufficiently raised, the rear fuselage may be supported, if necessary, at the rear trestling point, with a U.J. trestle, No.7, fitted with a former (Ref.No.26FZ/95018).

For bomb loading (gun pack not fitted)

6. To jack the aircraft for bomb loading without gun pack fitted:

- (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 bomb trolley to be positioned under the bomb bay.

Note...

Full information on the preparation of the aircraft and the method of loading stores is given in A.P.2852B, Vol.1.

For bomb loading (gun pack fitted)

7. To jack the aircraft, with the gun pack fitted:

- (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 a jack (Ref.No.4Q/2232), trestle (Ref.No.4Q/2266) and adapter (Ref.No.4Q/2627) under the nose spigot.

- (4) Position jacks (Ref.No.4Q/2657) and adapters (Ref.No.26FZ/95449) at the main wheel lifting points.

- (5) With the wheel brakes OFF, raise the front fuselage approximately seven inches.

- (6) Move the nose undercarriage ground selector valve to GROUND, and using the hydraulic hand pump, retract the nose undercarriage to permit entry of the loaded bomb trolley to the bomb bay from the front of the aircraft.

- (7) Raise the aircraft at the nose fuselage and main wheel jacking points simultaneously to give five or eleven inches lift at the main wheels, for a two or three-bomb loading operation, respectively.

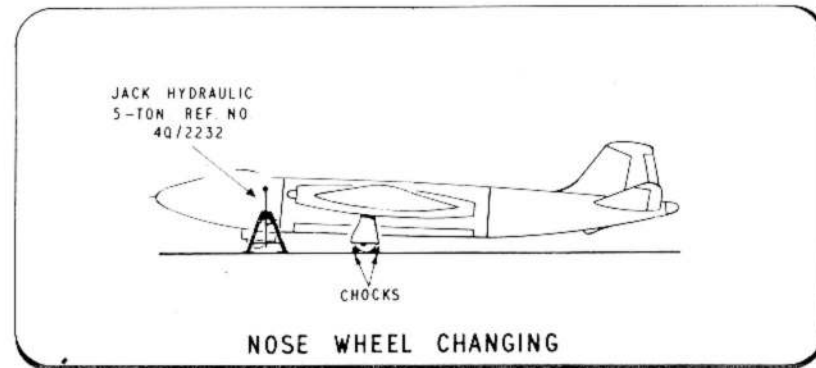
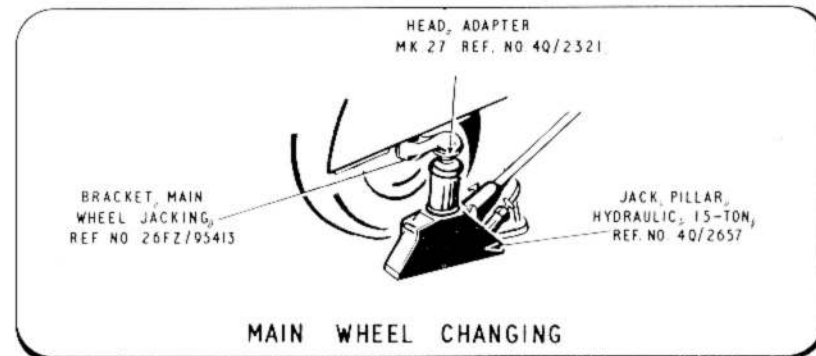
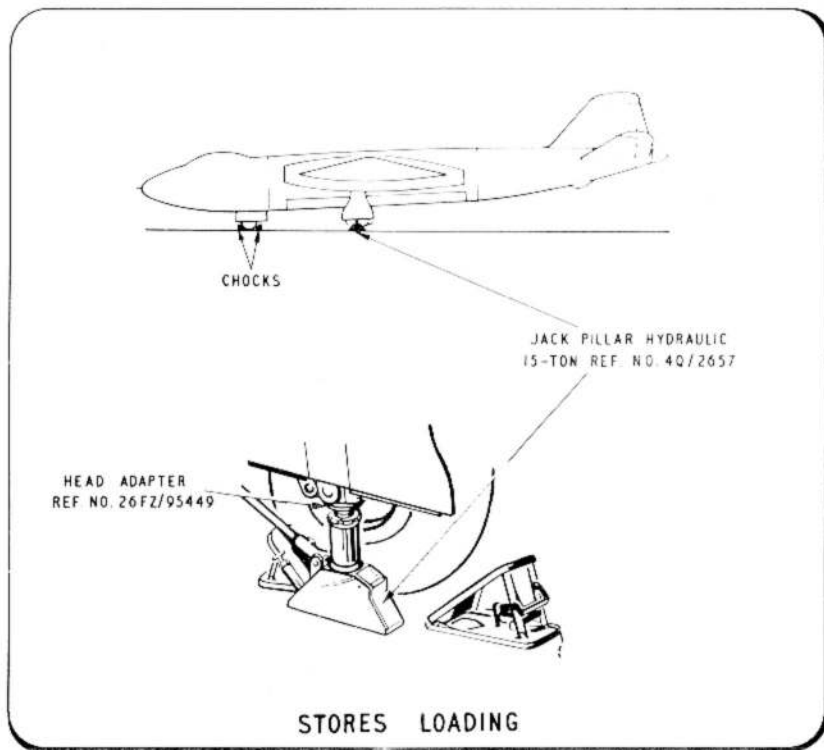
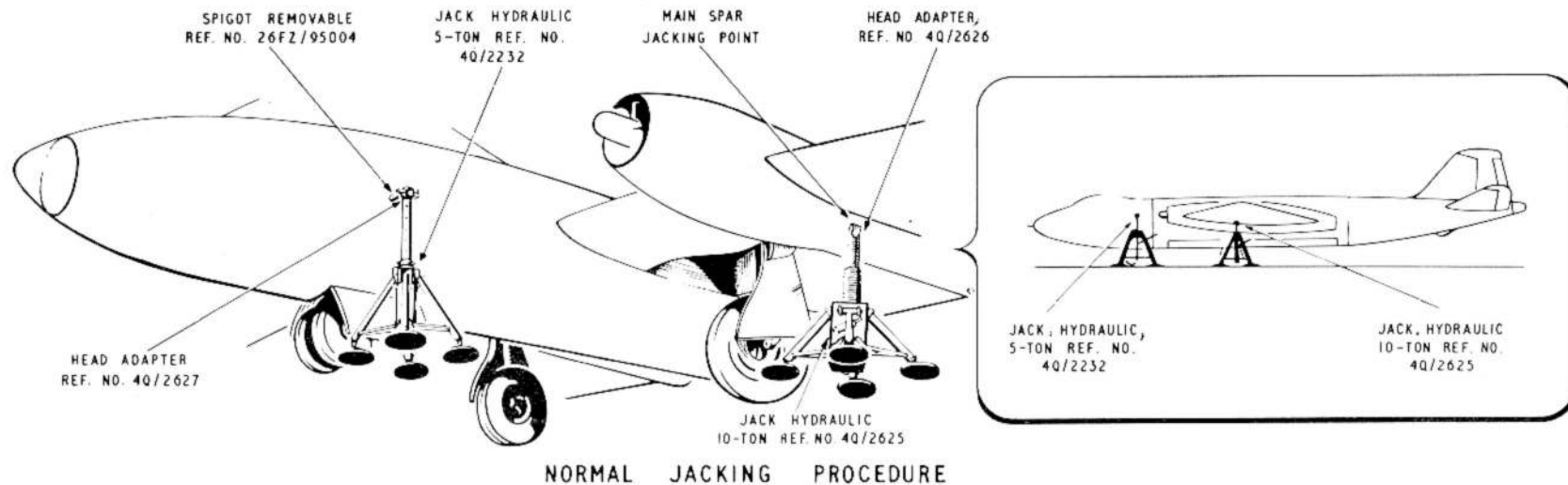
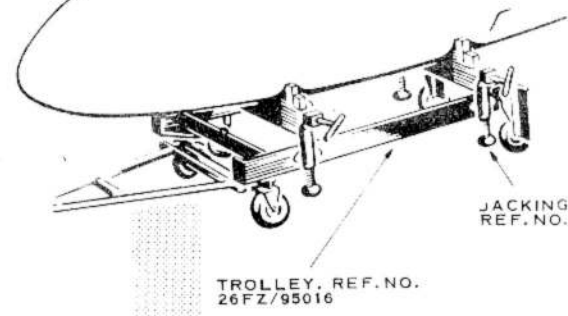


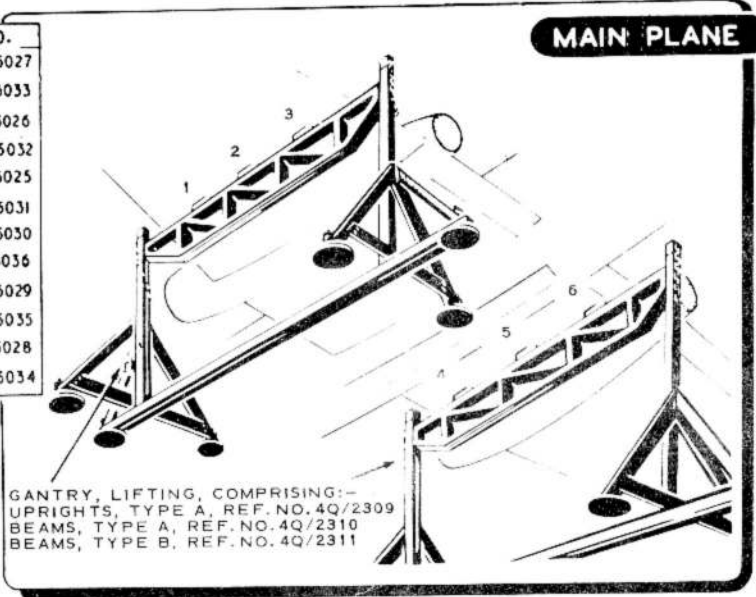
Fig. 1. Jacking

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FRONT FUSELAGE



FORMERS	REF. NO.
1 PORT	26FZ/95027
STARBOARD	26FZ/95033
2 PORT	26FZ/95026
STARBOARD	26FZ/95032
3 PORT	26FZ/95025
STARBOARD	26FZ/95031
4 PORT	26FZ/95030
STARBOARD	26FZ/95036
5 PORT	26FZ/95029
STARBOARD	26FZ/95035
6 PORT	26FZ/95028
STARBOARD	26FZ/95034



CENTRE FUSELAGE

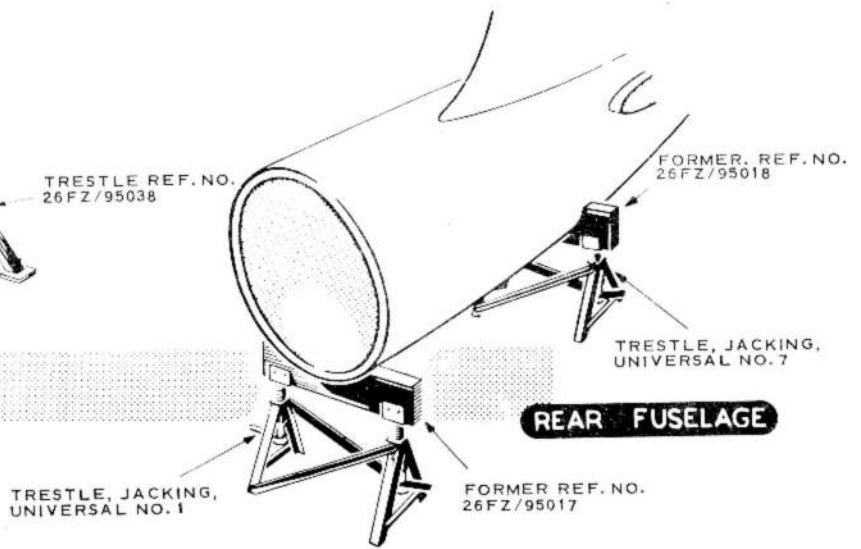
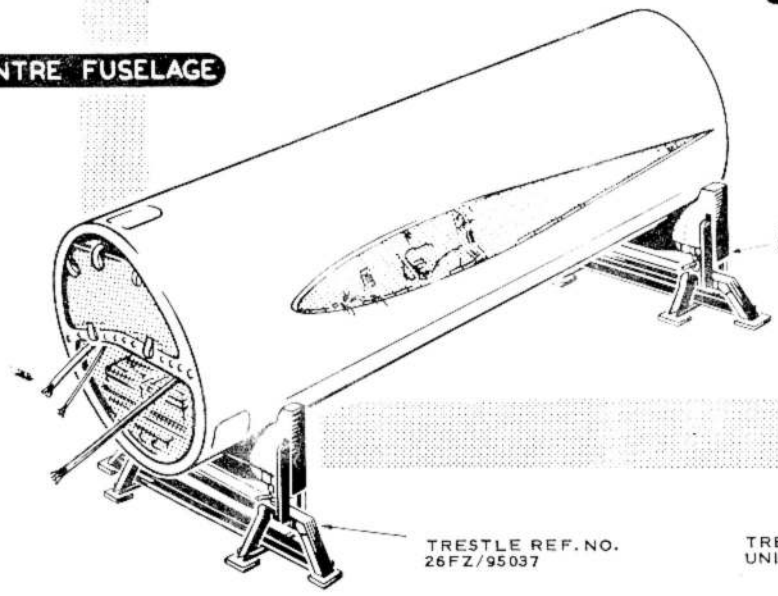


Fig. 2. Trestling

◀ (Centre fuselage trestle Ref.No. corrected) ▶

(8) Fully open the flare doors and fit the jury ties.

(9) After positioning the bomb trolley under the bomb bay, lower the aircraft evenly to maintain the original lift of seven inches at the front fuselage position.

For main wheel changing

8. To jack the aircraft for main wheel changing:

(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 wheel just clear of the ground.

For nose wheel changing

9. 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

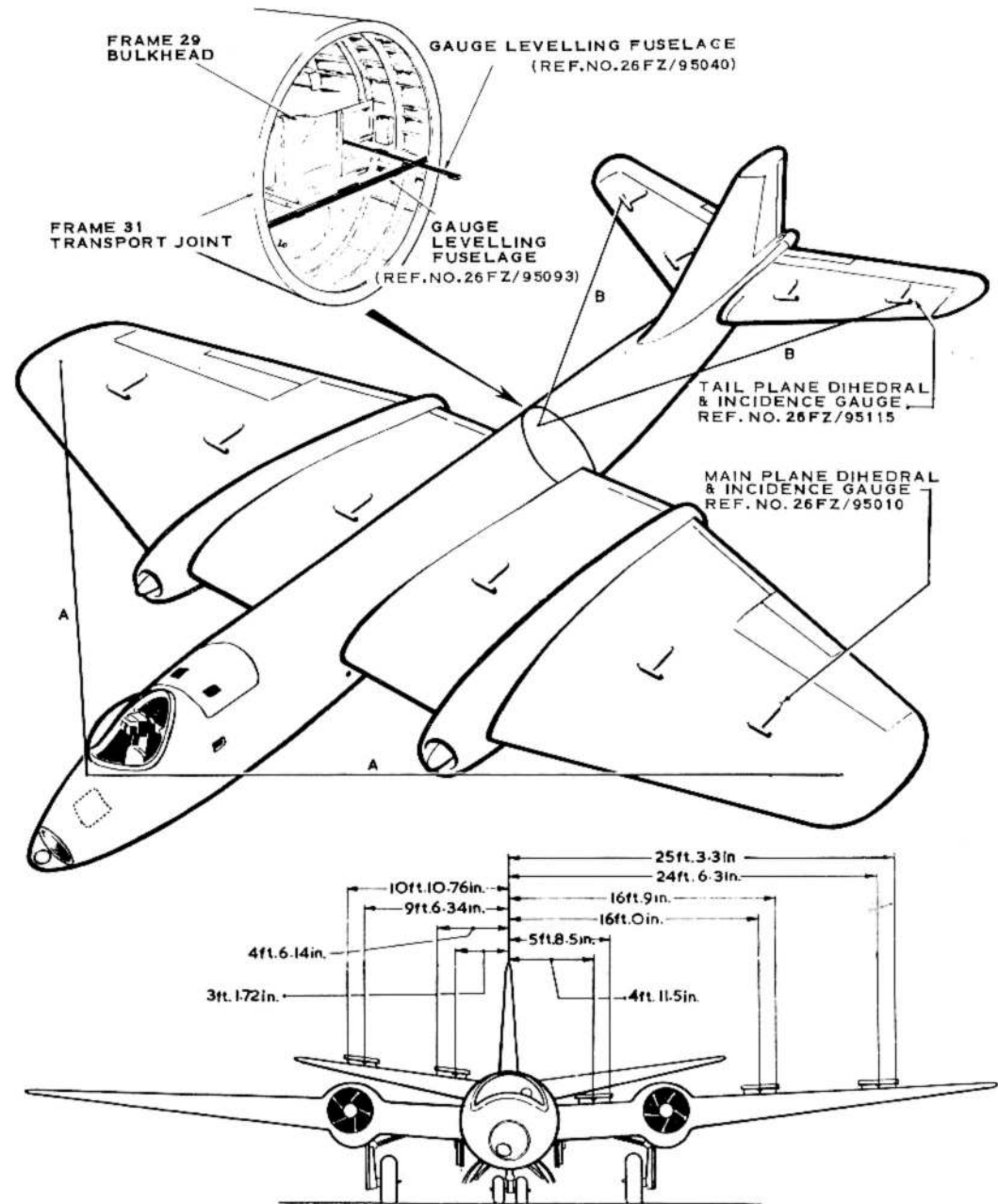


Fig. 3. Alignment checks and rigging gauge positions

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spigot, and raise until the nose wheels are just clear of the ground.

(5) Support the fuselage at frame 42.

Trestling

10. When trestling the aircraft, or components of the aircraft, the correct type of trestle with appropriate former as specified in Table 1 must be used. The methods of trestling are illustrated in Fig.2.

Drainage holes

11. Drainage holes are provided in various parts of the aircraft skinning, the number of holes and their position is illustrated in fig.4. These holes must always be kept free from obstructions, especially those in the jet pipe cowlings.

12. A drain plug, in the shape of a large mushroom headed screw, situated in the fuselage lower skin just forward of the pressure bulkhead and starboard of the keel unit centre line, is provided for periodic draining of the pressure cabin (fig. 4). When unscrewed, the drain plug is retained suspended below the drain hole by a captive split-pin and no attempt should be made to remove the plug from the aircraft. After draining the cabin, care must be taken before screwing back the drain plug, to ensure that no foreign matter remains on or about the plug rubber seal as this will cause loss of cabin pressure. Two $\frac{1}{8}$ in. drain holes are also provided for the canopy coaming tube (S.T.I.CAN.120); these are situated at the lowest points of the tube and are plugged with self tapping screws rolled in bostic sealing compound to prevent loss of cabin pressure.

Order of dismantling

13. The sequence of dismantling an air-

craft 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 pipes 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) Remove the front fuselage from the centre fuselage (Sect.3, Chap.1).

(5) Remove the rear fuselage from the centre fuselage (Sect.3, Chap.1).

(6) Remove the main planes from the centre fuselage (Sect.3, Chap.2).

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

Rigging of fixed surfaces

14. The main plane, tail plane and fin are fixed cantilever structures which are rigged when correctly assembled to the fuselage; adjustment is, therefore, impossible. The symmetry of the aircraft and the incidence and dihedral of the planes should be checked however, in the manner indicated in the following paragraphs, after the aircraft has been rigged or whenever it is necessary to verify that the components are true. The location points for the incidence and dihedral gauges are marked on the upper surfaces of the main and tail planes, they are on the centre-line of the main spar booms and their positions outboard of the centre-line of the fuselage are indicated in fig.3.

15. The procedure for checking the alignment and rigging of the aircraft is:

(1) Jack the aircraft (para.4 and 5).

(2) Place a lateral levelling gauge (Ref. No.26FZ/95093) on the port and starboard levelling brackets at frame 31 (fig.3); the port and starboard ends are indicated on the gauge. Using a clinometer on the gauge, level the aircraft laterally (0 deg. \pm 0 min.).

(3) With the lateral gauge in position, place a longitudinal gauge (Ref.No.26FZ/95040) on the levelling bracket on the starboard side of frame 29 bulkhead and on the datum pad on the lateral gauge (fig.3). Using a clinometer on the gauge, level the aircraft longitudinally (0 deg \pm 0 min.). Support the rear fuselage with a trestle.

(4) Check for symmetry by measuring the diagonals at the following points on both sides of the aircraft.

(a) From a point 2.46 in. aft of frame 1 on the upper surface of the fuselage to the datum bolt on the centre-line of the main plane spar at the wing tip. The dimensions should be 38 ft. 11.5 in. \pm 0.5 in. (fig.3, dimension A).

(b) From a point 1 in. aft of frame 31 datum on the upper surface of the fuselage to the outboard incidence gauge point on the tail plane, with the tail plane at minimum incidence. The dimension should be 21 ft \pm 0.25 in (fig.3, dimension B).

(c) From the datum bolt at the wing tip to the outboard incidence gauge point on the tail plane, on both sides; the dimension should be equal \pm 1 in. with the tail plane at minimum incidence.

(5) Check the main plane incidence and dihedral, using a clinometer, with a gauge (Ref.No.26FZ/95010), positioned at each of the three points shown in fig.3. The dihedral reading should be 2 deg \pm 10 min at all points, and the incidence reading 5 deg 50 min \pm 15 min at the outboard position of the outer wing (*rib 6*), 5 deg 8 min \pm 15 min at the inboard position of the outer wing (*rib 3*) and 4 deg 49 min \pm 15 min at the inner wing position (*rib 3*).

(6) Check the tail plane dihedral (*port and starboard*) with the tail plane at maximum incidence, using a clinometer, with a gauge (Ref.No.26FZ/95115) positioned at the inboard position; the reading should be 7 deg 57 min \pm 15 min.

(7) Check the tail plane incidence at minimum incidence, using a clinometer, with a gauge (Ref.No.26FZ/95115) positioned at the starboard inboard position; the reading should be 2 deg 12 min \pm 13

min. Set the tail plane at maximum incidence and, using a clinometer with the same gauge, check the incidence at the inboard position; the reading should be 3 deg 59 min \pm 13 min. Check the incidence at the outboard position; the reading should be that obtained at the inboard position plus 1 deg 48 min + 1 deg 2 min. - 50 min.

Component weights and dimensions

16. The component weights and dimensions are given in the key to fig.7.

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TABLE 1

Special ground equipment

Ref. No.	Part No.	Description	Application
<i>Towing and steering equipment</i>			
26FZ/95022	EA3.88.15	Adapter, fork	Used with towing arm (Ref.No.4G/2792)
26FZ/95087	EA3.88.157	Arm, nose steering	
<i>Jacking equipment</i>			
26FZ/95004	EA1.88.23	Spigot, nose jacking	Used in conjunction with hydraulic jacks for nose raising and lowering
26FZ/95413	EA3.88.307	Bracket, main wheel jacking	Main wheel changing
26FZ/95449	EA9.88.39	Adapter, jacking	Used with jack (Ref.No.4Q/2657) for lifting aircraft when bomb loading
<i>Slinging equipment</i>			
26FZ/95005	EA1.88.63	Sling, fuselage nose	} Integral tank } removal } Used when lifting a } damaged component } Rib 4 } Port } Used together with } beams, gantry } (Ref.No.4Q/2310) } Rib 5 } Port } and uprights, gantry } (Ref.No.4Q/2309) } Rib 4 } Starb. } for main plane } changing } Rib 5 } Starb. }
26FZ/95006	EA1.88.61	Sling, centre fuselage	
26FZ/95007	EA1.88.65	Sling, fuselage tail	
26FZ/95008	EA1.88.11	Sling, main plane	
26FZ/95009	EA1.88.59	Sling, tail plane	
26FZ/95084	EA1.88.601	Sling, fin and rudder	
26FZ/95273	EA1.88.785	Sling, complete aircraft	
26FZ/95443	EB6.88.39	Sling assembly	
26FZ/95445	EB6.88.83	Strap (outer)	
26FZ/95444	EB6.88.81	Strap (inner)	
26FZ/95094	EA1.88.741	Sling, nose and centre fuselage	
26FZ/95262	EA3.88.273	Strap, metal	
26FZ/95025	EA1.88.91A	Former, wing, forward	
26FZ/95026	EA1.88.91B	Former, wing, centre	
26FZ/95027	EA1.88.91C	Former, wing, aft	
26FZ/95028	EA1.99.91D	Former, wing, forward	
26FZ/95029	EA1.88.91E	Former, wing, centre	
26FZ/95030	EA1.88.91F	Former, wing, aft	
26FZ/95031	EA1.88.92A	Former, wing, forward	
26FZ/95032	EA1.88.92B	Former, wing, centre	
26FZ/95033	EA1.88.92C	Former, wing, aft	
26FZ/95034	EA1.88.92D	Former, wing, forward	
26FZ/95035	EA1.88.92E	Former, wing, centre	
26FZ/95036	EA1.88.92F	Former, wing, aft	

TABLE 1 - continued

Ref. No.	Part No.	Description	Application
		<i>Trestling equipment</i>	
26F'Z/95017	EA1.88.87A	Former, rear fuselage, front	Used with U.J.T. No.1
26F'Z/95018	EA1.88.87B	Former, rear fuselage, rear	Used with U.J.T. No.7
26F'Z/95037	EA1.88.417	Trestle, adjustable, centre fuselage, front	
26F'Z/95038	EA1.88.419	Trestle adjustable, centre fuselage, rear	
		<i>Rigging equipment</i>	
26F'Z/95010	EA1.88.93	Gauge, incidence and dihedral, main plane	
26F'Z/95115	EA3.88.179	Gauge, incidence and dihedral, tail plane	
26F'Z/95040	EA1.88.447	Gauge, levelling, fuselage	Lateral (<i>cockpit</i>) and longitudinal (<i>rear fuselage</i>)
26F'Z/95093	EA1.88.747	Gauge, levelling, fuselage	Longitudinal (<i>cockpit</i>) and lateral (<i>rear fuselage</i>)
		<i>Miscellaneous equipment</i>	
26F'Z/95013	EA3.88.79	Bridge, piece, wing	Fitted when engine is removed
26F'Z/95012	EA1.88.89	Cables, retaining, bomb doors	For assembling bomb doors
26F'Z/95298	EA3.88.205	Covers, blanking	} For No.1 and 2 fuel tank vents
26F'Z/95299	EA3.88.297	Blocks, removal	
26F'Z/95412	GM/C/1776	Covers, waterproof	Avro triple carrier
26F'Z/95442	EB6.88.85	Cowling, slave, port and starboard	Fitted for engine ground testing
26F'Z/95113	AS.18086	Cradle, bomb loading	Used with Trolley, bomb, Type F (<i>Ref.No.4G/2668</i>)
26F'Z/95109	EA3.88.211	Cradle, wing tip fuel tank	
26F'Z/95539	-	Assister, loading	For Avro triple carrier
26F'Z/95276	EB7.88.15	Guard, safety, engine nacelle	
26F'Z/95080	EA1.88.489	Handle, crutching	For Avro triple carrier
26F'Z/95416	AS.19322	Jig, alignment	
26F'Z/95263	AS.18152	Pack, power	Used with Trolley, bomb loading, Mk.2
26F'Z/95270	EA3.88.281	Plug, blanking	Cabin pressure control valve
26F'Z/95415	AS.19327	Set, adapter	
26F'Z/95090	EA1.88.799	Strut, jury, tail plane	
26F'Z/95016	EA1.88.85	Trolley, fuselage nose	

RESTRICTED

TABLE 1 - continued

Ref. No.	Part No.	Description	Application	
26FZ/95111	-	Trolley, bomb loading, Mk.2		
26FZ/95562	EA9.88.479	Sighting rod, aft	} Compass alignment.	
26FZ/95561	EA9.88.477	Sighting rod, fwd.		
26FZ/95563	EA9.88.481	Carrying case, sighting rods	} L. A. B. S. horizontal and vertical gyro alignment	
-	EB6.88.141	Trestle assembly		
-	EB6.88.173	Cradle assembly		
-	EB6.88.205	Alignment frame assembly		
-	EB6.88.239	Centre plug		
-	EB6.88.255	Location plate		
<i>Tools</i>				
26FZ/95103	Messier T.1342/75	Block, split	Used on air brakes	
26FZ/95044	EA1.88.375	Extractor	Tab torque lever aileron and rudder	
26FZ/95104	EA1.88.825	Extractor	Aileron hinge pins	
-	EB6.88.101	Separating tool	} Rudder tab operating gear removal	
-	EB6.88.103	Extractor		
26FZ/95047	EA1.88.359	Extractor	Main plane pick-up pins	
26FZ/95292	A.6300	Extractor	Main wheels	
-	A.10056	Fixture, brake alignment		
26FZ/95100	EA1.88.823	Gauge	} Aileron fixed tab	
26FZ/95101	EA1.88.821	Tool, setting		
26FZ/95048	EA1.88.363	Insertor	Main plane pick-up pins	
26FZ/95088	EA1.88.733	Insertor	Main undercarriage pivot pin	
26FZ/95063	EA1.88.395	Key	Hydraulic filler cap	
26FZ/95408	EB6.88.27	Disc, setting, port engine layshaft	} For rigging engine controls	
26FZ/95072	EA1.88.551	Disc, setting		
26FZ/95293	EA1.88.831	Indicator		
26FZ/95074	EA1.88.549	Plate, setting, throttle box		
26FZ/95407	EB6.88.29	Plate, setting, port bell-crank lever		
26FZ/95295	EA1.88.548	Plate, setting, starboard bell-crank lever		
26FZ/95082	A/MBEU/70/EE	Rig, re-setting		For elevator snatch unit
26FZ/95493	EA1.88.877	Spanner, release		For nose wheel doors
26FZ/95490	EA1.88.889	Canopy slave bolt	} Assembly of canopy	
26FZ/95491	EA1.88.891	Location pin		
-	EA1.88.893	Inspection gauge		

RESTRICTED

TABLE 1 - continued

Ref.No.	Part No.	Description	Application
26FZ/95059	EA1.88.385	Spanner	For undercarriage pivot bolt
26FZ/95060	EA1.88.387	Spanner	For undercarriage pivot nut
26FZ/95054	EA1.88.345	Spanner	For torque links
26FZ/95095	EA1.88.749	Spanner	For bomb crutch
26FZ/95046	EA1.88.379	Spanner, universal	Aileron centre hinge pin
26FZ/95065	EA1.88.365	Spanner	Front fuselage jacking socket plug
26FZ/95264	AS.130	Spanner	Wing tip tank filler cap
26FZ/95269	EA3.88.293	Spanner	Wing tip tank drain valve
26FZ/95079	EA1.88.531	Spanner	Wing tip tank explosive bolts
26FZ/95265	EA3.88.247	Rudder neutral rigging lock	
26FZ/95296	EB7.88.55	Elevator neutral rigging lock	
26FZ/95297	EB7.88.65	Aileron neutral rigging lock	
26FZ/95450	EA9.88.33	Spanner	Bomb and rocket pylon spigot
—	DL.617.44.C	Tool, crutching	Bomb and rocket pylon
26FZ/95451	EA9.88.35	Shaft, tool, crutching	
26FZ/95419	EA9.88.113	Bar, levelling	
26FZ/95420	EA9.88.111	Gauge, gap	
26FZ/95421	EA9.88.109	Spanner, hot air connection	
26FZ/95422	EA9.88.107	Spanner, locknut	
26FZ/95423	EA9.88.105	Spanner, ring nut	
26FZ/95426	EA9.88.117	Strap, loading, ammunition	
26FZ/95427	EA9.88.103	Tool, belt making	
26FZ/95429	EA9.88.115	Platform, trolley loading	
26FZ/95087	EA9.88.157	Ammunition dispenser box	
26FZ/95438	EA9.88.255	Stand, storage, gun pack	
26FZ/95439	EA9.88.257	Stand, loading/servicing, gun pack	
26FZ/95481	EA9.88.127	Cover, ammunition trolley	
26FZ/95482	EA9.88.159	Trolley, ammunition loading	
26FZ/95056	EA1.88.347	Spanner	Main oleo
26FZ/95051	EA1.88.349	Insertor, piston, ring	Main oleo
26FZ/95061	EA1.88.351	Tool, centralising, piston	Shock absorber
26FZ/95062	EA1.88.361	Combination tool	Undercarriage bearing bush
26FZ/95053	EA1.88.391	Insertor and extractor	Sealing ring, main oleo
26FZ/95086	EA3.88.135	Spanner	Axle clamp
26FZ/95466	EB7.88.203	Spanner	Integral tank fuel pump pipe

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TABLE 2

Standard ground equipment

Ref.No.	Description	Application
	<i>Towing equipment</i>	
4G/2792	Arm, towing	
4G/4139	Bridle, towing 50 ft	
	<i>Jacking equipment</i>	
4Q/2626	Adapter head, Mk.48	} Aircraft jacking at main plane
4Q/2625	Body, jacking, hydraulic, 10 ton	
4Q/2652	Trestle, Mk.1	
4Q/2659	Trolley, transporter	} Aircraft jacking at nose wheel
4Q/2627	Adapter head, Mk.49	
4Q/2232	Body, jacking, hydraulic, 5 ton	} Jacking for main wheel changing (<i>Post Mod. 3</i>) used with bracket, EA3.88.307
4Q/2266	Trestle, Mk.2	
4Q/2321	Adapter head, Mk.27	
4Q/2657	Jack, pillar, hydraulic 15 ton	
4Q/2666	Trolley, transporter	
	<i>Trestling equipment</i>	
4G/ -	Trestle, U.J. No.1 c/w type A brackets	} Rear fuselage support
4G/ -	Trestle, U.J. No.7 c/w type A brackets	
	Gantry, lifting, comprising :-	} For main plane changing
4Q/2309	Upright, Type A	
4Q/2310	Beam, Type A	
4Q/2311	Beam, Type B	
	<i>Engine changing equipment</i>	
4G/5348	Sling, engine, Avon, universal, Mk.2	
40B/1030	Stand, Avon, universal	
40B/1031	Adapters, stand, Type Avon/1	
4G/4858	Trolley, E.C.U. servicing, Mk.2	
	<i>Miscellaneous equipment</i>	
4G/6246	Adapter, inflation Mk.2	Use with pressure gauge (<i>Ref.No. 4G/3028</i>)
4G/4342	Mat, main plane, Type C	
4G/2668	Trolley, bomb, Type F	
4F/1913	Trolley, electrical servicing, Mk.4	

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TABLE 2 - continued

Ref. No.	Description	Application
4G/4221 or 4G/5888	Trolley, high pressure, air charging, Mk.2	
4F/1715 or 4F/1856	Trolley, instrument and auto-pilot testing, Mk.1A	
4F/1805	Trolley, instrument and auto-pilot testing, Mk.1B	
4G/4220	Trolley, low pressure, pneumatic, Mk.1B	
4F/1714	Trolley, oxygen charging, Mk.2	
	Trolley, pressure cabin testing, Mk.1C	Used with adapter, air supply (Ref.No. 4F/1807)
4F/1723	Trolley, radar hoist, servicing, Type B	
4F/1796		
4F/2345	Trolley, servicing, hydraulic, Mk.2A or 2B or 2C	
4F/2375		
	<i>Tools</i>	
1B/4467	Gun, lubricating, universal	} Nose wheel strut shock absorber charging
27Q/14103	Adapter, flexible, charging	
1C/7003	Wrench, torque, 30-40 lb ft.	} Main plane attachment bolts
1L/45	Spanner, socket, 3/4 in. B.S.F. x 1/2 in. sq. drive	
1L/67	Spanner, socket, bi-hex, 1 in. B.S.F. x 3/4 in. sq drive	
1L/158	Adapter, 1/2 in. socket x 3/4 in. plug	} Generator cooling duct Main fuel feed
1C/2161	Screwdriver	
1C/3226	Spanner, S.E. 1-1/8 in. W	} Removal of radar head (A.R.I.5800) and generator
1L/32	Spanner, bi-hex, ring 1/4 in. x 5/16 in. W	
1C/5598	Trammels, steel, 42 in.	Checking tail plane actuator movement
1B/4235	Level, spirit, 0-10 deg.	Checking tail plane incidence
27H/3222	Strap, lashing	
27Y/3564	Spanner, hook (RS.181/10)	} Used on air brakes
27Y/4933	Spanner, hook (RS.181/23)	
27G/5193	Gauge, friction pad wear (AD.100071)	} Wheel brakes
27G/5249	Gauge, tenon wear (AD.100070)	
1L/156	Wrench, torque, 5-50 lb ft x 1/2 in sq drive	} For explosive bolts, pilot's canopy
1L/178	Adapter, socket, 1/2 in. sq socket x 3/8 in. sq plug	
1L/22	Spanner, socket 3/8 in. W x 3/8 in. sq drive	
5A/3859	Torch, electric, hand, probe, illuminator	
1C/6771	Spanner, tubular, box, 5/16 in. x 1/4 in. x 7/2 in. long	Wing-tip explosive-bolt detonators

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TABLE 2 - continued

Ref.No.	Description	Application
	<i>Weighing equipment</i>	
4G/4895	Hydrostatic unit, 25-ton	Main wheel position
4G/4902	Adapter (<i>unit to aircraft pad</i>)	
4G/5050	Adapter (<i>jack to unit</i>)	For use with Ref.No.4G/4895
4Q/2657	Jack, 15-ton	
4G/4894	Hydrostatic unit, 10-ton	Nose wheel position
4G/5055	Adapter (<i>unit to nose u/c</i>)	
4G/5063	Adapter (<i>jack to unit</i>)	For use with Ref.No.4G/4894
4Q/2667	Jack, 8-ton	

TABLE 1

FRONT FUSELAGE	NO. OF DRAIN HOLES
DRAIN PLUG, AFT OF FR.7	1

TABLE 2

CENTRE FUSELAGE	NO. OF DRAIN HOLES
TANK BAYS 1, 2, 3	1 PORT 1 STBD.
AFT CAMERA WINDOW	FWD. AFT
BOMB DOORS	1 PORT 1 STBD. 1 PORT 1 STBD.
	8

TABLE 4

WING	NO. OF DRAIN HOLES
FRONT COWLING INTAKE	2
SERVICE PANEL	6
LOWER REAR COWL	21
NACELLE	18
JET PIPE FAIRING	10, 1/8 IN. DIA. 10, 1/4 IN. DIA.
INBOARD FLAP	16
OUTBOARD FLAP	27
AILERON	39
JET END CONE	1
INTEGRAL TANKS	6

TABLE 3

REAR FUSELAGE	NO. OF DRAIN HOLES
LOWER SKIN, AFT OF FR.33	1 PORT 1 STBD.
AFT OF FR.46 IN FAIRING	2
ANTI-COLLISION LIGHT, FR.33	1 PORT 1 STBD.
ACCESS IN REAR FUSELAGE FAIRING	2
BUMPER	2 FWD. 2 AFT
AFT OF FR.42	2
PICKETING PLUG	1

TABLE 5

TAIL UNIT	NO. OF DRAIN HOLES
TAIL PLANE	4
ELEVATOR	5
RUDDER TAB	T/H 1

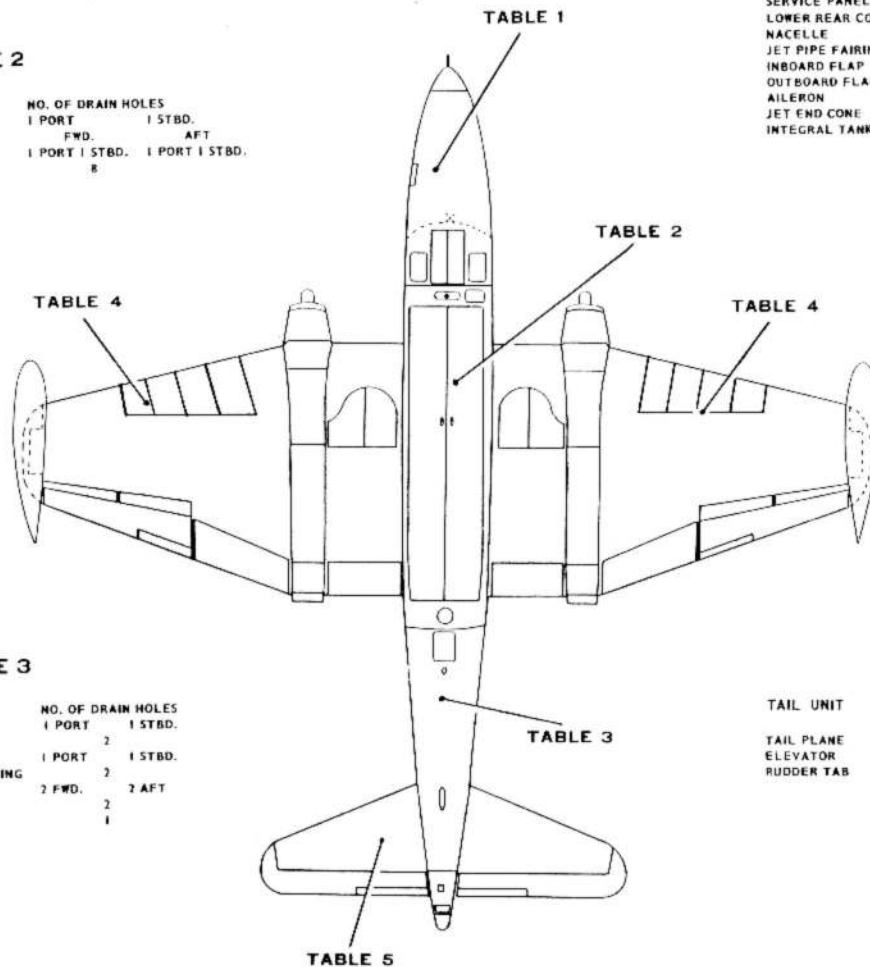


FIG. 4. DRAINAGE HOLES

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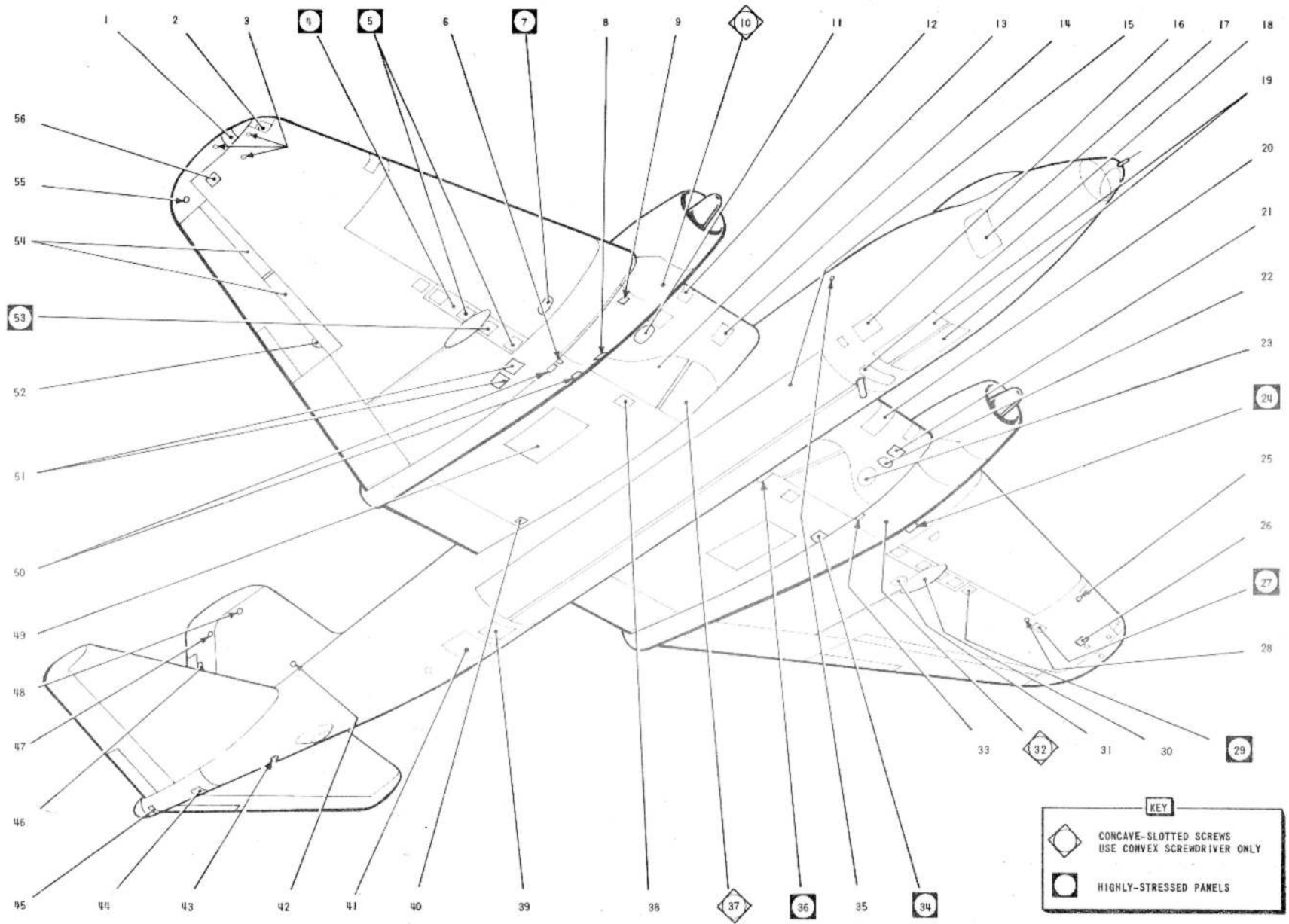


FIG. 5. ACCESS PANELS, LOWER SURFACE AND STARBOARD SIDE

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KEY TO FIG.5 (ACCESS PANELS, LOWER SURFACE AND STARBOARD SIDE)

All panels in the main planes are on both the port and starboard side, unless otherwise stated.

- | | | | | | |
|----|--|----|---|----|--|
| 1 | WING-TIP FUEL TANKS AIR AND FUEL PIPES | 16 | MAIN ELECTRICAL PANEL; EXTERNAL ELECTRICAL SUPPLY SOCKET | 41 | CAMERA AND REAR FUSELAGE HATCH-DOWNWARD IDENTIFICATION LAMP (B(1) Mk.6 AIRCRAFT) REAR DATUM BLOCKS; FLYING CONTROL TUBE COUPLINGS; PICKETING RING-BOLTS STOWAGE; FIRE EXTINGUISHER BOTTLE; NO.3 FUEL TANK; ENGINE STARTER CARTRIDGES |
| 2 | NAVIGATION AND TAXYING LAMPS (PRE. MOD.4152) | 17 | ENTRANCE DOOR | | <i>Note...</i> |
| 3 | WING-TIP FUEL TANKS EXPLOSIVE ATTACHMENT BOLTS | 18 | DOWNWARD IDENTIFICATION LAMP (B Mk.6 AIRCRAFT) | | <i>Should difficulty be experienced when closing and securing hatch, it is recommended that the hatch be secured by first engaging the fasteners nearest to the hinge line and then working across the fuselage to the hatch outer edge.</i> |
| 4 | SERVICE PANEL, AIR BRAKES | 19 | NOSE UNDERCARRIAGE DOORS | | |
| 5 | AIR BRAKES MECHANISM | 20 | SERVICE PANEL (PORT) | | |
| 6 | JACKING POINT | 21 | ACCESSORIES GEARBOX DRAIN | | |
| 7 | INTEGRAL FUEL TANK COLLECTOR BOX AND FUEL PUMP | 22 | CONSTANT-FLOW VALVE (PORT) | | |
| 8 | UNDERCARRIAGE COWLING FLAP ACTUATING LINK | 23 | AIR MILEAGE UNIT (PORT) | | |
| 9 | FIRE PANEL | 24 | INTEGRAL FUEL TANK PUMP AND FUEL COCKS; FUEL PUMP GLANDS AND FUEL RECUPERATOR | | |
| 10 | SERVICE PANEL - ENGINE H.P. FUEL COCK COUPLING; THROTTLE VALVE COUPLING; OIL SUMP DRAIN; OIL SUMP FILLER CAP; OIL FILTER; LOW PRESSURE FUEL FILTER AND DRAIN; OIL COOLER PIPES TO SUMP; OIL PRESSURE TRANSMITTER; OIL COOLER; ANTI-ICING PIPE TOGGLE CLAMP | 25 | I.L.S. GLIDE PATH AERIAL | | |
| 11 | I.L.S. MARKER AERIAL (STARBOARD) | 26 | ELECTRICAL CONNECTIONS | 42 | RUDDER OPERATING LEVER |
| 12 | HYDRAULIC PUMP | 27 | ELECTRICAL CONNECTIONS | 43 | PICKETING POINT |
| 13 | MAIN UNDERCARRIAGE FIXED FAIRING-HYDRAULIC ACCUMULATOR CHARGING VALVE AND GAUGE (STARBOARD) | 28 | PICKETING POINT | 44 | DOWNWARD REAR LAMP |
| 14 | G.45 CAMERA - B(1) Mk.6 AIRCRAFT (STARBOARD) | 29 | AILERON CONTROL | 45 | REAR CONE ATTACHMENTS |
| 15 | BOMB DOORS - HYDRAULIC SELECTOR VALVES; HYDRAULIC RELIEF VALVES; FUEL DRAINS; FUEL PUMPS; FUEL COCKS AND ACTUATORS; AIR BRAKES AND FLAPS GROUND SELECTOR | 30 | PYLON MOUNTING | 46 | RUDDER TAB CONTROL TUBE |
| | | 31 | LANDING LAMP (PORT) | 47 | RUDDER SLINGING POINT |
| | | 32 | ENGINE BOTTOM REAR COWLING | 48 | FIN SLINGING POINT |
| | | 33 | UNDERCARRIAGE COWLING FLAP | 49 | A.R.I.5885 AERIAL (PORT) |
| | | 34 | UNDERCARRIAGE PIVOT PIN | 50 | AILERON CONTROL TUBE COUPLINGS |
| | | 35 | HYDRAULIC RESERVOIR FILLER CAP | 51 | NITROGEN BOTTLES (NOT FITTED) |
| | | 36 | MAIN SPAR ATTACHMENT | 52 | AILERON TAB OPERATING LEVER |
| | | 37 | UNDERCARRIAGE DOOR- DOOR JACKS AND SEQUENCE VALVES | 53 | FUEL CONTENTS GAUGE CONNECTOR BOX |
| | | 38 | AILERON CONTROL TUBES; FUEL AND HYDRAULIC PIPES | 54 | AILERON SHROUD SCREENS |
| | | 39 | F.24 CAMERA APERTURE BLANKING PLATE | 55 | AILERON OUTBOARD HINGE PIN |
| | | 40 | MAIN PLANE REAR WALL ATTACHMENT | 56 | G.M.4B COMPASS FLUX DETECTOR |

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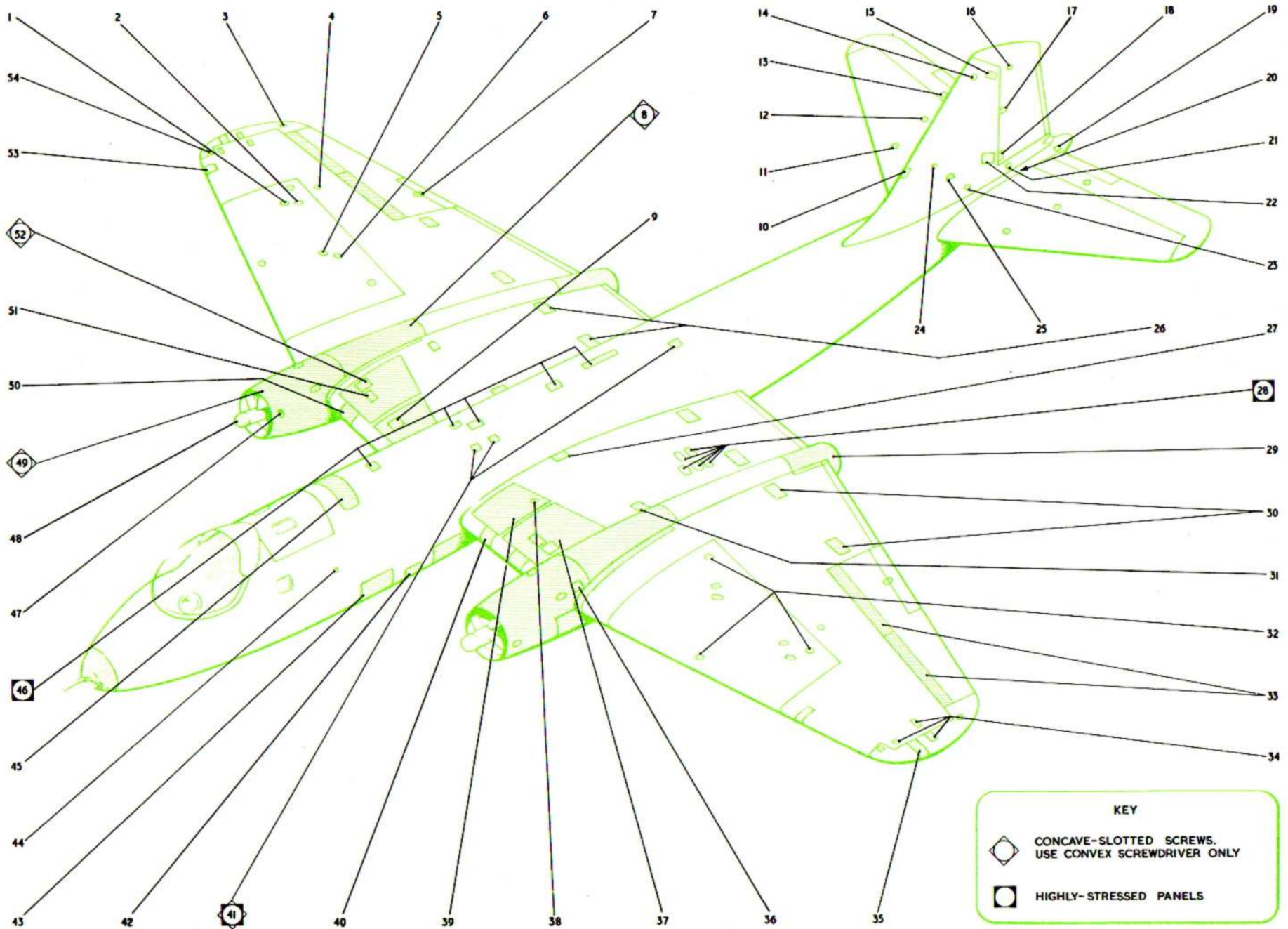


Fig. 6. Access panels, upper surface and port side

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KEY TO FIG.6 (ACCESS PANELS, UPPER SURFACE AND PORT SIDE)

All panels in the main planes are on both the port and starboard side. unless otherwise stated.

1	INTEGRAL FUEL TANK VENT VALVE, OUTBOARD COMPARTMENT		ACTUATOR ELECTRICAL CONNEC- TIONS (STARBOARD)		<i>screws securing panel to fuselage boundary angle must be fully tightened and then slackened off one quarter of a turn.</i>
2	INTEGRAL FUEL TANK FILLER CAP, OUTBOARD COMPARTMENT	23	REAR FUSELAGE SUPPORT STRUT		
3	AILERON HINGE	24	FIN ATTACHMENT		
4	MAIN PLANE SLINGING POINT	25	AERIAL SWITCH	40	SERVICE PANEL (PORT)
5	INTEGRAL FUEL TANK VENT VALVE, INBOARD COMPARTMENT	26	FLAP ADJUSTMENT POINTS	41	NO.1, 2 AND 3 FUEL TANK FILLER CAPS
6	INTEGRAL FUEL TANK FILLER CAP, INBOARD COMPARTMENT	27	MAIN SPAR ATTACHMENT	42	BATTERIES: OXYGEN CHARGING VALVE: NOSE UNDERCARRIAGE GROUND SELECTOR: WHEEL BRAKES HYDRAULIC ACCUMULATOR
7	AILERON TAB OPERATING LEVER	28	AERIAL, A.R.I.5885 (PORT)	43	V.H.F. COMPARTMENT; CABIN AIR SYSTEM SILENCER; FLYING CONTROL TUBES AND CONNECTING LEVERS
8	ENGINE UPPER REAR COWLING	29	JET PIPE REAR CONE; JET PIPE ADJUSTMENT: THERMOCOUPLES	44	FORWARD JACKING POINT
9	G.45 CAMERA (B(1) Mk.6 AIRCRAFT (STARBOARD)	30	FLAP ADJUSTMENT POINTS	45	EQUIPMENT BAY, HYDRAULIC RESERVOIR: MISCEL- LANEOUS ELECTRICAL EQUIPMENT: OXYGEN BOTTLES
10	FIN FORWARD ATTACHMENT POINT	31	UNDERCARRIAGE UP LATCH HOOK	46	TANK VENTING GALLERY
11	TAIL PLANE SLINGING POINT	32	INTEGRAL FUEL TANK SLINGING POINT	47	TURBO-STARTER EXHAUST
12	TAIL PLANE SLINGING POINT	33	AILERON SHROUD SCREENS	48	ENGINE STARTER HOUSING
13	ELEVATOR TAB CONTROL LEVER	34	WING-TIP FUEL TANK EXPLOSIVE ATTACHMENT BOLTS	49	ENGINE FRONT COWLING
14	FIN SLINGING POINT	35	WING-TIP FUEL TANK AIR AND FUEL PIPE CONNECTIONS	50	HYDRAULIC PUMP
15	AERIAL PLUG	36	CONTROL UNIT BLEED VALVE	51	TWO-SPEED GEARBOX OIL LEVEL DIPSTICK
16	RUDDER SLINGING POINT	37	ACCESSORIES GEARBOX: TWO-SPEED GEARBOX: MIXING VALVE (PORT): CONSTANT-FLOW VALVE (PORT)	52	ACCESSORIES GEARBOX OIL FILLER CAP
17	RUDDER TAB OPERATING LEVER	38	COLD-AIR UNIT OIL LEVEL DIPSTICK (PORT)	53	I. L. S. AERIAL
18	RUDDER CONTROL TUBE ATTACHMENT (PORT): RUDDER TAB ACTUATOR (STARBOARD)	39	COLD-AIR UNIT (PORT): HYDRAULIC, FUEL AND AIR PIPES: SUPPRESSOR: FUEL FLOW TRANSMITTER: AIR COOLER: HYDRAULIC ACCUMULATOR: CUT-OUT VALVE AND NON-RETURN VALVE	54	NAVIGATION AND TAXYING LAMPS (POST MOD.4152)
19	REAR CONE ATTACHMENT				
20	REAR FAIRING ATTACHMENTS				
21	RUDDER LOWER HINGE				
22	RUDDER CONTROL TUBE AND LOWER MASS-BALANCE WEIGHT (PORT): RUDDER TAB ACTUATOR LEVER AND				

Note...

When fitting access panel, the eight 2BA

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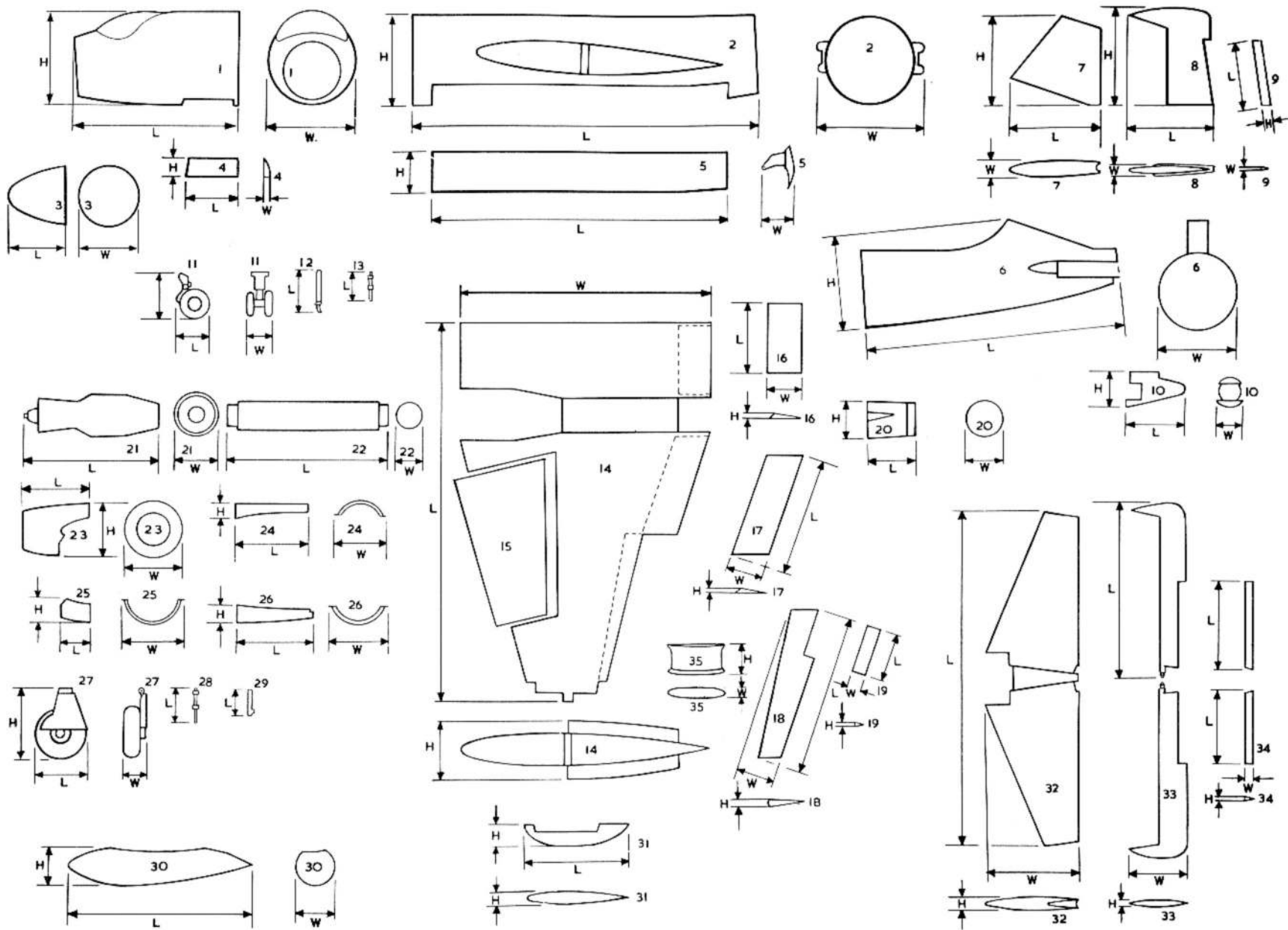


Fig. 7. Component weights and dimensions

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KEY TO FIG.7 (COMPONENT WEIGHTS AND DIMENSIONS)

Item No.	Component	Length (L)	Width (W)	Height (H)	Tare weight (lb)	Equipped weight (lb)
1	FRONT FUSELAGE	15ft. 0 in.	6 ft. 6 in.	6 ft. 6 in.	1,000	2,750
2	CENTRE FUSELAGE	25ft.11 in.	7 ft. 7 in.	6 ft. 6 in.	2,000	3,500
3	NOSE FAIRING	1 ft. 5 in.	2 ft. 7 in.	-	56	-
4	NOSE UNDERCARRIAGE DOORS	4 ft. 2 in.	0 ft. 3 in.	1 ft. 5 in.	10	-
5	BOMB DOORS (BOMBER)	22 ft. 1 in.	1 ft. 8 in.	3 ft. 0 in.	240	-
	BOMB DOORS (INTERDICTOR)				220	-
6	REAR FUSELAGE	19 ft. 1 in.	5 ft.10 in.	7 ft.11 in.	550	650
7	FIN	6 ft. 4 in.	1 ft. 6 in.	6 ft. 9 in.	94	-
8	RUDDER	7 ft. 1 in.	1 ft. 3 in.	7 ft. 0 in.	132	-
9	RUDDER TAB	5 ft. 5 in.	0 ft. 2 in.	0 ft. 9 in.	7	-
10	REAR CONE	4 ft. 9 in.	2 ft. 5 in.	2 ft.10 in.	25	-
11	NOSE UNDERCARRIAGE WHEEL AND LEG	2 ft. 2 in.	1 ft. 7 in.	3 ft. 7 in.	230	-
12	NOSE UNDERCARRIAGE RADIUS ROD	3 ft.11 in.	0 ft. 4 in.	0 ft. 8 in.	20	-
13	NOSE UNDERCARRIAGE JACK	1 ft.11 in.	0 ft. 5 in.	0 ft. 6 in.	9	10 (filled)
14	MAIN PLANE	29 ft. 1 in.	19 ft. 0 in.	4 ft. 3 in.	2,576	3,002 (with integral tank)
15	MAIN PLANE INTEGRAL TANK	11 ft. 4 in.	6 ft. 9 in.	2 ft. 1½ in.	426	-
16	INBOARD FLAP	5 ft. 7 in.	2 ft. 6 in.	0 ft. 3 in.	22	-
17	OUTBOARD FLAP	8 ft.11 in.	2 ft. 9 in.	0 ft. 3 in.	31	-
18	AILERON	12 ft. 6 in.	1 ft 3 in.	0 ft. 9 in.	93	-
19	AILERON TAB	4 ft. 2 in.	0 ft. 8 in.	0 ft. 2 in.	4	-
20	JET PIPE COWLING	3 ft. 8 in.	2 ft. 8 in.	2 ft. 7 in.	21	-
21	ENGINE CHANGE UNIT	11 ft. 0 in.	3 ft. 6 in. (diameter)	-	2,500	-
22	JET PIPE	12 ft. 3 in.	2 ft. 2 in. (diameter)	-	180	-
23	ENGINE FRONT COWLING	4 ft. 9½ in.	3 ft.10 in.	3 ft.10 in.	59	-
24	ENGINE TOP REAR COWLING	5 ft. 5 in.	2 ft. 0 in.	1 ft. 3 in.	30	-
25	SERVICE PANEL	2 ft. 2 in.	2 ft. 0 in.	1 ft. 9 in.	15	-
26	ENGINE BOTTOM REAR COWLING	5 ft. 5 in.	2 ft. 0 in.	1 ft. 3 in.	33	-
27	MAIN UNDERCARRIAGE WHEEL AND LEG	3 ft.11 in.	2 ft. 1 in.	6 ft. 3 in.	670	-
28	MAIN UNDERCARRIAGE JACK	1 ft.11 in.	0 ft. 4 in.	0 ft. 7 in.	14	16 (filled)
29	MAIN UNDERCARRIAGE SIDE STAY	2 ft. 9 in.	0 ft. 8 in.	0 ft. 8 in.	36	-
30	WING-TIP TANK	14 ft. 7 in.	1 ft.11 in.	1 ft.10 in.	120	-
31	WING TIP	7 ft. 8 in.	1 ft. 8 in.	0 ft.10 in.	16	-
32	TAIL PLANE	26 ft. 0 in.	7 ft. 9 in.	1 ft. 6 in.	495	-
33	ELEVATOR	13 ft.11 in.	4 ft. 5 in.	0 ft. 5 in.	85	110
34	ELEVATOR TAB	5 ft. 7 in.	0 ft. 8 in.	0 ft. 2 in.	7	-
35	WING PYLON MOUNTING	2 ft. 6 in.	0 ft. 6 in.	0 ft.13½ in.	24	-

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Chapter 5 CHANGE OF ROLE

LIST OF CONTENTS

	<i>Para.</i>		<i>Para.</i>		<i>Para.</i>
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<i>Removal and installation of equipment.</i> ...	2	<i>S.W.S. role</i>	5	<i>Gun pack and superstructure installation</i> ...	9
<i>Installation tests</i>	3	<i>Interdictor role.</i>	7	<i>Wing pylon removal and installation</i>	10

TABLE

	<i>Table</i>
<i>Removable equipment: change of role..</i> ...	1

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	<i>Fig.</i>
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<i>Gun pack installation</i>	2
<i>Gun pack and superstructure removal and installation</i>	3

◀ General

1. The B(I) Mk.6 aircraft can be used for three different roles (*fig.1*) namely, interdictor, normal bombing or special weapon system (S.W.S.) role. Practice bomb facilities are afforded when the aircraft is being used in the S.W.S. role. Interdictor role is the basic duty but conversion to the normal bombing or S.W.S. role can be made by removing and fitting equipment as listed in Table 1. ▶

Removal and installation of equipment

2. The removal and installation of role equipment is fully described in the relevant Section and Chapter, i.e., electrical equip-

ment and instruments, Sect.5, Chap.1 and 2, and armament equipment, Sect.7.

Installation tests

3. Electrical continuity tests and functional checks of all equipment must be carried out after the installation of any items of equipment when converting the aircraft to fulfil a particular role.

Normal bombing role

4. For the normal bombing role the equipment listed under NORMAL BOMBING in Table 1 is to be fitted, and the previous role equipment, unless also required for bombing, removed.

◀ S.W.S. role

5. For S.W.S. role the equipment listed under S.W.S. in Table 1 is to be fitted and, unless also used in S.W.S. role, the previous role equipment removed. ▶

6. Minor wiring changes are necessary in the aircraft standard wiring when converting the aircraft from interdictor to S.W.S. or reversion from S.W.S. to interdictor. ▶
These changes are given in Sect.5, Chap.1, Group A & B.

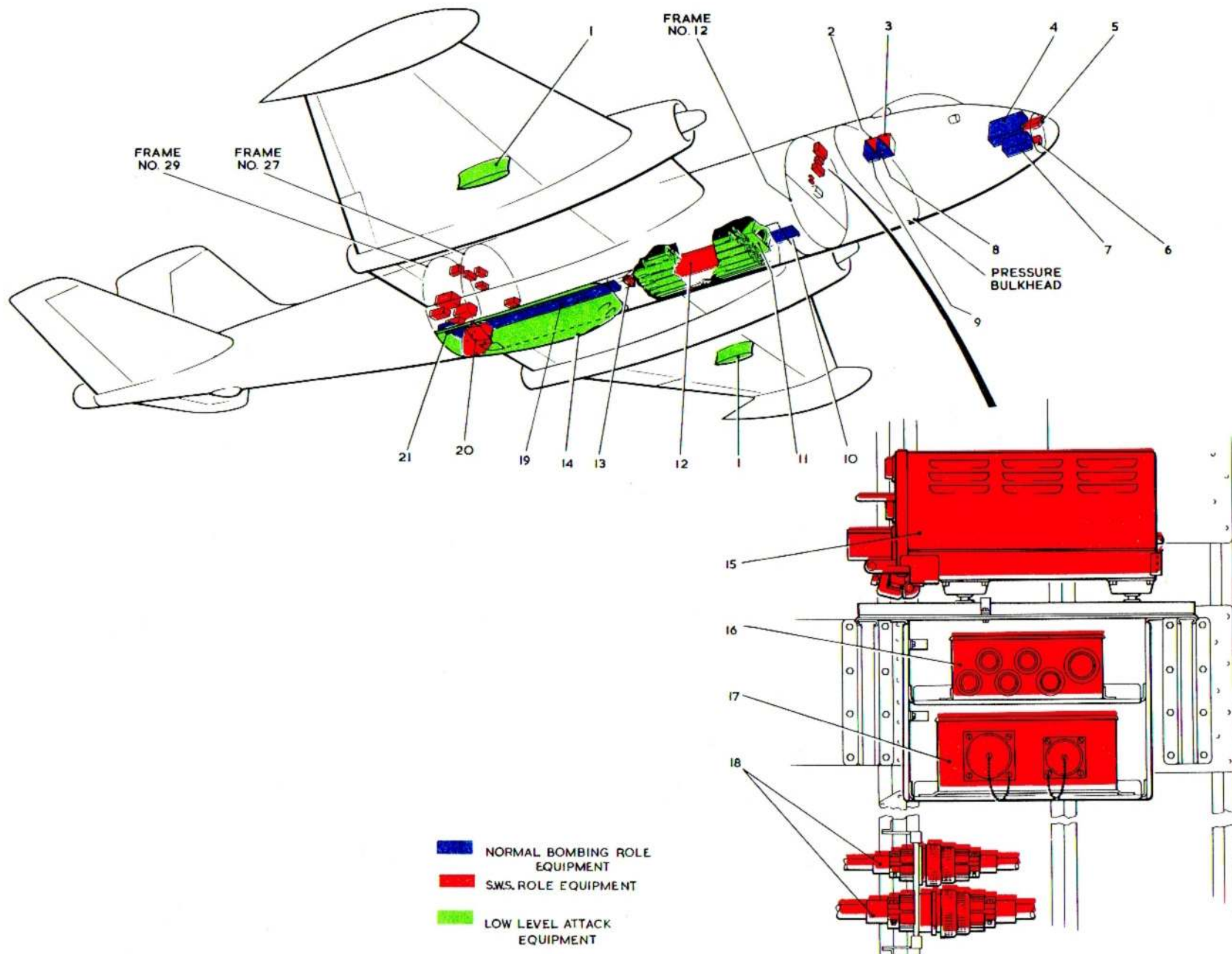


Fig. 1. Change of role details

◀ (Mod. 4329 embodied) ▶

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Key to Fig.1 (Change of role details)

- 1 WING PYLON
- ◀ 2 S.W.S. PRACTICE BOMB FACILITIES PANEL
- 3 S.W.S. CONTROL PANEL
- 4 BOMBSIGHT COMPUTOR
- 5 ROLLER MAP
- 6 F95 CAMERA
- 7 SIGHTING HEAD
- 8 12/24-WAY BOMB DISTRIBUTOR
- 9 BOMB CONTROL UNIT
- 10 FORWARD Mk.1 SECONDARY BOMB BEAM
- 11 16 x 4.5 FLARE CARRIER (OR ALTERNATIVELY - Mk.2 SECONDARY BOMB BEAM)
- 12 S.W.S. BOMB BEAM
- 13 S.W.S. BOMB BEAM JUNCTION BOX
- 14 GUN PACK
- 15 FUZE CHARGE UNIT
- 16 PROTECTIVE RELAY UNIT } IF FITTED
- 17 JUNCTION BOX 'A' }
- 18 FIXED COUPLER CONNECTORS
- 19 REAR Mk.1 SECONDARY BOMB BEAM
- 20 DEFLECTOR PLATE
- 21 F24 CAMERA ▶

Interdictor role

7. For interdictor duties the equipment listed under INTERDICTOR ROLE in Table 1 is to be fitted and the previous role equipment, unless also used in this role, removed.

◀ When converting the aircraft from S.W.S. to interdictor, minor wiring changes in the aircraft standard wiring are necessary (para.6). ▶

Gun pack and superstructure removal

8. To remove the gun pack and superstructure proceed as follows:-

(1) Jack and trestle the aircraft (Sect.2, Chap.4) to give a ground clearance of forty-eight inches measured at the extreme rear end of the bomb bay.

(2) Release the air pressure from the gas purging system accumulator at the external charging valve.

(3) Fully open the flare doors.

(4) Disconnect the air heating pipe coupling on frame 29 bulkhead, and blank off the connection remaining in the aircraft.

(5) Disconnect the electrical leads to the gun pack at the plug and socket connection on frame 29 bulkhead, and fit the rubber blanking cap provided to the bulkhead connection.

(6) Withdraw the two quick-release pins (1) securing the baffle plate to the front of the gun pack. The baffle plate will remain suspended from the support rods (2).

(7) Remove the port and starboard access

panels (3) on top of the gun pack, remove the split pin from the pin (4) securing the gun pack stay and withdraw the pin.

(8) Position a hydraulic low-loading trolley (Ref.No.26FZ/95069 or 95111) beneath the gun pack, and operate the controls until the platform is in contact with the underside of the gun pack.

(9) Withdraw the four quick-release pins (5) securing the gunpack to the rear and forward diaphragms.

(10) Operate the trolley controls to lower the gun pack clear of the aircraft and withdraw the trolley.

(11) Remove the two nuts and bolts (6) securing the baffle-plate support rods to the attachment bracket in the roof of the bomb bay and remove the baffle plate (7).

(12) Remove the nut and bolt (8) securing the gun pack stay to the bracket in the roof of the bomb bay and remove the stay.

(13) Remove the two nuts and bolts (9) securing the forward diaphragm to the eye-bolts in the roof of the bomb bay and remove the diaphragm. Repeat for the rear diaphragm.

Gun pack and superstructure installation

9. The gun pack, less guns, belt feed mechanism, and ammunition, is mounted on a Type F bomb trolley for transporting to the aircraft. When installation of the superstructure is completed, the gun pack is transferred by means of fixed rails on the Type F trolley, to a low-loading trolley fitted with a loading platform. The following stores are required for installation:-

(a) Bar, levelling (Ref.No.26FZ/95419).

(b) Clinometer (Ref.No.1A/4124).

(c) Spanner, hot-air connection (Ref.No.26FZ/95421).

(d) Gauges, aircraft levelling, lateral and longitudinal (Ref.No.26FZ/95468 and 26FZ/95470).

To install the gun pack and superstructure in the aircraft, proceed as follows:-

(1) Jack and trestle the aircraft (Sect.2, Chap.4), to give a minimum ground clearance of forty-eight inches measured at the extreme rear end of the bomb bay.

(2) Using the datum pad positions in the cockpit, and the aircraft levelling gauges (Sect.2, Chap.4, Table 1), level the aircraft laterally and note the longitudinal reading.

(3) Fully open the flare doors.

(4) Slacken the locknuts of the forward diaphragm supporting eye-bolts in the bomb bay roof, and ensure that the eye-bolts are screwed home.

(5) Offer up the forward diaphragm to the eye-bolts and secure it with the two 5/8 in. B.S.F. nuts and bolts (9), fitting a plain washer under each nut.

(6) Place the levelling bar on the two datum dowels protruding from the front face of the diaphragm, and with a clinometer on the bar, level the diaphragm by adjusting the supporting eye-bolts. Tighten the eye-bolt lock nuts and wire-lock.

(7) Offer up the rear diaphragm to the supporting brackets in the bomb bay roof and secure it with the two 5/8 in. B.S.F. nuts and bolts, fitting a plain washer under each nut.

(8) Pass the gun pack stay over the for-

ward diaphragm from the rear and connect the larger of the two eye-bolts to the bracket in the roof of the bomb bay with the 9/16 in. B.S.F. nut and bolt (8). Fit a plain washer under the nut. Tie the free end of the stay to a convenient point in the bomb bay roof.

(9) Transfer the gun pack from the Type F trolley to the low loading trolley and, approaching the aircraft from the rear, position the gun pack beneath the points of suspension of the diaphragms.

(10) Remove the access panels on the top centre of the gun pack (3) and the two panels, one on each side, immediately below.

(11) Remove the five main attachment pins from the gun pack.

(12) Operate the trolley to raise the gun pack and manoeuvre the trolley until the two forward and two rear attachment pins can be inserted. Fit a plain washer and split pin to each attachment pin.

(13) Operate the trolley to lower the platform clear of the gun pack and remove the trolley.

(14) Using the levelling bar and a clinometer on the longitudinal and lateral datum pads on the gun pack, check that the readings correspond with the aircraft readings obtained in operation (2). If adjustment is necessary, slacken the locknuts of the lower eye-bolts on the rear diaphragm and adjust until the correct readings are obtained. Tighten the lock nuts and wire-lock.

(15) Position the lower end of the gun pack stay in the attachment lug on the top of the gun pack. If adjustment is necessary before the attachment pin (4) can be inserted,

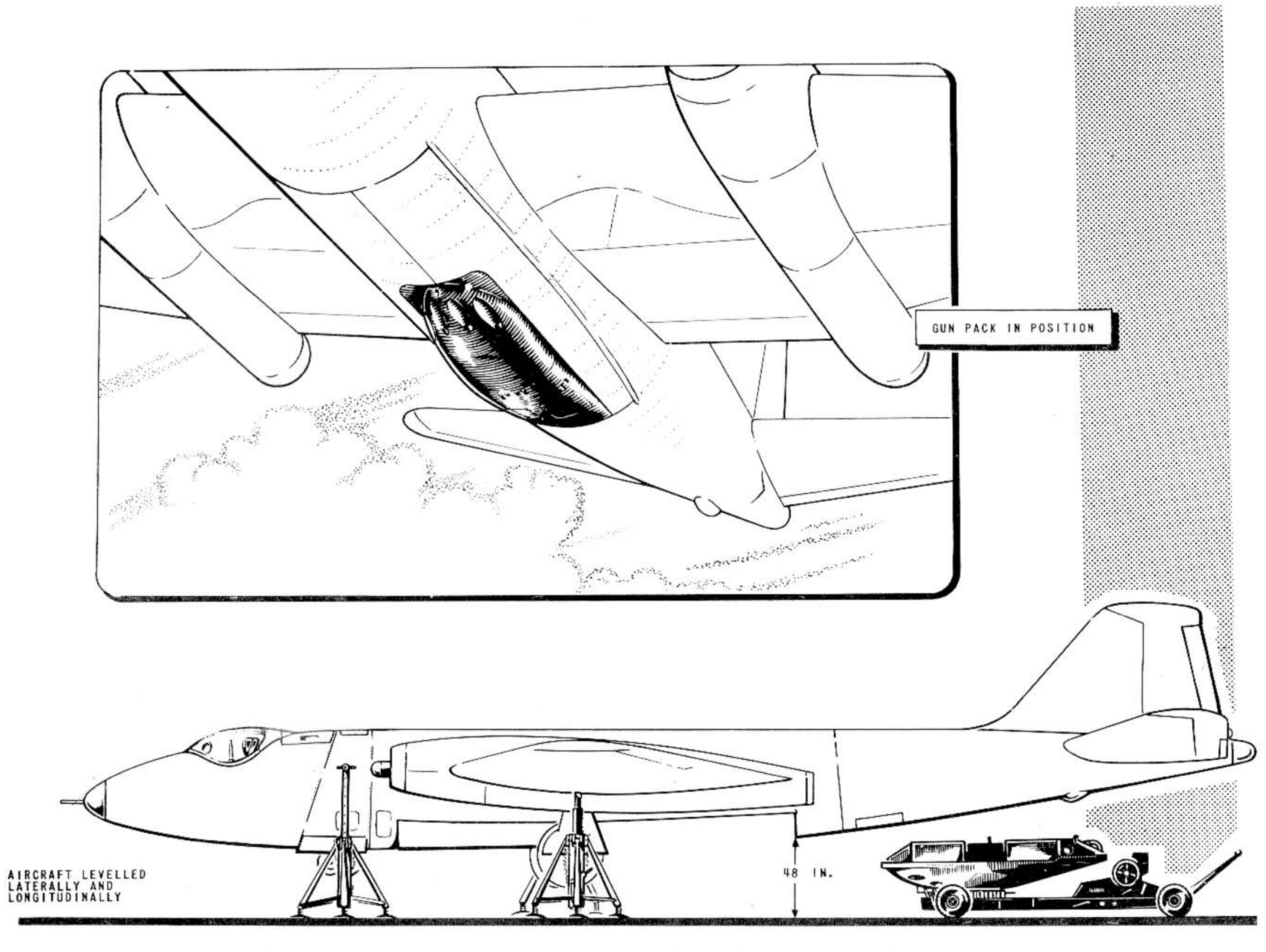


Fig. 2. Gun pack installation

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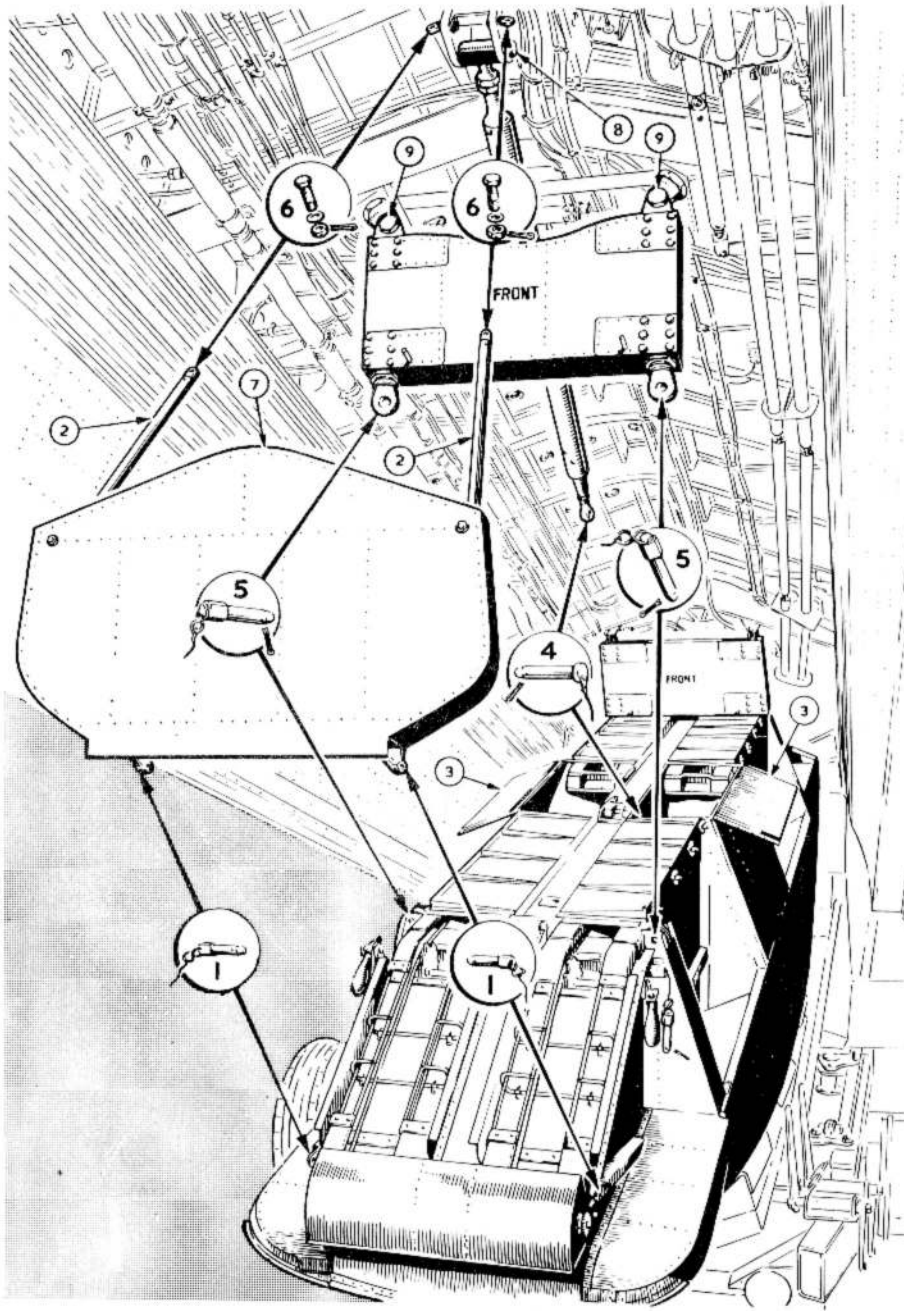


Fig. 3. Gun pack and superstructure removal and installation

slacken the locknut of the upper eye-bolt and adjust the eye-bolt as required. Insert the attachment pin and check the extreme rear of the gun pack for correct butting against the fuselage structure; this should be close and even without undue pressure. Insert a split pin in the attachment pin.

Note...

It may be necessary, when making this adjustment, to move the gun pack forward slightly to allow the rear end to move without fouling the fuselage structure.

(16) Close the flare doors and check for a close fit around the gun pack. To obtain this it may be necessary to adjust the appropriate eye-bolts on the diaphragms and the gun pack stay.

Note...

The adjustment of the lower eye-bolts of the forward diaphragm is pre-set by the manufacturer and should not normally be disturbed. Further adjustments may, however, be necessary to maintain the longitudinal and lateral clinometer readings obtained in operation (14) when adjusting the gun pack position in relation to the flare bay doors.

(17) Check that all locknuts are tight and wire-locked. The upper eye-bolt of the gun pack stay in addition to the locknut must also be wire-locked.

(18) Remove the four quick-release pins from the baffle plate attachment forks. Position the baffle plate in front of the gun pack and attach the two lower attachment forks to the lugs on the gun pack structure with quick-release pins (1). Connect the support struts to the bracket in the bomb bay roof with the two $\frac{1}{4}$ in. B.S.F. nuts and bolts, fitting a plain

washer under each nut. Tighten the nuts and insert split pins. Align the free ends of the support struts with the attachment forks on the baffle plate, adjust the struts as necessary and insert the quick-release pins. Tighten the locknuts on the support struts and wire-lock.

(19) Remove the blanking cap from the hot-air system tapping on the bomb bay rear bulkhead and connect the flexible pipe on the gun pack to the point using the special spanner, and wire-lock.

(20) Remove the blanking cap from the electrical services connection on the bomb bay rear bulkhead and connect the gunpack electrical cable to the point.

(21) If gun installation is not to be carried out immediately, close the hinged panels on the top of the gun pack and replace the two side panels.

(22) Close the flare doors and lower the aircraft to the ground.

Wing pylon removal

10. The pylons are secured to the outer wings at rib 3, aft of the integral tank, by twenty special B.S.F. mushroom-headed bolts which engage with trapnuts fitted on the internal wing pylon casting. When the pylon is removed a cover plate is fitted over the aperture in the wing skin. The electrical leads to the release and fuzing units are connected to junction boxes J.B.17 (port) and J.B.18 (starboard), fitted in the wings adjacent to the pylon. To remove a pylon from the aircraft, proceed as follows:-

(1) Remove the panel giving access to the junction box from the underside of the wing and detach the electrical fuzing and release cables from the box.

(2) Support the pylon and remove the four ¼ in. and sixteen 5/16 in. B.S.F. special mushroom-headed bolts (*Part No.E.A9.97.627 and E.A9.97.623 respectively*) securing the pylon to the main spar and the internal pylon casting.

(3) Remove the pylon from the aircraft, position the cover plate (*Ref.No.26FZ/12320, port, or 12327, starboard*), over the aperture and secure it with the two ¼ in. B.S.F. mushroom-headed bolts (*Part No.AS.1248/4E*) in the forward position, two ¼ in. B.S.F. mushroom-headed bolts, (*Part No.AS.1248/6E*), immediately aft of these, and sixteen 5/16 in. B.S.F. 120 deg. countersunk bolts (*Part No.EEAS.1/5G*) in the remaining positions.

11. Installation of the pylon is a reversal of the removal procedure, but continuity and functioning tests must be made on the pylon upon completion.

TABLE 1
REMOVABLE EQUIPMENT : CHANGE OF ROLE

Location	Interdictor Role	Normal bombing	◀ S.W.S. ▶
Bomb bay	<p>Gun pack and superstructure (para.8 and Fig.3)</p> <p>(2) Flare carrier (Sect.7, Chap.1) or alternatively Mk.2 secondary bomb beam (A.P.1664A, Vol.1, Book 2, Sect.3, Chap.6)</p> <p>(3) Flare doors (Sect.3, Chap.1)</p>	<p>Forward and rear secondary bomb beams (A.P.1664A, Vol.1, Book 2, Sect.3, Chap.6).</p> <p>(2) Bomb doors (Sect.3, Chap.1)</p>	<p>(1) Special bomb beam</p> <p>(2) Bomb doors (Sect.3, Chap.1)</p> <p>(3) Deflector plate</p>

TABLE 1 - continued

Location	Interdictor Role	Normal bombing	◀ S.W.S. ▶
Main planes	(1) Mk.3 pylon bomb/rocket carriers (A.P.1664A (2nd Edn.) Vol.1, Book 1, Sect.1, Chap.18) wired for bombs or rockets according to operational requirements (2) G45B camera (starboard main-plane (Sect.5, Chap.2, Group A & B))	(1) Mk.1 pylon bomb carrier or alternatively Mk.3 pylon bomb/rocket carrier wired for bombs	(1) Wing pylon cover plates Ref.No.26FZ/12320, port, 26FZ/12327, starboard
Rear fuselage : between frames 27 and 29	F24 camera (if required) - (Sect.5, Chap.2, Group A & B)	F24 camera	
Upper equipment bay			(1) Fuze charge unit (2) Protective relay unit (3) Junction box A } if fitted
Air bomber's rear station		(1) 12/24 way distribution unit (2) Bomb control unit	(1) Control panel incorporating D.C.U.9A control unit (2) Practice bomb facility box
Air bomber's forward station		(1) Bombsight and computer	(1) F.95 camera (2) Decca roller map

Chapter 6

PROCEDURES FOLLOWING HAZARDOUS INCIDENTS

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<i>Hazardous incidents</i>	2
<i>Safety precautions</i>	3
<i>Servicing notes</i>	4
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	<i>Appendix</i>
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<i>Excess G</i>	2
<i>Flight turbulence</i>	3
<i>Lightning strikes</i>	4
◀ <i>Violent braking</i> ▶	5 ▶

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) A lightning strike
- ◀ (5) 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 upon the aircraft.
- (2) The N.C.O. immediately in charge of airframe servicing is the only person allowed to authorize the following:-
 - (a) Work by armament tradesmen on such equipment.

(b) Entry by any person into a cabin or compartment containing ejection seats, cartridge and detonator operated jettison equipment.

(c) The fitting, removal, or repositioning of any safety device.

(3) Upon completion of authorized servicing, all tradesmen concerned must report to the N.C.O. immediately in charge of airframe servicing.

(4) Before any servicing by any tradesman is commenced, the armament safety break must be disconnected.

(5) The bomb door operating switch lock

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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 categorized and repaired in accordance with A.P. 101B-0400-6.

(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) The 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 instructions are applied.

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

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

Definitions

5. The following definitions apply throughout this chapter:-

(1) DAMAGE - 'Examine for damage' means examination to ascertain that the value or usefulness of the item has not been impaired by:-

(a) Insecurity of attachments

(b) Cracks in, or fractures of, structure and components

(c) Corrosion or contamination

(d) Structure distortion or skin wrinkling

(e) Defective or missing rivets

(f) Chafing, scoring or fraying

(g) Broken locking devices

(2) REPLENISH - when applied to liquids in this chapter, incorporates the following operations where necessary:-

(a) Remove cap(s), or cover(s), from filler orifices and/or drains

(b) Clear orifices

(c) Fill container as directed in the particular operation

(d) Ensure drains are free from obstructions

(e) Ensure gasket(s), and cap(s) or cover(s) are free from damage

(f) Refit cap(s), or cover(s)

(g) Fit locking devices as necessary.

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◀ Appendix 1 HEAVY LANDINGS ▶

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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			
1	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
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 - indicate gland failure - renew strut	Sect.3, Chap.5 Sect.3, Chap.5 Sect.3, Chap.5
		Jack and trestle the aircraft. Support the rear fuselage with No.7 universal jacking trestle and former, at frame 42.	Sect.2, Chap.4		
3	MAIN UNDERCARRIAGE (a) Torque links	(i) Examine for damage (ii) Check clearance at centre pivot pin. Permissible clearance between 0.001 in. and 0.010 in.	Sect.2, Chap.2 1803P, Vol.1 Sect.6	(i) Renew torque links (ii) Clearance in excess of limit to be rectified by fitting new washer (Ref.No.26FZ/715) with the thickness adjusted to give a clearance of 0.001 in. to 0.004 in. Note... Serious deviation indicates torque link twisted - renew torque link	Sect.3, Chap.5
	(b) Torque links, side stay, and main attachment lugs (c) Side stays and stay links	(iii) Remove centre pivot pin and examine for bowing, cracks and shear	} Examine for damage } 1803P, Vol.2 Pt.3, Sect.6	Renew if necessary	Sect.3, Chap.5
	(d) 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			
	(e) Retraction jacks	(i) Examine attachment fitting for damage (ii) Examine rams for damage	1803P, Vol.2, Pt.3, Sect.6	Renew jacks	
	(f) 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.	Vol.6, Pt.1, Chap.3.		

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
		(iii) Examine bolts attaching top and bottom plates for shearing and signs of movement		Renew bolts	
		(iv) Examine all bracket-to-spar attachment bolts for shearing and signs of movement.		Renew bolts	
(g)	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	A.P.2337	(i) Fit serviced wheels and check tyre pressures. Secure valve caps	Vol.4, Part 2.
		(ii) Wheels for symmetry-spin; wheel casting on dummy axle		(ii) Renew wheel casting	
		(iii) Brake unit	A.P.2337	(iii) Fit serviced brake units	
		Note... Damage to wheel and brake unit is to be suspected if brake unit is difficult to remove from wheel.			
4	NOSE UNDERCARRIAGE				
(a)	Torque links	Examine for damage		} If defects exist, change complete strut.	Sect.3, Chap.5
(b)	Stay link attachment lugs	Examine for damage			
(c)	Main attachment lug	Examine for damage			
(d)	Retraction jack	(i) Examine attachment fittings for damage	1803E, Vol.2, Pt.3	(i) Renew jack	Sect.3, Chap.5
		(ii) Examine ram for damage		(ii) Renew jack	Sect.3, Chap.5
(e)	Shock-absorber strut attachment bracket	(i) Examine for damage	Vol.6, Pt.1, Chap.2		
		(ii) Examine structure in vicinity for damage			
(f)	Attachment bracket top securing bolts	(i) Examine for signs of shearing		(i) Renew as necessary	
		Note... Damage is more likely to occur to top bolts but, if damage is suspected, all four bolts must be removed for examination.			
	Note... The following two items are applicable if damage has been found elsewhere in nose undercarriage or surrounding structure.				
(g)	Main pivot bolt	Remove and examine for damage	1803E, Vol.2, Pt.3	Fit new bolt	Sect.3, Chap.5
(h)	Radius rod top and bottom attachment bolts	Remove and examine for damage		Fit new bolts	Sect.3, Chap.5
(i)	Radius rod stay link	Examine for damage		Fit new stay link	Sect.3, Chap.5
(k)	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

(Continued)

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ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
5	ALIGHTING GEAR FUNCTIONAL 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 (ii) Check cut-out valve operation (iii) Raise and lower the alighting gear five times, and ensure that mechanical up and down locks function correctly. (iv) Check operating times Pre. Mod. Post Mod. UP 12 sec. 14 sec. DOWN 14 sec. 8 sec. (v) Check warning device (vi) Examine fairings and doors for correct fitting. (vii) Operate undercarriage emergency control, then reset. (viii) Check UP and DOWN locks (ix) Fit undercarriage down locks (x) Prime and bleed the system	Leading Particulars Leading Particulars Sect.3, Chap.5 Sect.5, Chap.1 Sect.3, Chap.5 Sect.3, Chap.11 Sect.3, Chap.5 Sect.2, Chap.1 Sect.3, Chap.6		
		Lower the aircraft to the ground, and remove the jacks and trestle.			
6	MAIN PLANES	Remove the following access panels:- 1. Main spar attachment 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	Sect.2, Chap.4		
	(a) Main spar in vicinity of undercarriage 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.		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.	Sect.4, Chap.1
	(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.	Vol.6, Pt.1, Chap.3		
	(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.			

(Continued)

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ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
	(h) Leading edge diaphragm	Examine for damage			
	(j) 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	Vol.6, Pt.1, Chap.3		
7	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 inch 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:- (i) Vertical beam carrying radius rod rear attachments (ii) Rear bulkhead (iii) Side walls (iv) Roof (v) Horizontal beam on roof	Examine for damage	Vol.6		
	(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	Pre Fire Extinguisher Mod.3 - White indicator turns RED Post Mod. - discharge indicated by plunger protruding through cap.	

continued...

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ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
8	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		
◀ 9	SERVICING INSTRUCTIONS				
	(a) Main undercarriage side stay	Examine lugs for damage	101B-0406-5A3, S.P. 436 (S.I./Canberra/49B)		
	(b) Rear engine-mounting struture	Examine Z-section extrusion for damage	101B-0406-5A3, S.P. 445 (S.I./Canberra/71C)		
	(c) Main undercarriage oleo head	Examine apex of bore for damage	101B-0406-5A3, S.P. 601 (S.I./Canberra/85B)		
	(d) Main undercarriage oleo head	Examine main pivot housing for damage	101B-0406-5A3, S.P. 602 (S.I./Canberra/86B)		
	(e) Main undercarriage torque links	Examine attachment lugs for damage	101B-0406-5A3, S.P. 603 (S.I./Canberra/87C)		
	(f) Centre section forging	Examine for damage	101B-0406-5A3, S.P. 604 (S.I./Canberra/94)		
	(g) Centre section forging	Examine for damage	101B-0406-5A3, S.P. 456 (S.I./Canberra/99A)		
	(h) Engine forward mounting assemblies	Examine for damage	101B-0406-5A3, S.P. 461 (S.I./Canberra/104B)		
	(j) Main undercarriage attachment	Examine lower plate for damage	S.I./Canberra/103A	} NOTE ... These S.I.'s are not as yet issued as S.P.'s. ▶	
	(k) Centre section forging	Examine for damage	S.I./Canberra/105A		
	(l) Centre section forging	Examine for damage	S.I./Canberra/107		
	(m) Centre section forging	Examine for damage	S.I./Canberra/108		
	(n) Engine ribs and associated structure	Examine for damage	S.I./Canberra/116		

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) All starter cartridges are to be removed before commencing servicing.
- (2) Before any servicing on the high energy igniter plugs or the H.T. wiring is commenced, the low tension supply cable to the input plug must be disconnected by an electrical tradesman, and a period of one minute allowed to elapse. This allows dissipation of stored capacitor energy, and prevents inadvertent discharge.
- (3) The high-energy unit is not to be operated with the H.T. lead disconnected.
- (4) The battery isolation switch must be set to OFF, and any external electrical supply disconnected, before loading the starter breech.
- (5) When the turbo-combustion starter is cold (at normal air temperature), three cartridges may be fired at 30 sec intervals. If a cartridge fails to fire, wait 30 sec before trying the next cartridge, or making an investigation. After firing three cartridges in quick succession, a period of 10 minutes must elapse before reloading with a further three cartridges. If these cartridges are fired immediately, a period of 20 minutes must elapse before further reloading.
- (6) 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.
- (7) 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	Sect.4, Chap.1 Vol.6, Pt.1, Chap.3	Renew if necessary	
	(b) Forward outboard mounting support diaphragm brackets	(iii) Examine bolts for damage Examine for cracks with the aid of torch probe and mirror attachment through the forward lightning 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, Chap.3	Renew if necessary	
	(d) Rear mounting brackets	Examine for damage		Renew if necessary	
	If engine damage is suspected, refer to A.P.4321G, J, L, N, U and V, 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.				

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, Vol.1	If found, neutralise 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 micro switches	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)

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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 Breeze plug connections, both internal and external electrical supplies must be disconnected. Electrical supplies must not be re-connected until Breeze plugs have been refitted.
- (3) All electrical circuits affected by the disconnection of Breeze plugs are to be functionally tested after Breeze plugs have been refitted.
- (4) I.F.F. Mk.10 servicing must not be carried out with destructors fitted.

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
		Examine the bonding of all components for serviceability and good connection during the course of this servicing			
1	AIRCRAFT generally			Rectify any defects already reported	
2	Type 1 radar head	Examine for damage	2891H	Renew as necessary	
3	UPPER EQUIPMENT HATCH				
	(a) TR.3624 (if fitted)	} Examine for damage	2914Y	} Renew items as necessary	
	(b) Type 76 waveform generator		2891H		
	(c) Mountings and trays		2891H		
4	PILOT'S STATION, NAVIGATOR'S STATION AND NOSE COMPARTMENT				
	(a) C.U.611	} Examine for damage	2891H	} Renew items as necessary	
	(b) Type 27 indicator		2891H		
	(c) Mountings and trays				
5	REAR FUSELAGE				
	(a) TR.4585	} Examine for damage	2887N	} Renew items as necessary	
	(b) Type 6850 aerial switch unit		2887N		
	(c) Mountings and trays				
6	NAVIGATOR'S AND AIR BOMBER'S COMPARTMENTS				
	(a) C.U.927	} Examine for damage	2887N	} Renew items as necessary	
	(b) Type 166A indicator		2557G		
	(c) Receiver 3582A		2557G		
	(d) Type 6337 RF unit		2557G		

(continued)

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ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
	(e) Type 61A strobe units	} Examine for damage	2557G	} Renew items as necessary	
	(f) Type 114 drive unit		2557G		
	(g) Type 1629A		2557G		
	(h) C.U.426		2557G		
	(j) JB.255		2557G		
	(k) JB.266		2557G		
	(l) C.U.522		2557G		
	(m) Type 190 filter unit		2557G		
	(n) C.U.526 (if fitted)		2974Y		
	(o) Type 208 indicator (if fitted)		2914Y		
	(p) JB.4816		2557G		
	(q) JB.4817		2557G		
	(r) Mountings and trays				
7	Gee H installation		2557G		
8	Rebecca Mk.4 installation	Carry out functional test	2914Y		
9	Orange Putter installation		2891E		
10	I.F.F.Mk.10 installation		2887N		
11	I.F.F. Aerials	Examine for damage	2887N	Renew as necessary	

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 WIRELESS INSTALLATIONS

(This table details the examination and checks to be made to the wireless 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 Breeze plug connections, both internal and external electrical power supplies must be disconnected. Electrical power supplies must not be re-connected until Breeze plugs have been refitted.
- (3) All electrical circuits affected by the disconnection of Breeze plug connections are to be functionally tested after Breeze plugs have been refitted.

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
		<p>Note (1) The bonding of all components is to be examined for serviceability and good connections.</p> <p>(2) The sealed pre-set controls (DEFL. SENS and SET ZERO) both located on the R.1964 front panel must NOT be adjusted whilst I.L.S. equipment is installed in the aircraft.</p> <p>(3) Aircraft must be at least 200 ft. away from any building, power lines etc. before carrying out any functional tests on the radio compass installation</p> <p>(4) The gear trains on the loop base must NOT be dismantled or replaced.</p> <p>(5) Trimmer or coil slugs on loop amplifier must NOT be adjusted.</p>			
1	AIRCRAFT generally			Rectify any defects already reported	
2	COCKPIT				
	(a) Type 382 control units	} Examine for damage	2538HA	} Renew items as necessary	
	(b) C.U.705 (if fitted)		2534E		
	(c) Type 7 indicator		2534E		
	(d) A.Y.F. altitude indicator		2533C		
	(e) Type 1630 indicator		2883KD		
	(f) Mounting and trays				
3	AIR BOMBER'S COMPARTMENT				
	(a) A.1961	} Examine for damage	} 2876E	} Renew as necessary	
	(b) I/C relay panel				
	(c) JB.154		} 2534E	} Renew as necessary	
	(d) Mountings and trays				
4	NAVIGATOR'S COMPARTMENT				
	(a) C.U.1342 or 1347	} Examine for damage	2883KD	} Renew item as necessary	
	(b) C.U.1274		2883KD		
	(c) Type 1630 indicator		2883KD		
	(d) Mountings and trays				
5	UPPER EQUIPMENT COMPARTMENT				
	(a) R.1964 (if fitted)	} Examine for damage	2534E	} Renew items as necessary	
	(b) R.1965 (if fitted)		2534E		
	(c) V.R.60 (if fitted)		2534E		

(continued)

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ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
	(d) JB.1629 (if fitted)	} Examine for damage	2883KD	} Renew items as necessary	
	(e) Type 1555A voltage regulator		2883KD		
	(f) Type 1571 power factor transformer		2883KD	} Repair or replace	
	(g) Type 1342 loop aerial		2883KD		
	(h) Mountings and trays				
6	STARBOARD WHEEL WELL				
	(a) Receiver AD.7092D	} Examine for damage	2883KD	} Renew items as necessary	
	(b) Type 1343 aerial transformer		2883KD		
7	REAR COMPARTMENT AND BOMB BAY				
	(a) RT-7/APN-1	} Examine for damage	2533C	} Renew items as necessary	
	(b) Type 1628 sense amplifier		2883KD		
	(c) Mountings and trays			} Repair or replace	
	(d) Sense aerial		2883KD		
8	V.H.F. COMPARTMENT				
	(a) TR.1985	} Examine for damage	2538H A	} Renew items as necessary	
	(b) TR.1986		2538H A		
	(c) V.H.F. relay panel		2538H A		
	(d) Type 27 noise modulator				
	(e) Mountings and trays				
9	A.Y.F. Aerial	Examine for damage	2533C	Repair or replace as necessary	
10	V.H.F. whip aerial	Examine for damage	2538HA	Repair or replace as necessary	
11	(a) I/C installation	} Carry out a functional test	2876E		
	(b) Oxygen audio warning system				
	(c) V.H.F. installation		2538HA		
	(d) Noise modulator				
	(e) I.L.S. installation		2534E		
	(f) Radio compass installation		2833KD		
	(g) A.Y.F. installation		2533C		

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

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APPENDIX 2 EXCESS G
(completely revised)

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TABLE

	<i>Table</i>
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General information

Check aircraft for damage whenever 5.0 'g' has been reached or exceeded. The indication that an aircraft has exceeded the maximum permissible 'g' loading is normally obtained from the fatigue meter. On certain aircraft fitted with Mk.3 or Mk.13 fatigue meters a figure lower than 5.0 'g' may apply (*see below*). When an increase in the reading of the highest counter of the meter is recorded beyond the stated limit, an excess 'g' check is required. Dependent on the type of fatigue meter fitted the limits are:

- 5.1 'g' with the Mk.16 fatigue meter
- 4.5 'g' with the Mk.13 fatigue meter
- 4.0 'g' with the Mk.3 fatigue meter

In the case of the Mk.3 and Mk.13 fatigue meters, due to the instrument limitations, these lower figures have to be applied unless a pilot's accelerometer is fitted to the aircraft. Excess 'g' checks on these aircraft are necessary only when the pilot's accelerometer readings of 5.0 'g' and above are recorded, notwithstanding the flight 'g' limitations in Pilot's Notes.

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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
		Carry out rigging checks. Correct rigging dimensions cannot be assumed to indicate that no defects exist.		
1	MAIN PLANES			
	(a) Outboard wing.	Inspect the outboard wing upper surface aft of the main spar, just outboard and inboard of rib 4 (inboard aileron hinge location) for skin buckling and rib distortion	Vol.6, Pt.1, Chap.3	Repair as necessary
	(b) Forward wing pick-up bracket (frame 17)	On aircraft pre Mod.3156, examine the forward wing pick-up bracket at frame 17 for stretching of the lower attachment bolts and for lifting off from the fuselage contour		Embody Mod.3156
	(c) Leading edge	Examine the corners of the air intake slots on the wing leading edge for distortions or cracking	Vol.6, Pt.1, Chap.3	Repair or renew as necessary.
	(d) Outboard engine rib/main spar attachment	On aircraft pre Mod.1993 or 2545, remove the engine aft lower cowl and examine the cleats (Pt.No.EA3.20.223), securing the forward outboard engine rib at its lower attachment point to the main spar, for cracks as described in S.I./Can/55.		Renew cleats and embody Mod.2545
2	SERVICES			
	(a) Wing root services	Examine all wing root services i.e. Fuel, cabin air, hydraulics, engine controls, Generator controls, for looseness of joints and chafing.	Vol.6, Pt.1, Chap.7. Sect.4, Chap.1. Sect.5, Chap.1.	Repair or renew as necessary.
3	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
		Examine floor girder 18, in the bomb bay at the forward door hinge point, for any distortion or buckling.	Vol.6, Pt.1, Chap.2	Repair or renew as necessary

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ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
4	SERVICING INSTRUCTIONS			
	(a) Rear engine-mounting structure	Examine Z-section extrusion for damage	101B-0406-5A3, S.P. 445 (S.I./Canberra/71C)	
	(b) Outer wing trailing-edge rib 8	Examine upper and lower booms for damage	101B-0406-5A3, S.P. 446 (S.I./Canberra/74)	
	(c) Inner wing leading edge	Examine attachment cleats for damage	101B-0406-5A3, S.P. 449 (S.I./Canberra/77C)	
	(d) Fin stub angles at frame 42	Examine for damage	101B-0406-5A3, S.P. 452 (S.I./Canberra/80B)	
	(e) Inner wing main-spar shear web	Examine attachment bracket for damage	101B-0406-5A3, S.P. 453 (S.I./Canberra/82B)	
	(f) Centre section forging	Examine for damage	101B-0406-5A3, S.P. 604 (S.I./Canberra/94)	
	(g) Centre section forging	Examine for damage	101B-0406-5A3, S.P. 456 (S.I./Canberra/99A)	
	(h) Engine forward mounting assemblies	Examine for damage	101B-0406-5A3, S.P. 461 (S.I./Canberra/104B)	
	(j) Wing-tip fuel tanks explosive bolts	Examine for damage	S.I./Canberra/98A	} NOTE ... These S.I.'s are not yet issued as S.P.'s
	(k) Centre section forging	Examine for damage	S.I./Canberra/105A	
	(l) Centre section forging	Examine for damage	S.I./Canberra/107	
	(m) Centre section forging	Examine for damage	S.I./Canberra/108	
	(n) Inner wing main-spar shear web	Examine attachment brackets for damage	S.I./Canberra/112B	
	(p) Engine ribs and associated	Examine for damage	S.I./Canberra/116	

◀ Appendix 3 FLIGHT TURBULENCE

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Table

Airframe 1

TABLE 1 AIRFRAME

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

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
1	AIRCRAFT generally			Rectify any defects already reported.
2	MAIN PLANES			
	(a) Access panels	Remove the inner and outer panels from the upper surface, inner main plane.	Chap.4.	
	(b) Inner wing diaphragm	Examine, particularly for cracks, in area adjacent to main plane forward attachment point at fuselage frame 17 and in areas where pipes pass through the diaphragm.	101B-0400-6, Part 2, Leaflet C3/17.	Repair as necessary.
	(c) Access panels.	Refit.		

APPENDIX 4 LIGHTNING STRIKES

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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.

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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.

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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	External stores and pylons	(1) Ensure that armament is rendered safe and examine for damage. (2) Check the integrity of the circuits and operating system.	2852B, Vol.1. Sect.5, Chap.1, Group A & B.	
10	Ailerons	(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.	101B-0400-6, Pt.1, Chap.3. Sect.3, Chap.4.	Repair or renew as necessary.
11	Aileron tabs	(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.	101B-0400-6, Pt.1, Chap.3. Sect.3, Chap.4.	Repair or renew as necessary.
12	Flaps	(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.	101B-0400-6, Pt.1, Chap.3. Sect.3, Chap.4.	Repair or renew as necessary.
13	Air brake assemblies	(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.	Sect.3, Chap.2. Sect.3, Chap.4.	Renew as necessary.

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

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
14	(a) Main-wheel units (b) Nose-wheel unit	If extended at time of incident:— Examine, paying particular attention to the lower parts of the shock-absorber struts and wheels.	2337, Vol.1 and 1803E, Vol.1.	Renew as necessary.
15	Aircraft generally	If any aerials (or other protuberances) have broken away during incident, examine for incidental damage.		Renew aerials and repair damage as necessary.
16	ELECTRICAL (a) External lighting (b) Cockpit lighting	Operate, and check for correct functioning.	Sect.5, Chap.1, Group L.	
17	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.
18	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.			
19	Aerials	Examine.	Sect.6, Chap.2.	Renew as necessary.
20	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.
21	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.
22	All connectors	Reconnect.		
23	Installation	Operate, and check for correct functioning.	Sect.6, Chap.2.	

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

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
24	RADIO Aerials	Examine.	Sect.6, Chap.1.	Renew as necessary.
25	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.
26	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.
27	All connectors	Reconnect.		
28	Installation	Operate and, using test equipment, check for correct functioning.	Sect.6, Chap.1.	

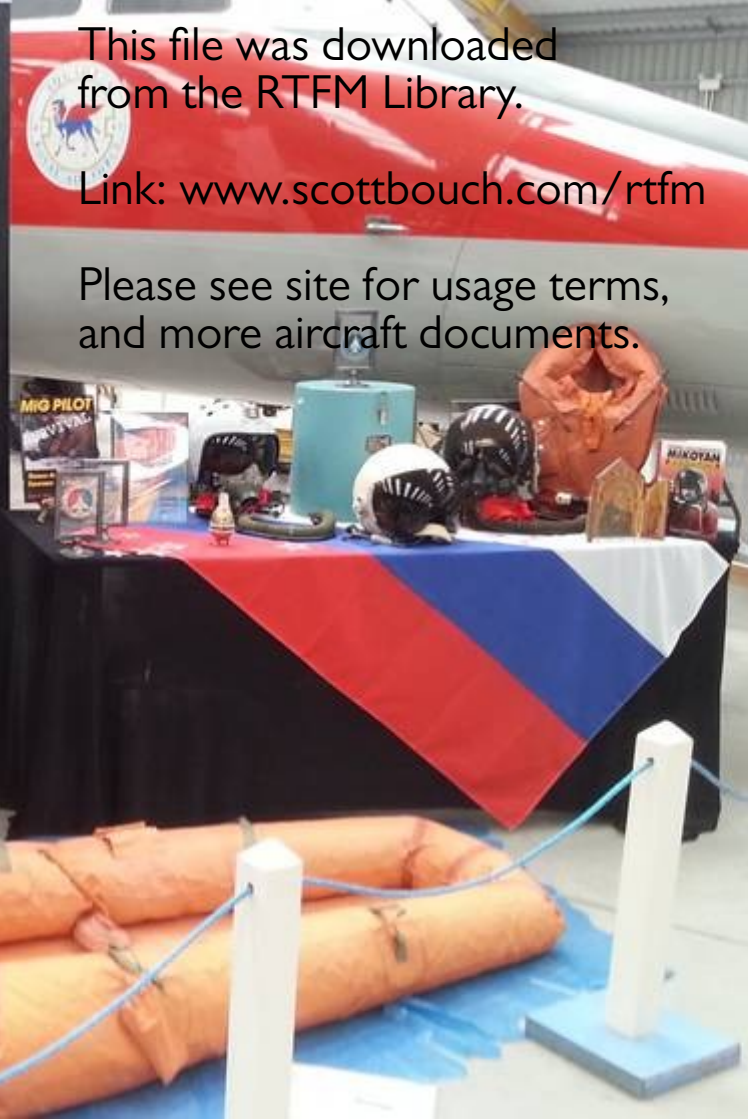
Appendix 5 VIOLENT BRAKING

LIST OF CONTENTS

	<i>Para.</i>
<i>General information</i>	<i>1</i>

◀ **General information**

1. Following an emergency stop, violent braking, or overheating, the wheels, tyres and brakes must be removed and undergo full Bay Servicing. ▶



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