

SECTION 2

**GROUND HANDLING AND
PREPARATION FOR FLIGHT**

LIST OF CHAPTERS OVERLEAF

RESTRICTED

SECTION 2

**GROUND HANDLING AND
PREPARATION FOR FLIGHT**

LIST OF CHAPTERS

Note:- *A list of contents appears at the beginning of each chapter.*

- Chapter 1 – Ground handling
- Chapter 2 – Preparation for flight
- ◀ Chapter 3 – Loading and C.G. data (pre Mod.5466)
- Chapter 3A – Loading and C.G. data (post Mod.5466 to be issued) ▶
- Chapter 3B – Fatigue index data
- Chapter 4 – General servicing
- Chapter 4A – External finish and markings
- Chapter 5 – *(Not applicable to this aircraft)*
- Chapter 6 – Procedures following hazardous incidents.

Chapter 1 GROUND HANDLING

(completely revised)

LIST OF CONTENTS

	Para.		Para.
<i>Introduction</i>	1	<i>Elevator</i>	11
<i>Armament safety plug break</i>	2	<i>Air-intake shutters (pack bay)</i>	12
<i>Towing</i>	3	<i>Covers</i>	13
<i>Picketing</i>	4	<i>External intercomm. socket</i>	14
<i>Alighting gear safety devices</i>			
<i>Ground safety locks</i>	6	<i>Crashed aircraft</i>	
<i>Master safety switch</i>	7	<i>Entry into aircraft</i>	15
<i>Control surface locking</i>		<i>Lifting and removal</i>	16
<i>Flaps</i>	8	<i>Lifting the aircraft</i>	17
<i>Ailerons</i>	9	<i>Emergency removal</i>	18
<i>Rudder</i>	10	<i>High wind exposure. Checking procedure</i>	19

LIST OF ILLUSTRATIONS

	Fig.
<i>Towing equipment</i>	1
<i>Picketing points</i>	2
<i>Ground safety locks</i>	3
<i>Control surface – external locks</i>	4
<i>Aircraft covers, plugs and bungs</i>	5
<i>Lifting a crashed aircraft</i>	6
<i>Emergency towing equipment</i>	7

UK RESTRICTED

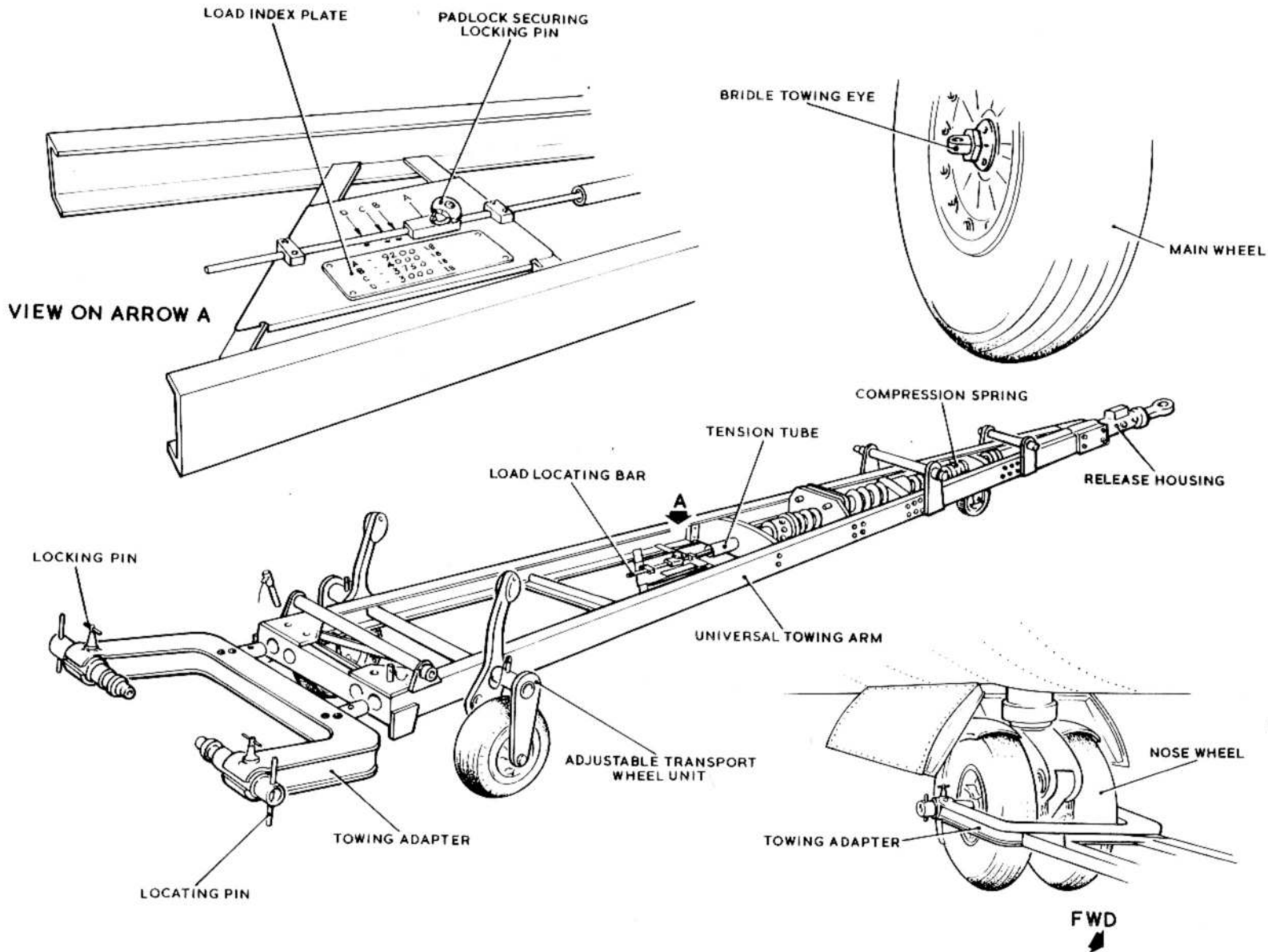


FIG. I. TOWING EQUIPMENT

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. 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

2. The plug break is located behind the armament safety break panel (*Chap.4, fig.5*) situated aft of the starboard equipment bay door. The plug must be removed from its mating socket as soon as practicable after the aircraft has landed and not refitted until just prior to take off, except when it is required to test the system. When removed, the plug must be stowed in the canvas bag, to which it is attached, and the bag and its red pennant left hanging from the panel aperture as evidence that the armament circuits are broken.

Towing (fig.1)

3. Normal towing is from the nose-wheel axle, the towing gear consisting of a towing arm (*Chap.4, Table 2*) adapted to suit the axle by fitting an adapter (*Chap.4, Table 1*). 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.119K-0704-15F6A (towing arm) and A.P.119K-0710-15F (towing bridle). The aircraft may, if necessary, be towed either forward or backward from the main wheel axles by attaching a 50 ft towing bridle to the towing eyes on the axles; when towing from the main wheels the aircraft is steered with a steering arm attached to the nose-wheel axle. During all towing operations, the cockpit must be occupied by a tradesman qualified to operate the brakes as necessary.

Note . . .

1. The wheel brake system hydraulic pressure must not be permitted to fall below 2200 lbf in² during aircraft towing.

2. Turbo alternator access panels must be fitted in position before any movement of the aircraft in the open. It is only permissible to move the aircraft within the confines of a hangar without the panels being fitted.

Picketing (fig.2)

4. The aircraft must, where possible, be picketed facing into wind. The nose is to be picketed using 12mm dia. Polypropylene 'Nelson' rope of suitable length. Ref. No.32A/5256204. Chocks must be positioned fore- and-aft of each wheel securely chained and tensioned at all times until the aircraft is being prepared for flight, the aircrew have entered and effective wheel braking has been applied. The following additional safety precautions must be observed.

- (1) For wind speeds greater than 25 knots:—
 - (a) Fit the rudder lock (*para.9*).
 - (b) Fit the elevator lock (*para.10*).
- (2) For wind speeds greater than 35 knots additionally:—
 - (a) Fit the aileron locks (*para.8*).
 - (b) If the aircraft is more than 10 deg out of alignment nose into wind, fit the nose picket.
- (3) Wind speeds between 50 knots and 80 knots additionally:—
 - (a) Fit nose-wheel picket.
 - (b) Fit main-wheel pickets.
 - (c) Fit the secondary pickets.

CAUTION

Design requirements do not cater for the aircraft structure to be capable of withstanding loads from picketing at wind speeds in excess of 80 knots.

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

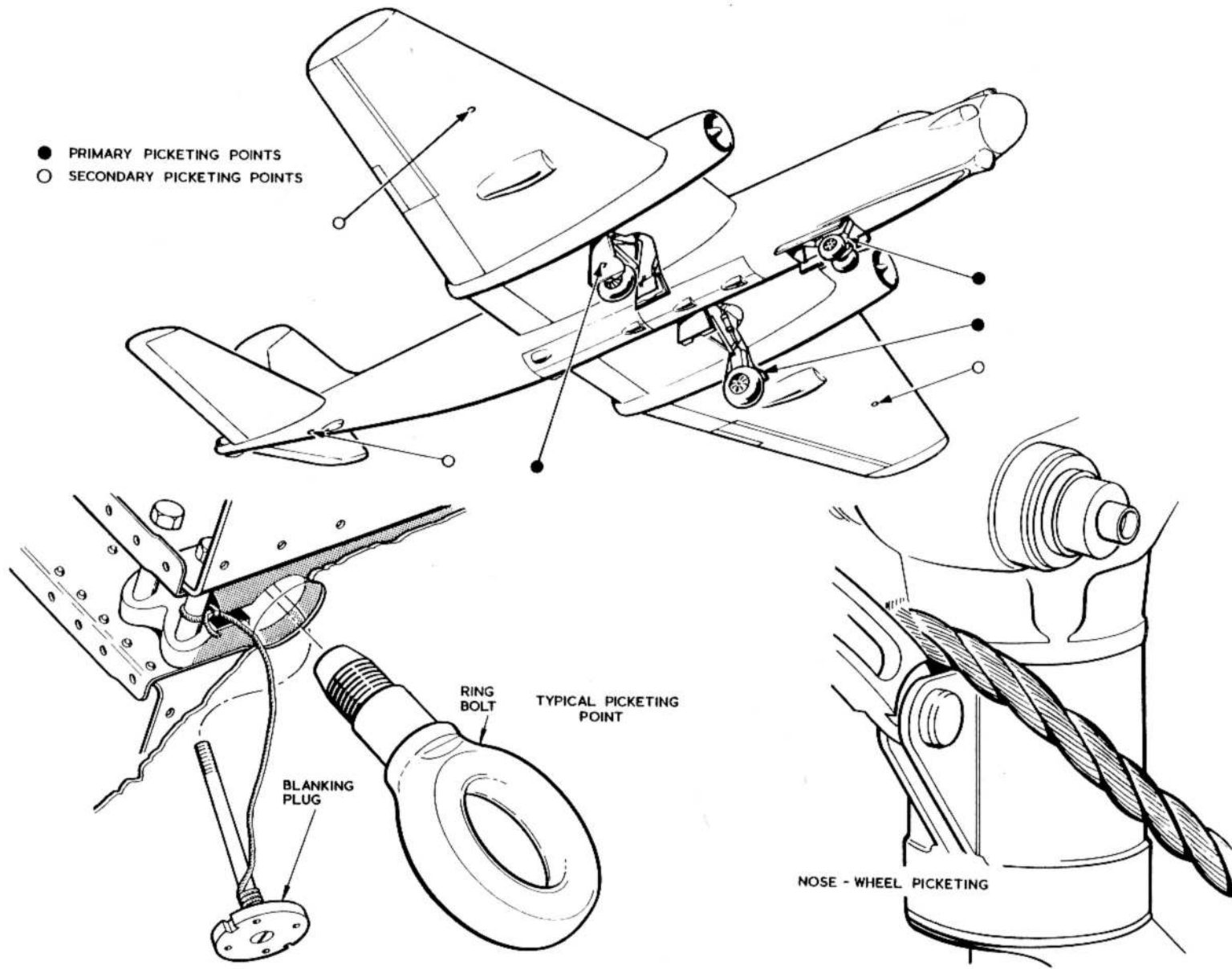
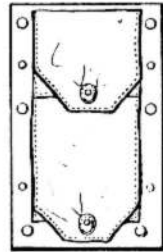
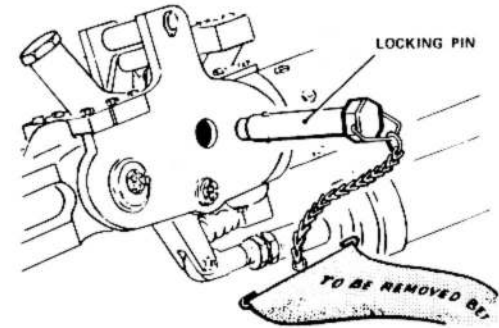


FIG. 2. PICKETING POINTS

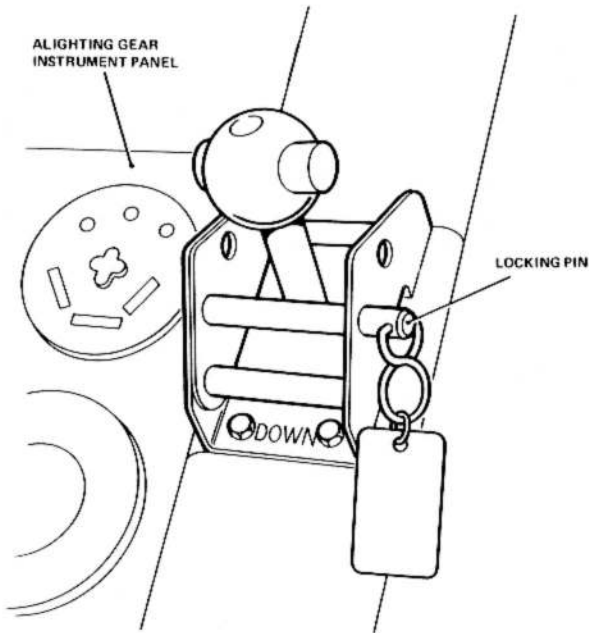
UK RESTRICTED



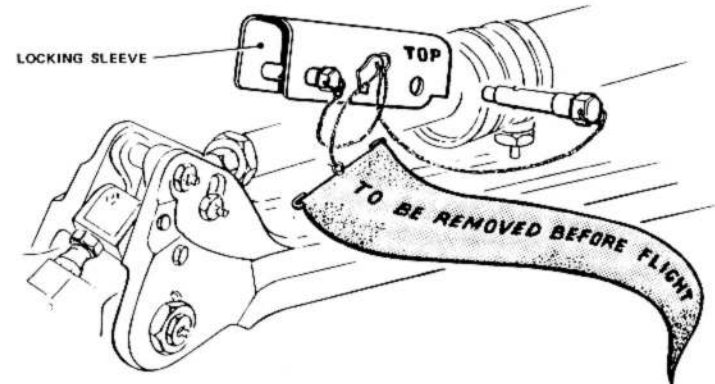
STOWAGE BAG ON INNER FACE OF ENTRANCE DOOR FOR FLAPS SWITCH LOCKING PIN AND AIRCRAFT DOOR KEY



NOSE UNDERCARRIAGE LOCKING



FLAPS SELECTOR SWITCH LOCKING



MAIN UNDERCARRIAGE LOCKING

FIG. 3. GROUND SAFETY LOCKS

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 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

Ground safety locks (fig.3)

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 main undercarriage locks comprise 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.

Note . . .

Alighting gear and control surface safety devices are stowed in a stowage located on the inside of the battery compartment hatch (SEM/CAN/0136/STC).

Master safety switch

7. A guarded two-position switch, marked LIVE and SAFE, is fitted adjacent to the alighting gear selector switches. When at SAFE, 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 locking

Flaps

8. The flaps are locked in the UP position by a quick-release pin (fig.3) which is inserted in the side plates of the switch lever in the cockpit; when not in use, the pin is stowed on the inner face of the entrance door.

Ailerons (fig.4)

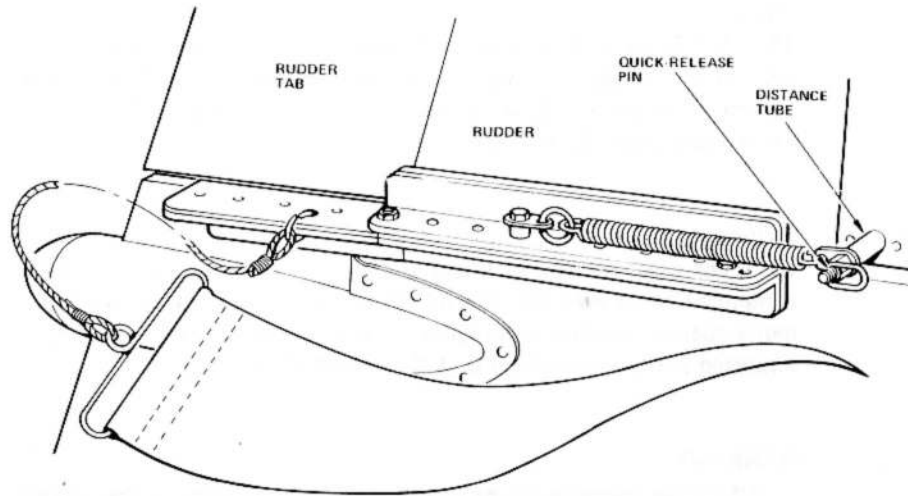
9. After ensuring that the flaps are fully up, move the aileron until it is level with the flap and insert the web of the lock, wide end foremost and the securing strap at the bottom, between the aileron and the flap. Push the lock forward until its upper and lower flanges bear on the aileron and the 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.

CAUTION

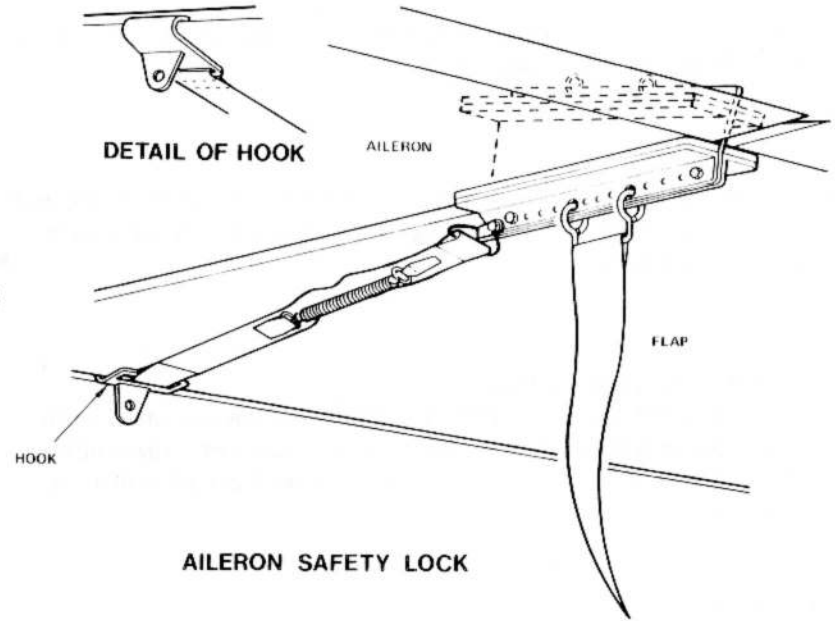
The lower flange of the aileron lock fouls the flap, therefore on no account must the flaps be lowered whilst the locks are in position. The flap switch lock must always be in position when the aileron locks are fitted.

Rudder (fig.4)

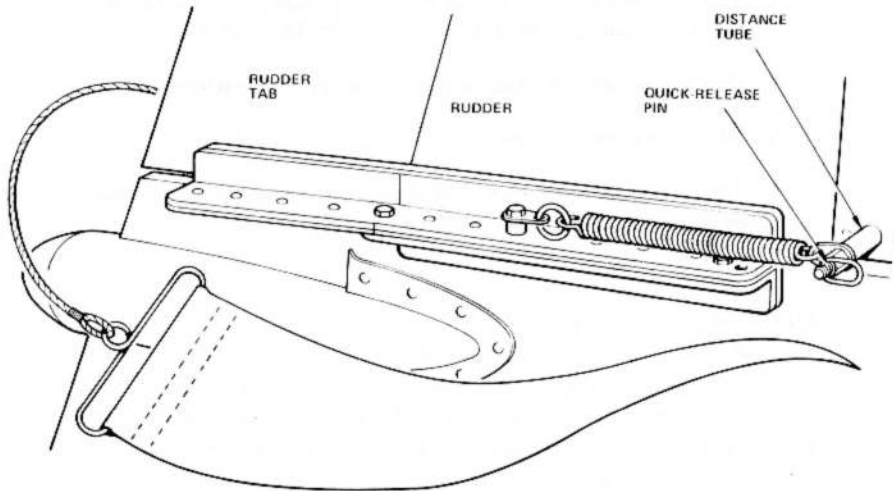
10. The rudder lock has engraved on its web, in white, the annotations THIS SIDE UP FOR PARKING and THIS SIDE UP FOR TAXYING ONLY. During parking both the rudder and the rudder tab are locked but during taxiing only the rudder is locked, thus, with the tab free, differential braking is obtainable; for either requirement the fitting procedure is the same. Before fitting the lock, ensure that both quick-release pins on the ends of the extension springs are secure in the PIN stowage at the wide end of the lock. Centralize the rudder and insert the web of the lock, wide end foremost, 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 stub, remove the starboard



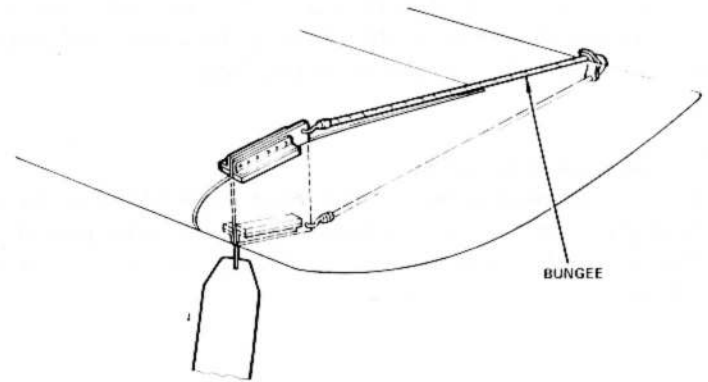
RUDDER SAFETY LOCK - TAXYING



AILERON SAFETY LOCK



RUDDER SAFETY LOCK - PARKING



ELEVATOR SAFETY LOCK

FIG.4 CONTROL SURFACE - EXTERNAL LOCKS

◀ UFR/C/297 embodied ▶

quick-release pin from the PIN STOWAGE and insert it into the hole in the starboard side of the rudder.

Elevator (fig.4)

- ◀ 11. Set the elevator to neutral and insert the lock between the elevator horn and the tailplane at the leading edge and secure with the bungee around the elevator. ▶

Air-intake shutters (pack bay)

12. The shutters are to be kept closed whenever the aircraft is on the ground except when ground testing the pack equipment. The shutters OPEN-CLOSED selector switch is situated on the starboard wall at the A.E.O. station.

Covers (fig.5)

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 intercomm. socket

14. An intercomm. socket, located on the inboard wall of the starboard alighting gear bay, provides a means of contact between ground crew and cabin personnel. The system is controlled by a switch on the pilot's radio panel.

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 seat 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 hoses inserted through the filler cap orifices.

Lifting the aircraft (fig.6)

17. Should it be possible to lift the aircraft by cranes or gantries, the following methods may be adopted. A complete set of slings (*Chap.4, Table 1*) is capable of lifting an aircraft at its maximum all up weight. If, owing to crane limitations, this weight is beyond the combined capacity of the cranes available, the weight of the aircraft must be reduced accordingly.

- (1) Remove the top cowling, service panel, and bottom cowling from each engine.
- (2) Open the main spar jacking point access panel and remove the detachable panel immediately aft of this point.

UK RESTRICTED

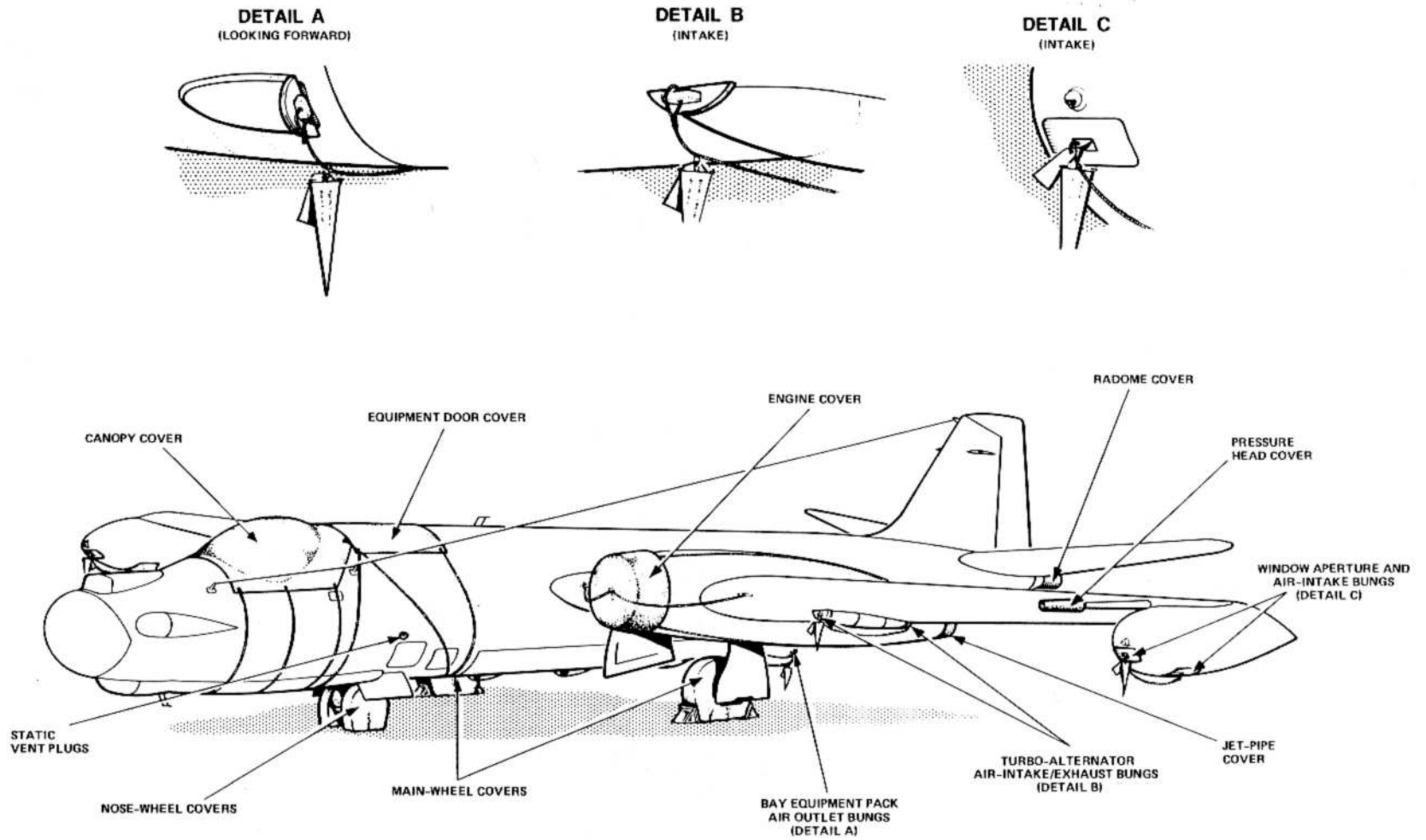


FIG. 5. AIRCRAFT COVERS, PLUGS AND BUNGS

UK RESTRICTED

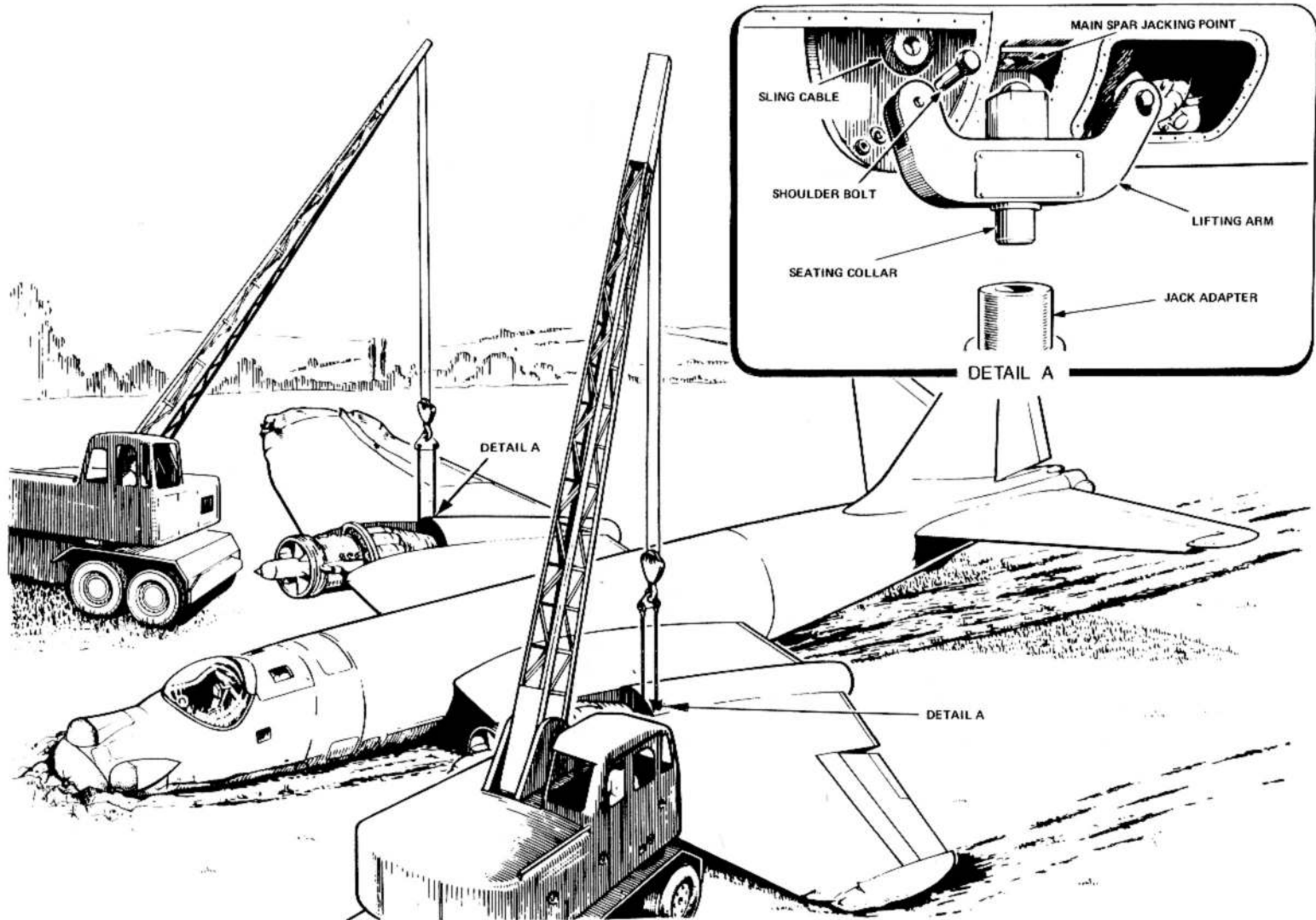


FIG. 6. LIFTING A CRASHED AIRCRAFT

- (3) Cut through the top jet pipe cowl on the outboard side aft of the main spar to provide access for the sling cable.
- (4) Position the cranes at each outer wing leading edge immediately outboard of the 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 each side of the engine firewall until the cable ends protrude beneath the engine cowlings.
- (7) Attach the lifting arms to the cables (*detail A*) with 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.
- (8) Raise the aircraft and position a 10-ton hydraulic jack and Mk.1 trestle (*Chap.4, Table 2*), suitably supported on a firm foundation, with a Mk.48 adapter head (*Chap.4, Table 2*) 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.

Emergency removal

18. One method of removing crashed aircraft from runways is as follows:—

- (1) *Equipment required (fig.7)*
 - (a) Two locally manufactured crow bars. Make from steel bar, $1\frac{1}{2}$ in. dia. Ref. No.30A/9610622.
 - (b) Four locally manufactured stop plates. Make from 6 s.w.g. steel sheet Ref. No.30A/9610795.
 - (c) Four quick-release pins Ref. No.27FT/1200982.

- (d) Two soft towing bridles (Ref. No.4GB/4409987) fitted with one $\frac{3}{4}$ in. shackle (Ref. No.28Y/1057116) and shackle pin (Ref. No.28Y/9508299) on each end.
- (e) Sledge hammer Ref. No.1B/9104699.
- (f) Suitable towing/winch vehicles.

(2) *Preparation (fig.7)*

- (a) Place the point of a crow bar on the inboard front corner of the main spar access panel and, using a sledge hammer, drive the crow bar through the top panel.
- (b) When the crow 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 quick-release pin.
- (c) Locate the point of the bridle attachment bar on the inner surface of the lower access panel and force the bar through the main plane until the upper quick-release pin prevents further penetration.
- (d) Thread the other shackle end of the towing bridle, and the stop plate over the protruding lower end of the crow bar, and secure with a quick-release pin.
- (e) Repeat this operation on the opposite main plane.

(3) *Removal*

- (a) Connect the towing bridles to a suitable vehicle and tow/winch clear.

CAUTION

To minimise the risk of damage to flying controls caused by high winds, control locks must be fitted whenever the aircraft is parked in the open.

Note . . .

Control locks may not necessarily prevent high winds from damaging the control systems and surfaces.

High Wind Exposure. Checking procedure

19. Aircraft which have been exposed to wind speeds in excess of 25 knots must be examined before the next flight in accordance with the following procedure.

- (1) Examine all control locks. Ensure they are still correctly fitted and the controls still correctly locked.
- (2) Remove the locks. Examine the locks for signs of strain or damage.

Any defects found during the checks (1) or (2) will render the aircraft unserviceable. Continue to check the relevant control systems as follows.

- (3) Ensure free operation of the controls over the full range of movement.
- (4) Examine the control surfaces primary limit stops and their attachment brackets. Ensure there are no fractures, distortion or signs of strain.

Any defects found during checks (3) or (4) will require a detailed investigation of the flying control systems. Continue to check the relevant control systems as follows.

20. Commence in the cockpit. Examine the control column and rudder pedals. Then work outward along the main planes and rearward along the fuselage, carefully examining the following points of the flying controls system.

- (1) Pivot pins and fulcrum bolts. Check for excessive wear, distortion and signs of stress.
- (2) Rivets and bolts securing brackets and fairleads. Check for looseness, distortion and signs of shear.
- (3) Secondary limit stops and their attachment brackets. Check for fractures, distortion and signs of strain.
- (4) Control rods. Check for fractures, distortion and signs of strain.
- (5) Control surface fairings. Check for damage resulting from harsh or excessive movements.
- (6) Control surfaces. Examine. Especially in the vicinity of the hinge brackets. Check for damage and distortion.
- (7) Controls actuating arms and levers. Check for fractures, rivet failure and signs of distortion.

UK RESTRICTED

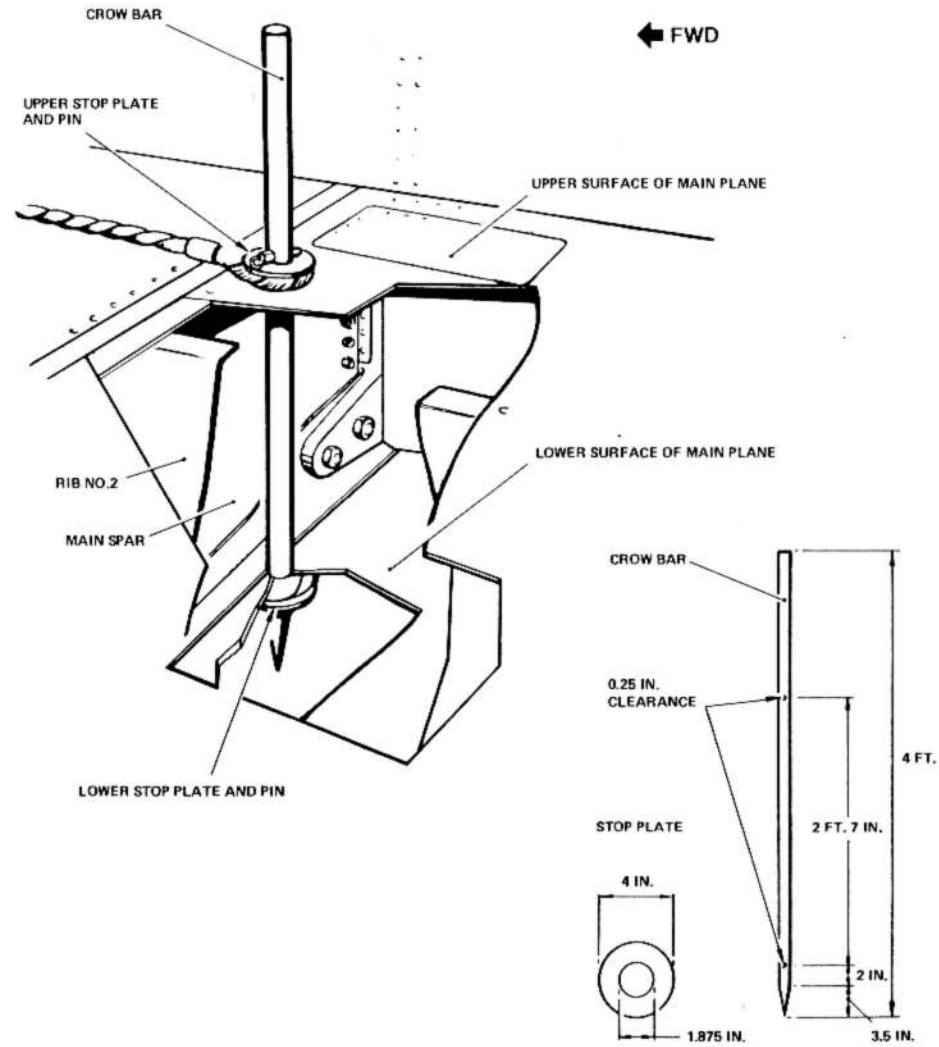


Fig.7. EMERGENCY TOWING EQUIPMENT

Chapter 2 PREPARATION FOR FLIGHT

(Completely revised)

LIST OF CONTENTS

	Para.		Para.
Introduction	1	Checking the pack-bay fire extinguisher contents	14
Refuelling/defuelling precautions	2	Coolanol liquid coolant level check (post Mod.5466)	15
Checking the tank contents	3	Battery isolating switch	16
Checking the accessory gearbox oil level	4	External electrical supply sockets	17
Refilling the oil sumps	5	Canopy de-misting	18
Checking the cold-air unit oil level	6	Alighting-gear inflation	19
Topping-up the hydraulic fluid reservoir	7	Tyre pressures	21
Checking the turbine-gearbox oil level	9	Positioning the aircraft for ground running	22
Turbine-gearbox hydraulic accumulator air inflation	10	Turbine-gearbox alternators – ground running	23
Hydraulic accumulator inflation	11	Reloading the engine starter	24
Brakes accumulator inflation	12	Reloading interval	25
Oxygen system	13	Nitrogen system	26

LIST OF ILLUSTRATIONS

	Fig.
Nose undercarriage shock-absorber extension	1
Servicing points	2A-2B
Turbo-starter reloading	3
Main undercarriage inflation chart	4
Liquid cooling system contents check post Mod.5466	5

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 fuel tank and other replenishment points is illustrated in fig.2A and 2B.

Refuelling/defuelling precautions

2. 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 (*Leading Particulars*).
- (2) Prior to removing the filler caps, ensure that the fuel hose and refueller are correctly earthed.
- (3) On no account drain No.1 tank whilst fuel remains in No.2 and/or No.3 tanks, without supporting the fuselage at frame 42. When refuelling, fill No.1 tank first; when defuelling, drain No.1 tank last.

Checking the tank contents

3. 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, located on the engine instrument panel, register the tank contents when the battery isolating switch is switched on or when an external supply is connected.

Checking the accessory gearbox oil level

4. The accessory gearbox oil dipstick is located on the top of the gearbox, and is accessible after removing a panel in the main plane (*Chap.4*). If the oil level is lower than the FULL mark on the dipstick, replenish the gearbox through the filler-cap adjacent to the dipstick with oil as specified in *Leading Particulars*.

Note. . .

The gearbox and sump oil has a deleterious effect on paint, rubber, electric cables etc., care must be taken to avoid spilling it on such parts.

Refilling the oil sumps

5. The oil sump filler caps (*fig.2B*) are accessible through removable panels (*Chap.4*). Refer to *Leading Particulars* for the correct type of oil. 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 1.5 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 the level as in (1)(a).

(2) Starboard engine

- (a) With the aircraft standing on level ground, fill the sump to approximately 0.5 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 the level as in (2)(a).

(3) Intermediate topping-up

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

Checking the cold-air unit oil level

6. The combined oil filler and dipstick is located on the top of the cold-air unit and is accessible after removing a panel on the port inner wing *Chap.4*. If the oil level is lower than the FULL mark on the dipstick, top-up with oil OEP-71.

Note. . .

Pour oil slowly into the filler neck allowing a few minutes for it to settle before checking the dipstick. The oil level is critical, do not overfill.

Topping-up the hydraulic fluid reservoir**Note . . .**

Before operating the flap selector, ensure that the aileron locks are not fitted. Refer to Chap.1.

7. An elliptical panel in the upper surface of the fuselage, aft of the crew escape hatch (*Chap.4*), provides access to the hydraulic reservoir filler cap. Exhaust the hydraulic fluid accumulators (*Sect.3, Chap.6*) by operating the flaps selector and wheel brakes until the flaps and brakes cease to respond. Check the accumulator inflation pressures and, if necessary, inflate (*Sect.3, Chap.6*) to the figures given in Leading Particulars. Top up the reservoir to the maximum with the fluid specified in Leading Particulars (a drainpipe is provided for excess fluid).

8. Before topping up the reservoir ensure that the pressures shown on the accumulator pressure gauges agree with those given in Leading Particulars when the respective system is exhausted. If the pressure shown is in excess of the given figure it is an indication that fluid is still contained in the respective accumulator. If the pressure is below the given figure the accumulator must be recharged. Also before filling ensure that the alighting gear is down, the pack-bay air intake shutters open and the air brakes in. The flaps may be in either the fully up or fully down positions.

Checking the turbine-gear ed alternator gearbox oil level

9. The gearbox dipstick is situated at the starboard side of the unit in both cases, and is accessible after removing a panel in the main plane (*Chap.4*). If the level is lower than the MAX mark engraved on the dipstick, pour sufficient oil (*Leading Particulars*) into the sump by way of the dipstick housing to restore it to the MAX level.

Turbine-gear ed alternator gearbox hydraulic accumulator air inflation

10. The accumulator is mounted on the turbine alternator gearbox sump and is accessible after removing a panel in the main plane (*Chap.4*). The procedure for charging the accumulator with air is given in A.P.101B-0417-5A2, Sect.2, Chap.4 and A.P.103C-0201-16A.

Hydraulic accumulator inflation

11. The hydraulic accumulator inflation point is adjacent to the hydraulic accumulator in the starboard undercarriage well, together with

its pressure gauge. The correct inflation pressure when the accumulator is exhausted is given in Leading Particulars.

Brakes accumulator inflation

12. The brakes accumulator inflation point is in the port equipment compartment together with its pressure gauge on the nitrogen charging panel. The correct inflation pressure when the system is exhausted is given in Leading Particulars.

Oxygen system

13. The procedure for charging the system is described in Sect.3, Chap.10.

Checking the pack-bay fire extinguisher contents

14. The procedure for checking the extinguisher contents is described in Sect.4, Chap.5.

Coolanol liquid coolant level check (post Mod.5466)

15. Access to the fluid check/charging point is by removing the access panel from the port side of the forward electronics pack (*fig.2B*). Check the contents as follows:—

- (1) Switch on the light at the switch on the forward face of Frame 17.
- (2) Read off and note the temperature sight indicator number (*fig.5*).
- (3) Using the graph on *fig.5*, or the graph on the liquid reservoir, read off and note the rolling diaphragm position letter for the noted temperature sight indication.
- (4) Check that the rolling diaphragm is located against the appropriate indicator window for the rolling diaphragm position letter noted in operation (3). The permissible tolerance on the reservoir setting is $\pm \frac{1}{2}$ letter division as shown on the graph in *fig.5*.

Note . . .

Reference should be made to Sect.3, Chap.8E for details of Coolanol system and maintenance procedures.

Battery isolating switch

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

External electrical supply sockets

17. Refer to fig.2A.

Canopy de-misting

18. Windows provided in the air-drier tubes fitted to the canopy permit visual inspection of the contents of the 'tell-tale' compartments. The desiccant used in the air-driers is silica gel, which is blue when dry and is to be changed when it becomes pink.

Lighting-gear inflation

19. 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 initial inflation pressure with the strut fully extended, should be 545 ± 25 lbf in.

20. The nose undercarriage is liquid sprung and is not inflated with air, consequently graphs are not provided for checking its condition. The shock-absorber must be charged to 1500 ± 0.00 lbf in² with oil OM-15 and with the nose-wheel clear of the ground for optimum efficiency. After charging and when the shock-absorber has settled down, the extension (*dimension X in fig.1*) should be noted for the most common C.G. configuration and all-up weight. The serviceability of the unit may be subsequently checked by using this dimension as a norm. Any abnormal variance is to be investigated by jacking up the nose and checking the pressure (*Sect.3, Chap.5B, para.16*).

Note . . .

The dimension will vary from aircraft to aircraft and according to the type of shock-absorber unit fitted.

Tyre pressures

21. Refer to A.P.101B-0417-5A2.

- ◀ To obviate the risk of auto-ignition dry nitrogen should be used to inflate the undercarriage wheel tyres. The occasional 'topping up' of pressure may be accomplished using dry air if nitrogen is not available. In an emergency dry air may be used to inflate the tyres but this must be rectified at the earliest opportunity. ▶

Positioning the aircraft for ground running

22. 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 the wheel brakes must be applied and chocks placed forward of each wheels also the air-intake cover must be removed and a safety guard Ref. No.26FZ/95276 fitted. The adjacent turbine-gear alternator air-intake/exhaust bungs must also be removed. Ensure that the aircraft is standing on concrete (not tarmac) or grass, and is well clear of buildings and other aircraft; the latter, if less than 100 yards away, are likely to be damaged by the stream of hot gases or by loose objects thrown up by the air stream from the jet pipe. The ground in the immediate vicinity of the air-intake must be kept clear of loose objects which could be drawn into the engines. Personnel must keep at least 5 yards clear of the air-intakes.

UK RESTRICTED

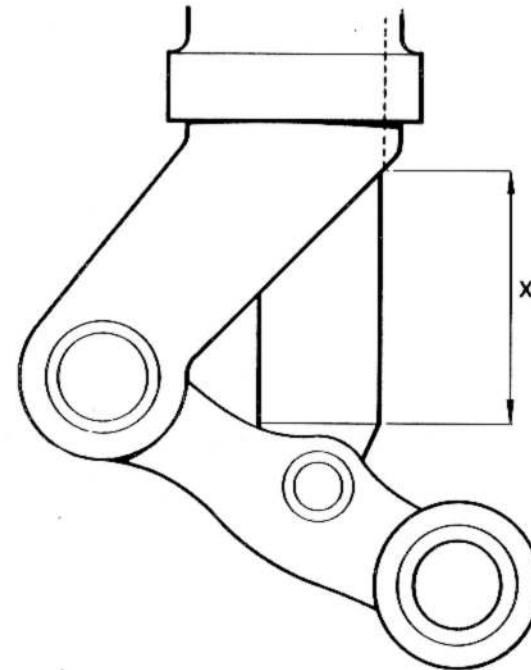


FIG. 1 NOSE UNDERCARRIAGE SHOCK-ABSORBER EXTENSION

Turbine-gearred alternators – ground running

23. Ground running of the turbine-gearred alternators is subject to the following limitations. At 1/3 max. (10kVA) load and with the lower access panels removed:—

Temperate climates 60 min
(refer below)

Tropical climates 20 min

At 1/3 max. (10kVA) load and with the lower access panels fitted:—

Temperate climates 30 min

Tropical climates 14 min

The 60 min ground running period is to be followed by a cooling period of 90 min before a restart is made. At full load (30kVA), the ground running period is not to exceed 5 sec.

Reloading the engine starter

24. The engines are started by single-breech turbo-starters positioned in the air-intakes of both engines. The procedure for reloading the starter is given in fig.3.

WARNING . . .

◀ Before attempting to diagnose starter faults, turn off the electrical supply at the master switch and disconnect the electrical lead to the starter. The breech cap must not be removed until one minute has elapsed following an unsuccessful attempt to fire a cartridge. The cartridge may then be removed and if faulty, disposed of in accordance with the safety precautions laid down for handling of high explosive. ▶

Reloading interval

25. When the starter is cold two shots may be fired without restrictions on the reloading interval, but thereafter a cooling period of 10 minutes must be allowed after firing a shot, before reloading.

Nitrogen system

26. The procedure for charging the system is given in Sect.3. Chap.9.

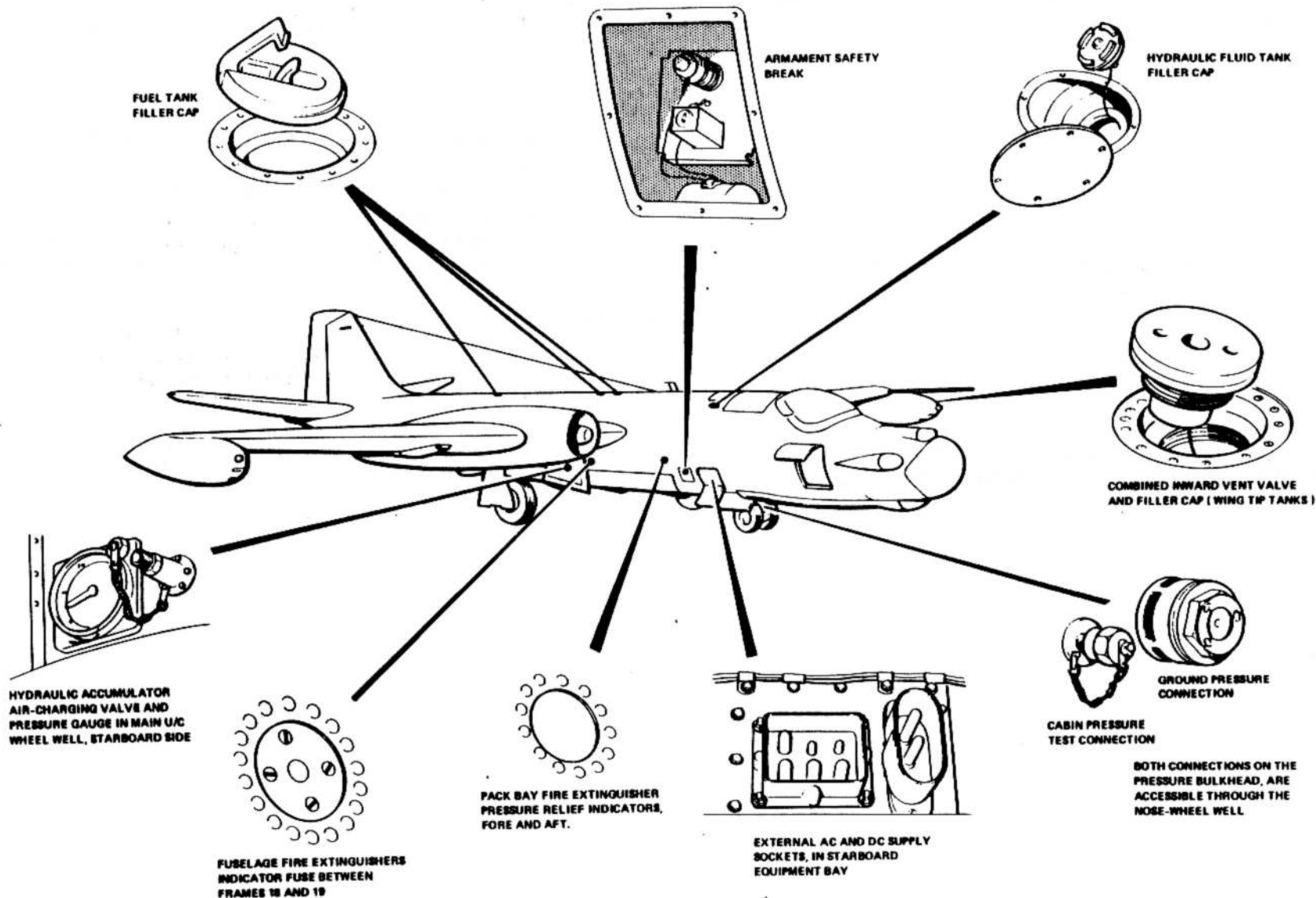


FIG. 2A SERVICING POINTS

UK RESTRICTED

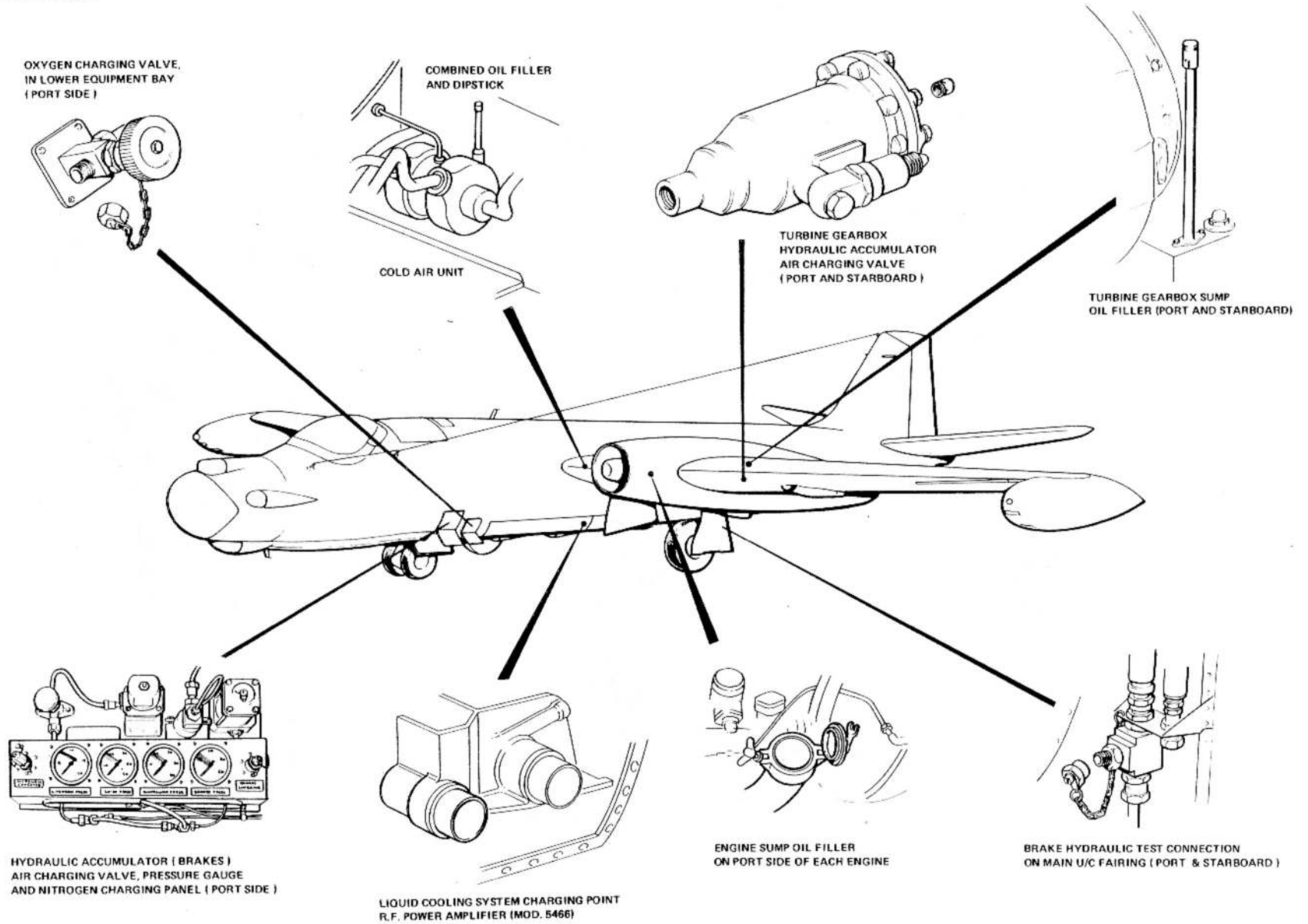
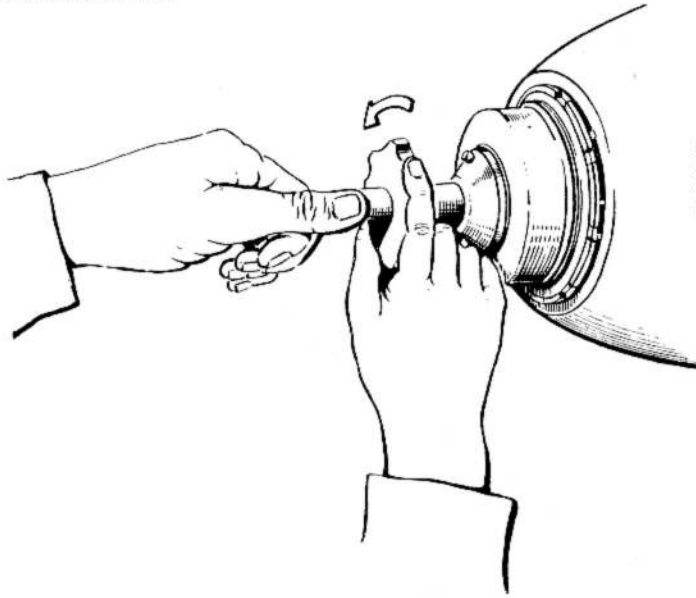


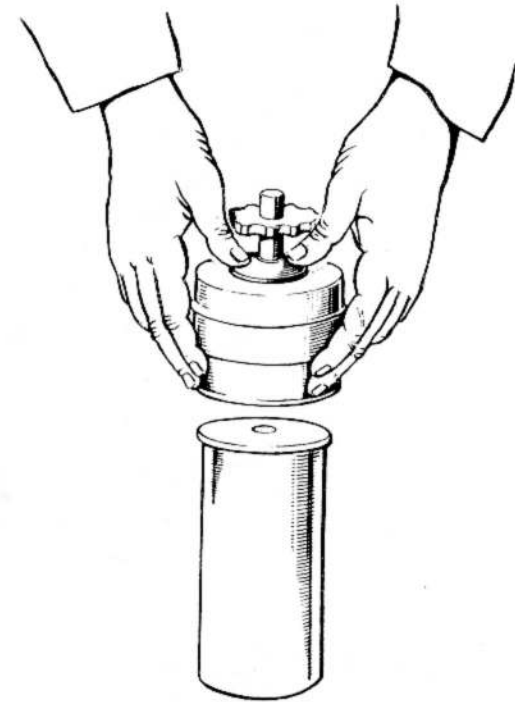
FIG. 2B SERVICING POINTS
MOD 5466 EMBODIED

UK RESTRICTED



UNLOCKING THE BREECH-CAP

PRESS THE CENTRAL BUTTON AND UNSCREW THE STARWHEEL UNTIL THE RATCHET DISENGAGES. RELEASE THE BUTTON AND CONTINUE TO UNSCREW UNTIL THE BREECH CAP IS FREE.



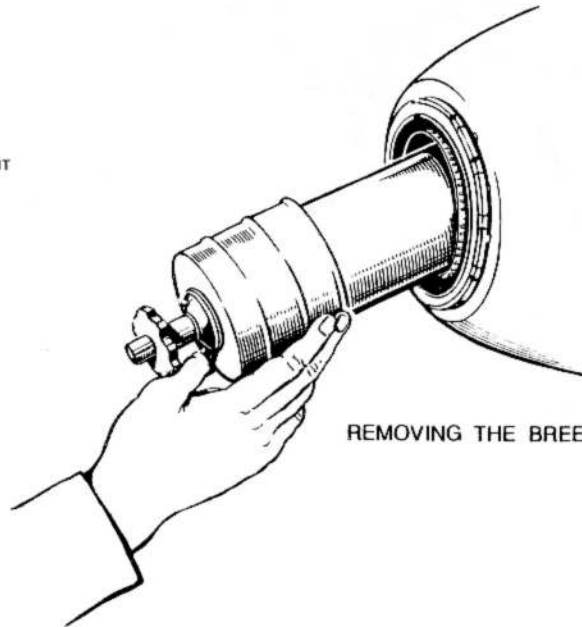
UNLOADING THE BREECH-CAP

HOLD THE BREECH CAP VERTICAL AND PRESS THE EXTRACTOR CLAW BUTTONS

LOADING THE BREECH:-

PUSH THE CARTRIDGE INTO THE BREECH CAP ENSURING THAT THE EXTRACTOR CLAWS ENGAGE OVER THE CARTRIDGE RIM. INSERT THE ASSEMBLY INTO THE BREECH AND SCREW THE BREECH CAP INTO PLACE WITH THE STARWHEEL UNTIL FINGER TIGHT

NOTE...
DO NOT OVER TIGHTEN THE BREECH CAP



REMOVING THE BREECH-CAP

FIG.3 TURBO-STARTER RELOADING

UK RESTRICTED

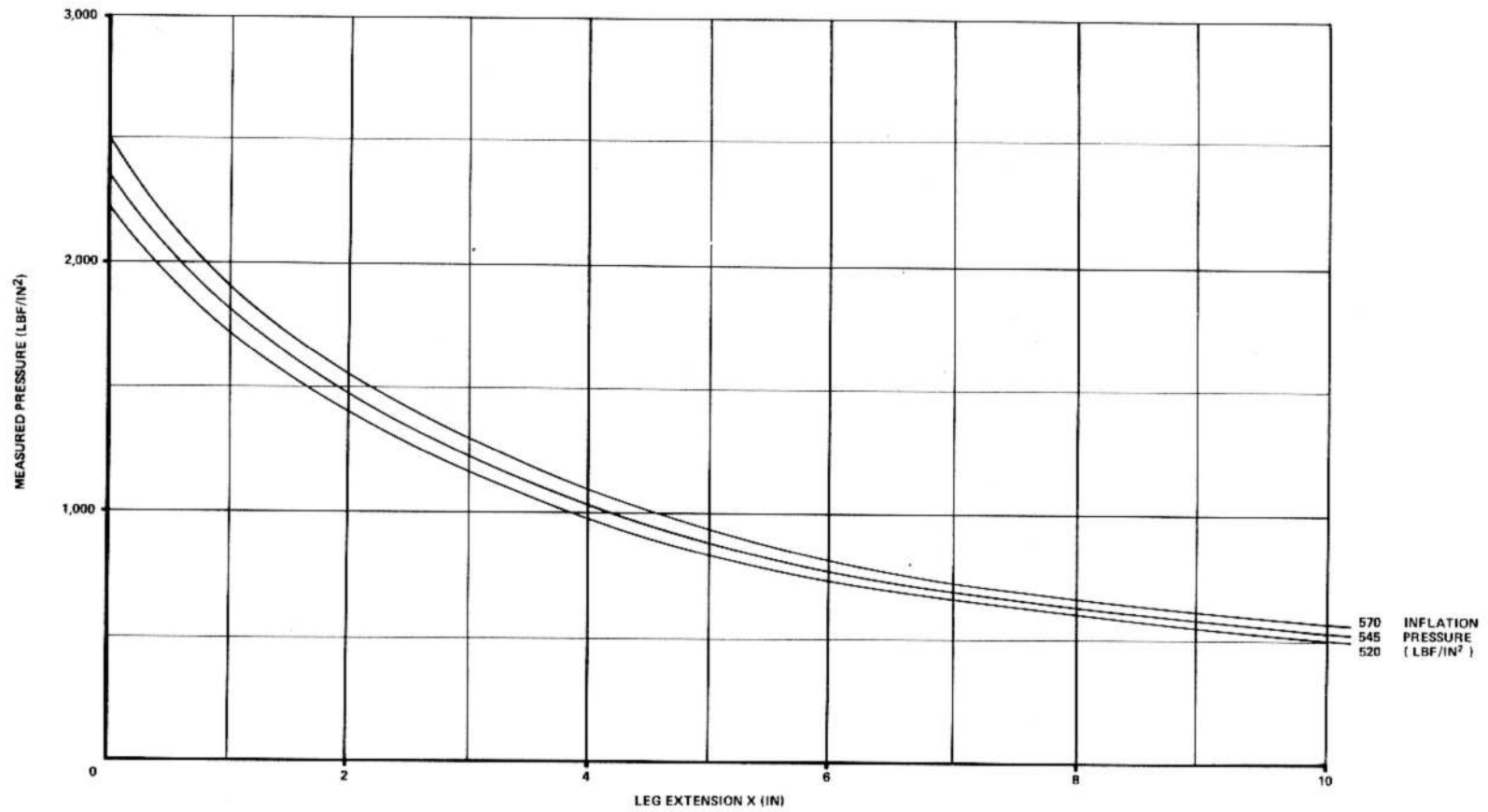
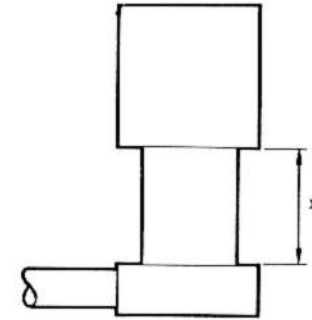


FIG.4 MAIN UNDERCARRIAGE INFLATION CHART

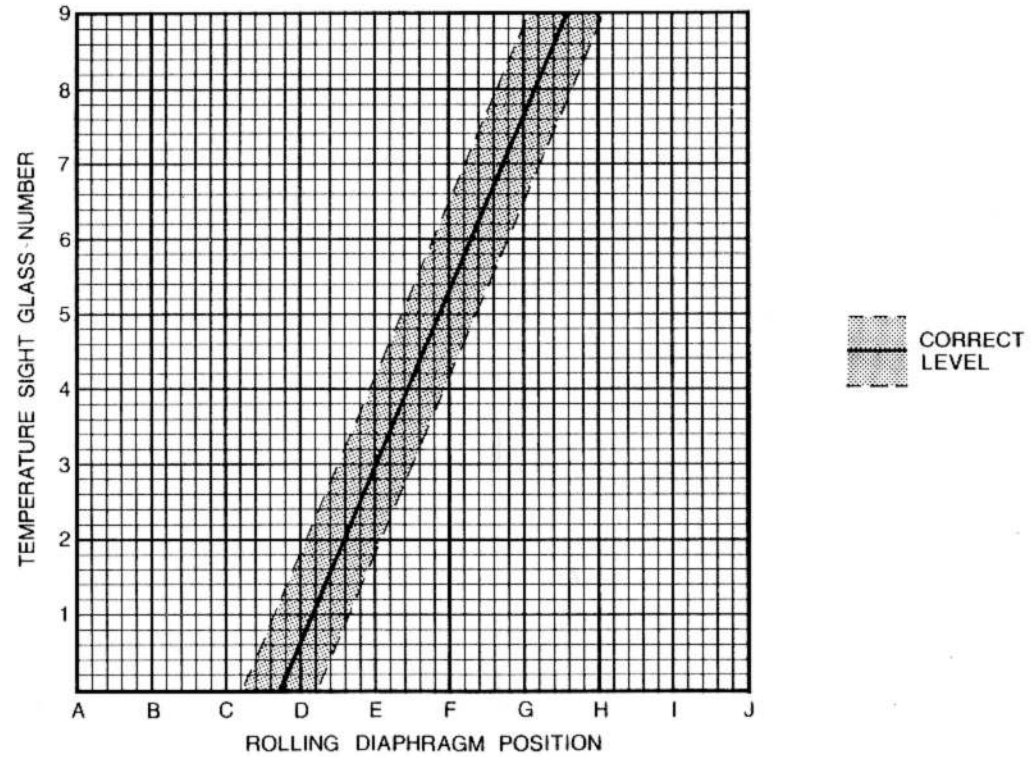
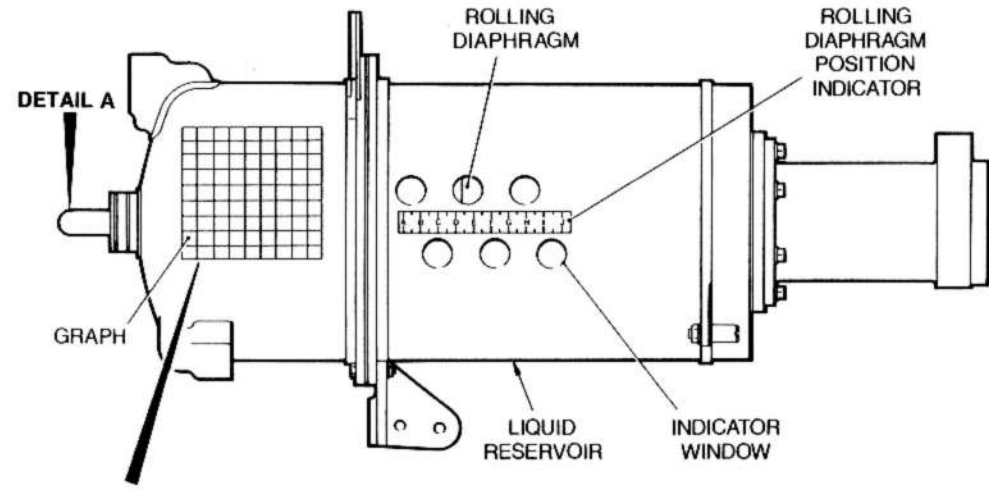
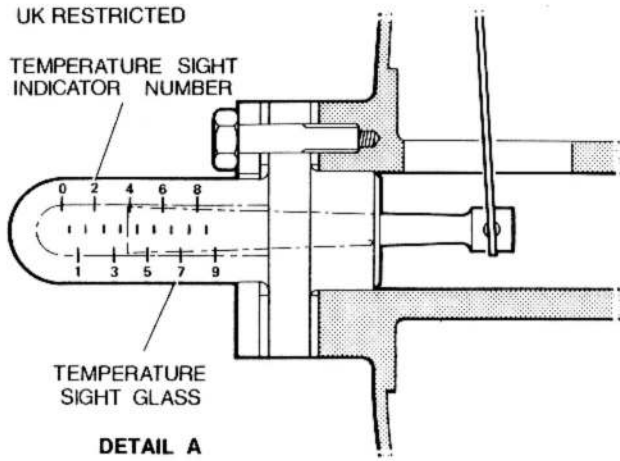


FIG.5 LIQUID COOLING SYSTEM CONTENTS CHECK POST MOD 5466

◀ (GRAPH AND DETAIL A AMENDED) ▶

Chapter 3

◀ LOADING AND C.G. DATA (PRE MOD.5466) ▶

LIST OF CONTENTS

	Para.		Para.
General information.....	1	Maximum all-up weights.....	7
C.G. position.....	2	Alternative load items.....	8
C.G. datum.....	3	Weighing the aircraft.....	9
Flight C.G. limits.....	4	Basic weight and determination.....	10
Effect of alighting gear retraction.....	5	Engine data.....	11
Basic weight and C.G.....	6	Modifications.....	12

LIST OF TABLES

	Table
Summary of drainable and undrainable unusable fuel to be included in basic weight.....	1
Removable load items included in basic weight.....	2
Crew and crew removable operating load items common to all roles.....	3
Alternative operating load items.....	4
Fuel load items.....	5
All-up weight summary.....	6

LIST OF ILLUSTRATIONS

	Fig.
Flight C.G. limits.....	1
Engine change data.....	2
Loading and C.G. diagram - removable load items included in basic weight (misc.).....	3
Loading and C.G. diagram - removable load items included in basic weight.....	4
Loading and C.G. diagram - crew and crew removable load items....	5
Loading and C.G. diagram - alternative and fuel load items.....	6

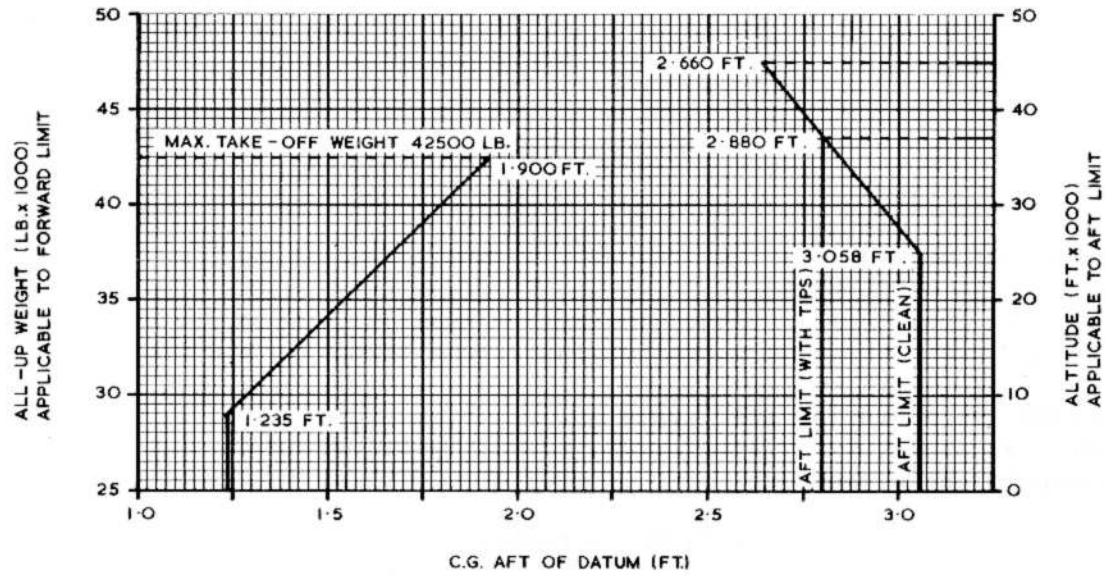


FIG.1. FLIGHT C.G. LIMITS

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 alighting gear 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 0.445 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.

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 29,000 lb the permissible forward limit is 1,235 ft aft and at a weight of 42,500 lb the permissible forward limit is 1.900 ft aft.

Aft limit

This is dependent upon the altitude of the aircraft.

Aircraft without tip tanks:

Up to 25,000 ft the aft C.G. limit is 3.058 ft aft of datum; it then moves linearly forward to 2.660 ft aft of datum at 45,000 ft.

Aircraft with tip tanks:

Up to 37,000 ft the aft C.G. limit is 2.808 ft aft of datum; it then moves linearly forward to 2.660 ft aft of datum at 45,000 ft.

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 -1299 lb ft which must be taken into account when making calculations which assume that the alighting gear is retracted.

Basic weight and C.G.

6. Table 6 refers to a basic weight of 25838 lb and a basic C.G. position of +2.917 ft aft of the datum. These figures are based on the weight of aircraft S/Nos. WJ986, WJ981, WD955, WK111 to the modification standard detailed in paragraph 12. A definition of the term basic weight may be found in A.P.119W-0001-1. The basic weight and moment will vary between aircraft depending on their modification standard.

C.G. Limits for aircraft in basic condition

2.9 ± 0.1 ft aft of datum

Maximum all-up weights (fig.1)

7. The aircraft is cleared for operational flying at the following maximum weights:-

Take-off	42,500 lb
Landing	40,000 lb

Note...

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

Alternative load items

8. 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.

Weighing the aircraft

9.

Preparation

◀ (1) With the aircraft in the rigging position drain the fuel tanks (Sect 4, Chap.2. For details of undrainable fuel refer to Table 1) Remove all expendable load items and all possible alternative items. Detailed information on aircraft weighing is given in A.P.119W-0001-1. Electronic weighing units and ancillary equipment are dealt with in A.P.119W-0304-1.

(2) The following weighing equipment is required in addition to the normal jacking equipment called for in Sect.2, Chap.4:

Bottle jack x 3	4Q/1045837
Electronic Weighing Kit	4GB/2453967
Adaptor x 2	4GB/4398891
	(At each main oleo)
Adaptor	4GB/4398902
	(At nose wheel axle)

(3) To weigh the aircraft with the electronic weighing kit use the following procedure:

- (a) Plug the electronic weighing kit into a 240 volt supply and leave for 20 minutes warm up period. Zero the load cells.
- (b) Attach capstan on each bottle jack.
- (c) Place electronic weigh cells on top of each capstan. ▶

◀ **Note . . .**

During operations (d) and (e) it may be necessary to jack the aircraft with normal jacking equipment to give sufficient clearance for positioning the bottle jacks.

- (d) Place adaptors (4GB/4398891) on base of main oleo. Hold in place and position bottle jack under them.
- (e) Position adaptor (4GB/4398902) under axle between two nose wheels and slide bottle jack into position.
- (f) Take 500 Kg. of weight on to each load cell. Wait 15 minutes. Lower bottle jacks and re-check that load cells are at zero.
- (g) Raise aircraft on bottle jacks until clear of ground and level into rigging position. Ensure all weight is taken by load cells.
- (h) Weigh the aircraft as instructed by A.P.119W-0304-1.
- (i) Lower aircraft to ground.
- (j) Remove weighing equipment.
- (k) Ensure new basic weight and moment figures entered on F765 in red ink. ▶

Basic weight and determination

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

- (1) The weight and moment of drainable unusable fuel in the pipelines (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 Tables 3, 4, 5 and 6 which were fitted at weighing.

▶ The resultant figures are the basic weight and moment.

Engine data (fig.2)

11. In the event of an engine change, Mod.F751 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, either the front or rear suspension point which can be corrected to the A/C datum using the data given in fig.2.

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

Modifications

12. The basic weight given (Table 6), includes the modifications quoted in the CAN.17/Y/3 Leaflet, plus the modifications listed in sub-para.(1), minus those in sub-para.(2):-

(1) 55, 263, 426, 704, 735, 859, 875, 883, 1199, 1479, 2132, 4356, 4450, 4451, 4723, 5018, 5208, 5176, 5428.

(2) 871, 1016, 1175, 1705, 2395, 2531, 3797, 4788.

The following modifications are part embodied.

721 (No.3 tank only), 4080 (less U/C up positions), 4152 (stbd. wing only), 5184 (less CM0449 and SRIM 3791).

UK RESTRICTED

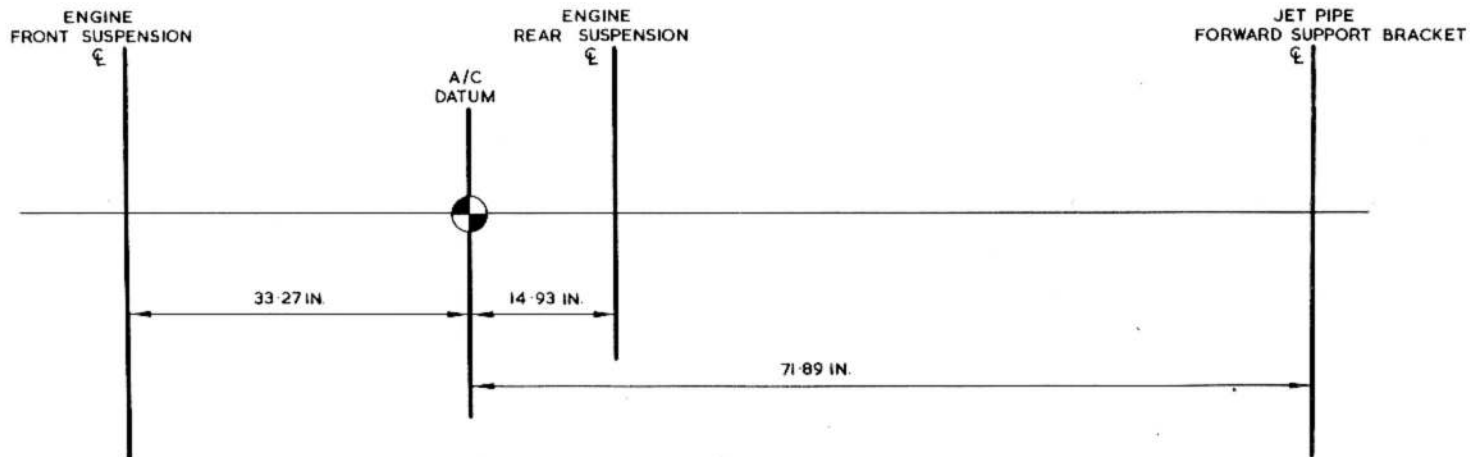


FIG.2. ENGINE CHANGE DATA.

TABLE 1

Summary of drainable and undrainable unusable fuel to be included in basic weight

Location	Weight (lb)	Arm (ft)	Moment (lb ft)
Trapped (undrainable) fuel in pipes (wings and fuselage)	6.70	-0.228	-1.53
Note.....			
1. Due to the disposition of certain fuel pipes, the above weight of fuel will remain trapped when the fuel tanks are drained.			
2. Since all fuel in the pipelines 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 pipes (wings and fuselage)	9.00	+1.534	+13.81

TABLE 2 Removable load items included in basic weight (fig.3)

Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
MISCELLANEOUS ITEMS						
22	12L/203	1	Destructor, aircraft, No.1, Mk.1	3.25	- 8.73	- 28.37
6	12K/9625465	1 set	Cartridge, seat ejection, No.13, Mk.1	1.58	-14.74	- 23.29
12	12K/9625465	2 sets	Cartridge, seat ejection, No.13, Mk.1	3.16	-10.23	- 32.33
4	12K/9625446	1	Cartridge, canopy jettison, No.3, Mk.2	1.60	-16.19	- 25.90
20	12K/1220	6	Cartridge, engine starting	18.00	+17.35	+ 312.30
2	12G/9625203	1	Charge, H.E. emergency control, severing No.1, Mk.3	0.37	-16.19	- 5.99
5	12G/9635206	32	Detonator, electric, No.108, Mk.3 (Canopy)	0.74	-15.70	- 11.62
11	12G/9635206	34	Detonator, electric, No.108, Mk.3 (Hatch)	0.78	-11.20	- 8.74
3	12G/9635205	1	Detonator, electric, No.109, Mk.2 (Controls)	0.02	-16.19	- 0.32
29	6140-99-910-1543	2	Battery, 12 volt, 4 amp. hours	9.88	-17.48	- 172.70
21	6140-99-910-1534	4	Battery, 12 volt, 40 amp. hours, Type C	198.76	- 6.65	-1321.75
8	5CX/369	1	Lamp, inspection, and extension lead	0.90	-13.34	- 12.01
9	6B/633	1	Amplifier unit, Type B	10.00	-11.89	- 118.90
17	6B/4343681	1	Detector unit, Type A	1.72	+ 5.70	+ 9.80
1	6B/4343640	1	Gyro unit, Type B			
7	6B/4352094	1	Indicator, master, Type E5	7.06	-14.22	- 100.39
18	27N/100	1	Extinguisher, fire, methyl-bromide, Type 12A	10.63	+13.96	+ 148.39
16	27N/102	2	Extinguisher, fire, methyl-bromide, Type 14A	38.62	+ 1.01	+ 39.01
15	27N/N.I.V.	1	Extinguisher, fire, methyl-bromide, Type 60A	18.50	- 5.54	- 102.49
19	27N/N.I.V.	1	Extinguisher, fire, methyl-bromide, Type 60A	18.50	+15.99	+ 295.83
25	27N/299	1	Extinguisher, fire, trigger hand operated, Type 34H	5.19	-13.72	- 71.21
26	22G/9108081	1	Gauntlets, fire fighting, (1 pair)	0.88	-14.12	- 12.43
27	27H/3224	1	Container, urine, Mk.2, and funnel	1.09	-13.97	- 15.23
23	27N/1	1	Axe, fire	2.42	-13.43	- 52.50
28	26FZ/3501	1	Handle for emergency hydraulic system hand pump (stowed)	0.85	-14.97	- 12.72
14			Oxygen charge	25.78	- 8.14	- 209.85
13			Nitrogen charge	4.12	- 9.61	- 37.74
24	9A/02430	1	First aid outfit	3.00	- 13.66	- 40.98
10	27N/299	1	Extinguisher, fire, trigger hand operated, Type 34H	5.19	-11.89	- 61.71

continued..

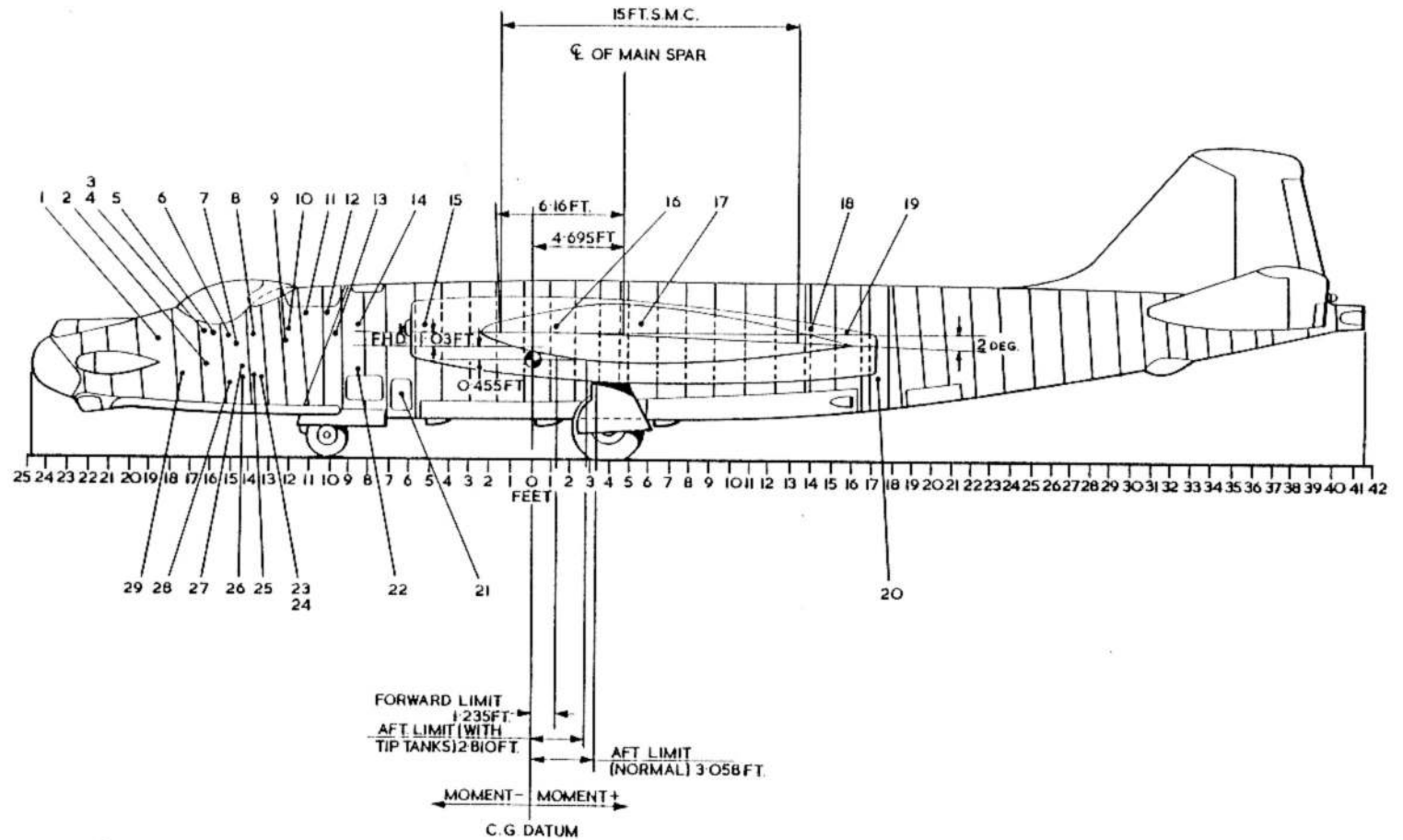


FIG. 3. LOADING AND C.G. DIAGRAM - REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT (MISCELLANEOUS)

TABLE 2 Removable load items included in basic weight (fig.4) - continued

Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.R.I.23165			
110		1	Delay unit, line, Type 151942	3.50	- 4.14	- 14.49
78		1	Delay unit, line, Type 151942	3.50	+15.42	+ 53.97
105	110D/35440	1	Receiver, Type 151061	21.00	- 2.73	- 57.33
106	110AJ/35445	1	Tray, mounting, (for receiver)	2.28	- 2.73	- 6.22
85	110D/35440	1	Receiver, Type 151061	21.00	+12.36	+ 259.56
86	110AJ/35445	1	Tray, mounting, (for receiver)	2.28	+12.26	+ 28.18
107	110D/35439		Transmitter, Type 150886			
108	110D/35448	1	Ferrite modulator, Type 6088-5003	178.00	- 4.14	- 736.92
109	110AJ/35575	1	Tray, mounting, (for transmitter)	2.98	- 4.14	- 12.34
79	110D/35439	1	Transmitter, Type 150886			
80	110D/35448	1	Ferrite modulator, Type 6088-5003	178.00	+14.00	+2492.00
81	110AJ/35575	1	Tray, mounting, (for transmitter)	2.98	+14.00	+ 41.72
101	110K/35444	1	Deception generator, Type 151064	21.00	- 1.24	- 26.04
102	110AJ/35445	1	Tray, mounting, (for deception generator)	2.82	- 1.24	- 3.50
87	110K/35444	1	Deception generator, Type 151064	21.00	+10.58	+ 222.18
88	110AJ/35445	1	Tray, mounting, (for deception generator)	2.82	+10.58	+ 29.84
103	110K/35441	1	Power supply unit, Type 151060	48.00	- 1.24	- 59.52
104	110AJ/35446	1	Tray, mounting, (for power supply unit)	2.98	- 1.24	- 3.70
89	110K/35441	1	Power supply unit, Type 151060	48.00	+10.58	+ 507.84
90	110AJ/35446	1	Tray, mounting, (for power supply unit)	2.98	+10.58	+ 31.53
44	110L/35443	2	Control unit, modulator, Type 151063	8.00	-12.02	- 96.16
45	110L/35442	2	Control unit, systems, Type 151062	9.38	-12.02	- 112.75
			A.R.I.23166			
91	110D/35449	1	Transmitter, counter measure, Type T 915/ALT.21A	115.00	+ 8.30	+ 954.50
92	110V/35452	1	R.F. oscillator, Type 0-1101/ALT.21A band 1	32.00	+ 8.30	+ 265.60
93	110AJ/33842	1	Tray, mounting, Type 840-20	2.98	+ 8.30	+ 24.73
96	110D/35449	1	Transmitter, counter measure, Type T 915/ALT.21A	115.00	+ 3.56	+ 409.40
97	110V/35451	1	R.F. oscillator, Type 0-1104/ALT.21A band 4	32.00	+ 3.56	+ 113.92
98	110AJ/33842	1	Tray, mounting, Type 840-20	2.98	+ 3.56	+ 10.61
94	110AQ/35450	1	Cooler, liquid, Type HD.609/ALT.21A	40.00	+ 8.30	+ 332.00
95	110AJ/35454	1	Tray, mounting	2.98	+ 8.30	+ 24.73

continued.....

UK RESTRICTED

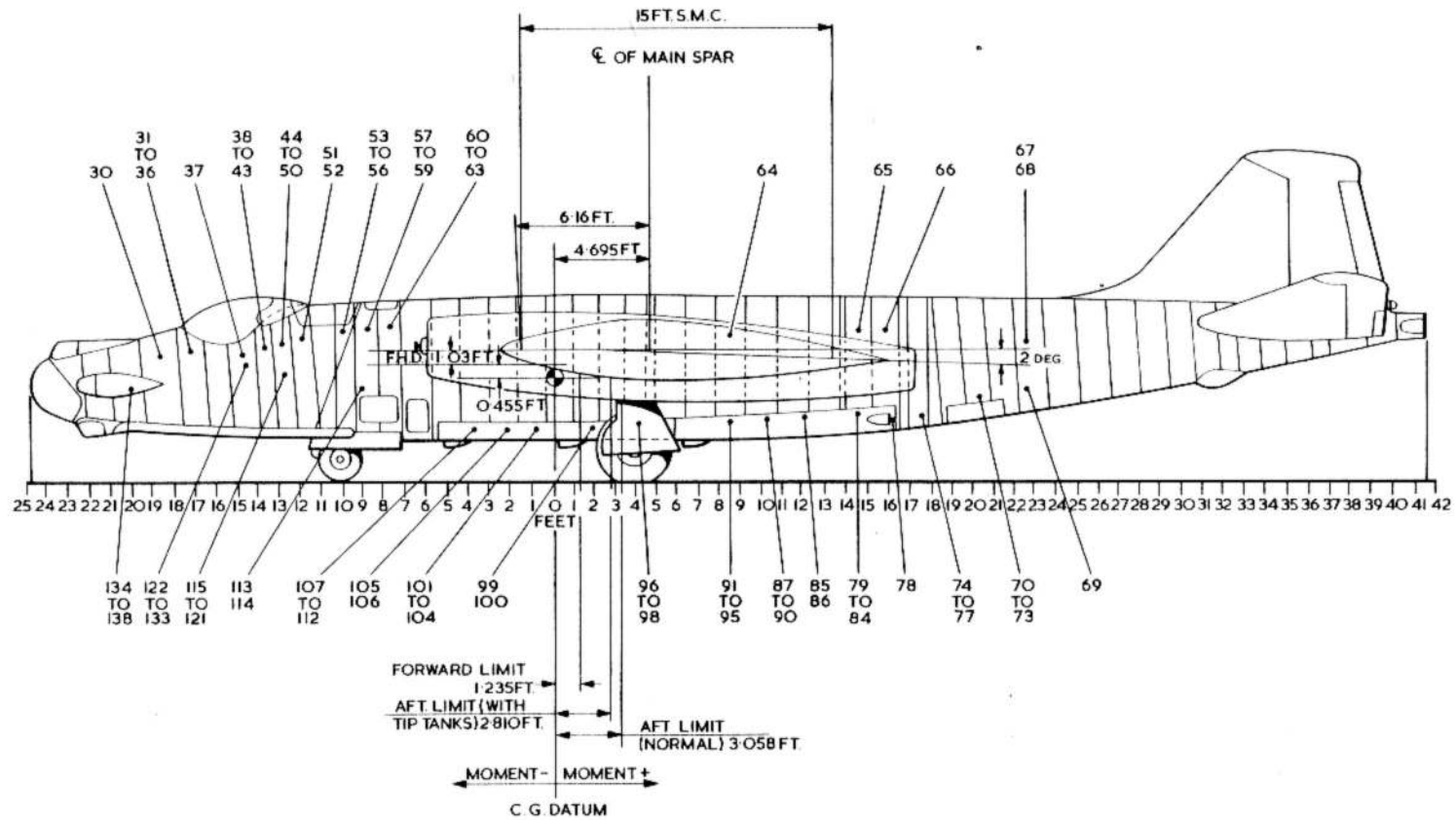


FIG. 4. LOADING AND C.G. DIAGRAM - REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT.

UK RESTRICTED

TABLE 2 Removable load items included in basic weight (fig.4) - continued

Fig.4 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
A.R.I.23166 - continued						
99	110AQ/35450	1	Cooler, liquid, Type 609/ALT.21A	40.00	+ 1.82	+ 72.80
100	110AJ/35454	1	Tray, mounting	2.98	+ 1.82	+ 5.42
46	110L/35453	3	Control indicator, Type C.4646/ALT.21A	11.40	-12.75	- 145.35
A.R.I.18207/1						
47	10L/9528209	1	Control transmitter, radio, Type X13920	5.78	-12.89	- 74.50
84	10L/9528210	1	Transmitter, radio, Type X13919	38.00	+14.00	+ 532.00
83	EG7.82.759	1	Tray, mounting	2.82	+14.00	+ 39.48
111	10D/9528210	1	Transmitter, radio, Type X13919	38.00	- 4.14	- 157.32
112	EG7.82.783	1	Tray, mounting	2.82	- 4.14	- 11.67
A.R.I.23301/1 U.H.F. (Set 1) PTR1751						
115	5821-99-649-6595	1	Tranceiver PTR 1751W	15.43	-12.70	-195.96
116	5821-99-649-9755	1	Tray, mounting, PV 17488	3.30	-12.70	- 41.91
31	5821-99-649-0317	1	Control unit, PV1754L	3.39	-17.40	- 58.99
122	5821-99-652-0258	1	Interface unit PV1746B	2.64	-12.7	- 33.60
123	5821-99-932-6361	1	Box, interconnecting	1.25	-14.45	- 18.06
A.R.I.18107/4 TACAN						
63	5826-00-691-4896	1	Transmitter/receiver, Type RT220 C/ARN-21	50.00	- 8.10	- 405.00
60	10A/251	1	Tray, mounting, Type 9274 (for T/R unit)	7.77	- 8.10	- 62.94
61	10D/22534	1	Coupling unit, Type 9546	7.74	- 7.84	- 58.56
62	10AJ/258	1	Tray mounting (for coupling unit)	1.88	- 7.84	- 14.74
51	10L/16310	1	Control unit, Type 7750	1.23	-12.20	- 15.01
126A	10Q/16355	1	Indicator, Type 9547	1.50	-15.70	- 23.55
30	10Q/16355	1	Indicator, Type 9547	1.50	-18.25	- 27.38
A.R.I.23172 RADIO ALTIMETER						
70	10D/9542617	1	Transmitter/receiver, Type 16098	16.50	+20.50	+ 338.25
71	10AJ/698	1	Tray, mounting, (For T/R unit)	1.80	+20.50	+ 36.90
113	10U/9542618	1	Amplifier, Type 16089	4.75	- 9.05	- 42.99
114	10AJ/699	1	Tray, mounting, (for amplifier)	0.55	- 9.05	- 4.98
36	10L/16720	1	Control unit, Type 16095	1.85	-17.10	- 31.64
72	10D/22305	1	Delay unit, Type 16119	1.50	+19.80	+ 29.70
32	10Q/16459	1	Indicator, Type 16094 (height)	0.90	-17.90	- 16.11
73	5826-99-104-2242	2	Horn (waveguides) aerial system	7.00	+19.80	+ 138.60

continued.....

UK RESTRICTED

TABLE 2 Removable load items included in basic weight (fig.4) - continued

Fig.4 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.R.I.23099/7, UA60 INTERCOMM.			
117	5831-99-945-2676	1	Amplifier, A.F. Type UA6070	2.00	-12.90	- 25.80
118	6110-99-945-2673	1	Junction box, Type UA6043/7	2.40	-12.90	- 30.96
38		1	Box, station, Type UA6016/5F	3.50	-13.50	- 47.25
33		1	Box, station, Type UA6016/5F	3.50	-17.70	- 61.95
37		1	Box, station, Type UA6016/5F	3.50	-13.80	- 48.30
			A.R.I.5877, RADIO COMPASS			
124	10U/17211	1	Amplifier, R.F. Type A8281	4.90	-14.35	- 70.32
125	10U/17212	1	Amplifier, I.F. Type A8282	9.10	-14.35	- 130.59
48	10L/16287	1	Control unit, Type 8283	2.24	-12.32	- 27.60
57	10D/20169	1	Corrector unit, Type QE	1.00	- 8.50	- 8.50
52	10P/16303	1	Filter, voice range, Type 1275	1.00	-10.80	- 10.80
39	10Q/16357	1	Indicator, master bearing, Type 9551	1.50	-13.80	- 20.70
126	10AJ/1572	1	Tray, mounting, (for amplifier R.F.)	1.85	-14.35	- 26.69
127	10AJ/1573	1	Tray, mounting, (for amplifier, I.F.)	1.00	-14.35	- 14.35
			A.R.I. 5951, GREEN SATIN			
65	10D/18843	1	Transmitter/receiver, Type TR3710	116.00	+14.75	+1711.00
66	10D/9543808	1	Computer unit, Type 100	48.00	+15.90	+ 763.20
40	6B/541	1	Indicator, ground position, Mk.4	25.00	-14.25	- 356.25
41	10D/9543807	1	Indicator, electrical, DA-GS	21.00	-14.25	- 299.25
64	10B/ 4693359	1	Aerial system, Type 501 A	40.00	+ 9.00	+ 360.00
42	6B/633	1	Amplifier	3.00	-13.90	- 41.70
			A.R.I.23090, H.F. RADIO 618T-3			
134	10D/23518	1	Transmitter/receiver, Type M15 (618T-3)	52.00	-20.10	-1045.20
135	5340-99-945-1643	1	Tray, mounting, resilient, (for transmitter/ receiver)	5.00	-20.10	- 100.50
136	5831-99-914-8966	1	Pre-amplifier, Type UA6002	0.63	-20.70	- 13.04
137	10D/23525	1	Aerial tuning unit, Type 180L-3A	18.00	-20.00	- 360.00
138	5340-99-945-1644	1	Tray, mounting, resilient, 350-D3 (for aerial tuning unit)	1.25	-20.00	- 25.00
43	10L/16857	1	Control unit, Type M53 (714E-3)	3.00	-13.55	- 40.65

continued.....

UK RESTRICTED

TABLE 2 Removable load items included in basic weight (fig.4) - continued

Fig.4 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.R.I.23118, VOR/ILS INSTALLATION			
128	10D/9704803	1	Receiver, VHF, Type 6401M	8.20	-14.20	- 116.44
129	10D/9702192	1	Receiver, Glide slope, Type 6404M	7.80	-14.20	- 110.76
130	10D/9702193	1	Marker receiver, Type 6403M	6.70	-14.20	- 95.14
131	10D/25393	1	Tray, mounting, (for marker receiver)	0.63	-14.20	- 8.95
132	10D/23594	1	Tray, mounting, (for nav. unit & G.S. receiver)	1.50	-14.20	- 21.30
34	10L/9702196	1	Control unit, Type 7430M	1.25	-17.40	- 21.75
133	10D/9702194	1	Navigation unit, Type 6402MA	9.90	-14.20	- 140.58
			A.R.I.23288/3, V.H.F. AD120			
119	5821-99-639-5428	1	Transmitter/Receiver AA1201-2	14.90	-12.00	- 58.80
			A.R.I.18051/2, (IN PART)			
121	5821-99-639-2480	1	Tray, mounting, (For TR/Receiver AA1206-1)	1.80	-12.00	- 21.60
35	-5821-99-639-2496	1	Control unit, AA1202-2	1.32	-17.55	- 23.17
			A.R.I.18051/2, (IN PART)			
53	10L/291	1	Control unit, Type 7122	7.88	-10.19	- 80.30
54	7B/2589	1	Panel	5.33	-10.19	- 54.31
			A.R.I.23301/1 U.H.F.(SET 2) PTR 1751			
58	5821-99-649-6595	1	Transceiver PTR1751W	15.43	- 8.90	-137.33
59	5821-99-649-9755	1	Tray mounting, PV1748B	3.30	- 8.90	- 29.37
49	5821-99-649-0317	1	Control unit, PV1754L	3.31	-13.98	- 46.28
55	5821-99-652-0258	1	Interface unit PV1746B	2.64	- 8.9	- 23.55
56	5821-99-932-6361	1	Box interconnecting	1.25	- 9.98	- 12.48
			A.R.I.23134, IFF/SSR 1520			
67	5895-99-956-3378	1	Transponder, 16928	30.00	+23.50	+ 705.00
68	5820-99-107-5637	1	Mounting, 16946	1.25	+23.50	+ 29.38
50	5895-99-956-3379	1	Control unit, 16929	2.00	-12.10	- 24.20
			A.R.I.23287 (APR/9 INSTALLATION)			
74		1	Power supply unit PP.337	14.50	+17.90	+ 259.55
75		1	Radar unit CV43	12.50	+17.90	+ 223.75
69		1	Power supply unit PP.336	33.50	+22.70	+ 760.45
76		2	Switching unit X/539	29.00	+17.90	+ 519.10
77		3	Tuning unit(any 3 off types TN 128,129, 130 or 131)	63.00	+17.90	+1127.70

UK RESTRICTED

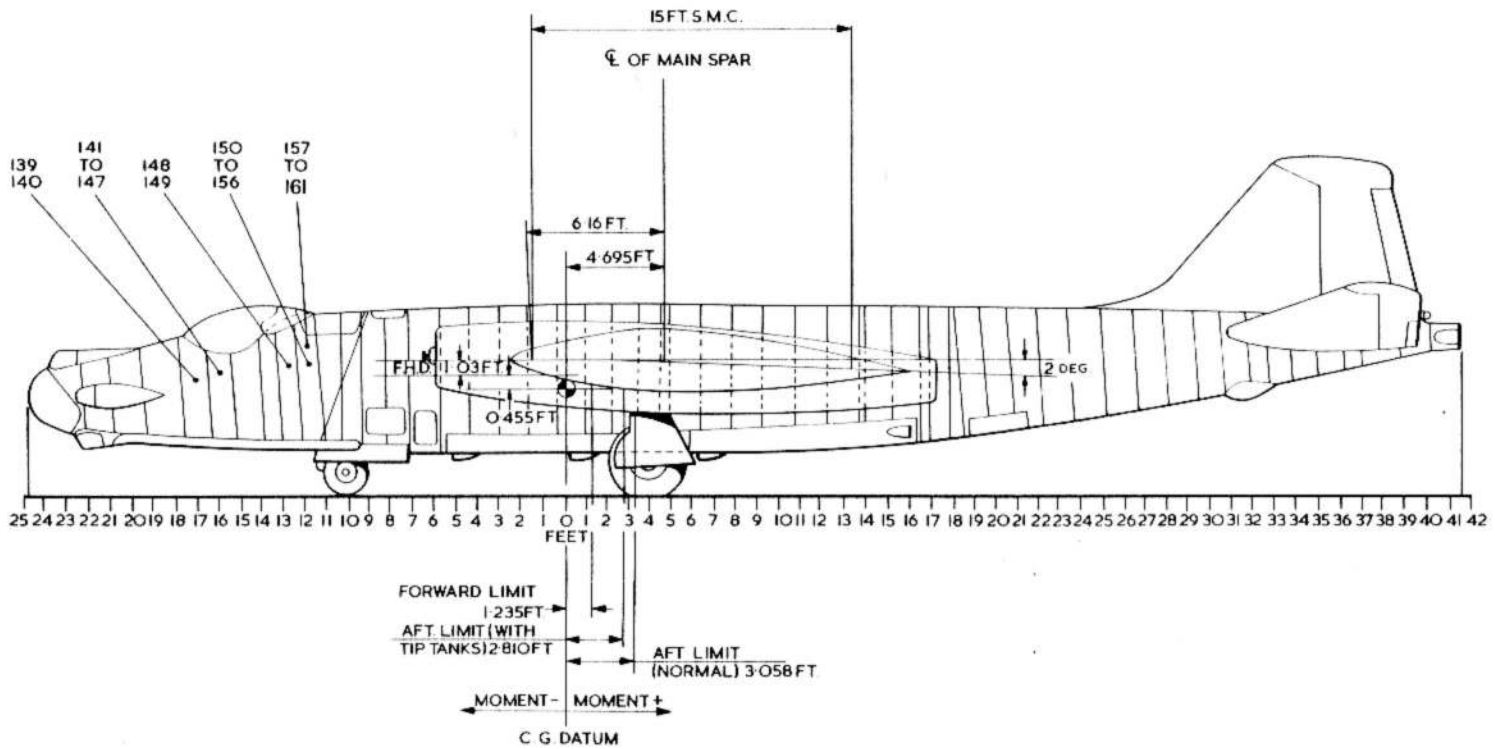


FIG. 5. LOADING AND C.G. DIAGRAM — CREW AND CREW REMOVABLE LOAD ITEMS

◀DELETE ITEM 162. ADD ITEM 161▶

UK RESTRICTED

UK RESTRICTED

TABLE 3 Crew and crew removable operating load items common to all roles (fig.5)

Fig.5

Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
PILOT AND EQUIPMENT						
143		1	Pilot	180.00	-16.44	-2959.20
144	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	-16.44	- 427.44
145	27C/2274	1	Jacket, life saving, Mk.7	6.50	-15.78	- 102.57
146	22C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	-16.40	- 393.60
147	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	-16.40	- 53.30
139		1	Pilot's notes for Canberra T Mk.17 aircraft	0.20	-17.96	- 3.59
140	6F/171	1	Pad, writing, Pilot's, knee type	1.37	-17.23	- 23.61
141	5A/9105033	1	Torch, electric, Type Y, c/w cells	0.72	-16.44	- 11.84
NAVIGATOR AND EQUIPMENT						
157		1	Navigator	180.00	-11.88	-2138.40
154	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	-11.92	- 309.92
155	27C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	-11.85	- 284.40
152	22C/2274	1	Jacket, life saving, Mk.7	6.50	-11.31	- 73.52
150	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	-11.92	- 38.74
149	6B/469	1	Case carrying navigator's equipment			
			containing:-	1.00	-13.04	- 13.04
	5A/9105033	1	Torch, electric Type Y, c/w cells	0.72	-13.04	- 9.39
	6E/293	1	Binoculars, prismatic, 6 x 30mm	2.00	-13.04	- 26.08
	6E/9604560	1	Binoculars, prismatic, Mk.5, 5 x 40mm, c/w rubber face piece	2.25	-13.04	- 29.34
	6B/2645	1	Computer, dead reckoning, Mk.4A	0.25	-13.04	- 3.26
	6B/3677	1	Corrector slide, astro acceleration	0.13	-13.04	- 1.70
	6B/47	1	Protractor, Douglas, 5-inch	0.14	-13.04	- 1.83
	6B/260	1	Rule, navigation Mk.1	0.13	-13.04	- 1.70
	6B/349	1	Straight edge, 20-inch, Mk.3	0.30	-13.04	- 3.91
148	6B/2837	1	Sextant, periscopic, carrying case containing:-	5.86	-13.24	- 77.59
	6B/2836	1	Sextant, periscopic, Mk.2A	7.00	-13.24	- 92.68

continued....

TABLE 3 Crew and crew removable operating load items common to all roles (fig.5) - continued

Fig.5						
Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.E. OPERATOR AND EQUIPMENT			
159		1	A.E. operator	180.00	-11.83	-2129.40
153	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	-11.87	- 308.62
151	22C/2274	1	Jacket, life saving, Mk.7	6.25	-11.27	- 70.44
160	27C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	-11.80	- 283.20
156	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	-11.87	- 38.58
161	5A/9105033	1	Torch, electric, Type Y, c/w cells	0.72	-11.83	- 8.52
Total crew and crew removable load items				741.842		-9919.41

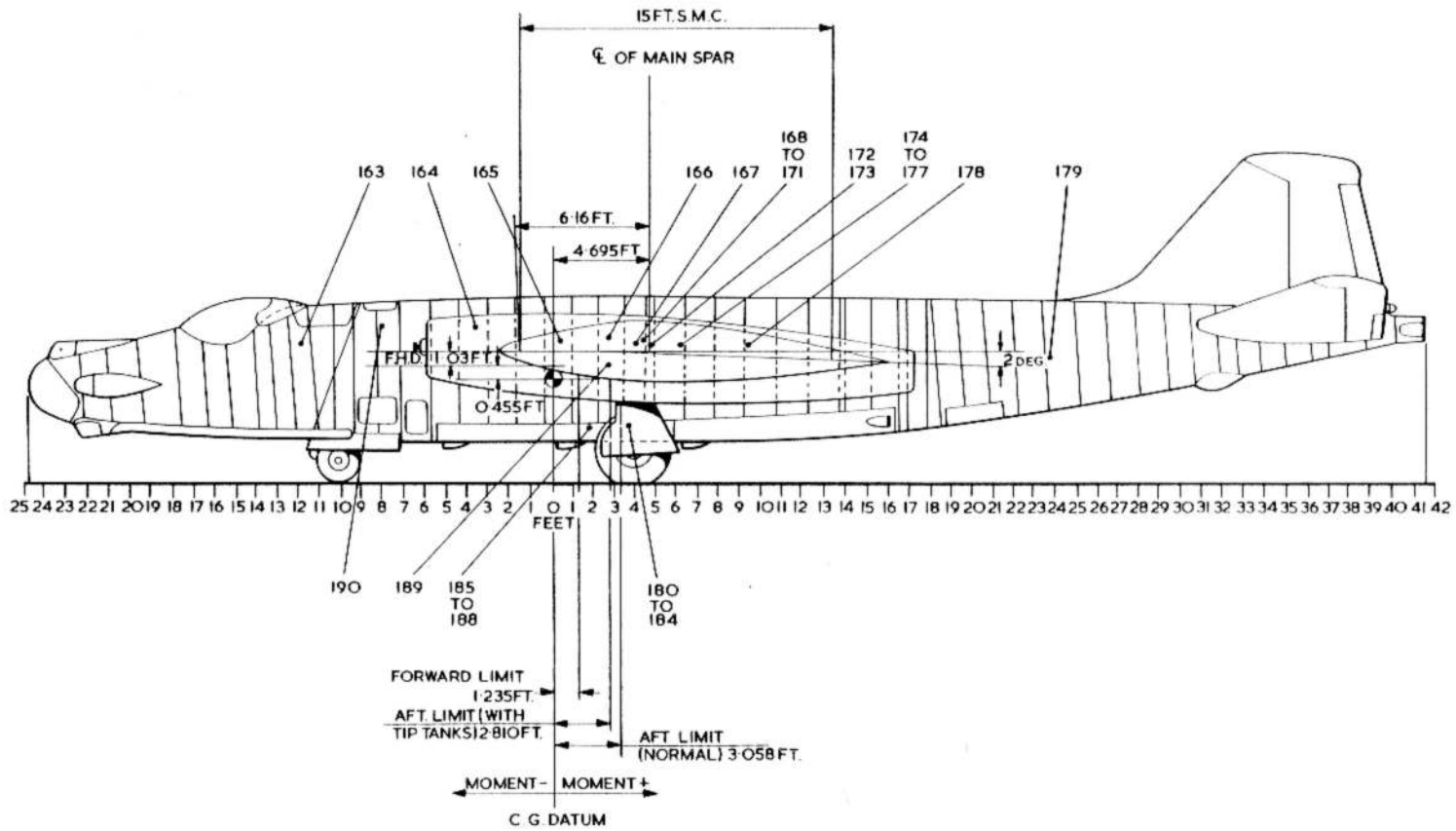


FIG. 6. LOADING AND C.G. DIAGRAM - ALTERNATIVE AND FUEL LOAD ITEMS.

TABLE 4 Alternative operating load items (fig.6)

				CASE A		CASE A1		CASE B		CASE B1		
				Tip tanks with ARI 23166		Tip tanks with ARI 23167		Dispenser system with ARI 23166		Dispenser system with ARI 23167		
Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
169	EA3.62.217/8	2	Wing tip tanks	+ 4.25	238.00	+1011.50	238.00	+1011.50				
170	26FZ/1577	6	Bolt explosive	+ 4.16	2.75	+ 11.44	2.75	+ 11.44				
171	EA1.00.81/2	2	Wing tip tank									
168	12G/1279	6	Detonator electric, No.109 Mk.1	+ 4.10 + 4.15	0.73	+ 2.94	0.73	+ 2.94				
ARI 18051/2 DISPENSER SYSTEM												
172	EG7.81.1	1	Wing tip pod assembly (port)	+ 4.54					249.00	+1130.46	249.00	+1130.46
173	EG7.81.2	1	Wing tip pod assembly (stbd.)	+ 4.54					249.00	+1130.46	249.00	+1130.46
177	7B/2587	6	Discharger cartridge, Mk.4 matrix assembly	+ 6.49					75.00	+ 486.75	75.00	+ 486.75
176	7B/2590	2	Distributor unit, R.B.W.	+ 6.61					24.00	+ 158.64	24.00	+ 158.64
165	10AS/9528340	2	Stripper, counter measure chaff	+ 0.35					82.00	+ 28.70	82.00	+ 28.70

continued..

RESTRICTED

TABLE 4 Alternative operating load items (fig.6) - continued

				CASE A	CASE A1	CASE B	CASE B1		
				Tip tanks with ARI 23166	Tip tanks with ARI 23167	Dispenser system with ARI 23166	Dispenser system with ARI 23167		
Fig.6 Item No.	Ref. or Part No.	Qty	Description Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
175	12D/1390	156	Cartridge, Type 200, No.1,Mk.1 window + 6.49			187.20	+1214.93	187.20	+1214.93
189			Conventional window + 2.63			310.00	+ 815.30	310.00	+ 815.30
174	EG7.84.1301	6	Plate blanking (not required if cartridges fitted) + 6.49						
			ARI 23166 (PORT FORWARD)						
182	110D/35449	1	Transmitter counter measure, T915/ALT218 + 3.56	115.00	+ 409.40	115.00	+409.40		
183	110V/35451	1	R.F. Oscillator, 0-1104/ALT21A band 4 + 3.56	32.00	+ 113.92	32.00	+ 113.92		
184	110AJ/33842	1	Tray mounting 840-20 + 3.56	2.98	+ 10.61	2.98	+ 10.61		
186	110AQ/35450	1	Cooler, liquid,H.D. 609/ALT21A + 1.82	40.00	+ 72.80	40.00	+ 72.80		
185	110AJ/35454	1	Tray mounting + 1.82	2.98	+ 5.42	2.98	+ 5.42		
180	110D/7836263	1	ARI 23167 Transmitter, PNT.782/ ALT15H + 3.56			86.00	+ 306.16	86.00	+ 306.16

continued.....

TABLE 4 Alternative operating load items (fig.6) - continued

					CASE A		CASE A1		CASE B		CASE B1			
					Tip tanks with ARI 23166		Tip tanks with ARI 23167		Dispenser system with ARI 23166		Dispenser system with ARI 23167			
Fig.6	Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	
				ARI 23167 - continued										
	181	110AJ/35579	1	Tray mounting	+ 3.56			7.50	+ 26.70			7.50	+ 26.70	
	187	110K/783659	1	Power supply unit PP.2679/ALT 15H	+ 1.82			45.00	+ 81.90			45.00	+ 81.90	
	188	110AJ/35580	1	Tray mounting	+ 1.82			7.50	+ 13.65			7.50	+ 13.65	
	163	110L/7836260	1	Control, indicator, C3324/ALT 15H	-11.71			2.75	- 32.20			2.75	- 32.20	
	190		4	Ferry role, personal stowage	- 8.00									
	179	27C/2379	*3	Pack survival, Type A, desert	+23.66	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12	
			*3	Pack survival, artic (34 lb each)	+23.66									
	*ALTERNATIVES		*3	Pack survival, tropical (11 lb each)	+23.66									
						566.57	+4761.69	522.36	+4545.75	1501.16	+8700.51	1456.95	+8484.57	

continued.....

TABLE 4 Alternative operating load items (fig.6) - continued

					CASE C		CASE C1		CASE D		CASE D1	
					Dispenser system (without cartridges) with ARI23166		Dispenser system (without cartridges) with ARI23167		Ferry role with ARI23166		Ferry role with ARI23167	
Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
169	EA3.62.217/8	2	Wing tip tanks	+ 4.25					238.00	+1011.50	238.00	+1011.50
170	26FZ/1577	6	Bolt explosive	+ 4.16					2.75	+ 11.44	2.75	+ 11.44
171	EA1.00.81/2	2	Wing tip tank attach- ments	+ 4.10					0.73	+ 2.94	0.73	+ 2.94
168	12G/1279	6	Detonator electric, No.109 Mk.1	+ 4.15					0.13	+ 0.54	0.13	+ 0.54
ARI 18051/2 DISPENSER SYSTEM												
172	EG7.81/1	1	Wing tip pod assembly (port)	+ 4.54	249.00	+1130.46	249.00	+1130.46				
173	EG7.81/2	1	Wing tip pod assembly (stbd.)	+ 4.54	249.00	+1130.46	249.00	+1130.46				
177	7B/2587	6	Discharger cartridge Mk.4 Matrix assy	+ 6.49	75.00	+ 486.75	75.00	+ 486.75				
176	7B/2590	2	Distributor unit RBW	+ 6.61	24.00	+ 158.64	24.00	+ 158.64				
165	10AS/9528340	2	Stripper, counter measure, chaff	+ 0.35	82.00	+ 28.70	82.00	+ 28.70				
175	12D/1390	156	Cartridge, Type 200, No.1 Mk.1 window	+ 6.49								

continued.....

TABLE 4 Alternative operating load items (fig.6) - continued

				CASE C		CASE C1		CASE D		CASE D1		
				Dispenser system (without cartridges) with ARI23166		Dispenser system (without cartridges) with ARI23167		Ferry role with ARI23166		Ferry role with ARI23167		
Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
ARI 18051/2 DISPENSER SYSTEM - continued												
189			Conventional window	+ 2.63	310.00	+ 815.30	310.00	+ 815.30				
174	EG7.84.1301	6	Plate blanking (not required if cartridges fitted)	+ 6.49	7.17	+ 46.53	7.17	+ 46.53				
ARI 23166 (PORT FORWARD)												
182	110D/35449	1	Transmitter, counter measure, T915/ALT21A	+ 3.56	115.00	+ 409.40			115.00	+ 409.40		
183	110V/35451	1	RF Oscillator 0-1104/ALT21A band 4	+ 3.56	32.00	+ 113.92			32.00	+ 113.92		
184	110AJ/33842	1	Tray mounting 840-20	+ 3.56	2.98	+ 10.61			2.98	+ 10.61		
186	110AQ/35450	1	Cooler liquid, HD609/ALT21A+	1.82	40.00	+ 72.80			40.00	+ 72.80		
185	110AJ/35454	1	Tray mounting	+ 1.82	2.98	+ 5.42			2.98	+ 5.42		
ARI 23167												
180	110D/7836263	1	Transmitter, PNT 782/ALT 15H	+ 3.56			86.00	+ 306.16			86.00	+ 306.16
181	110AJ/35579	1	Tray mounting	+ 3.56			7.50	+ 26.70			7.50	+ 26.70

continued.....

TABLE 4 Alternative operating load items (fig.6) - continued

					CASE C		CASE C1		CASE D		CASE D1	
					Dispenser system (without cartridges) with ARI23166		Dispenser system (without cartridges) with ARI23167		Ferry role with ARI23166		Ferry role with ARI23167	
Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
ARI 23167 - continued												
187	110K/783659	1	Power supply unit PP2679/ ALT15H	+ 1.82			45.00	+ 81.90			45.00	+ 81.90
188	110AJ/35580	1	Tray mounting	+ 1.82			7.50	+ 13.65			7.50	+ 13.65
163	110L/7836260	1	Control indicator, C3324/ ALT15H	-11.71			2.75	- 32.20			2.75	- 32.20
190		4	Ferry role, personal stowage	- 8.00					200.00	-1600.00	200.00	-1600.00
179	27C/2379	*3	Pack survival, Type A desert	+23.66	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12
		*3	Pack survival, arctic(34 lb each)	+23.66								
*ALTERNATIVES		*3	Pack survival, tropical (11 lb each)	+23.66								
					1321.13	+7532.11	1276.92	+7316.17	766.57	+3161.69	722.36	+2945.75

TABLE 5 Fuel load items (fig.6)

Fig.6						
Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			FUEL IN FUSELAGE (AT 8 LB/GAL)			
164			Fuel, No.1 tank, 520 gal	4160.00	- 3.86	-16057.60
166			Fuel, No.2 tank, 317 gal	2536.00	+ 2.21	+ 5604.56
178			Fuel, No.3 tank, 540 gal	4320.00	+ 9.13	+39441.60
			Total for fuel in fuselage	11016.00		+28988.56
			WING-TIP TANKS FUEL (AT 8 LB/GAL)			
167			Fuel, wing-tip tanks, 488 gal	3904.00	+ 3.88	+15147.52

TABLE 6 All-up weight summary

	CASE A			CASE A1			CASE B			CASE B1			
	Tip tanks with ARI23166			Tip tanks with ARI23167			Dispenser system with ARI23166			Dispenser system with ARI23167			
	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (lb)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	
◀ Basic weight	25838	+2.917	+75372	25838	+2.917	+75372	25838	+2.917	+75372	25838	+2.917	+75372	▶
Alternative load items (Table 4)	567		+ 4762	522		+ 4546	1501		+ 8701	1457		+ 8485	
◀ Crew and equip- ment (Table 3)	742		-9919	742		-9919	742		-9919	742		-9919	▶
◀ Operating weight	27147	+2.586	+70215	27102	+2.589	+69999	28081	+2.641	+74154	28037	+2.637	+73938	▶
Fuel: Fuselage (Table 5)	11016		+28989	11016		+28989	11016		+28989	11016		+28989	
Wing tips	3904		+15148	3904		+15148							
◀ All Up Weight	42067	+2.718	+114352	42022	+2.716	+114136	39097	+2.638	+103143	39053	+2.636	+102927	▶

continued.....

TABLE 6 All-up weight summary - continued

	CASE C			CASE C1			CASE D			CASE D1			
	Dispenser system (less cartridges) with ARI23166			Dispenser system (less cartridges) with ARI23167			Ferry role with ARI23166			Ferry role with ARI23167			
	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	
◀ Basic weight	25838	+2.917	+75372	25838	+2.917	+75372	25838	+2.917	+75372	25838	+2.917	+75372	▶
Alternative load items (Table 4)	1321		+ 7532	1277		+ 7316	767		+ 3162	722		+ 2946	
◀ Crew and equip- ment (Table 3)	742		-9919	742		-9919	742		-9919	742		-9919	▶
◀ Operating weight	27901	+2.616	+72985	27857	+2.612	+72769	27347	+2.509	+68615	27302	+2.505	+68399	▶
Fuel: Fuselage (Table 5)	11016		+28989	11016		+28989	11016		+28989	11016		+28989	
Wing tips							3904		+15148	3904		+15148	
◀ All Up Weight	38917	+2.620	+101974	38873	+2.618	+101758	42267	+2.67	+112752	42222	+2.665	+112536	▶

Chapter 3A LOADING AND C.G. DATA (Post Mod.5466 issue 1)

LIST OF CONTENTS

	Para.		Para.
<i>General information</i>	1	<i>Maximum all-up weights</i>	7
<i>C.G. position</i>	2	<i>Alternative load items</i>	8
<i>C.G. datum</i>	3	<i>Weighing the aircraft</i>	9
<i>Flight C.G. limits</i>	4	<i>Basic weight and determination</i>	10
<i>Effect of alighting gear retraction</i>	5	<i>Engine data</i>	11
<i>Basic weight and C.G.</i>	6	<i>Modifications</i>	12

LIST OF TABLES

	Table
<i>Summary of drainable and undrainable unusable fuel to be included in basic weight</i>	1
<i>Removable load items included in basic weight</i>	2
<i>Crew and crew removable operating load items common to all roles</i>	3
<i>Alternative operating load items</i>	4
<i>Fuel load items</i>	5
<i>All-up weight summary</i>	6

LIST OF ILLUSTRATIONS

	Fig.
<i>Flight C.G. limits</i>	1
<i>Engine change data</i>	2
<i>Loading and C.G. diagram – removable load items included in basic weight (misc.)</i>	3
<i>Loading and C.G. diagram – removable load items included in basic weight</i>	4
<i>Loading and C.G. diagram – crew and crew removable load items</i>	5
<i>Loading and C.G. diagram – alternative and fuel load items</i>	6

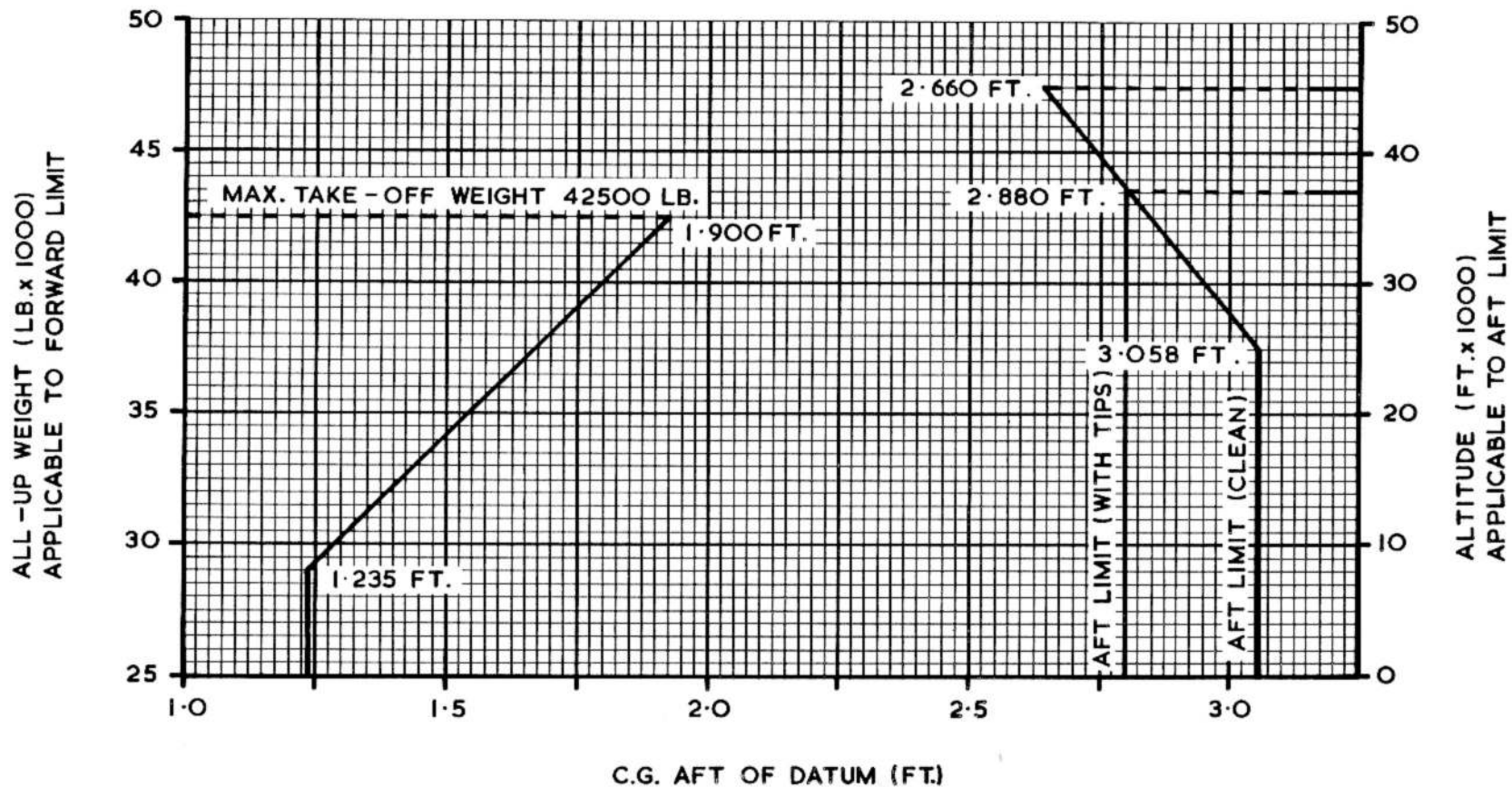


FIG.1. FLIGHT C.G. LIMITS

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 alighting gear 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 0.445 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.

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 29,000 lb the permissible forward limit is 1,235 ft aft and at a weight of 42,500 lb the permissible forward limit is 1,900 ft aft.

Aft limit

This is dependent upon the altitude of the aircraft.

Aircraft without tip tanks:

Up to 25,000 ft the aft C.G. limit is 3,058 ft aft of datum; it then moves linearly forward to 2,660 ft aft of datum at 45,000 ft.

Aircraft with tip tanks:

Up to 37,000 ft the aft C.G. limit is 2,808 ft aft of datum; it then moves linearly forward to 2,660 ft aft of datum at 45,000 ft.

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 -1299 lb ft which must be taken into account when making calculations which assume that the alighting gear is retracted.

Basic weight and C.G.

6. Table 6 refers to a basic weight of 25653 lb and a basic C.G. position of +2,676 ft aft of the datum. These figures are based on the weight of aircraft S/Nos. WJ981, WJ607 and WH646 to the modification standard detailed in paragraph 12. A definition of the term basic weight may be found in A.P.119W-0001-1. The basic weight and moment will vary between aircraft depending on their modification standard.

C.G. Limits for aircraft in basic condition

2.7 ± 0.1 ft aft of datum

Maximum all-up weights (fig.1)

7. The aircraft is cleared for operational flying at the following maximum weights:-

Take-off	42,500 lb
Landing	40,000 lb

Note . . .

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

Alternative load items

8. 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.

Weighing the aircraft

9

Preparation

◀ (1) With the aircraft in the rigging position drain the fuel tanks (Sect.4, Chap.2. For details of undrainable fuel refer to Table 1). Remove all expendable load items and all possible alternative items. Detailed information on aircraft weighing is given in A.P.119W-0001-1. Electronic weighing units and ancillary equipment are dealt with in A.P.119W-0304-1.

(2) The following weighing equipment is required in addition to the normal jacking equipment called for in Sect.2, Chap.4:

Bottle jack x 3	4Q/1045837
Electronic Weighing Kit	4GB/2453967
Adaptor x 2	4GB/4398891 (At each main oleo)
Adaptor	4GB/4398902 (At nose wheel axle)

(3) To weigh the aircraft with the electronic weighing kit use the following procedure:

- (a) Plug the electronic weighing kit into a 240 volt supply and leave for 20 minutes warm up period. Zero the load cells.
- (b) Attach capstan on each bottle jack.
- (c) Place electronic weigh cells on top of each capstan.

Note . . .

During operations (d) and (e) it may be necessary to jack the aircraft with normal jacking equipment to give sufficient clearance for positioning the bottle jacks.

- (d) Place adaptors (4GB/4398891) on base of main oleo. Hold in place and position bottle jack under them.
- (e) Position adaptor (4GB/4398902) under axle between two nose wheels and slide bottle jack into position.
- (f) Take 500 Kg. of weight on to each load cell. Wait 15 minutes. Lower bottle jacks and re-check that load cells are at zero. ▶

- ◀ (g) Raise aircraft on bottle jacks until clear of ground and level into rigging position. Ensure all weight is taken by load cells.
- (h) Weigh the aircraft as instructed by A.P.119W-0304-1.
- (i) Lower aircraft to ground.
- (j) Remove weighing equipment.
- (k) Ensure new basic weight and moment figures entered on F765 in red ink. ▶

Basic weight and determination

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

- (1) The weight and moment of drainable unusable fuel in the pipelines (*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 Tables 3, 4, 5 and 6 which were fitted at weighing.

The resultant figures are the basic weight and moment.

Engine data (fig.2)

11. In the event of an engine change, Mod.F751 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, either the front or rear suspension point which can be corrected to the A/C datum using the data given in fig.2.

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

Modifications

12. The basic weight given (*Table 6*), includes the modifications quoted in the CAN.17/Y/3 Leaflet, plus the modifications listed in sub-

para.(1), minus those in sub-para.(2):—

(1) 263, 426, 648, 704, 859, 883, 1199, 1497, 2132, 4356, 4451,
4723, 4930, 5176, 5208, 5209, 5220, 5229, 5231, 5238, 5239, 5244,
5250, 5253, 5257, 5265, 5267, 5269, 5428, 5466 issue 1.

(2) NIL.

The following modifications are part embodied. 721 (No.3 tank only),
875 (Port aileron), 4080 (Less u/c up positions), 5216 (Part B), 5473
(Port elevator), 5503.

UK RESTRICTED

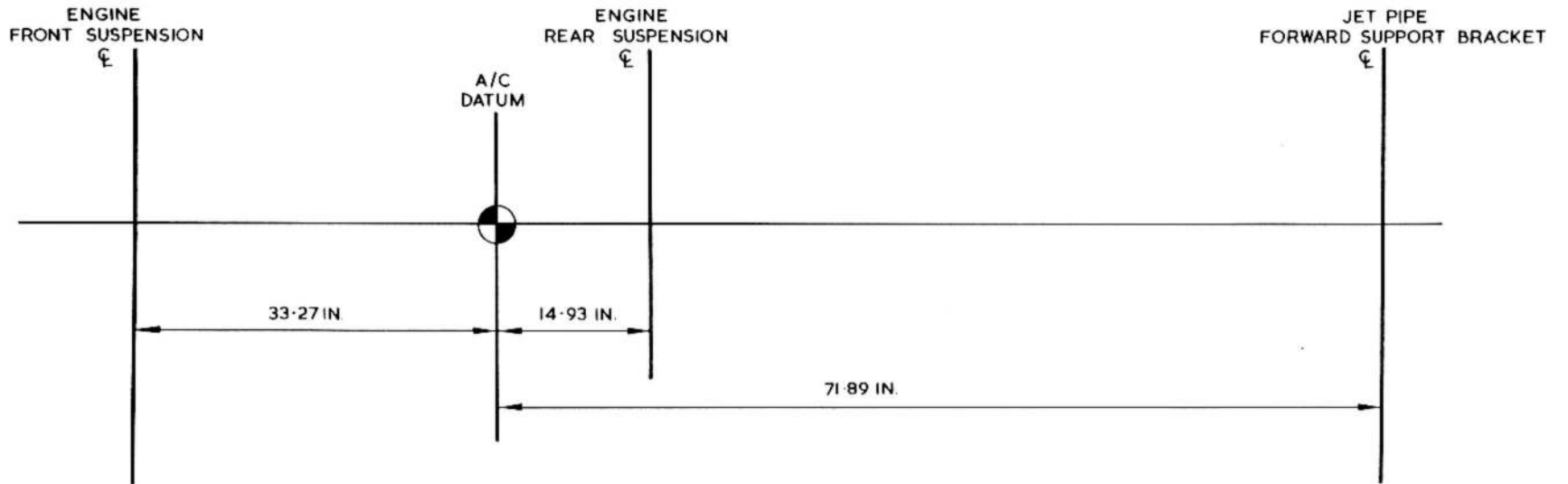


FIG. 2. ENGINE CHANGE DATA

TABLE 1

Summary of drainable and undrainable unusable fuel to be included in basic weight

Location	Weight (lb)	Arm (ft)	Moment (lb ft)
Trapped (undrainable) fuel in pipes (wings and fuselage)	6.70	-0.228	-1.53
Note . . .			
1. <i>Due to the disposition of certain fuel pipes, the above weight of fuel will remain trapped when the fuel tanks are drained.</i>			
2. <i>Since all fuel in the pipelines is included in the basic weight, the following fuel weights must be added when determining the basic weight after weighing the aircraft.</i>			
Drainable fuel in pipes (wings and fuselage)	9.00	+1.534	+13.81

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						
22	12L/203	1	Destructor, aircraft, No.1, Mk.1	3.25	- 8.73	- 28.37
6	12K/9625465	1 set	Cartridge, seat ejection, No.13, Mk.1	1.58	- 14.74	- 23.29
12	12K/9625465	2 sets	Cartridge, seat ejection, No.13, Mk.1	3.16	- 10.23	- 32.33
4	12K/9625446	1	Cartridge, canopy jettison, No.3, Mk.2	1.60	- 16.19	- 25.90
20	12K/1220	6	Cartridge, engine starting	18.00	+ 17.35	+ 312.30
2	12G/9625203	1	Charge, H.E. emergency control, severing No.1, Mk.3	0.37	- 16.19	- 5.99
5	12G/9635206	32	Detonator, electric, No.108, Mk.3 (Canopy)	0.74	- 15.70	- 11.62
11	12G/9635206	34	Detonator, electric, No.108, Mk.3 (Hatch)	0.78	- 11.20	- 8.74
3	12G/9635205	1	Detonator, electric, No.109, Mk.2 (Controls)	0.02	- 16.19	- 0.32
29	6140-99-910-1543	2	Battery, 12 volt, 4 amp. hours	9.88	- 17.48	- 172.70
21	6140-99-910-1534	4	Battery, 12 volt, 40 amp. hours, Type C	198.76	- 6.65	- 1321.75
8	5CX/369	1	Lamp, inspection, and extension lead	0.90	- 13.34	- 12.01
9	6B/633	1	Amplifier unit, Type B	10.00	- 11.89	- 118.90
17	6B/4343681	1	Detector unit, Type A	1.72	+ 5.70	+ 9.80
1	6B/4343640	1	Gyro unit, Type B	6.00	- 18.69	- 112.14
7	6B/4352094	1	Indicator, master, Type E5	7.06	- 14.22	- 100.39
18	27N/100	1	Extinguisher, fire, methyl-bromide, Type 12A	10.63	+ 13.96	+ 148.39
16	27N/102	2	Extinguisher, fire, methyl-bromide, Type 14A	38.62	+ 1.01	+ 39.01
15	27N/N.I.V.	1	Extinguisher, fire, methyl-bromide, Type 60A	18.50	- 5.54	- 102.49
19	27N/N.I.V.	1	Extinguisher, fire, methyl-bromide, Type 60A	18.50	+ 15.99	+ 295.83
25	27N/299	1	Extinguisher, fire, trigger hand operated, Type 34H	5.19	- 13.72	- 71.21
26	22G/9108081	1	Gauntlets, fire fighting, (1 pair)	0.88	- 14.12	- 12.43
27	27H/3224	1	Container, urine, Mk.2, and funnel	1.09	- 13.97	- 15.23
23	27N/1	1	Axe, fire	2.42	- 13.43	- 52.50
28	26FZ/3501	1	Handle for emergency hydraulic system hand pump (stowed)	0.85	- 14.97	- 12.72
14			Oxygen charge	25.78	- 8.14	- 209.85
13			Nitrogen charge	4.12	- 9.61	- 37.74
24	9A/02430	1	First aid outfit	3.00	- 13.66	- 40.98
10	27N/299	1	Extinguisher, fire, trigger hand operated, Type 34H	5.19	- 11.89	- 61.71

continued . . .

UK RESTRICTED

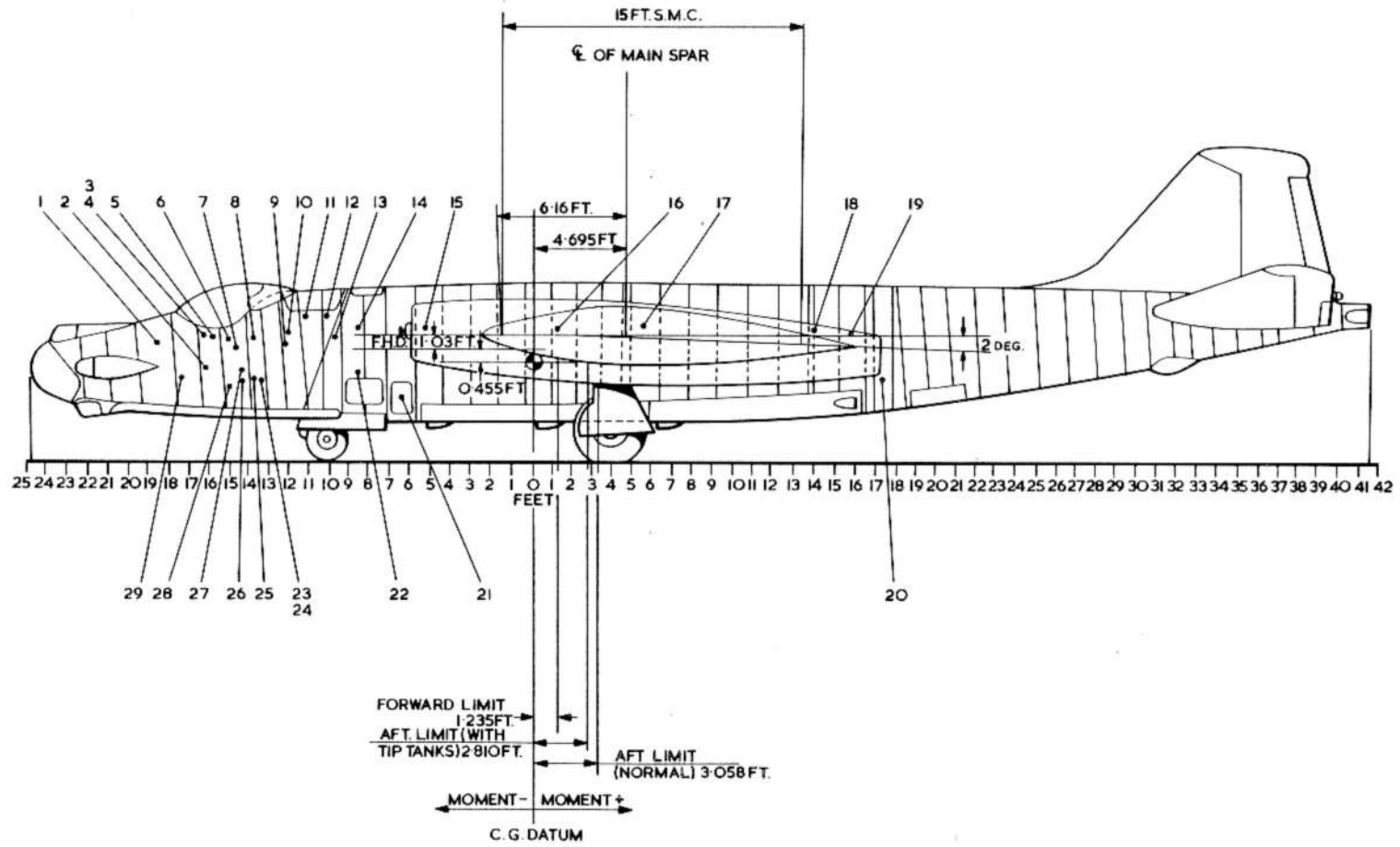


FIG. 3. LOADING AND C.G. DIAGRAM - REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT (MISCELLANEOUS)

TABLE 2 Removable load items included in basic weight (fig.4) -- continued

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.R.I. 23099/7 UA60 INTERCOMM.			
44	5831-99-945-2676	1	Amplifier, A.F. Type UA60	2.00	- 12.80	- 25.60
36		2	Station box, UA6018/3F	6.50	- 15.35	- 99.78
40		1	Station box, UA6118/1F	3.25	- 13.50	- 43.88
41		1	Davall recorder	3.13	- 13.00	- 40.63
			A.R.I. 23361/0 SPECTRUM ANALYSER			
51		1	Computer/Controller, 4041	20.39	- 11.76	- 239.76
92		1	Spectrum analyser, 492P	44.00	- 14.21	- 625.24
42	118-0070-00	1	Audio detector	0.30	- 13.34	- 4.00
			A.R.I.23314 OMEGA NAVIGATION SYSTEM			
37		1	Control display unit, 458100	3.80	- 13.77	- 52.33
93		1	True airspeed unit, 60071	2.09	- 14.21	- 29.70
94		1	Total head thermometer, DB350	1.00	- 14.50	- 14.50
66	457300-04-12	1	Receiver/Processor unit	24.69	+ 14.93	+ 368.62
			A.R.I. 23363 I/J BAND JAMMER			
95		2	Control unit, 236577-1	3.00	- 14.22	- 42.66
67		2	Main unit, 236576-1	340.00	+ 12.80	+4352.00
			A.R.I. 23166			
68	110D/35449	1	Transmitter, counter measure, Type T 915/ALT.21A	115.00	+ 8.30	+ 954.50
69	110V/35452	1	R.F. oscillator, Type 0-1101/ALT.21A band 1	32.00	+ 8.30	+ 265.60
70	110AJ/33842	1	Tray, mounting, Type 840-20	7.50	+ 8.30	+ 62.25
73	110D/35449	1	Transmitter, counter measure, Type T 915/ALT.21A	115.00	+ 3.56	+ 409.40
74	110V/35451	1	R.F. oscillator, Type 0-1104/ALT.21A band 4	32.00	+ 3.56	+ 113.92
75	110AJ/33842	1	Tray, mounting, Type 840-20	7.50	+ 3.56	+ 26.70
71	110AQ/35450	1	Cooler, liquid, Type HD.609/ALT.21A	40.00	+ 8.30	+ 332.00
72	110AJ/35454	1	Tray, mounting	7.50	+ 8.30	+ 62.25
76	110AQ/35450	1	Cooler, liquid, Type 609/ALT.21A	40.00	+ 1.14	+ 45.60
77	110AJ/35454	1	Tray, mounting	7.50	+ 1.14	+ 8.55
46	110L/35453	3	Control indicator, Type C.4646/ALT.21A	11.40	- 12.75	- 145.35

continued . . .

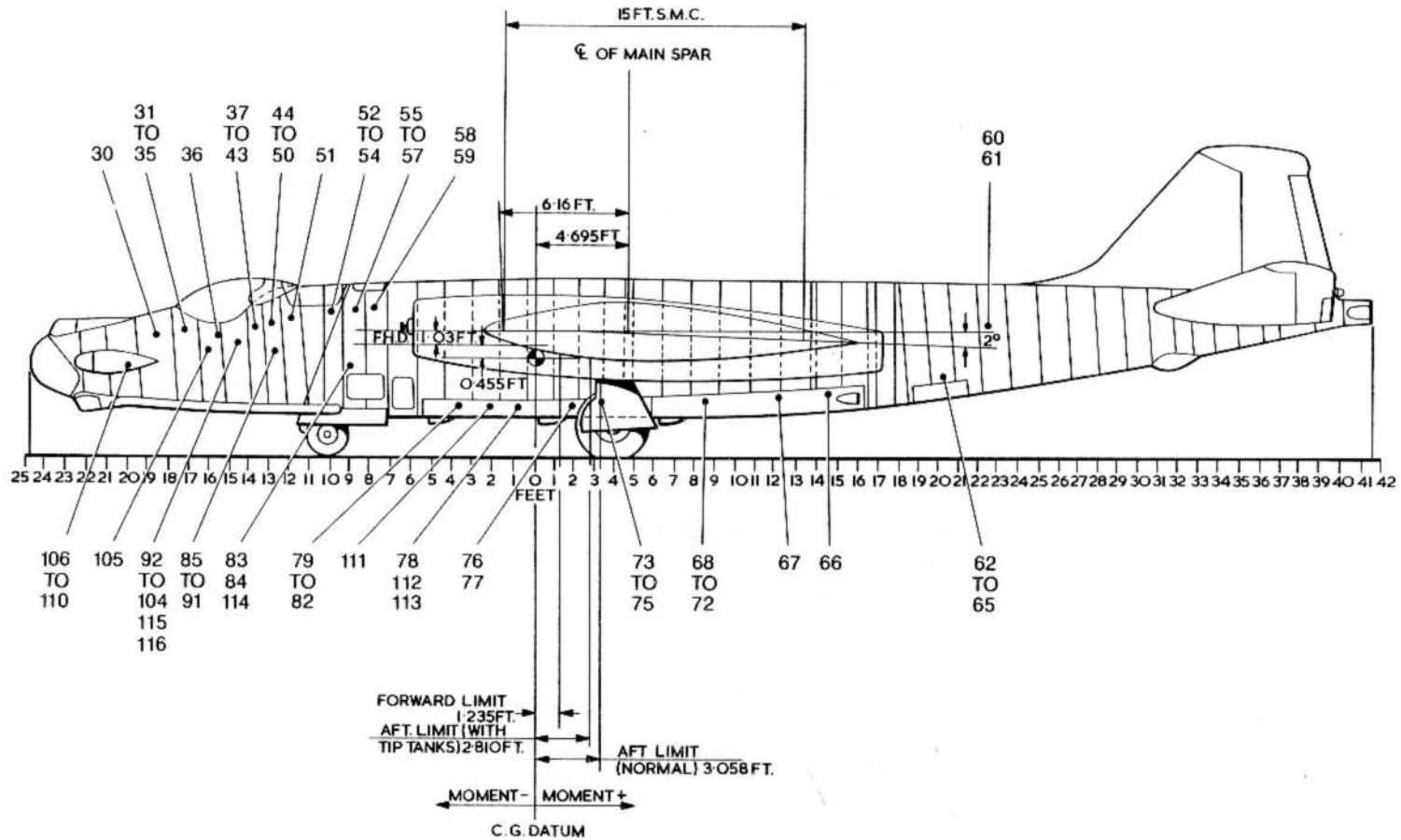


FIG. 4. LOADING AND C.G. DIAGRAM - REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT.

TABLE 2 Removable load items included in basic weight (fig.4) — continued

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
85		1	A.R.I. 23167 Control indicator, Type C.3324/ALT.15H	2.75	- 12.02	- 33.06
86	5821-99-649-6595	1	A.R.I. 23301/1 U.H.F. (Set 1) PTR 1751 Transceiver, PTR 1751W	15.43	- 12.70	-195.96
87	5821-99-649-9755	1	Tray, mounting, PV 17488	3.30	- 12.70	- 41.91
31	5821-99-649-0317	1	Control unit, PV1754L	3.39	- 17.40	- 58.99
88	5821-99-652-0258	1	Interface unit, PV1746B	2.64	- 12.7	- 33.60
96	5821-99-932-6361	1	Box, interconnecting	1.25	- 14.45	- 18.06
45	5826-00-897-5519	1	A.R.I. 18107/4 TACAN Transmitter/receiver, Type RT636/ARN72	50.00	- 12.44	-621.90
47	10A/251	1	Tray, mounting, Type 9274 (for T/R unit)	7.77	- 12.44	- 96.64
58	10D/22534	1	Coupling unit, Type 9546	7.74	- 7.84	- 58.56
59	10AJ/258	1	Tray mounting (for coupling unit)	1.88	- 7.84	- 14.74
48	10L/16310	1	Control unit, Type 92734	1.06	- 12.44	- 13.22
105	10Q/16355	1	Indicator, Type 9547	1.50	- 15.70	- 23.55
30	10Q/16355	1	Indicator, Type 9547	1.50	- 18.25	- 27.38
62	10D/9542617	1	A.R.I. 23172 RADIO ALTIMETER Transmitter/receiver, Type 16098	16.50	+ 20.50	+338.25
63	10AJ/698	1	Tray, mounting, (For T/R unit)	1.80	+ 20.50	+ 36.90
83	10U/9542618	1	Amplifier, Type 16089	4.75	- 9.05	- 42.99
84	10AJ/699	1	Tray, mounting, (for amplifier)	0.55	- 9.05	- 4.98
33	10L/16720	1	Control unit, Type 16095	1.85	- 17.10	- 31.64
64	10D/22305	1	Delay unit, Type 16119	1.50	+ 19.80	+ 29.70
32	10Q/16459	1	Indicator, Type 16094 (height)	0.90	- 17.90	- 16.11
65	5826-99-104-2242	2	Horn (waveguides) aerial system	7.00	+ 19.80	+138.60
115	10U/17211	1	A.R.I. 5877, RADIO COMPASS Amplifier, R.F. Type A8281	4.90	- 14.35	- 70.32
116	10U/17212	1	Amplifier, I.F. Type A8282	9.10	- 14.35	-130.59
38	10L/16287	1	Control unit, Type 8283	2.24	- 13.50	- 30.24

continued . . .

UK RESTRICTED

TABLE 2 Removable load items included in basic weight (fig.4) — continued

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
A.R.I. 5877, RADIO COMPASS — continued						
57	10D/20169	1	Corrector unit, Type QE	1.00	— 8.50	— 8.50
39	10Q/16357	1	Indicator, master bearing, Type 9551	1.50	— 13.50	— 20.25
97	10AJ/1572	1	Tray, mounting, (for amplifier R.F.)	1.85	— 14.35	— 26.69
98	10AJ/1573	1	Tray, mounting, (for amplifier, I.F.)	1.00	— 14.35	— 14.35
A.R.I. 23090, H.F. RADIO 618T-3						
106	10D/23518	1	Transmitter/receiver, Type M15 (618T-3)	52.00	— 20.10	—1045.20
107	5340-99-945-1643	1	Tray, mounting, resilient, (for transmitter/receiver)	5.00	— 20.10	— 100.50
108	5831-99-914-8966	1	Pre-amplifier, Type UA6002	0.63	— 20.70	— 13.04
109	10D/23525	1	Aerial tuning unit, Type 180L-3A	18.00	— 20.00	— 360.00
110	5340-99-945-1644	1	Tray, mounting, resilient, 350-D3 (for aerial tuning unit)	1.25	— 20.00	— 25.00
43	10L/16857	1	Control unit, Type M53 (714E-3)	3.00	— 13.55	— 40.65
A.R.I. 23118, VOR/ILS INSTALLATION						
99	10D/9704803	1	Receiver, VHF, Type 6401M	8.20	— 14.20	— 116.44
100	10D/9702192	1	Receiver, Glide slope, Type 6404M	7.80	— 14.20	— 110.76
101	10D/9702193	1	Marker receiver, Type 6403M	6.70	— 14.20	— 95.14
102	10D/25393	1	Tray, mounting, (for marker receiver)	0.63	— 14.20	— 8.95
103	10D/23594	1	Tray, mounting, (for nav. unit & G.S. receiver)	1.50	— 14.20	— 21.30
34	10L/9702196	1	Control unit, Type 7430M	1.25	— 17.40	— 21.75
104	10D/9702194	1	Navigation unit, Type 6402MA	9.90	— 14.20	— 140.58
A.R.I. 23288/3, V.H.F. AD120						
89	5821-99-639-5428	1	Transmitter/receiver AA1201-2	14.90	— 12.00	— 58.80
90	5821-99-639-2480	1	Tray, mounting, (for TR/receiver) AA1206-1	1.80	— 12.00	— 21.60
35	5821-99-639-2496	1	Control unit, AA1202-2	1.32	— 17.55	— 23.17
A.R.I. 18051/2, (IN PART)						
53	10L/291	1	Control unit, Type 7122	7.88	— 10.19	— 80.30
52	7B/2589	1	Panel	5.33	— 10.19	— 54.31

continued . . .

TABLE 2 Removable load items included in basic weight (fig.4) — continued

Fig.4 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.R.I. 23301/1 U.H.F. (SET 2) PTR 1751			
114	5821-99-649-6595	1	Transceiver PTR1751W	15.43	- 8.90	- 137.33
56	5821-99-649-9755	1	Tray mounting, PV1748B	3.30	- 8.90	- 29.37
49	5821-99-649-0317	1	Control unit, PV1754L	3.31	- 13.98	- 46.28
55	5821-99-652-0258	1	Interface unit, PV1746B	2.64	- 8.9	- 23.55
54	5821-99-932-6361	1	Box interconnecting	1.25	- 9.98	- 12.48
			A.R.I. 23134, IFF/SSR 1520			
60	5895-99-956-3378	1	Transponder, 16928	30.00	+ 23.50	+ 705.00
61	5820-99-107-5637	1	Mounting, 16946	1.25	+ 23.50	+ 29.38
50	5895-99-956-3379	1	Control unit, 16929	2.00	- 12.10	- 24.20
			A.R.I. 23362, SYLVANIA COMMUNICATIONS JAMMER			
91	02-1279600-1	1	Controller	10.00	- 12.88	- 128.80
79	02-1278109-1	1	Processor	21.03	- 4.53	- 95.27
80	02-1278105-1	2	Receiver 1 & 2	83.02	- 4.53	- 376.08
81	02-1278105-1	1	L.V. power supply	25.24	- 4.53	- 114.34
82	02-1278108-1	1	Exciter	17.99	- 4.53	- 81.49
78	02-1278104-1	1	R.F. power amplifier	180.00	- 1.64	- 295.02
111	D3620-70A	1	Heat exchanger, Marston	22.04	- 2.43	- 53.56
112	B01A-301288A	1	Reservoir BAe D6	20.17	- 0.63	- 12.71
113	568-8-25235-002	1	Pump, Plessey	3.90	- 0.17	- 0.66
				Weights include a fluid allowance		

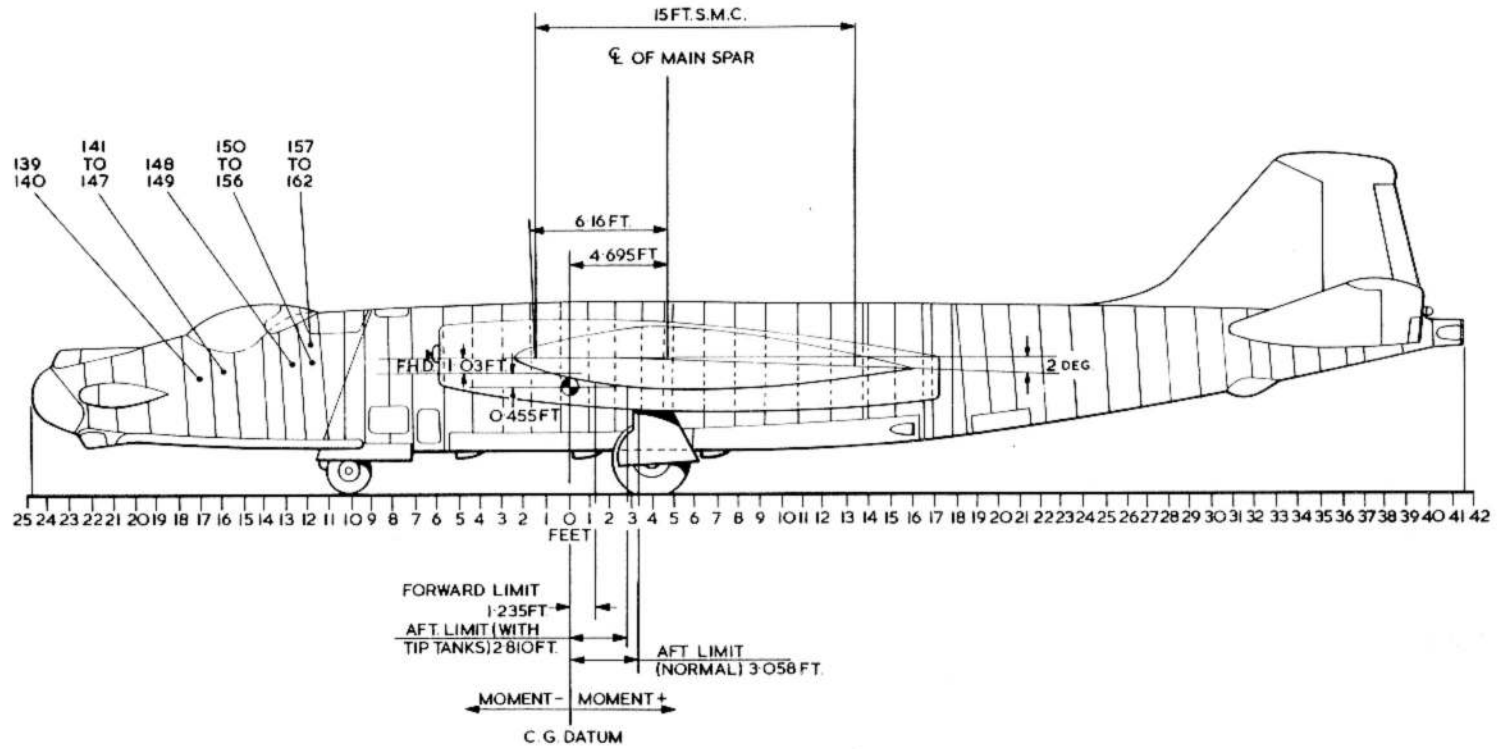


FIG. 5. LOADING AND C.G. DIAGRAM — CREW AND CREW REMOVABLE LOAD ITEMS

TABLE 3 Crew and crew removable operating load items common to all roles (fig.5)

Fig.5 Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
PILOT AND EQUIPMENT						
143		1	Pilot	180.00	- 16.44	-2959.20
144	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	- 16.44	- 427.44
145	27C/2274	1	Jacket, life saving, Mk.7	6.50	- 15.78	- 102.57
146	22C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	- 16.40	- 393.60
147	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	- 16.40	- 53.30
139		1	Pilot's notes for Canberra T Mk.17 aircraft	0.20	- 17.96	- 3.59
140	6F/171	1	Pad, writing, Pilot's, knee type	1.37	- 17.23	- 23.61
141	5A/9105033	1	Torch, electric, Type Y, c/w cells	0.72	- 16.44	- 11.84
NAVIGATOR AND EQUIPMENT						
157		1	Navigator	180.00	- 11.88	-2138.40
154	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	- 11.92	- 309.92
155	27C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	- 11.85	- 284.40
152	22C/2274	1	Jacket, life saving, Mk.7	6.50	- 11.31	- 73.52
150	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	- 11.92	- 38.74
149	6B/469	1	Case carrying navigator's equipment containing:-	1.00	- 13.04	- 13.04
	5A/9105033	1	Torch, electric, Type Y, c/w cells	0.72	- 13.04	- 9.39
	6E/293	1	Binoculars, prismatic, 6 x 30 mm	2.00	- 13.04	- 26.08
	6E/9604560	1	Binoculars, prismatic, Mk.5, 5 x 40 mm, c/w rubber face piece	2.25	- 13.04	- 29.34
	6B/2645	1	Computer, dead reckoning, Mk.4A	0.25	- 13.04	- 3.26
	6B/3677	1	Corrector slide, astro acceleration	0.13	- 13.04	- 1.70
	6B/47	1	Protractor, Douglas, 5-inch	0.14	- 13.04	- 1.83
	6B/260	1	Rule, navigation, Mk.1	0.13	- 13.04	- 1.70
	6B/349	1	Straight edge, 20-inch, Mk.3	0.30	- 13.04	- 3.91
148	6B/2837	1	Sextant, periscopic, carrying case containing:-	5.86	- 13.24	- 77.59
	6B/2836	1	Sextant, periscopic, Mk.2A	7.00	- 13.24	- 92.68

continued . . .

TABLE 3 Crew and crew removable operating load items common to all roles (fig.5) — continued

Fig.5 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
A.E. OPERATOR AND EQUIPMENT						
159		1	A.E. operator	180.00	- 11.83	-2129.40
153	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	- 11.87	- 308.62
151	22C/2274	1	Jacket, life saving, Mk.7	6.25	- 11.27	- 70.44
160	27C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	- 11.80	- 283.20
156	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	- 11.87	- 38.58
161	5A/9105033	1	Torch, electric, Type Y, c/w cells	0.72	- 11.83	- 8.52
Total crew and crew removable load items				741.842		-9919.41

UK RESTRICTED

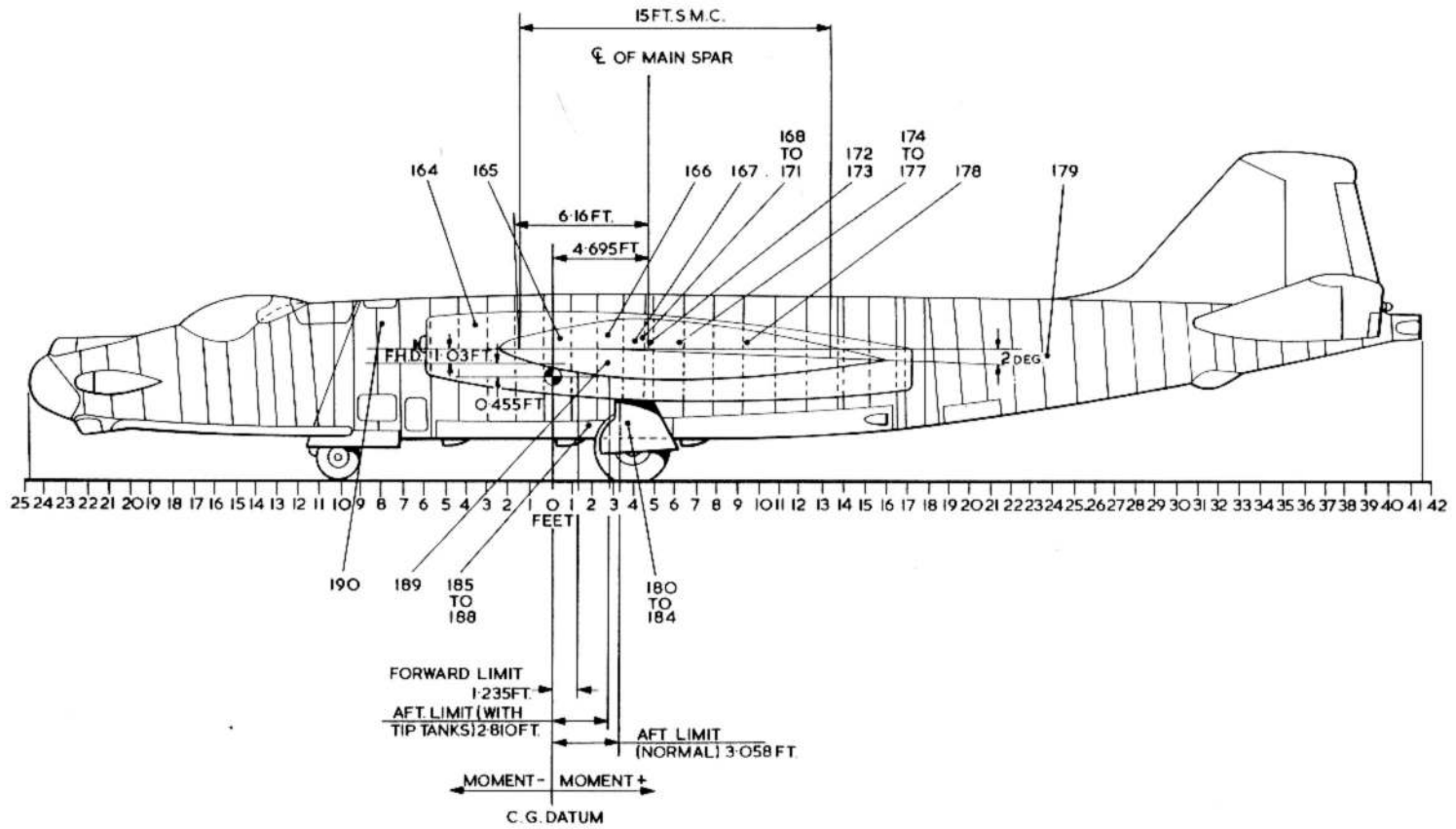


FIG. 6. LOADING AND C.G. DIAGRAM - ALTERNATIVE AND FUEL LOAD ITEMS.

TABLE 4 Alternative operating load items (fig.6)

Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	CASE A		CASE A1		CASE B		CASE B1	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
169	EA3.62.217/8	2	Wing tip tanks	+ 4.25	238.00	+1011.50	238.00	+1011.50				
170	26FZ/1577	6	Bolt explosive	+ 4.16	2.75	+ 11.44	2.75	+ 11.44				
171	EA1.00.81/2	2	Wing tip tank attachments	+ 4.10	0.73	+ 2.94	0.73	+ 2.94				
168	12G/1279	6	Detonator electric, No.109 Mk.1	+ 4.15	0.13	+ 0.54	0.13	+ 0.54				
ARI 18051/2 DISPENSER SYSTEM												
172	EG7.81.1	1	Wing tip pod assembly (port)	+ 4.54					249.00	+1130.46	249.00	+1130.46
173	EG7.81.2	1	Wing tip pod assembly (stbd.)	+ 4.54					249.00	+1130.46	249.00	+1130.46
177	7B/2587	6	Discharger cartridge, Mk.4 matrix assembly	+ 6.49					75.00	+ 486.75	75.00	+ 486.75
176	7B/2590	2	Distributor unit, R.B.W.	+ 6.61					24.00	+ 158.64	24.00	+ 158.64
165	10AS/9528340	2	Stripper, counter measure chaff	+ 0.35					82.00	+ 28.70	82.00	+ 28.70

continued . . .

TABLE 4 Alternative operating load items (fig.6) — continued

Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	CASE A		CASE A1		CASE B		CASE B1	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
175	12D/1390	156	Cartridge, Type 200, No.1, Mk.1 window	+ 6.49					187.20	+1214.93	187.20	+1214.93
189			Conventional window	+ 2.63					310.00	+ 815.30	310.00	+ 815.30
174	EG7.84.1301	6	Plate blanking (not required if cartridges fitted)	+ 6.49								
			ARI 23166 (PORT FORWARD)									
182	110D/35449	1	Transmitter counter measure, T915/ALT 218	+ 3.56	115.00	+ 409.40			115.00	+ 409.40		
183	110V/35451	1	R.F. Oscillator, 0-1104/ALT 21A band 4	+ 3.56	32.00	+ 113.92			32.00	+ 113.92		
184		1	Tray mounting 840-20	+ 3.56	7.50	+ 26.70			7.50	+ 26.70		
186	110AQ/35450	1	Cooler, liquid, H.D. 609/ALT 21A	+ 1.14	40.00	+ 45.60			40.00	+ 45.60		
185		1	Tray mounting	+ 1.14	7.50	+ 8.55			7.50	+ 8.55		

continued . . .

TABLE 4 Alternative operating load items (fig.6) – continued

Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	CASE A		CASE A1		CASE B		CASE B1	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
180	110D/7836263	1	ARI 23167 Transmitter, PNT.782/ ALT 15H	+ 3.56			86.00	+ 306.16			86.00	+ 306.16
181	110AJ/35579	1	Tray mounting	+ 3.56			7.50	+ 26.70			7.50	+ 26.70
187	110K/783659	1	Power supply unit PP.2679/ ALT 15H	+ 1.14			45.00	+ 51.30			45.00	+ 51.30
188	110AJ/35580	1	Tray mounting	+ 1.14			7.50	+ 8.55			7.50	+ 8.55
190		4	Ferry role, personal stowage	- 8.00								
179	27C/2379	*3	Pack survival, Type A, desert	+23.66	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12
		*3	Pack survival, arctic (34 lb each)	+23.66								
*ALTERNATIVES		*3	Pack survival, tropical (11 lb each)	+23.66								
					575.61	+4753.71	519.61	+4542.25	1510.00	+8692.53	1454.20	+8481.07

continued . . .

TABLE 4 Alternative operating load items (fig.6) — continued

Fig.6 Item No.	Ref or Part No.	Qty	Description	Arm (ft)	CASE C		CASE C1		CASE D		CASE D1	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
169	EA3.62.217/8	2	Wing tip tanks	+ 4.25					238.00	+1011.50	238.00	+1011.50
170	26FZ/1577	6	Bolt explosive	+ 4.16					2.75	+ 11.44	2.75	+ 11.44
171	EA1.00.81/2	2	Wing tip tank attachments	+ 4.10					0.73	+ 2.94	0.73	+ 2.94
168	12G/1279	6	Detonator electric, No.109 Mk.1	+ 4.15					0.13	+ 0.54	0.13	+ 0.54
ARI 18051/2 DISPENSER SYSTEM												
172	EG7.81/1	1	Wing tip pod assembly (port)	+ 4.54	249.00	+1130.46	249.00	+1130.46				
173	EG7.81/2	1	Wing tip pod assembly (stbd.)	+ 4.54	249.00	+1130.46	249.00	+1130.46				
177	7B/2587	6	Discharger cartridge Mk.4 Matrix assy	+ 6.49	75.00	+ 486.75	75.00	+ 486.75				
176	7B/2590	2	Distributor unit RBW	+ 6.61	24.00	+ 158.64	24.00	+ 158.64				
165	10AS/9528340	2	Stripper, counter measure, chaff	+ 0.35	82.00	+ 28.70	82.00	+ 28.70				

continued . . .

TABLE 4 Alternative operating load items (fig.6) — continued

Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	CASE C		CASE C1		CASE D		CASE D1	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
ARI 18051/2 DISPENSER SYSTEM — continued												
175	12D/1390	156	Cartridge, Type 200, No.1, Mk.1									
			window	+ 6.49								
189			Conventional window	+ 2.63	310.00	+ 815.30	310.00	+ 815.30				
174	EG7.84.1301	6	Plate blanking (not required if cartridges fitted)	+ 6.49	7.17	+ 46.53	7.17	+ 46.53				
ARI 23166 (PORT FORWARD)												
182	110D/35449	1	Transmitter, counter measure, T915/ ALT21A	+ 3.56	115.00	+ 409.40			115.00	+ 409.40		
183	110V/35451	1	RF Oscillator 0-1104/ALT21A band 4	+ 3.56	32.00	+ 113.92			32.00	+ 113.92		
184	110AJ/33842	1	Tray mounting 840-20	+ 3.56	7.50	+ 26.70			7.50	+ 26.70		
186	110AQ/35450	1	Cooler liquid, HD609/ALT21A	+ 1.14	40.00	+ 45.60			40.00	+ 45.60		
185	110AJ/35454	1	Tray mounting	+ 1.14	7.50	+ 8.55			7.50	+ 8.55		

continued . . .

TABLE 4 Alternative operating load items (fig.6) — continued

Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	CASE C		CASE C1		CASE D		CASE D1	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
180	110D/7836263	1	ARI 23167 Transmitter, PNT 782/ ALT 15H	+ 3.56			86.00	+ 306.16			86.00	+ 306.16
181	110AJ/35579	1	Tray mounting	+ 3.56			7.50	+ 26.70			7.50	+ 26.70
187	110K/783659	1	Power supply unit PP2679/ ALT 15H	+ 1.14			45.00	+ 51.30			45.00	+ 51.30
188	110AJ/35580	1	Tray mounting	+ 1.14			7.50	+ 8.55			7.50	+ 8.55
190		4	Ferry role, personal stowage	- 8.00					200.00	-1600.00	200.00	-1600.00
179	27C/2379	*3	Pack survival, Type A desert	+23.66	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12
		*3	Pack survival, arctic (34 lb each)	+23.66								
*ALTERNATIVES		*3	Pack survival, tropical (11 lb each)	+23.66								
					1330.17	+7524.13	1274.17	+7312.67	775.61	+3153.71	719.61	+2942.25

TABLE 5 Fuel load items (fig.6)

Fig.6 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			FUEL IN FUSELAGE (AT 8 LB/GAL)			
164			Fuel, No.1 tank, 520 gal	4160.00	- 3.86	-16057.60
166			Fuel, No.2 tank, 317 gal	2536.00	+ 2.21	+ 5604.56
178			Fuel, No.3 tank, 540 gal	4320.00	+ 9.13	+39441.60
			Total for fuel in fuselage	11016.00		+28988.56
			WING-TIP TANKS FUEL (AT 8 LB/GAL)			
167			Fuel, wing-tip tanks, 488 gal	3904.00	+ 3.88	+15147.52

TABLE 6 All-up weight summary

	CASE A			CASE A1			CASE B			CASE B1		
	Tip tanks with ARI 23166			Tip tanks with ARI 23167			Dispenser system with ARI 23166			Dispenser system with ARI 23167		
	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
Basic weight	25653	+2.676	+68650	25653	+2.676	+68650	25653	+2.676	+68650	25653	+2.676	+68650
Alternative load items (Table 4)	576		+ 4754	520		+ 4542	1510		+ 8693	1454		+ 8481
Crew and equip- ment (Table 3)	742		- 9919	742		- 9919	742		- 9919	742		- 9919
Operating weight	26971	+2.354	+63485	26915	+2.351	+63273	27905	+2.416	+67424	27849	+2.413	+67212
Fuel: Fuselage (Table 5)	11016		+28989	11016		+28989	11016		+28989	11016		+28989
Wing tips	3904		+15148	3904		+15148						
All Up Weight	41891	+2.569	+107622	41835	+2.567	+107410	38921	+2.477	+96413	38865	+2.475	+96201

continued . . .

TABLE 6 All-up weight summary — continued

	CASE C			CASE C1			CASE D			CASE D1		
	Dispenser system (less cartridges) with ARI 23166			Dispenser system (less cartridges) with ARI 23167			Ferry role with ARI 23166			Ferry role with ARI 23167		
	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
Basic weight	25653	+2.676	+68650	25653	+2.676	+68650	25653	+2.676	+68650	25653	+2.676	+68650
Alternative load items (Table 4)	1330		+ 7524	1274		+ 7313	776		+ 3154	720		+ 2942
Crew and equip- ment (Table 3)	742		- 9919	742		- 9919	742		- 9919	742		- 9919
Operating weight	27725	+2.390	+66255	27669	+2.387	+66044	27171	+2.278	+61885	27115	+2.274	+61673
Fuel: Fuselage (Table 5)	11016		+28989	11016		+28989	11016		+28989	11016		+28989
Wing tips							3904		+15148	3904		+15148
All Up Weight	38741	+2.458	+95244	38685	+2.457	+95033	42091	+2.519	+106022	42035	+2.517	+105810

Chapter 3B – FATIGUE INDEX DATA

LIST OF CONTENTS

	<i>Para.</i>		<i>Para.</i>
INTRODUCTION		APPLICATION	
<i>General</i>	<i>1</i>	<i>General</i>	<i>11</i>
<i>Fatigue Index</i>	<i>2</i>	<i>Fatigue lives</i>	<i>13</i>
<i>Assessing fatigue life consumption</i>	<i>3</i>	<i>Cabin life</i>	<i>17</i>
<i>Unmetered flying</i>	<i>4</i>	<i>Components limiting aircraft service life</i>	<i>18</i>
<i>Flight patterns</i>	<i>5</i>	<i>Fuel tanks</i>	<i>19</i>
<i>Recording of fatigue data</i>	<i>6</i>	<i>Wing stores</i>	<i>20</i>
<i>Refining of Fatigue Index</i>	<i>9</i>	<i>Fatigue monitoring</i>	<i>21</i>
<i>Action on fitment of a new fatigue meter</i>	<i>10</i>	<i>Fatigue meter formulae</i>	<i>23</i>

LIST OF TABLES

	<i>Table</i>
<i>G + M coefficient K_1 for T.Mk.17 without tip tanks fitted</i>	<i>1</i>
<i>G-A-G coefficient K_2 for T.Mk.17 without tip tanks fitted</i>	<i>2</i>
<i>G + M coefficient K_3 for T.Mk.17 with tip tanks fitted</i>	<i>3</i>
<i>G-A-G coefficient K_4 for T.Mk.17 with tip tanks fitted</i>	<i>4</i>
<i>G + M coefficient K_5 for T.Mk.17 with wing tip pods fitted</i>	<i>5</i>
<i>G-A-G coefficient K_6 for T.Mk.17 with wing tip pods fitted</i>	<i>6</i>

INTRODUCTION

General

1. Every aircraft structure suffers fatigue damage accumulatively, from pilot induced manoeuvres, from gust effects resulting from flight through turbulent air, and from undercarriage-to-wing load transference during the ground-air-ground cycle of take-off and landing. Because of this, each type of aircraft has a safe fatigue life stated, which, when expired, will cause the aircraft to be withdrawn from service, or modified to permit further flying. The declared safe life may be evolved, initially, from calculations but is usually confirmed by full scale fatigue testing. The consumption of fatigue life is monitored as each aircraft is flown in order to ensure that the declared safe fatigue life is not exceeded.

Fatigue Index

2. Fatigue life consumed is measured in terms of 'fatigue index' (F.I.) which is a non-dimensional number, calculated either from fatigue meter readings, or by converting sortie hours flown using appropriate fatigue index rates (FI/hr). Generally the fully consumed fatigue life of an aircraft is represented by a fatigue index of 100 but in special circumstances, e.g., following a modification to the aircraft, or re-testing of the structure to revised load spectra, a figure in excess of 100 may be quoted as the fully consumed limit. Also, where major components such as wings, tailplanes, and fins are considered to be interchangeable, it will be necessary to evaluate their individual limiting fatigue lives relative to that of the original critical component established by the fatigue test. The aircraft limiting F.I. will then have to be identified with the least of all such values. The methods of calculating F.I. are described in the following two paragraphs and at the end of this chapter.

Assessing fatigue life consumption

3. The most accurate method of determining the F.I. consumed, due to gust and manoeuvring effects is by using a fatigue meter. This instrument records on counters the number of times that 'g' thresholds of a pre-determined series of levels are reached or exceeded. By entering the difference values of the counters over a period of flying time into a formula, together with the appropriate numbers of roller and full-stop landings, the incremental F.I. consumption for the period can be calculated. One aircraft type may have several formulae to cover variations in operating role, average all-up weights, or the fitment of different types of fatigue meter. Alternatively, average all up weight variations may be covered by the use of different weight factors inserted into the fatigue formulae.

Unmetered flying

4. For the periods prior to the fitment of fatigue meters, or when an installed meter is unserviceable, fatigue consumption is assessed from details of the flying patterns flown and is dependent upon the type of aircraft manoeuvres and theatre of operations. This assessment enables the design authority to estimate fatigue index consumption rates which, related to hours flown, enables the F.I. consumed for each sortie to be calculated. Because fatigue damage estimates based on sortie patterns are derived from average expected loadings, the F.I. rates are factored to allow for 'worst case' situations. Thus, fatigue consumption assessed on a sortie pattern basis is wasteful when compared with the more accurate fatigue meter based index. Hence, it is essential to give priority to the replacement of defective fatigue meters.

Flight patterns

5. The fatigue formulae and fatigue index rate values, for use during periods of fatigue meter unserviceability are compiled in conjunction with some of the flight details given in the 'Statement of Intent' which forms Part 2 of flying 'Patterns and Fatigue Parameters'. This document describes the various sortie patterns to which aircraft are generally expected to fly in terms of average weight, altitude, duration, percentage utilization, etc. Each of the complete sorties is summarized under a descriptive title and allocated a sortie pattern code number on the reverse side of the M.O.D. Form 725. The above parameters form the basis of fatigue consumption studies on major aircraft components other than the main wing attachment on the fuselage, the fatigue life of which is related directly to fatigue meter counts. In both contexts damage levels attributable to any particular mode or modes of flying can be isolated by use of the recorded sortie code number.

It follows that any significant proposed change to a sortie pattern should be referred to the 'Statement of Intent' issuing authority via Air. Eng. 30b.

Recording of fatigue data

6. The recording of flight data sortie codes and fatigue meter counts is made currently on M.O.D. Form 725 (Canberra) (ADP) (Revised Sept. 1983), the format of which has been adapted for Automatic Data Processing Techniques. Instructions on the use of this form are given in M.O.D. Form 799/4 (Canberra) (ADP) (Revised Sept. 1983). The in-use form is kept in the aircraft M.O.D. Form 700 and on completion, after four separately recorded flights, is processed at Station Level to yield incremental values of Fatigue Index, Landings, Cabin Pressurizations and other data to add to previously accumulated totals. A month by month

return is made from these totals on STC Form STATS 2062 (revised June 1984) as a statistical monitor of average F.I. rate per mark and of individual aircraft F.I. remaining.

7. The aircraft captain is responsible for completing the sortie details, whilst servicing personnel are responsible for reading fatigue meters and recording the information on M.O.D. Form 725 (Canberra) (ADP). All personnel responsible for the collection and compilation of fatigue data must appreciate the need for accuracy and legibility of the entries. Careless or incomplete recording is dangerous if it causes a less damaging sortie to be recorded; it is also wasteful if, in the interests of safety, the worst case has subsequently to be assumed. In extreme cases continued carelessness or incomplete recordings can result in the premature retirement of an aircraft because of doubt regarding the true F.I. situation.

8. All personnel responsible for reading fatigue meters are to be familiar with, and are to apply, the serviceability checks described in AP112G-0203-1, Chapter 2. In particular, the validity of fatigue meter readings are to be checked either before any fatigue life calculations are undertaken at the unit, or before M.O.D. Form 725 is despatched from the unit for fatigue calculations to be performed elsewhere. The replacement of unserviceable meters is to be regarded as a high priority task.

Refining of Fatigue Index

9. During the period of the Canberra Refurbishing Programme, 1978 to 1982, a parallel detailed exercise was undertaken by the A.D.A. to re-assess the flying and fatigue records of all flying Canberras. Account was taken of all special manoeuvres and allowances made to include the ground-air-ground effect on all pre-metered and metered flying. Refined totals of flying hours, landings, cabin pressurizations and F.I. were issued on a Company's marker Form 725 together with the allowable F.I. for each aircraft.

Consistent with the replacement of the fuselage Centre Section Forging, (C.S.F.) which, if not already achieved at an earlier date, was carried out during the refurbishing programme, together with the associated repair and inspection programme, agreement was reached with R.A.E. Structures Department, to extend the allowable F.I. for the Canberra to 133. For some aircraft, however, because of special circumstances, the allowable F.I. is quoted at a value less than 133. (See para. 16).

When the fatigue records for an aircraft show that it has consumed 80 per cent of its allowable F.I., action is to be taken in accordance with AP100B-01 ORDER 0786, paragraphs 10 and 11. It should be noted that the return of completed Forms 725 should be limited only to those accumulated since the Refurbishing Assessment, identified by the marker Form 725 issued by B.Ae. and filed with the completed forms.

Note . . .

Previously fatigue data was recorded on the following documents:

Entries in the Form 700
F.D.S. 1 and 2
Forms 4832 A and B
Forms 4832 A and B (Revised May, 1966)
Form 725/1 and Form 725/2 (Canberra). November, 1970 (provisional issue)
M.O.D. Form 725 (Canberra) (Jan. 1972 issue)
M.O.D. Form 725 (Canberra) Revised Nov. 1978
M.O.D. Form 725 (Canberra) (ADP) (Revised Sept. 1983) CURRENT ISSUE.

Collectively, these documents represent the complete fatigue history of the aircraft and therefore must be preserved intact for possible future reference

Whenever a mainplane is removed from a refurbished or non-refurbished aircraft for retention as a spare, the above records, or copies of them, should be identified with that mainplane and be available to complete the fatigue history of any new aircraft combination.

Action on fitment of a new fatigue meter

10. When a fatigue meter is changed the current M.O.D. Form 725 is to be closed and a new form raised. Block 1 of the new sheet is to be used to record the new meter window readings and the values of total flying hours and landings brought forward from the closed sheet. Further flying is recorded under Block 2. Refer to M.O.D. Form 799/4 (Canberra) (ADP) (Revised Sept. 1983), paras. 4 and 5.

The checks specified in AP112G-0203-1, Chapter 2, are to be applied after three hours of flight have been completed with a new or replacement meter installed.

APPLICATION

General

11. The fatigue life of the Canberra was originally based on calculations for the high altitude bomber role. However, later operations included low level loft bombing roles producing increased flight loading, so a full scale fatigue test was carried out.

12. Prior to the fitment of a fatigue meter, the fatigue consumption was assessed by factoring the flying hours according to the sortie flown. This produced a result called "fatigue hours". These were subsequently expressed as a percentage of a 20,000 hour datum life, and the result quoted in terms of fatigue index (F.I.). At the refurbishing fatigue record assessment all of this earlier flying assessment had to be further modified to take account of the ground-air-ground (G.A.G.) cycle with resultant increases in F.I. consumed.

Fatigue lives

13. The critical component on test proved to be the fuselage Centre Section Forging (C.S.F.) with the failure of the port front lower boom lug at the wing pick-up point. This was repaired and the test continued until failure occurred at the corresponding lug on the starboard side of the C.S.F.

14. Based on the geometric mean of the load cycles to failure of the two test results, a particular Safe Life was determined for Canberra aircraft flying in a similar manner to the test flight profiles, or from spectra plotted from actual fatigue meter counts. Safe lives for the other Canberra variants in aircraft weight, speed, altitude etc., have been derived by application of the theory of cumulative damage. In certain cases, where no fatigue meter readings are available for revised forms of flying, the safe life has had to be determined from step by step analysis of the sortie flight profiles. By further extensions of the above procedures, fatigue meter formulae and F.I. rates have been derived which express the safe life in terms of the fully consumed F.I.

15. Thus the fully consumed F.I. for all original built Canberras is 100 F.I. and is based on the afore mentioned failures of the C.S.F. main attachment lugs. However, because of structural integrity considerations associated with stress corrosion damage, a forging replacement programme was undertaken on all long term Canberras. By agreement with R.A.E. Structures the remainder of the tested airframes with a replacement C.S.F.

fitted, could be allowed to go to a revised limiting F.I. of 133, the equivalent of the second test failure mentioned above.

16. It follows that all mainplanes have a limiting F.I. of 133 but because certain components were removed, or not representatively loaded during the main fatigue test, revised calculated F.I.'s were allocated to these as follows:

Fin	160 F.I.
Tailplane and Attachments	200 F.I.
Front Transport Joint Cleats	231 F.I.

The replacement C.S.F. still has an allowable fatigue life of 100 F.I. based on the original test results. Therefore, if the total consumed fatigue life of an aircraft is less than 33 at C.S.F. replacement, then the revised allowable F.I. of that aircraft, post replacement, is that value of F.I. plus 100 for the new forging, a total value which will be less than 133. For such aircraft the maximum value of 133 F.I. could only be achieved by a second C.S.F. change.

Cabin life

17. Based on a full scale test carried out in 1975 a revised datum life for the pressure cabin has been established as 12,900 full pressurizations. This represents a very large increase in cabin life compared to the previously quoted value but it is applicable only to those variants having a fixed, bubble-type, canopy. This revised datum life is to be compared with the total of all cabin pressurizations. That is, those recorded on the marker Form 725 issued following the refurbishing assessment (See para. 9) and the combined totals of the Form 725 recorded events when 15,000 feet and 25,000 feet are reached, plus any ground pressurizations.

Form 725 records events when 15,000 ft and 25,000 ft are reached, plus any ground pressurizations, all events being counted as full pressurizations.

Components limiting aircraft service life

18. A number of components exist on the aircraft which require replacing or reconditioning after a pre-established period. These are listed in AP101B-0400-5A1, Section 2.

Fuel tanks

19. Extended periods of flying with wing-tip tanks empty at take-off may cause an increase in fatigue damage which is not covered by existing

formulae. When it is anticipated that such sorties will be flown over long periods the tip-tanks should be removed.

Wing stores

20. The T.Mk.17 aircraft may carry window dispensing pods as an alternative to wing tip fuel tanks. This configuration produces a different wing loading to that which is obtained in the 'with' or 'without' tip tank cases. Adjustment to the appropriate fatigue formulae is necessary as given in paragraph 23.

Fatigue monitoring

21. The TMK17 aircraft is fitted with a MK13 type fatigue meter

which records and displays, in the appropriate window, the number of times that each of eight different threshold levels of acceleration are reached, or exceeded. The letter suffixes by which these 'g' levels are identified are as follows:-

A	B	C	D	E	F	G	H
-0.5g	0.1g	0.5g	1.5g	1.9g	2.5g	3.5g	4.5g

22. The fatigue meter is located in the starboard main undercarriage bay attached to the slant diaphragm. It must be noted that revised fatigue formulae will be required if any type of fatigue meter other than a MK13 is fitted.

Fatigue meter formulae (T.Mk.17 aircraft)

23. The formula for a T.Mk.17 aircraft fitted with a Mk.13 fatigue meter is as follows:-

Note. . .

This formula is only applicable for RAF T.Mk.17 aircraft as detailed in FLA/CAN/4 Iss.2 of 12.8.88, Stress Office, BAe (Military Aircraft) Ltd., Warton, Lancashire, PR4 1AX.

METERED FLYING

For aircraft without tip-tanks fitted:-

$$FI = K_1 \frac{[23.9(A)+7.85(B)+0.65(C)+0.045(D)+0.78(E)+10.44(F)+50.73(G)+104.92(H)] + K_2(LF) + 0.53(LR)}{1000}$$

If wing tip pods are fitted, replace K_1 with K_5 and K_2 with K_6 .

For aircraft with tip tanks fitted:-

$$FI = K_3 \frac{[32.34(A)+13.03(B)+2.01(C)+0.064(D)+1.11(E)+13.83(F)+61.90(G)+125.0(H)] + K_4(LF) + 1.0(LR)}{1000}$$

◀ where A - H represents the total counts recorded by the windows marked as follows:-

WINDOW	A	B	C	D	E	F	G	H
g	-0.5	0.1	0.5	1.5	1.9	2.5	3.5	4.5

LF is the number of full stop or braked landings.

LR is the number of roller landings.

Note. . .

LF and LR will be the totals of each form of landing recorded over the same period as the meter count sample.

The factors K_1 to K_6 are given in Tables 1 to 6.

UNMETERED FLYING

For periods when a fatigue meter is not fitted or is faulty, the fatigue index is to be calculated as follows:-

FI = Flying hours x 1.5 x average FI rate for the relevant configuration. ▶

TABLE 1

G + M coefficient K_1 for T.Mk.17 without tip tanks fitted

SHUT-DOWN MASS (pounds)

	27500-28499	28500-29499	29500-30499	30500-31499	31500-32499	32500-33499	33500-34499	34500-35499	35500-36499	36500-37499	37500-38499
37500-38499	0.78	0.85	0.93	1.02	1.12	1.24	1.36	1.49	1.63	1.79	-
36500-37499	0.70	0.75	0.82	0.90	1.00	1.11	1.22	1.34	1.48	-	
35500-36499	0.65	0.69	0.72	0.80	0.89	0.99	1.10	1.21	-		
34500-35499	0.60	0.64	0.67	0.71	0.79	0.89	0.99	-			
33500-34499	0.51	0.57	0.62	0.66	0.71	0.80	-				
32500-33499	0.43	0.48	0.54	0.60	0.66	-					
31500-32499	0.37	0.41	0.46	0.51	-						
30500-31499	0.33	0.37	0.41	-							
29500-30499	0.29	0.33	-								
28500-29499	0.26	-									
27500-28499	-										

TABLE 2

G-A-G coefficient K_2 for T.Mk.17 without tip tanks fitted

SHUT-DOWN MASS (pounds)

START-UP MASS (pounds)	27500-28499	28500-29499	29500-30499	30500-31499	31500-32499	32500-33499	33500-34499	34500-35499	35500-36499	36500-37499	37500-38499
37500-38499	6.12	6.16	6.18	6.17	6.11	5.93	5.55	4.93	3.94	2.38	-
36500-37499	5.25	5.16	5.12	5.05	4.92	4.65	4.14	3.32	2.01	-	
35500-36499	4.64	4.43	4.19	4.05	3.84	3.47	2.79	1.70	-		
34500-35499	3.96	3.81	3.53	3.17	2.86	2.34	1.44	-			
33500-34499	3.14	3.06	2.88	2.48	1.93	1.21	-				
32500-33499	2.45	2.31	2.08	1.71	1.04	-					
31500-32499	1.85	1.66	1.35	0.86	-						
30500-31499	1.36	1.11	0.72	-							
29500-30499	0.91	0.60	-								
28500-29499	0.49	-									
27500-28499	-										

TABLE 3

G + M coefficient K_3 for T.Mk.17 with tip tanks fitted

SHUT-DOWN MASS (pounds)

START-UP MASS (pounds)	SHUT-DOWN MASS (pounds)															
	27500-28499	28500-29499	29500-30499	30500-31499	31500-32499	32500-33499	33500-34499	34500-35499	35500-36499	36500-37499	37500-38499	38500-39499	39500-40499	40500-41499	41500-42499	
41500-42499	0.78	0.83	0.88	0.94	0.99	1.04	1.08	1.11	1.11	1.06	0.95	0.81	0.69	0.61	-	
40500-41499	0.79	0.85	0.91	0.97	1.04	1.10	1.15	1.19	1.21	1.18	1.07	0.91	0.77	-		
39500-40499	0.79	0.85	0.92	1.00	1.07	1.14	1.22	1.28	1.33	1.32	1.22	1.05	-			
38500-39499	0.77	0.83	0.91	0.99	1.07	1.16	1.25	1.34	1.42	1.46	1.39	-				
37500-38499	0.71	0.77	0.85	0.93	1.02	1.11	1.22	1.32	1.43	1.53	-					
36500-37499	0.63	0.69	0.76	0.84	0.92	1.01	1.11	1.22	1.34	-						
35500-36499	0.55	0.60	0.67	0.74	0.82	0.91	1.00	1.10	-							
34500-35499	0.48	0.53	0.59	0.66	0.73	0.81	0.90	-								
33500-34499	0.42	0.46	0.52	0.58	0.65	0.73	-									
32500-33499	0.39	0.42	0.46	0.52	0.58	-										
31500-32499	0.35	0.39	0.41	0.46	-											
30500-31499	0.30	0.34	0.38	-												
29500-30499	0.26	0.29	-													
28500-29499	0.23	-														
27500-28499	-															

TABLE 4

G-A-G coefficient K_4 for T.Mk.17 with tip tanks fitted

SHUT-DOWN MASS (pounds)

START-UP MASS (pounds)	27500-28499	28500-29499	29500-30499	30500-31499	31500-32499	32500-33499	33500-34499	34500-35499	35500-36499	36500-37499	37500-38499	38500-39499	39500-40499	40500-41499	41500-42499
	41500-42499	12.21	12.48	12.74	12.93	13.02	12.99	12.80	12.39	11.67	10.48	8.71	6.54	4.64	2.64
40500-41499	11.40	11.69	11.96	12.17	12.27	12.25	12.07	11.66	10.93	9.70	7.67	5.17	2.82	-	-
39500-40499	10.36	10.64	10.91	11.13	11.24	11.22	11.05	10.63	9.87	8.47	6.06	3.16	-	-	-
38500-39499	9.64	9.76	9.87	9.92	9.93	9.90	9.69	9.19	8.23	6.49	3.57	-	-	-	-
37500-38499	8.76	8.87	8.95	8.96	8.85	8.57	8.06	7.19	5.76	3.42	-	-	-	-	-
36500-37499	7.59	7.65	7.68	7.62	7.40	6.96	6.23	5.01	3.04	-	-	-	-	-	-
35500-36499	6.37	6.38	6.35	6.20	5.85	5.23	4.21	2.57	-	-	-	-	-	-	-
34500-35499	5.26	5.20	5.08	4.84	4.35	3.52	2.17	-	-	-	-	-	-	-	-
33500-34499	4.31	4.15	3.95	3.59	2.94	1.83	-	-	-	-	-	-	-	-	-
32500-33499	3.65	3.30	2.93	2.44	1.53	-	-	-	-	-	-	-	-	-	-
31500-32499	2.94	2.59	2.03	1.25	-	-	-	-	-	-	-	-	-	-	-
30500-31499	2.10	1.73	1.10	-	-	-	-	-	-	-	-	-	-	-	-
29500-30499	1.37	0.88	-	-	-	-	-	-	-	-	-	-	-	-	-
28500-29499	0.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27500-28499	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 5

G + M coefficient K_5 for T.Mk.17 with wing tip pods fitted

SHUT-DOWN MASS (pounds)

	28500- 29499	29500- 30499	30500- 31499	31500- 32499	32500- 33499	33500- 34499	34500- 35499	35500- 36499	36500- 37499	37500- 38499	38500- 39499
38500-39499	0.90	0.98	1.08	1.19	1.32	1.46	1.60	1.76	1.94	2.13	-
37500-38499	0.78	0.85	0.94	1.04	1.16	1.29	1.42	1.57	1.74	-	
36500-37499	0.70	0.74	0.82	0.91	1.02	1.15	1.27	1.41	-		
35500-36499	0.65	0.68	0.72	0.80	0.90	1.02	1.14	-			
34500-35499	0.57	0.63	0.67	0.71	0.80	0.91	-				
33500-34499	0.48	0.54	0.60	0.65	0.70	-					
32500-33499	0.41	0.46	0.51	0.58	-						
31500-32499	0.35	0.40	0.45	-							
30500-31499	0.31	0.35	-								
29500-30499	0.27	-									
28500-29499	-										

TABLE 6

G-A-G coefficient K_6 for T.Mk. 17 with wing tip pods fitted

SHUT-DOWN MASS (pounds)

START-UP MASS (pounds)	SHUT-DOWN MASS (pounds)										
	28500-29499	29500-30499	30500-31499	31500-32499	32500-33499	33500-34499	34500-35499	35500-36499	36500-37499	37500-38499	38500-39499
38500-39499	7.07	7.14	7.18	7.19	7.13	6.92	6.49	5.79	4.66	2.90	-
37500-38499	5.90	5.91	5.89	5.82	5.68	5.35	4.76	3.81	2.33	-	
36500-37499	5.04	4.89	4.80	4.66	4.42	3.98	3.22	1.98	-		
35500-36499	4.41	4.16	3.86	3.64	3.31	2.72	1.67	-			
34500-35499	3.69	3.54	3.20	2.74	2.24	1.42	-				
33500-34499	2.88	2.72	2.46	1.93	1.16	-					
32500-33499	2.17	1.94	1.58	1.00	-						
31500-32499	1.58	1.29	0.81	-							
30500-31499	1.05	0.67	-								
29500-30499	0.55	-									
28500-29499	-										

Chapter 3 Appendix 1 LOADING AND C.G. DATA

(POST MOD 5101 and 5176 (SRIM3932))

LIST OF CONTENTS

	Para.		Para.
General information.....	1	Maximum all-up weights.....	7
C.G. position.....	2	Alternative load items.....	8
C.G. datum.....	3	Weighing the aircraft.....	9
Flight C.G. limits.....	4	Basic weight and determination.....	10
Effect of alighting gear retraction.....	5	Engine data.....	11
Basic weight and C.G.....	6	Modifications.....	12

LIST OF TABLES

	Table
Summary of drainable and undrainable unusable fuel to be included in basic weight.....	1
Removable load items included in basic weight.....	2
Crew and crew removable operating load items common to all roles.....	3
Alternative operating load items.....	4
Fuel load items.....	5
All-up weight summary.....	6

LIST OF ILLUSTRATIONS

	Fig.
Flight C.G. limits.....	1
Engine change data.....	2
Loading and C.G. diagram - removable load items included in basic weight (misc.).....	3
Loading and C.G. diagram - removable load items included in basic weight.....	4
Loading and C.G. diagram - crew and crew removable load items....	5
Loading and C.G. diagram - alternative and fuel load items.....	6

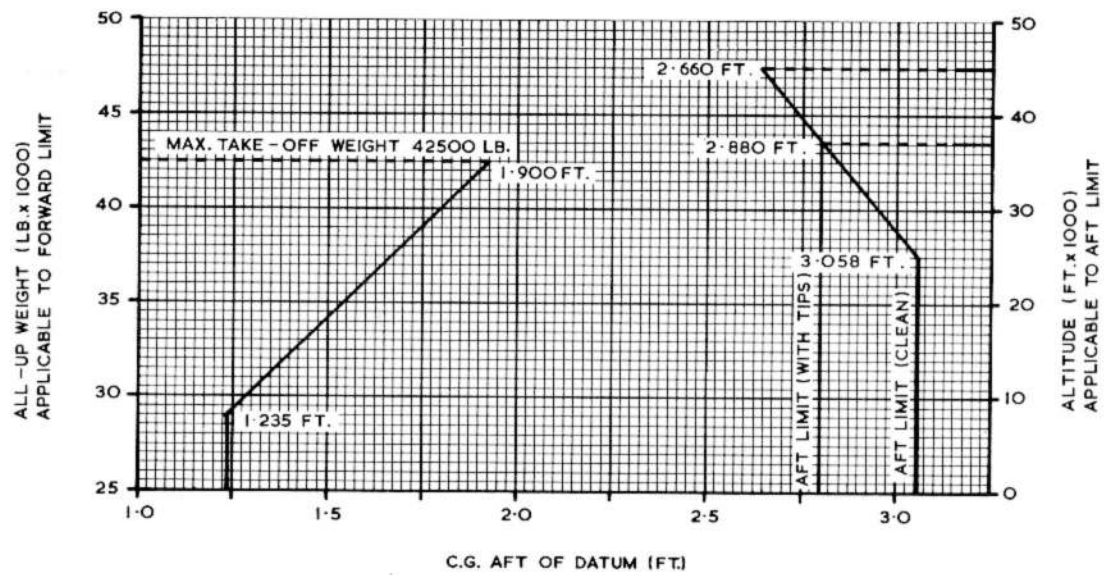


FIG.I. FLIGHT C.G. LIMITS

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 alighting gear 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 0.445 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.

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 29,000 lb the permissible forward limit is 1,235 ft aft and at a weight of 42,500 lb the permissible forward limit is 1.900 ft aft.

Aft limit

This is dependent upon the altitude of the aircraft.

Aircraft without tip tanks:

Up to 25,000 ft the aft C.G. limit is 3.058 ft aft of datum; it then moves linearly forward to 2.660 ft aft of datum at 45,000 ft.

Aircraft with tip tanks:

Up to 37,000 ft the aft C.G. limit is 2.808 ft aft of datum; it then moves linearly forward to 2.660 ft aft of datum at 45,000 ft.

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 -1299 lb ft which must be taken into account when making calculations which assume that the alighting gear is retracted.

Basic weight and C.G.

6. Table 6 refers to a basic weight of 25913 lb and a basic C.G. position of +2.877 ft aft of the datum. These figures are based on the weight of aircraft S/Nos. WJ986, WJ981, WD955, WK111 to the modification standard detailed in paragraph 12. A definition of the term basic weight may be found in A.P.119W-0001-1. The basic weight and moment will vary between aircraft depending on their modification standard.

C.G. Limits for aircraft in basic condition

2.9 ± 0.1 ft aft of datum

Maximum all-up weights (fig.1)

7. The aircraft is cleared for operational flying at the following maximum weights:-

Take-off	42,500 lb
Landing	40,000 lb

Note...

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

Alternative load items

8. 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 drain and the correct sequence for dropping stores are adhered to.

Weighing the aircraft

9.

Preparation

(1) With the aircraft in the rigging position drain the fuel tanks (Sect.4, Chap.2; for details of undrainable fuel refer to 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. 119W-0001-1.

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.119W-0301-1 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 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.119W-0301-1.

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

(f) Jack the aircraft (operation (a)) and remove the blocks.

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

Basic weight and determination

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

(1) The weight and moment of drainable unusable fuel in the pipelines (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 Tables 3, 4, 5 and 6 which were fitted at weighing.

The resultant figures are the basic weight and moment.

Engine data (fig.2)

11. In the event of an engine change, Mod.F751 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, either the front or rear suspension point which can be corrected to the A/C datum using the data given in fig.2.

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

Modifications

12. The basic weight given (Table 6), includes the modifications quoted in the CAN.17/Y/3 Leaflet, plus the modifications listed in sub-para.(1), minus those in sub-para.(2):-

(1) 55, 263, 426, 704, 735, 859, 875, 883, 1199, 1479, 2132, 4356, 4450, 4451, 4723, 5018, 5208, 5176.

(2) 871, 1016, 1175, 1705, 2395, 2531, 3797, 4788, 5177.

The following modifications are part embodied.

721 (No.3 tank only), 4080 (less U/C up positions), 4152 (stbd. wing only), 5184 (less CM0449 and SRIM 3791).

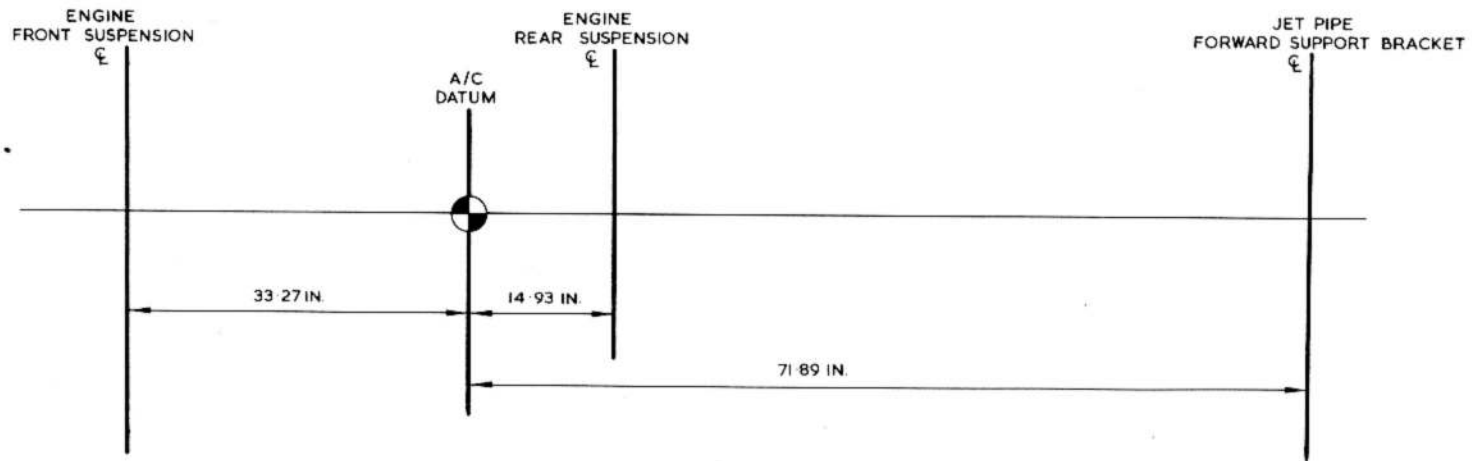


FIG.2. ENGINE CHANGE DATA.

TABLE 1

Summary of drainable and undrainable unusable fuel to be included in basic weight

Location	Weight (lb)	Arm (ft)	Moment (lb ft)
Trapped (undrainable) fuel in pipes (wings and fuselage)	6.70	-0.228	-1.53
Note.....			
1. Due to the disposition of certain fuel pipes, the above weight of fuel will remain trapped when the fuel tanks are drained.			
2. Since all fuel in the pipelines 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 pipes (wings and fuselage)	9.00	+1.534	+13.81

RESTRICTED

TABLE 2 Removable load items included in basic weight (fig.3)

Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
MISCELLANEOUS ITEMS						
22	12L/203	1	Destructor, aircraft, No.1, Mk.1	3.25	- 8.73	- 28.37
6	12K/9625465	1 set	Cartridge, seat ejection, No.13, Mk.1	1.58	-14.74	- 23.29
12	12K/9625465	2 sets	Cartridge, seat ejection, No.13, Mk.1	3.16	-10.23	- 32.33
4	12K/9625446	1	Cartridge, canopy jettison, No.3, Mk.2	1.60	-16.19	- 25.90
20	12K/1220	6	Cartridge, engine starting	18.00	+17.35	+ 312.30
2	12G/9625203	1	Charge, H.E. emergency control, severing No.1, Mk.3	0.37	-16.19	- 5.99
5	12G/9635206	32	Detonator, electric, No.108, Mk.3 (Canopy)	0.74	-15.70	- 11.62
11	12G/9635206	34	Detonator, electric, No.108, Mk.3 (Hatch)	0.78	-11.20	- 8.74
3	12G/9635205	1	Detonator, electric, No.109, Mk.2 (Controls)	0.02	-16.19	- 0.32
29	6140-99-910-1543	2	Battery, 12 volt, 4 amp. hours	9.88	-17.48	- 172.70
21	6140-99-910-1534	4	Battery, 12 volt, 40 amp. hours, Type C	198.76	- 6.65	-1321.75
8	5CX/369	1	Lamp, inspection, and extension lead	0.90	-13.34	- 12.01
9	6B/633	1	Amplifier unit, Type B	10.00	-11.89	- 118.90
17	6B/4343681	1	Detector unit, Type A	1.72	+ 5.70	+ 9.80
1	6B/4343640	1	Gyro unit, Type B			
7	6B/4352094	1	Indicator, master, Type E5	7.06	-14.22	- 100.39
18	27N/100	1	Extinguisher, fire, methyl-bromide, Type 12A	10.63	+13.96	+ 148.39
16	27N/102	2	Extinguisher, fire, methyl-bromide, Type 14A	38.62	+ 1.01	+ 39.01
15	27N/N. I. V.	1	Extinguisher, fire, methyl-bromide, Type 60A	18.50	- 5.54	- 102.49
19	27N/N. I. V.	1	Extinguisher, fire, methyl-bromide, Type 60A	18.50	+15.99	+ 295.83
25	27N/299	1	Extinguisher, fire, trigger hand operated, Type 34H	5.19	-13.72	- 71.21
26	22G/9108081	1	Gauntlets, fire fighting, (1 pair)	0.88	-14.12	- 12.43
27	27H/3224	1	Container, urine, Mk.2, and funnel	1.09	-13.97	- 15.23
23	27N/1	1	Axe, fire	2.42	-13.43	- 52.50
28	26FZ/3501	1	Handle for emergency hydraulic system hand pump (stowed)	0.85	-14.97	- 12.72
14			Oxygen charge	25.78	- 8.14	- 209.85
13			Nitrogen charge	4.12	- 9.61	- 37.74
24	9A/02430	1	First aid outfit	3.00	- 13.66	- 40.98
10	27N/299	1	Extinguisher, fire, trigger hand operated, Type 34H	5.19	-11.89	- 61.71

continued..

RESTRICTED

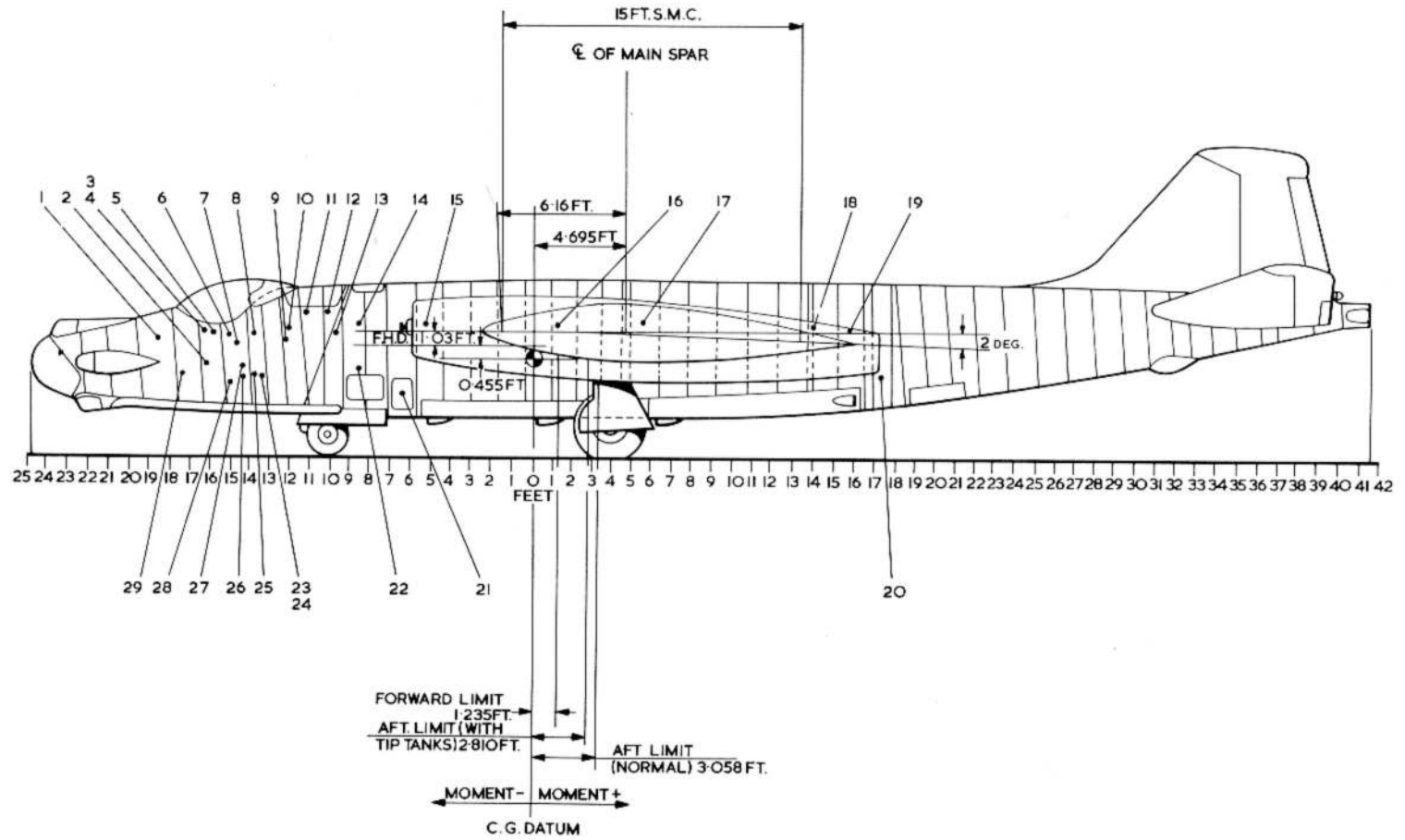


FIG. 3. LOADING AND C.G. DIAGRAM - REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT (MISCELLANEOUS)

RESTRICTED

TABLE 2 Removable load items included in basic weight (fig.4) - continued

Fig.4 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.R.I.23165			
110		1	Delay unit, line, Type 151942	3.50	- 4.14	- 14.49
78		1	Delay unit, line, Type 151942	3.50	+15.42	+ 53.97
105	110D/35440	1	Receiver, Type 151061	21.00	- 2.73	- 57.33
106	110AJ/35445	1	Tray, mounting, (for receiver)	2.28	- 2.73	- 6.22
85	110D/35440	1	Receiver, Type 151061	21.00	+12.36	+ 259.56
86	110AJ/35445	1	Tray, mounting, (for receiver)	2.28	+12.26	+ 28.18
107	110D/35439		Transmitter, Type 150886			
108	110D/35448	1	Ferrite modulator, Type 6088-5003	178.00	- 4.14	- 736.92
109	110AJ/35575	1	Tray, mounting, (for transmitter)	2.98	- 4.14	- 12.34
79	110D/35439	1	Transmitter, Type 150886			
80	110D/35448	1	Ferrite modulator, Type 6088-5003	178.00	+14.00	+2492.00
81	110AJ/35575	1	Tray, mounting, (for transmitter)	2.98	+14.00	+ 41.72
101	110K/35444	1	Deception generator, Type 151064	21.00	- 1.24	- 26.04
102	110AJ/35445	1	Tray, mounting, (for deception generator)	2.82	- 1.24	- 3.50
87	110K/35444	1	Deception generator, Type 151064	21.00	+10.58	+ 222.18
88	110AJ/35445	1	Tray, mounting, (for deception generator)	2.82	+10.58	+ 29.84
103	110K/35441	1	Power supply unit, Type 151060	48.00	- 1.24	- 59.52
104	110AJ/35446	1	Tray, mounting, (for power supply unit)	2.98	- 1.24	- 3.70
89	110K/35441	1	Power supply unit, Type 151060	48.00	+10.58	+ 507.84
90	110AJ/35446	1	Tray, mounting, (for power supply unit)	2.98	+10.58	+ 31.53
44	110L/35443	2	Control unit, modulator, Type 151063	8.00	-12.02	- 96.16
45	110L/35442	2	Control unit, systems, Type 151062	9.38	-12.02	- 112.75
			A.R.I.23166			
91	110D/35449	1	Transmitter, counter measure, Type T 915/ALT.21A	115.00	+ 8.30	+ 954.50
92	110V/35452	1	R.F. oscillator, Type 0-1101/ALT.21A band 1	32.00	+ 8.30	+ 265.60
93	110AJ/33842	1	Tray, mounting, Type 840-20	2.98	+ 8.30	+ 24.73
96	110D/35449	1	Transmitter, counter measure, Type T 915/ALT.21A	115.00	+ 3.56	+ 409.40
97	110V/35451	1	R.F. oscillator, Type 0-1104/ALT.21A band 4	32.00	+ 3.56	+ 113.92
98	110AJ/33842	1	Tray, mounting, Type 840-20	2.98	+ 3.56	+ 10.61
94	110AQ/35450	1	Cooler, liquid, Type HD.609/ALT.21A	40.00	+ 8.30	+ 332.00
95	110AJ/35454	1	Tray, mounting	2.98	+ 8.30	+ 24.73

continued.....

RESTRICTED

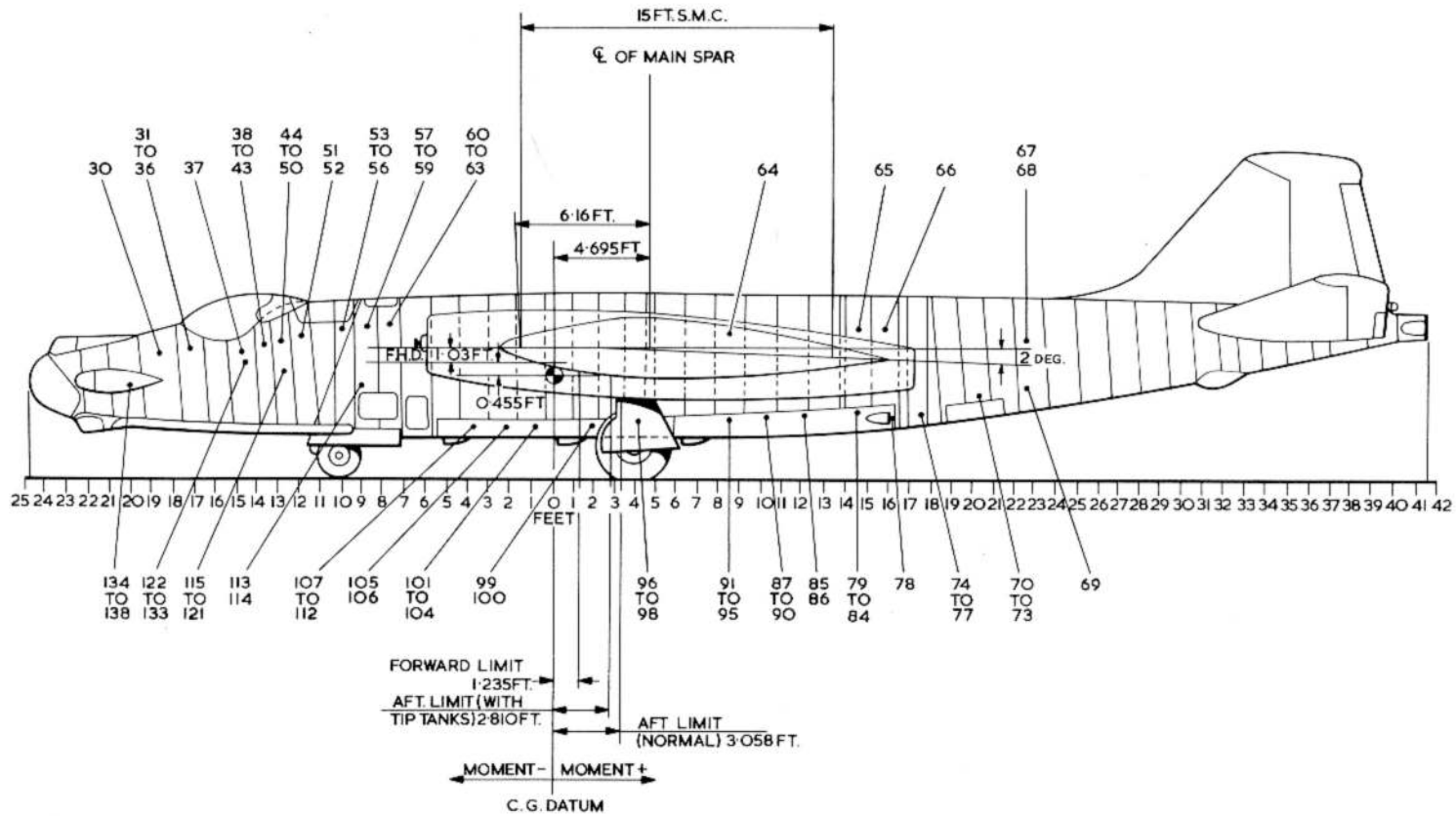


FIG. 4. LOADING AND C.G. DIAGRAM -REMOVABLE LOAD ITEMS INCLUDED IN BASIC WEIGHT.

RESTRICTED

TABLE 2 Removable load items included in basic weight (fig.4) - continued

Fig. 4 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.R.I.23166 - continued			
99	110AQ/35450	1	Cooler, liquid, Type 609/ALT.21A	40.00	+ 1.82	+ 72.80
100	110AJ/35454	1	Tray, mounting	2.98	+ 1.82	+ 5.42
46	110L/35453	3	Control indicator, Type C.4646/ALT.21A	11.40	-12.75	- 145.35
			A.R.I.18207/1			
47	10L/9528209	1	Control transmitter, radio, Type X13920	5.78	-12.89	- 74.50
84	10L/9528210	1	Transmitter, radio, Type X13919	38.00	+14.00	+ 532.00
83	EG7.82.759	1	Tray, mounting	2.82	+14.00	+ 39.48
111	10D/9528210	1	Transmitter, radio, Type X13919	38.00	- 4.14	- 157.32
112	EG7.82.783	1	Tray, mounting	2.82	- 4.14	- 11.67
			A.R.I.18124/1 Y.H.F.(Set 1)			
115	5821-99-942-8542	1	Transmitter/receiver, Type TR5/ARC52	48.50	-12.70	- 615.95
116	5821-99-942-8544	1	Tray, mounting, MT1477/ARC52	3.25	-12.70	- 41.28
31	5821-99-999-0839	1	Control unit, Type C1607/2	3.00	-17.40	- 52.20
	5821-99-945-5739	1	Control unit, Type C1607/4	3.25	-17.40	- 56.55
122	5821-99-943-3247	1	Muting bias unit	1.25	-14.90	- 18.63
123	5821-99-932-6361	1	Box, interconnecting	1.25	-14.45	- 18.06
			A.R.I.18107/4 TACAN			
63	5826-00-691-4896	1	Transmitter/receiver, Type RT220 C/ARN-21	50.00	- 8.10	- 405.00
60	10A/251	1	Tray, mounting, Type 9274 (for T/R unit)	7.77	- 8.10	- 62.94
61	10D/22534	1	Coupling unit, Type 9546	7.74	- 7.84	- 58.56
62	10AJ/258	1	Tray mounting (for coupling unit)	1.88	- 7.84	- 14.74
51	10L/16310	1	Control unit, Type 7750	1.23	-12.20	- 15.01
126A	10Q/16355	1	Indicator, Type 9547	1.50	-15.70	- 23.55
30	10Q/16355	1	Indicator, Type 9547	1.50	-18.25	- 27.38
			A.R.I.23172 RADIO ALTIMETER			
70	10D/9542617	1	Transmitter/receiver, Type 16098	16.50	+20.50	+ 338.25
71	10AJ/698	1	Tray, mounting, (For T/R unit)	1.80	+20.50	+ 36.90
113	10U/9542618	1	Amplifier, Type 16089	4.75	- 9.05	- 42.99
114	10AJ/699	1	Tray, mounting, (for amplifier)	0.55	- 9.05	- 4.98
36	10L/16720	1	Control unit, Type 16095	1.85	-17.10	- 31.64
72	10D/22305	1	Delay unit, Type 16119	1.50	+19.80	+ 29.70
32	10Q/16459	1	Indicator, Type 16094 (height)	0.90	-17.90	- 16.11
73	5826-99-104-2242	2	Horn (waveguides) aerial system	7.00	+19.80	+ 138.60

continued.....

TABLE 2 Removable load items included in basic weight (fig.4) - continued

Fig.4 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			A.R.I.23099/7, UA60 INTERCOMM.			
117	5831-99-945-2676	1	Amplifier, A.F. Type UA6070	2.00	-12.90	- 25.80
118	6110-99-945-2673	1	Junction box, Type UA6043/7	2.40	-12.90	- 30.96
38		1	Box, station, Type UA6016/5F	3.50	-13.50	- 47.25
33		1	Box, station, Type UA6016/5F	3.50	-17.70	- 61.95
37		1	Box, station, Type UA6016/5F	3.50	-13.80	- 48.30
			A.R.I.5877, RADIO COMPASS			
124	10U/17211	1	Amplifier, R.F. Type A8281	4.90	-14.35	- 70.32
125	10U/17212	1	Amplifier, I.F. Type A8282	9.10	-14.35	- 130.59
48	10L/16287	1	Control unit, Type 8283	2.24	-12.32	- 27.60
57	10D/20169	1	Corrector unit, Type QE	1.00	- 8.50	- 8.50
52	10P/16303	1	Filter, voice range, Type 1275	1.00	-10.80	- 10.80
39	10Q/16357	1	Indicator, master bearing, Type 9551	1.50	-13.80	- 20.70
126	10AJ/1572	1	Tray, mounting, (for amplifier R.F.)	1.85	-14.35	- 26.69
127	10AJ/1573	1	Tray, mounting, (for amplifier, I.F.)	1.00	-14.35	- 14.35
			A.R.I.5851, GREEN SATIN			
65	10D/18843	1	Transmitter/receiver, Type TR3710	116.00	+14.75	+1711.00
66	10Q/16094	1	Tracking unit, Type 100	48.00	+15.90	+ 763.20
40	6B/541	1	Indicator, ground position, Mk.4	25.00	-14.25	- 356.25
41	10Q/16095	1	Indicator, electrical, Type 101	21.00	-14.25	- 299.25
64	10B/16389	1	Aerial system, Type 501	40.00	+ 9.00	+ 360.00
42	6B/633	1	Amplifier	3.00	-13.90	- 41.70
			A.R.I.23090, H.F. RADIO 618T-3			
134	10D/23518	1	Transmitter/receiver, Type M15 (618T-3)	52.00	-20.10	-1045.20
135	5340-99-945-1643	1	Tray, mounting, resilient, (for transmitter/ receiver)	5.00	-20.10	- 100.50
136	5831-99-914-8966	1	Pre-amplifier, Type UA6002	0.63	-20.70	- 13.04
137	10D/23525	1	Aerial tuning unit, Type 180L-3A	18.00	-20.00	- 360.00
138	5340-99-945-1644	1	Tray, mounting, resilient, 350-D3 (for aerial tuning unit)	1.25	-20.00	- 25.00
43	10L/16857	1	Control unit, Type M53 (714E-3)	3.00	-13.55	- 40.65

continued.....

RESTRICTED

TABLE 2 Removable load items included in basic weight (fig.4) - continued

Fig. 4 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
A.R.I.23118, VOR/ILS INSTALLATION						
128	10D/9704803	1	Receiver, VHF, Type 6401M	8.20	-14.20	- 116.44
129	10D/9702192	1	Receiver, Glide slope, Type 6404M	7.80	-14.20	- 110.76
130	10D/9702193	1	Marker receiver, Type 6403M	6.70	-14.20	- 95.14
131	10D/25393	1	Tray, mounting, (for marker receiver)	0.63	-14.20	- 8.95
132	10D/23594	1	Tray, mounting, (for nav. unit & G.S. receiver)	1.50	-14.20	- 21.30
34	10L/9702196	1	Control unit, Type 7430M	1.25	-17.40	- 21.75
133	10D/9702194	1	Navigation unit, Type 6402MA	9.90	-14.20	- 140.58
A.R.I.23117/2, V.H.F.						
119	10D/9704801	1	Transmitter, Type 6400MA	14.30	-12.00	- 171.60
120	10D/9704803	1	Receiver, Type 6401M	8.50	-12.00	- 102.00
121	5841-99-947-8301	1	Tray, mounting, (for transmitter receiver)	2.63	-12.00	- 31.56
35	10D/9704802	1	Control unit, Type 7429M	1.50	-17.55	- 26.33
A.R.I.18051/2, (IN PART)						
53	10L/291	1	Control unit, Type 7122	7.88	-10.19	- 80.30
54	7B/2589	1	Panel	5.33	-10.19	- 54.31
A.R.I.18124, U.H.F. (SET 2)						
58	5821-99-942-8542	1	Transmitter/receiver, Type TR5/ARC 52	48.50	- 8.90	- 431.65
59	5821-99-942-8544	1	Tray mounting, MT 1477/ARC 52	3.25	- 8.90	- 28.93
49	5821-99-999-0839	1	Control unit, C1607/2	3.00	-13.98	- 41.94
55	5821-99-943-3247	1	Muting bias unit	1.25	- 9.98	- 12.48
56	5821-99-932-6361	1	Box interconnecting	1.25	- 9.98	- 12.48
A.R.I.23134, IFF/SSR 1520						
67	5895-99-956-3378	1	Transponder, 16928	30.00	+23.50	+ 705.00
68	5820-99-107-5637	1	Mounting, 16946	1.25	+23.50	+ 29.38
50	5895-99-956-3379	1	Control unit, 16929	2.00	-12.10	- 24.20
A.R.I.23287 (APR/9 INSTALLATION)						
74		1	Power supply unit PP.337	14.50	+17.90	+ 259.55
75		1	Radar unit CV43	12.50	+17.90	+ 223.75
69		1	Power supply unit PP.336	33.50	+22.70	+ 760.45
76		2	Switching unit X/539	29.00	+17.90	+ 519.10
77		3	Tuning unit (any 3 off types TN 128, 129, 130 or 131)	63.00	+17.90	+1127.70

RESTRICTED

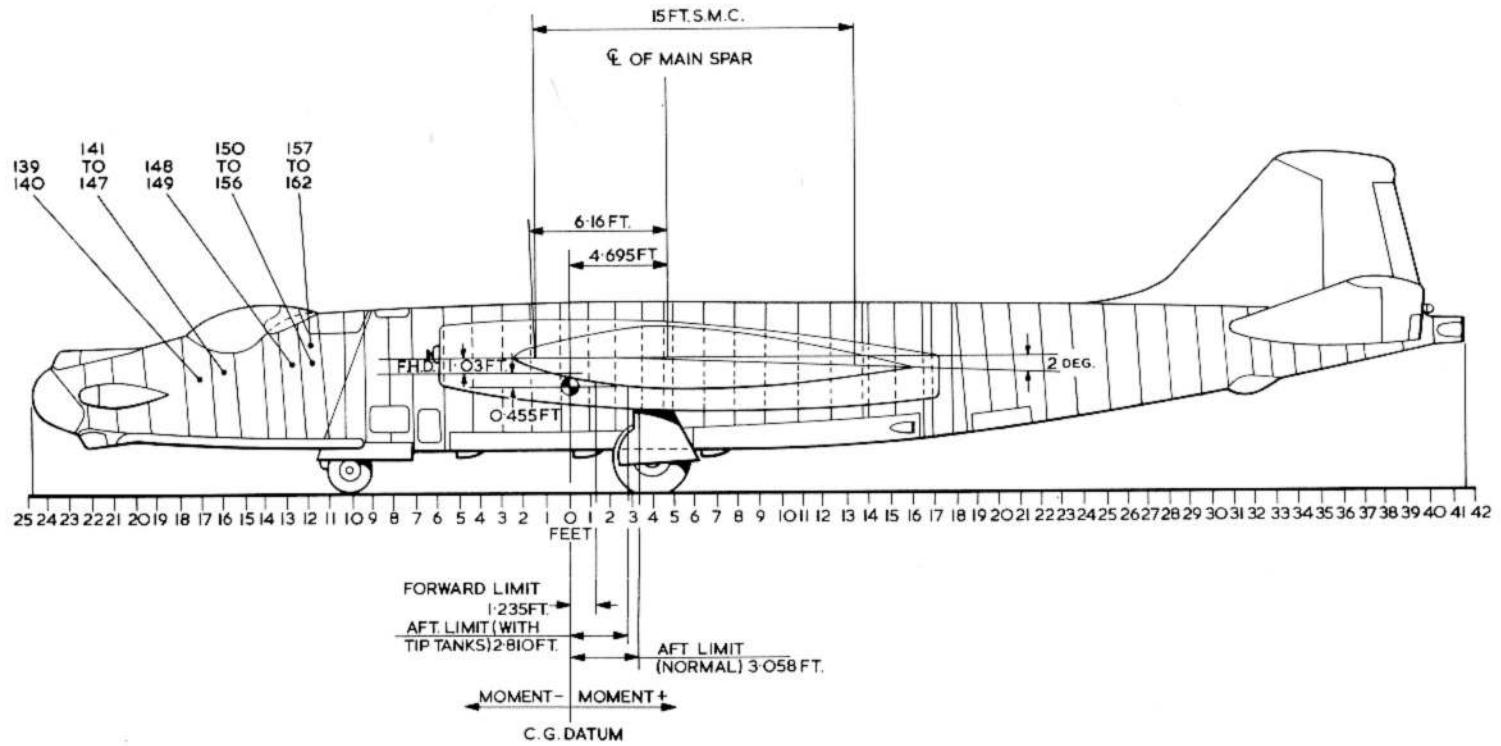


FIG. 5. LOADING AND C.G. DIAGRAM — CREW AND CREW REMOVABLE LOAD ITEMS

RESTRICTED

TABLE 3 Crew and crew removable operating load items common to all roles (fig.5)

Item No.	Ref. or Part No.	Qty.	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
PILOT AND EQUIPMENT						
143		1	Pilot	180.00	-16.44	-2959.20
144	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	-16.44	- 427.44
145	27C/2274	1	Jacket, life saving, Mk.7	6.50	-15.78	- 102.57
146	22C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	-16.40	- 393.60
147	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	-16.40	- 53.30
139		1	Pilot's notes for Canberra T Mk.17 aircraft	0.20	-17.96	- 3.59
140	6F/171	1	Pad, writing, Pilot's, knee type	1.37	-17.23	- 23.61
141	5A/9105033	1	Torch, electric, Type Y, c/w cells	0.72	-16.44	- 11.84
142	22C/1733 to 22C/1738	1	Suit, air ventilated, Mk.2 size 1 to 6	1.88	-16.44	- 30.91
NAVIGATOR AND EQUIPMENT						
157		1	Navigator	180.00	-11.88	-2138.40
154	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	-11.92	- 309.92
155	27C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	-11.85	- 284.40
152	22C/2274	1	Jacket, life saving, Mk.7	6.50	-11.31	- 73.52
150	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	-11.92	- 38.74
149	6B/469	1	Case carrying navigator's equipment containing:-	1.00	-13.04	- 13.04
	5A/9105033	1	Torch, electric Type Y, c/w cells	0.72	-13.04	- 9.39
	6E/293	1	Binoculars, prismatic, 6 x 30mm	2.00	-13.04	- 26.08
	6E/9604560	1	Binoculars, prismatic, Mk.5, 5 x 40mm, c/w rubber face piece	2.25	-13.04	- 29.34
	6B/2645	1	Computer, dead reckoning, Mk.4A	0.25	-13.04	- 3.26
	6B/3677	1	Corrector slide, astro acceleration	0.13	-13.04	- 1.70
	6B/47	1	Protractor, Douglas, 5-inch	0.14	-13.04	- 1.83
	6B/260	1	Rule, navigation Mk.1	0.13	-13.04	- 1.70
	6B/349	1	Straight edge, 20-inch, Mk.3	0.30	-13.04	- 3.91
148	6B/2837	1	Sextant, periscopic, carrying case containing:-	5.86	-13.24	- 77.59
	6B/2836	1	Sextant, periscopic, Mk.2A	7.00	-13.24	- 92.68
158	22C/1733 to 27C/1738	1	Suit, air ventilated, Mk.2, size 1 to 6	1.88	-11.88	- 22.33

continued....

TABLE 3 Crew and crew removable operating load items common to all roles (fig.5) - continued

Fig.5						
Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
A.E. OPERATOR AND EQUIPMENT						
159		1	A.E. operator	180.00	-11.83	-2129.40
153	15A/4177654	1	Parachute, seat, Type, Mk.18	26.00	-11.87	- 308.62
151	22C/2274	1	Jacket, life saving, Mk.7	6.25	-11.27	- 70.44
160	27C/2737	1	Pack, personal survival, Type YA Mk.1	24.00	-11.80	- 283.20
156	6D/2678	1	Oxygen, emergency set, Mk.7J	3.25	-11.87	- 38.58
161	5A/9105033	1	Torch, electric, Type Y, c/w cells	0.72	-11.83	- 8.52
162	22C/1733 to 22C/1738	1	Suit, air ventilated, Mk.2, size 1 to 6	1.88	-11.83	- 22.24
Total crew and crew removable load items				747.43		-9994.89

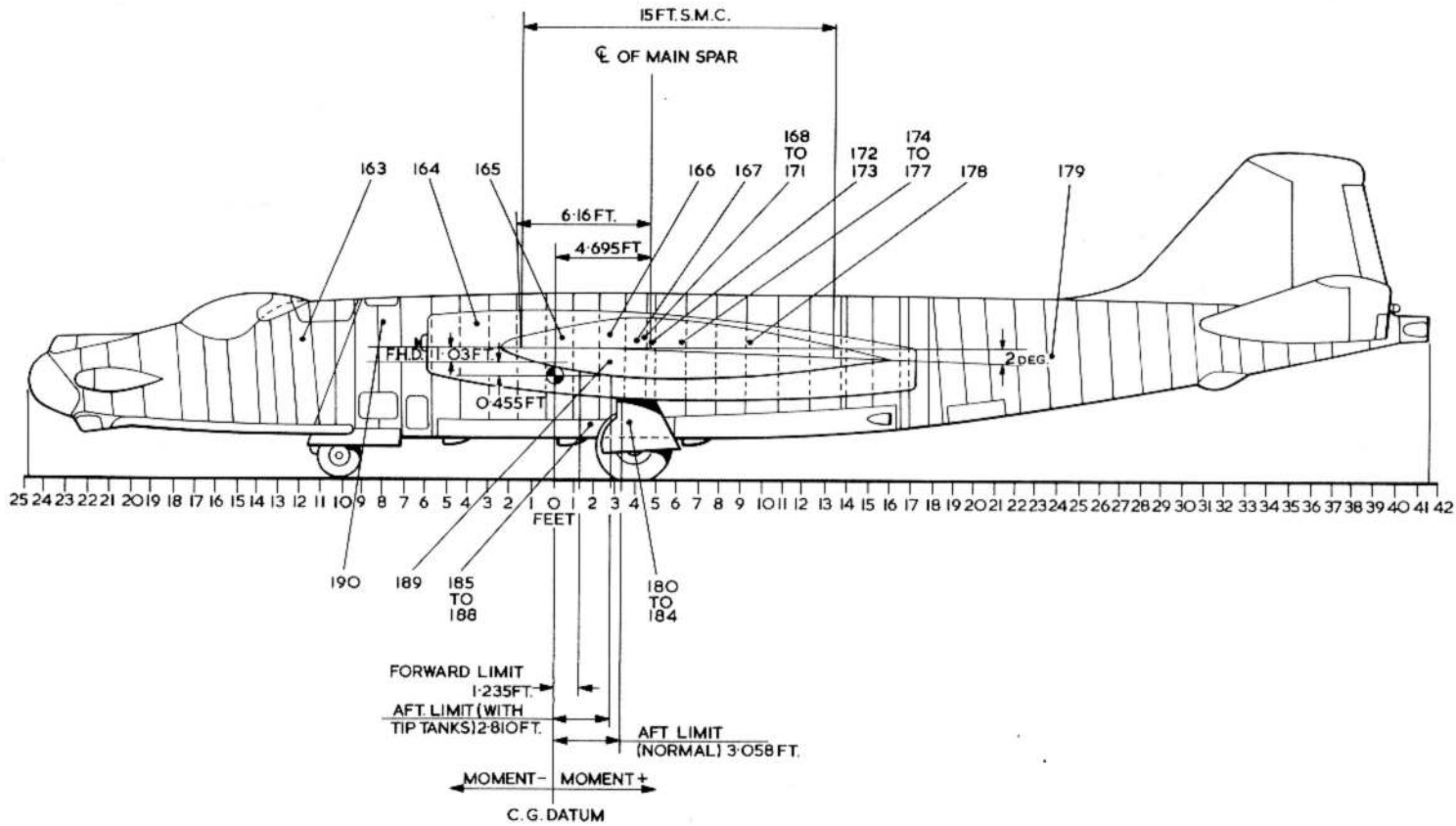


FIG. 6. LOADING AND C.G. DIAGRAM - ALTERNATIVE AND FUEL LOAD ITEMS.

TABLE 4 Alternative operating load items (fig.6)

				CASE A		CASE A1		CASE B		CASE B1	
				Tip tanks with ARI 23166		Tip tanks with ARI 23167		Dispenser system with ARI 23166		Dispenser system with ARI 23167	
Fig.6 Item No.	Ref. or Part No.	Qty	Arm Description (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
169	EA3.62.217/8	2	Wing tip tanks + 4.25	238.00	+1011.50	238.00	+1011.50				
170	26FZ/1577	6	Bolt explosive + 4.16	2.75	+ 11.44	2.75	+ 11.44				
171	EA1.00.81/2	2	Wing tip tank attachments + 4.10	0.73	+ 2.94	0.73	+ 2.94				
168	12G/1279	6	Detonator electric, No.109 Mk.1 + 4.15	0.13	+ 0.54	0.13	+ 0.54				
ARI 18051/2 DISPENSER SYSTEM											
172	EG7.81.1	1	Wing tip pod assembly (port) + 4.54					249.00	+1130.46	249.00	+1130.46
173	EG7.81.2	1	Wing tip pod assembly (stbd.) + 4.54					249.00	+1130.46	249.00	+1130.46
177	7B/2587	6	Discharger cartridge, Mk.4 matrix assembly + 6.49					75.00	+ 486.75	75.00	+ 486.75
176	7B/2590	2	Distributor unit, R.B.W.+ 6.61					24.00	+ 158.64	24.00	+ 158.64
165	10AS/9528340	2	Stripper, counter measure chafe + 0.35					82.00	+ 28.70	82.00	+ 28.70

continued..

RESTRICTED

TABLE 4 Alternative operating load items (fig.6) - continued

Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	CASE A		CASE A1		CASE B		CASE B1	
					Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
175	12D/1390	156	Cartridge, Type 200, No.1,Mk.1 window	+ 6.49					187.20	+1214.93	187.20	+1214.93
189			Conventional window	+ 2.63					310.00	+ 815.30	310.00	+ 815.30
174	EG7.84.1301	6	Plate blanking (not required if cartridges fitted)	+ 6.49								
			ARI 23166 (PORT FORWARD)									
182	110D/35449	1	Transmitter counter measure, T915/ALT218	+ 3.56	115.00	+ 409.40			115.00	+409.40		
183	110V/35451	1	R.F. Oscillator, 0-1104/ALT21A band 4	+ 3.56	32.00	+ 113.92			32.00	+ 113.92		
184	110AJ/33842	1	Tray mounting 840-20	+ 3.56	2.98	+ 10.61			2.98	+ 10.61		
186	110AQ/35450	1	Cooler, liquid,H.D. 609/ALT21A	+ 1.82	40.00	+ 72.80			40.00	+ 72.80		
185	110AJ/35454	1	Tray mounting	+ 1.82	2.98	+ 5.42			2.98	+ 5.42		
180	110D/7836263	1	ARI 23167 Transmitter, PNT.782/ ALT15H	+ 3.56					86.00	+ 306.16	86.00	+ 306.16

continued.....

TABLE 4 Alternative operating load items (fig.6) - continued

				CASE A	CASE A1	CASE B	CASE B1				
				Tip tanks with ARI 23166	Tip tanks with ARI 23167	Dispenser system with ARI 23166	Dispenser system with ARI 23167				
Item No.	Ref. or Part No.	Qty	Description Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)		
ARI 23167 - continued											
181	110AJ/35579	1	Tray mounting + 3.56			7.50 + 26.70		7.50 + 26.70			
187	110K/783659	1	Power supply unit PP.2679/ ALT 15H + 1.82			45.00 + 81.90		45.00 + 81.90			
188	110AJ/35580	1	Tray mounting + 1.82			7.50 + 13.65		7.50 + 13.65			
163	110L/7836260	1	Control, indicator, C3324/ ALT 15H -11.71			2.75 - 32.20		2.75 - 32.20			
190		4	Ferry role, personal stowage - 8.00								
179	27C/2379	*3	Pack survival, Type A, desert +23.66	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12		
		*3	Pack survival, artic (34 lb each)+23.66								
*ALTERNATIVES		*3	Pack survival, tropical (11 lb each)+23.66								
				566.57	+4761.69	522.36	+4545.75	1501.16	+8700.51	1456.95	+8484.57

continued.....

TABLE 4 Alternative operating load items (fig.6) - continued

					CASE C	CASE C1	CASE D	CASE D1		
					Dispenser system (without cartridges) with ARI23166	Dispenser system (without cartridges) with ARI23167	Ferry role with ARI23166	Ferry role with ARI23167		
Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
169	EA3.62.217/8	2	Wing tip tanks	+ 4.25			238.00	+1011.50	238.00	+1011.50
170	26FZ/1577	6	Bolt explosive	+ 4.16			2.75	+ 11.44	2.75	+ 11.44
171	EA1.00.81/2	2	Wing tip tank attachments	+ 4.10			0.73	+ 2.94	0.73	+ 2.94
168	12G/1279	6	Detonator electric, No.109 Mk.1	+ 4.15			0.13	+ 0.54	0.13	+ 0.54
					ARI 18051/2 DISPENSER SYSTEM					
172	EG7.81/1	1	Wing tip pod assembly (port)	+ 4.54	249.00	+1130.46	249.00	+1130.46		
173	EG7.81/2	1	Wing tip pod assembly (stbd.)	+ 4.54	249.00	+1130.46	249.00	+1130.46		
177	7B/2587	6	Discharger cartridge Mk.4 Matrix assy	+ 6.49	75.00	+ 486.75	75.00	+ 486.75		
176	7B/2590	2	Distributor unit RBW	+ 6.61	24.00	+ 158.64	24.00	+ 158.64		
165	10AS/9528340	2	Stripper, counter measure, chafe	+ 0.35	82.00	+ 28.70	82.00	+ 28.70		
175	12D/1390	156	Cartridge, Type 200, No.1 Mk.1 window	+ 6.49						

continued.....

TABLE 4 Alternative operating load items (fig.6) - continued

					CASE C	CASE C1	CASE D	CASE D1		
					Dispenser system (without cartridges) with ARI23166	Dispenser system (without cartridges) with ARI23167	Ferry role with ARI23166.	Ferry role with ARI23167		
Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
ARI 18051/2 DISPENSER SYSTEM - continued										
189			Conventional window	+ 2.63	310.00	+ 815.30	310.00	+ 815.30		
174	EG7.84.1301	6	Plate blanking (not required if cartridges fitted)	+ 6.49	7.17	+ 46.53	7.17	+ 46.53		
ARI 23166 (PORT FORWARD)										
182	110D/35449	1	Transmitter, counter measure, T915/ ALT21A	+ 3.56	115.00	+ 409.40			115.00	+ 409.40
183	110V/35451	1	RF Oscillator 0-1104/ALT21A band 4	+ 3.56	32.00	+ 113.92			32.00	+ 113.92
184	110AJ/33842	1	Tray mounting 840-20	+ 3.56	2.98	+ 10.61			2.98	+ 10.61
186	110AQ/35450	1	Cooler liquid, HD609/ALT21A	+ 1.82	40.00	+ 72.80			40.00	+ 72.80
185	110AJ/35454	1	Tray mounting	+ 1.82	2.98	+ 5.42			2.98	+ 5.42
ARI 23167										
180	110D/7836263	1	Transmitter, PNT 782/ ALT 15H	+ 3.56			86.00	+ 306.16		
181	110AJ/35579	1	Tray mounting	+ 3.56			7.50	+ 26.70		
										continued.....

TABLE 4 Alternative operating load items (fig.6) - continued

					CASE C		CASE C1		CASE D		CASE D1	
					Dispenser system (without cartridges) with ARI23166		Dispenser system (without cartridges) with ARI23167		Ferry role with ARI23166		Ferry role with ARI23167	
Fig.6 Item No.	Ref. or Part No.	Qty	Description	Arm (ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)	Weight (lb)	Moment (lb ft)
ARI 23167 - continued												
187	110K/783659	1	Power supply unit PP2679/ ALT15H	+ 1.82			45.00	+ 81.90			45.00	+ 81.90
188	110AJ/35580	1	Tray mounting	+ 1.82			7.50	+ 13.65			7.50	+ 13.65
163	110L/7836260	1	Control indicator, C3324/ ALT15H	-11.71			2.75	- 32.20			2.75	- 32.20
190		4	Ferry role, personal stowage	- 8.00					200.00	-1600.00	200.00	-1600.00
179	27C/2379	*3	Pack survival, Type A desert	+23.66	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12	132.00	+3123.12
		*3	Pack survival, arctic(34 lb each)	+23.66								
*ALTERNATIVES		*3	Pack survival, tropical (11 lb each)+23.66									
					1321.13	+7532.11	1276.92	+7316.17	766.57	+3161.69	722.36	+2945.75

TABLE 5 Fuel load items (fig.6)

Fig.6 Item No.	Ref. or Part No.	Qty	Description	Weight (lb)	Arm (ft)	Moment (lb ft)
			FUEL IN FUSELAGE (AT 8 LB/GAL)			
164			Fuel, No.1 tank, 520 gal	4160.00	- 3.86	-16057.60
166			Fuel, No.2 tank, 317 gal	2536.00	+ 2.21	+ 5604.56
178			Fuel, No.3 tank, 540 gal	4320.00	+ 9.13	+39441.60
			Total for fuel in fuselage	11016.00		+28988.56
			WING-TIP TANKS FUEL (AT 8 LB/GAL)			
167			Fuel, wing-tip tanks, 488 gal	3904.00	+ 3.88	+15147.52

TABLE 6 All-up weight summary

	CASE A			CASE A1			CASE B			CASE B1		
	Tip tanks with ARI23166			Tip tanks with ARI23167			Dispenser system with ARI23166			Dispenser system with ARI23167		
	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (lb)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
Basic weight	25913	+2.877	+74551	25913	+2.877	+74551	25913	+2.877	+74551	25913	+2.877	+74551
Alternative load items (Table 4)	567		+ 4762	522		+ 4546	1501		+ 8701	1457		+ 8485
Crew and equip- ment (Table 3)	747		- 9995	747		- 9995	747		- 9995	747		- 9995
Operating weight	27227	+2.546	+69318	27182	+2.542	+69102	28161	+2.601	+73257	28117	+2.598	+73041
Fuel: Fuselage (Table 5)	11016		+28989	11016		+28989	11016		+28989	11016		+28989
Wing tips	3904		+15148	3904		+15148						
All Up Weight	42147	+2.692	+113455	42102	+2.690	+113239	39177	+2.610	+102246	39133	+2.607	+102030

continued.....

TABLE 6 All-up weight summary - continued

	CASE C			CASE C1			CASE D			CASE D1		
	Dispenser system (less cartridges) with ARI23166			Dispenser system (less cartridges) with ARI23167			Ferry role with ARI23166			Ferry role with ARI23167		
	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)	Weight (lb)	Arm (ft)	Moment (lb ft)
Basic weight	25913	+2.877	+74551	25913	+2.877	+74551	25913	+2.877	+74551	25913	+2.877	+74551
Alternative load items (Table 4)	1321		+ 7532	1277		+ 7316	767		+ 3162	722		+ 2946
Crew and equip- ment (Table 3)	747		- 9995	747		- 9995	747		- 9995	747		- 9995
Operating weight	27981	+2.576	+72088	27937	+2.573	+71872	27427	+2.469	+67818	27382	+2.465	+67502
Fuel: Fuselage (Table 5)	11016		+28989	11016		+28989	11016		+28989	11016		+28989
Wing tips							3904		+15148	3904		+15148
All Up Weight	38997	+2.592	+101077	38953	+2.589	+100861	42347	+2.641	+111855	42302	+2.639	+111639

Chapter 4 GENERAL SERVICING

LIST OF CONTENTS

	Para.		Para.
Introduction	1	For nose-wheel changing	7
Ground equipment	2	In the open	8
Access panels	3	Trestling	9
Jacking		Drainage holes	10
Jacking procedure	4	Order of dismantling	12
For main-wheel changing	6	Rigging of fixed surfaces	13
		Component weights and dimensions	15

LIST OF TABLES

	Table
Special ground equipment	1
Standard ground equipment	2

LIST OF ILLUSTRATIONS

	Fig.		Fig.
Jacking	1	Drainage holes	4
Maximum permissible wind velocity for jacking in the open	1A	Access panels, lower surface and starboard side	5
Trestling	2	Access panels, upper surface and port side	6
Alignment checks and rigging gauge positions	3	Component weights and dimensions	7

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 contains information on the general servicing of complete aircraft; servicing of the individual components and systems is given in the associated chapters of Sections 3 and 4.

Ground equipment

2. The items of ground equipment provided for handling and servicing the

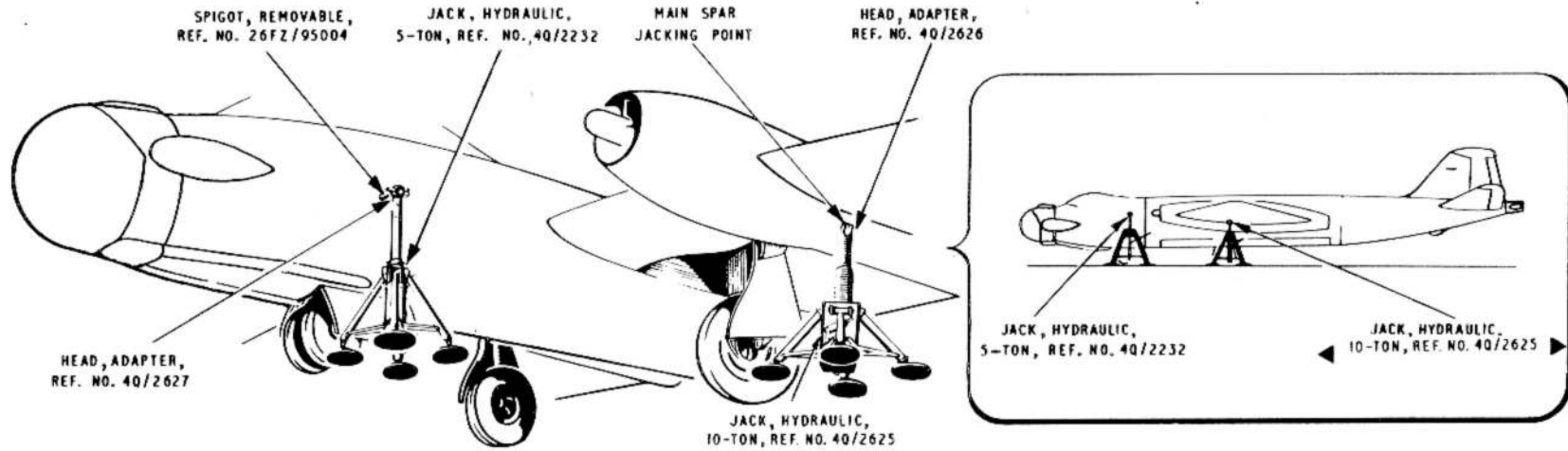
aircraft are listed at the end of this chapter. The items are arranged in two tables, Table 1 - Special Ground Equipment (handling and servicing equipment peculiar to this aircraft), and Table 2 - Standard Ground Equipment. These tables contain no items that are normally included in the associated Appendix A, nor standard equipment normally provided for purposes not confined to aircraft servicing.

Access panels**◀ WARNING**

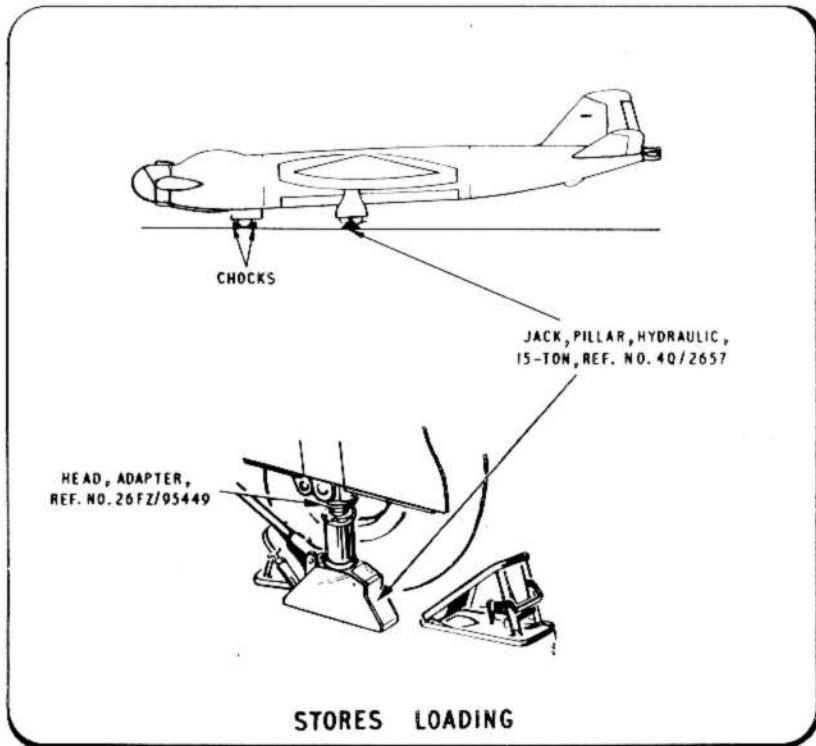
The closing panels (Post/STI/CAN/583B) must only be removed for access to the engine mounting bracket attachment fas-

teners. Each bolt securing the panels must be identified during removal of the panels to ensure correct relocation on reassembly of panels. ▶

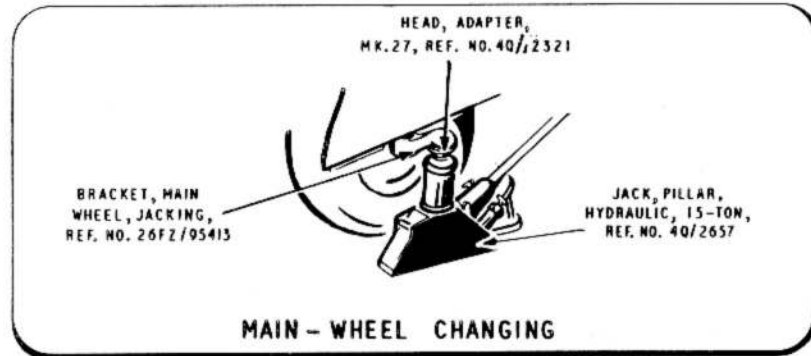
3. Removable access panels and inspection doors are provided throughout the structure, for access to the controls, services, etc.; the positions are illustrated in fig.5 and 6. Certain panels (indicated in the illustrations) are secured by screws having concave slots in their heads, and a specially ground screwdriver having a convex blade must be used to remove and insert these screws. When securing the panels, ensure that in all cases the correct type of screw is used, as in certain comparatively



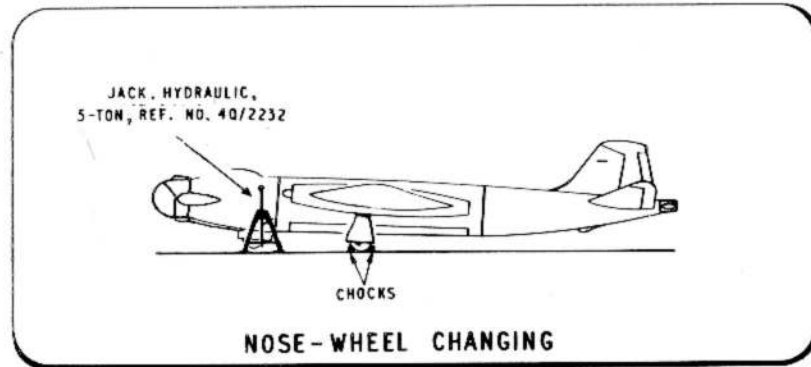
NORMAL JACKING PROCEDURE



STORES LOADING



MAIN - WHEEL CHANGING



NOSE - WHEEL CHANGING

FIG.1. JACKING

thin skin areas 120 deg countersunk-headed screws are used.

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) Remove the plug from the socket in the front fuselage and fit the nose jacking spigot. 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 ad-

justable 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.

For main-wheel changing

6. 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 with its adapter head and main-wheel changing bracket in position.

(4) Raise the wheel just clear of the ground.

For nose-wheel changing

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

(1) Ensure that the aircraft is positioned on level ground with a firm foundation.

(2) Remove the plug from the socket in the nose fuselage, and insert and tighten the jacking spigot.

(3) Place chocks fore-and-aft of the main wheels and release the brakes.

(4) Place a jack and adapter under the nose spigot, and raise until the nose wheels are just clear of the ground.

(5) Support the fuselage at frame 42.

In the open

8. Fig. 1A shows allowable wind velocity against wind angle through the full range of nose-to-wind to tail-to-wind at which the aircraft may be lifted on the main undercarriage pillar jacks for purposes of bomb/flare loading, or unloading, or for main wheel changing. In applying this graph there are certain precautions which must be observed:-

(1) Aircraft may be at any weight between basic and maximum take-off provided that fuselage fuel is evenly distributed.

(2) Fuelling or defuelling or changes to wing store loading must not be carried out whilst the aircraft is on pillar jacks.

(3) Bomb/flare loading and unloading procedures are to conform with techniques laid down in relevant Air Publications.

(4) Ground slope allowance of 4 degrees is permitted in the fore and aft direction only.

(5) Both main wheels are to be jacked simultaneously.

(6) Ground locks are to be fitted to all flying control surfaces.

RESTRICTED

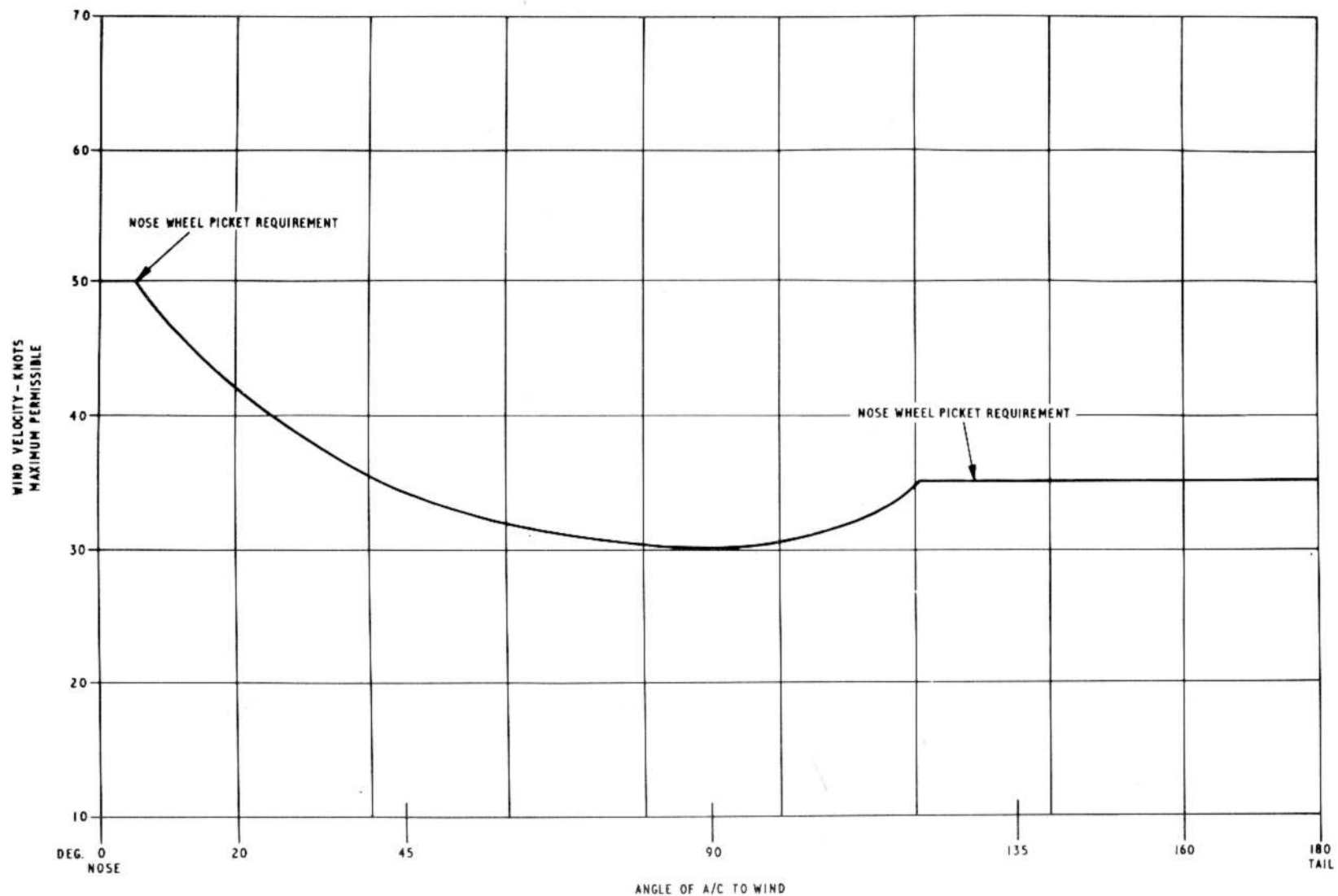
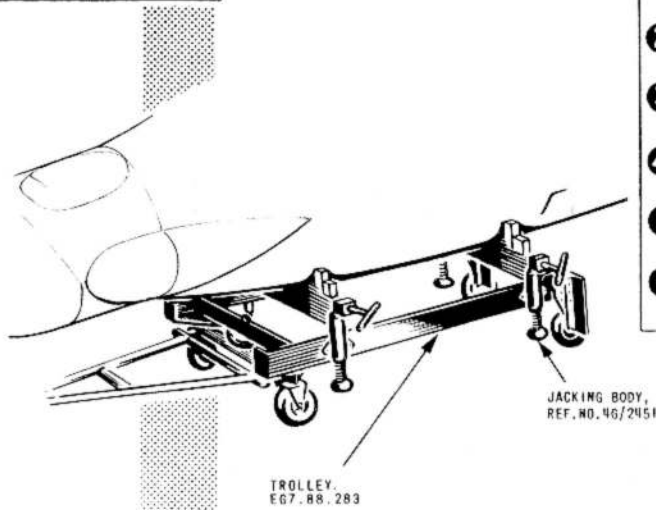


FIG. 1A. MAXIMUM PERMISSIBLE WIND VELOCITY FOR JACKING IN THE OPEN

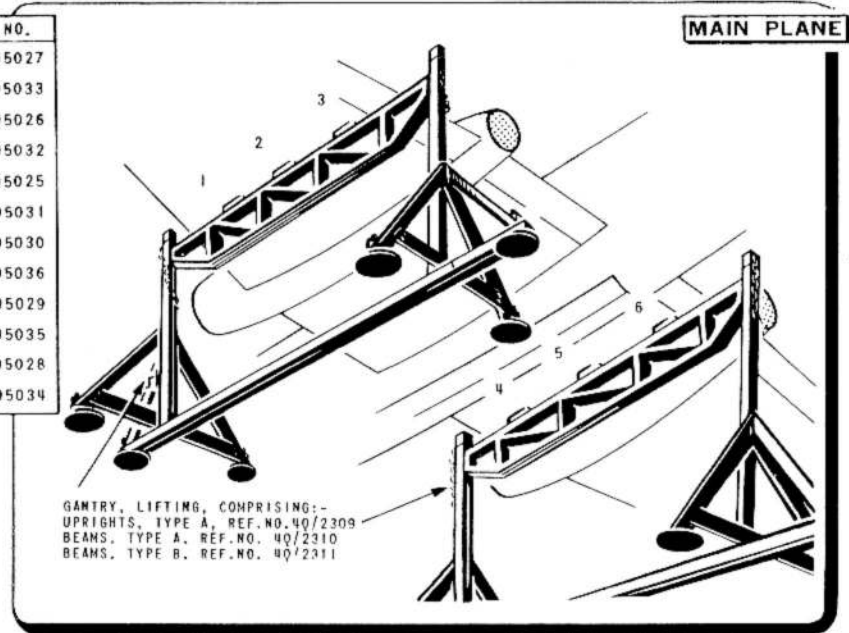
RESTRICTED

UK RESTRICTED

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

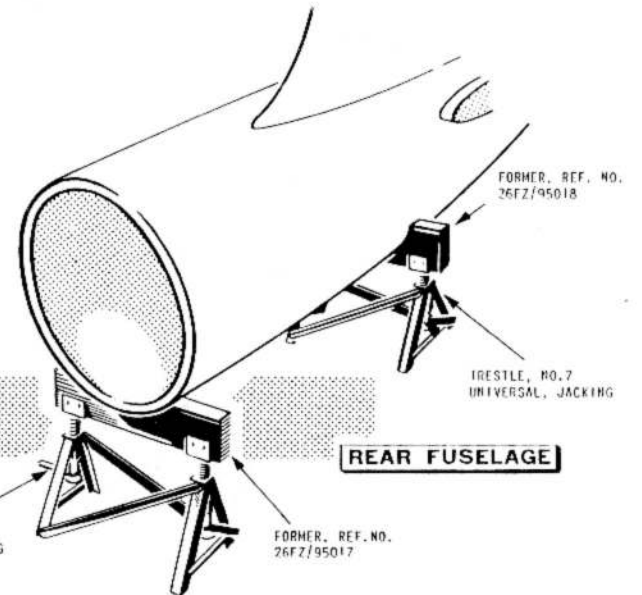
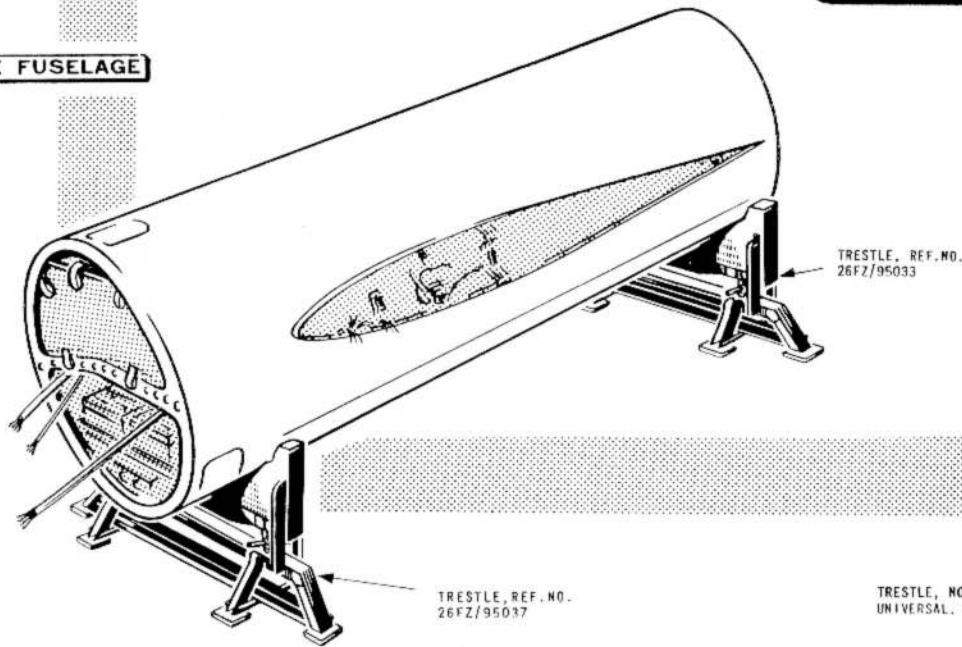


FIG. 2. TRESTLING

UK RESTRICTED

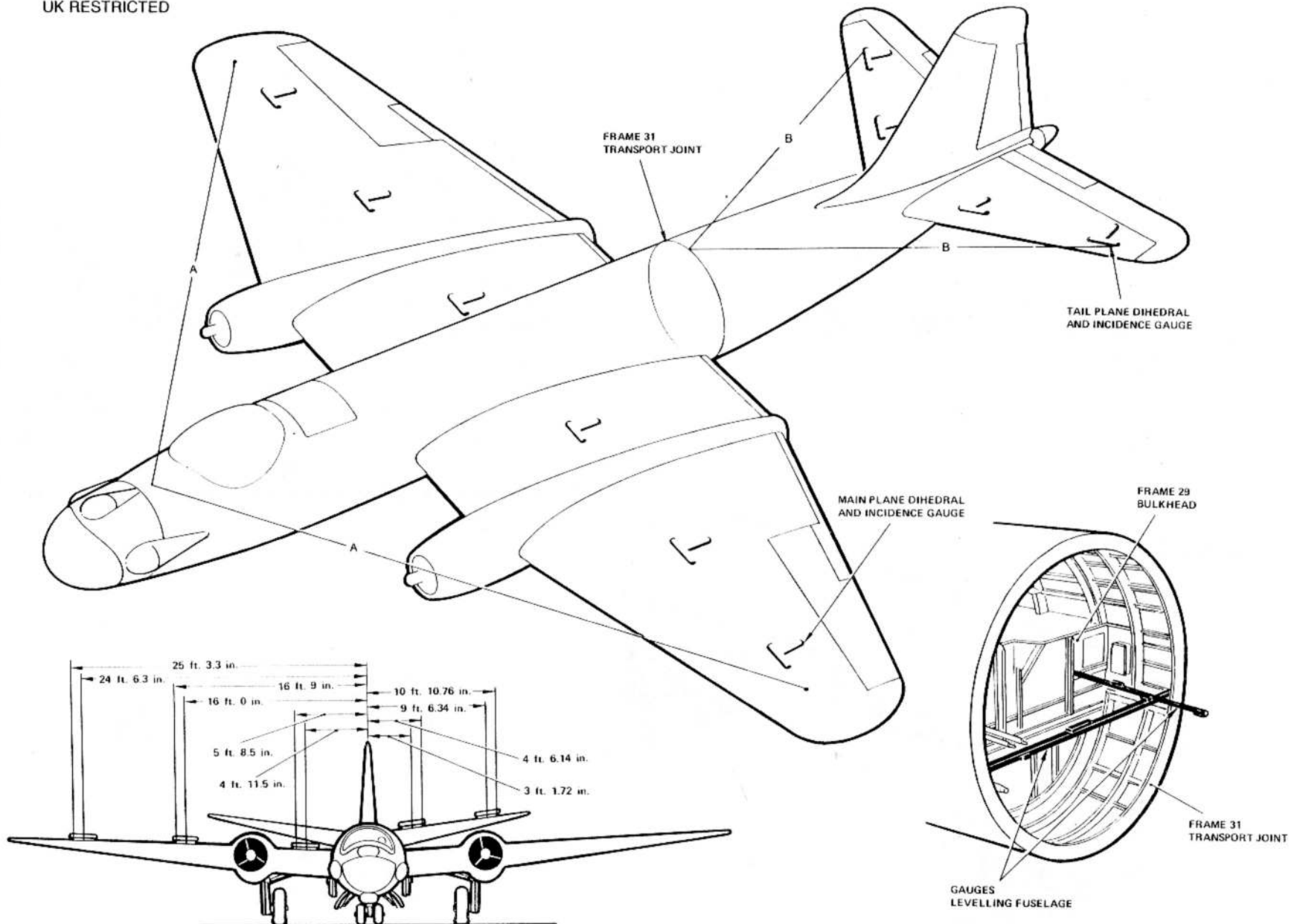


FIG.3 ALIGNMENT CHECKS AND RIGGING GAUGE POSITIONS

◀ DIMENSION 'B' CORRECTED ▶

(7) The nose-wheel picketing requirement must be applied when necessary (*fig. 1A and Sect.2, Chap.1*).

Trestling (*fig.2*)

9. Refer to Tables 1 and 2 for equipment details.

Drainage holes (*fig.4*)

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

11. 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 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 rubber cement Ref. No.33H/72 to prevent loss of cabin pressure.

Order of dismantling

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

- (1) Remove the engines and jet pipes from the main planes (*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 reverse of that given for dismantling.

Rigging of fixed surfaces

13. 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*.

14. 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 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 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 dimension 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 the gauge positioned at each of the three points shown in fig.3. The dihedral reading should be $2 \text{ deg} \pm 10 \text{ min}$ at all points, and the incidence reading $5 \text{ deg } 50 \text{ min} \pm 15 \text{ min}$ at the outboard position of the outer wing (rib 6), $5 \text{ deg } 8 \text{ min} \pm 15 \text{ min}$ at the inboard position of the outer wing (rib 3) and $4 \text{ deg } 49 \text{ min} \pm 15 \text{ min}$ 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 positioned at the inboard position; the reading should be $7 \text{ deg } 57 \text{ min} \pm 15 \text{ min}$.

(7) Check the tail plane incidence at minimum incidence, using a clinometer, with a gauge positioned at the starboard inboard position; the reading should be $2 \text{ deg } 12 \text{ min} \pm 4 \text{ min}$. 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 $3 \text{ deg } 59 \text{ min} \pm 4 \text{ min}$. Check the incidence at the outboard position; the reading should be that obtained at the inboard position plus $1 \text{ deg } 48 \text{ min} + 1 \text{ deg } 2 \text{ min} - 50 \text{ min}$.

Component weights and dimensions

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

TABLE 1
Special ground equipment

Ref. No.	Part No.	Description	Application	
		Towing and steering equipment		
26FZ/95022	EA3.88.15	Adapter, fork	Used with towing arm (4G/2792)	
26FZ/95637	EG7.88.3	Arm, nose steering		
		Jacking equipment		
26FZ/95004	EA1.88.23	Spigot, nose jacking	Used in conjunction with hydraulic jacks for nose raising and lowering Main-wheel changing Used with jack (4Q/2657) for lifting aircraft	
26FZ/95413	EA3.88.307	Bracket, main-wheel jacking		
26FZ/95449	EA9.88.39	Adapter, jacking		
		Slings equipment		
26FZ/95006	EA1.88.61	Sling, centre fuselage	Fitted when engine is removed Used when lifting a damaged component	
	EG7.88.259	Sling, fuselage nose		
26FZ/95007	EA1.88.65	Sling, fuselage tail		
◀ 26FZ/95008	EA1.88.919 ▶	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/95013	EA3.88.79	Bridge piece, wing		
26FZ/95094	EA1.88.741	Sling, nose and centre fuselage		
26FZ/95262	EA3.88.273	Strap, metal		
26FZ/95432	EB7.88.183	Sling, 'Green Satin' T.R., front		
26FZ/95433	EB7.88.143	Sling, 'Green Satin' T.R., rear		
26FZ/95434	EB7.88.135	Sling, tracking unit		
26FZ/95431	EB7.88.149	Trolley, con-rod, mono-rail		
	EB7.88.199	Hoist, minilift, 'Green Satin'		
26FZ/95025	EA1.88.91A	Former, wing, forward	Used together with beams, gantry (4Q/2310) and uprights, gantry (4Q/2309) for main-plane changing	
26FZ/95026	EA1.88.91B	Former, wing, centre		} Rib 4, port
26FZ/95027	EA1.88.91C	Former, wing, aft		
26FZ/95028	EA1.88.91D	Former, wing, forward		} Rib 5, port
26FZ/95029	EA1.88.91E	Former, wing, centre		
26FZ/95030	EA1.88.91F	Former, wing, aft		

continued...

TABLE 1 Special ground equipment - continued

Ref. No.	Part No.	Description	Application
Slinging equipment - continued			
26FZ/95031	EA1.88.92A	Former, wing, forward	} Used together with beams, gantry (4Q/2310) and uprights, gantry (4Q/2309) for main-plane changing
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	
Trestling equipment			
26FZ/95017	EA1.88.87A	Former, rear fuselage, front	Used with U.J.T. No.1
26FZ/95018	EA1.88.87B	Former, rear fuselage, rear	Used with U.J.T. No.7
26FZ/95037	EA1.88.417	Trestle, centre, adjustable fuselage, front	} EA1.88.417 } EA1.88.419
26FZ/95038	EA1.88.419	Trestle, centre, adjustable fuselage, rear	
	EA1.88.683	Trestle assembly	
	EA1.88.689	Support block assembly	
	EA1.88.683	Trestle assembly	} EA1.88.419
	EA1.88.691	Support block assembly	
Rigging equipment			
26FZ/95010	EA1.88.93	Gauge, main-plane, incidence and dihedral	} Lateral (cabin) and longitudinal (centre fuselage) Longitudinal (cabin) and lateral (rear fuselage)
26FZ/95115	EA3.88.179	Gauge, tail-plane, incidence and dihedral	
26FZ/95040	EA1.88.447	Gauge, fuselage leveling	
26FZ/95093	EA1.88.747	Gauge, fuselage leveling	
Miscellaneous equipment			
26FZ/95099	EA1.88.817	Guard, engine safety nacelle	} Fitted for engine ground testing
26FZ/95091	EA1.88.797	Cowling, port slave	
26FZ/95092	EA1.88.798	Cowling, starboard slave	
26FZ/95090	EA1.88.799	Strut, tail-plane jury	

continued...

TABLE 1 Special ground equipment – continued

Ref. No.	Part No.	Description	Application
Miscellaneous equipment – continued			
	EG7.88.283	Trolley, fuselage nose	No.1 and 2 fuel tank vents
26FZ/95298	EA3.88.205	Cover, blanking	
26FZ/95299	EA3.88.297	Block, removal	Cabin pressure control valve
26FZ/95270	EA3.88.281	Plug, blanking	
26FZ/95083	EA2.88.35	Trolley, equipment packs	
26FZ/1971	EA3.88.91	Clamp, port aileron locking	
26FZ/1972	EA3.88.92	Clamp, starboard aileron locking	
26FZ/1867	EA1.88.73	Clamp, starboard elevator locking	
26FZ/13142	EA1.88.873	Clamp, port elevator locking	
26FZ/2458	EA3.88.153	Clamp, rudder locking	
26FZ/95015	EA1.88.255	Pin, nose u/c locking	
	EA3.88.133	Lock pin, flap switch	
26FZ/95071	EA1.88.599	Plate, air-intake blanking	Also used to sling main plane
26FZ/1970	EA1.40.169	Ring, picketing	
26FZ/95089	EA1.88.743	Sleeve, main u/c locking	
26FZ/95627	EG7.88.89	Key, transit and arming	
26FZ/95628	EG7.88.151	Bung, turbine-gear alternator air-intake and exhaust	
26FZ/95634	EG7.88.43	Bung, radar pack exhaust	
26FZ/95635	EG7.88.167	Bung, window aperture	
26FZ/95636	EG7.88.277	Cover	
26FZ/95437	EB7.88.131	Cover, window photo cell	
	EG7.88.283	Trolley, pressure cabin	
26FZ/95289	43G/SAL/194	Beam M.P., outer port, issue 2	
26FZ/95290	43G/SAL/194	Beam M.P., outer starboard, issue 2	
26FZ/95283	43G/SAL/183	Beam, tail-plane transportation pedestal, issue 2	
26FZ/95284	43G/SAL/184	Beam, tail-plane transportation pedestal	
26FZ/95561	EA9.88.477	Rod, front sighting	
26FZ/95562	EA9.88.479	Rod, rear sighting	
26FZ/95563	EA9.88.481	Container, sighting rods	
26FZ/95619	EA3.88.5053	Sets, test installation (air ventilated suit G.E. Mod.4047)	
26FZ/95625	EG7.88.109	Hoist attachment, starboard	Turbine-gear alternator
26FZ/95626	EG7.88.123	Hoist attachment, port	Turbine-gear alternator
	1949/371T	Test rig adapter (Pre Mod.GE 5540)	Post Mod.5466
	MT30001/378	Ground support trolley	
	MT30004/378	Coolanol circuit test rig (Pre Mod.GE 5540)	
	EG7.88.5051	Test rig adapter (Post Mod.GE 5540)	
	EG7.88.5053	Coolanol circuit test rig (Post Mod.GE 5540)	

continued . . . ▶

TABLE 1 Special ground equipment — *continued*

Ref. No.	Part No.	Description	Application
Miscellaneous equipment — <i>continued</i>			
26FZ/95639	EG7.88.331	Table, lifting	Radar equipment
26FZ/95640	EG7.88.345	Trolley, handling	Radar equipment
26FZ/95642	EG7.88.261	Beam assembly	
26FZ/95646	EG7.88.269	Sling assembly	
26FZ/95643	EG7.88.285	Former (cradle, front)	
26FZ/95644	EG7.88.287	Former (cradle, rear)	
	CAN/GSS1	Adapter	
	CAN/GSS2	Adapter Local manufacture	For snatch unit checks
	CAN/GSS3	Adapter	
26FZ/95638	EG7.88.47	Table, lifting	For magazine window
26FZ/95641	EG7.88.125	Cradle, lifting	For wing-tip window container
26FZ/95631	EG7.88.153	Lead, test (no volt)	} Use with 5G/3365
26FZ/95632	EG7.88.155	Adapter, lead	
	EG7.88.247	Connector, (bench test)	
	EG7.88.301	Stowage bag, lead	
26FZ/1438554	EG7.88.369	Cover, wing-tip pod	
Tools			
26FZ/95462	EB6.88.103	Extractor	To remove rudder blow back assembly
26FZ/95044	EA1.88.375	Extractor	Tab torque lever, aileron and rudder
26FZ/95104	EA1.88.825	Extractor	Aileron hinge pins
26FZ/95047	EA1.88.359	Extractor	Main-plane pick-up pins
26FZ/95114	A.6313	Extractor	Main wheels
26FZ/95048	EA1.88.363	Insertor	Main-plane pick-up pins
26FZ/95088	EA1.88.733	Insertor	Main undercarriage adjustment pin
26FZ/95063	EA1.88.395	Key	Hydraulic filler cap
26FZ/95082	A/MBEU/70/EE	Rig, resetting	For elevator snatch unit
26FZ/95493	EA1.88.877	Spanner, release	For nose-wheel doors
26FZ/95059	EA1.88.385	Spanner	For undercarriage pivot bolt
26FZ/95060	EA1.88.387	Spanner	For undercarriage pivot nut
26FZ/95072	EA1.88.551	Disc, setting	} For rigging engine control
26FZ/95293	EA1.88.831	Indicator	
26FZ/95074	EA1.88.549	Plate, throttle box setting	
26FZ/95294	EA1.88.547	Plate, port bell-crank lever setting	

continued . . .

TABLE 1 Special ground equipment - continued

Ref. No.	Part No.	Description	Application
		Tools - continued	
26FZ/95295	EA1.88.548	Plate, starboard bell-crank lever setting	For rigging engine control
26FZ/95046	EA1.88.379	Spanner, universal	Aileron centre hinge pin
26FZ/95065	EA1.88.365	Spanner	Front fuselage jacking spigot
26FZ/95264	AS.130	Spanner	Wing-tip tank filler cap
26FZ/95269	EA3.88.293	Spanner	Wing-tip tank drain valve (post Mod.733)
26FZ/95079	EA1.88.531	Spanner	Wing-tip pod/tank explosive bolts
26FZ/95265	EA3.88.247	Template, rudder rigging	
26FZ/95267	EA3.88.223	Template, elevator rigging	
26FZ/95266	EA3.88.257	Template, aileron rigging	
26FZ/95100	EA1.88.823	Gauge	
26FZ/95101	EA1.88.821	Tool, setting	For aileron fixed tab
26FZ/95103	Messier T.1342/75	Block, split	Used on air brakes
26FZ/95054	EA1.88.345	Spanner	For torque links
26FZ/95441	TS/48/21	Tool, 3/4 in. (120 deg) countersinking	Nose cowlings
26FZ/95490	EA1.88.889	Bolts, canopy slave	
26FZ/95491	EA1.88.891	Pins, canopy locating	
26FZ/95088	EA1.88.733	Insertor	Main undercarriage adjustment pin
26FZ/95086	EA3.88.135	Spanner	Main-axle clamp
26FZ/95532	EA1.88.893	Gauge, inspection	
26FZ/95051	EA1.88.349	Insertor, piston ring	
26FZ/95052	EA1.88.383	Insertor, bush	
26FZ/95050	EA1.88.389	Insertor, bush	
26FZ/95053	EA1.88.391	Insertor, extractor	
26FZ/95056	EA1.88.347	Spanner	
26FZ/95057	EA1.88.353	Spanner	
26FZ/95325	EA3.88.303	Spanner	
26FZ/95061	EA1.88.351	Tool, centralizing	
26FZ/95062	EA1.88.361	Tool, combination	
26FZ/95597		Gauge, plug	
26FZ/95603	T56015	Reamer	
26FZ/95453	EA9.88.75	Tool assembly, locking	
26FZ/95450	EA9.88.33	Spanner	
	EG7.88.299	Tool, cartridge discharger setting	
26FZ/1438552	ST8/6232	Tool, stripper unit setting	Release chute

UK RESTRICTED

TABLE 2
Standard ground equipment

Ref. No.	Description	Application
Towing equipment		
4GB/2792	Arm, towing	
4GB/4139	Bridle, 50 ft towing	
28Y/1057116	Shackle, 3/4 in.	
28Y/9508299	Shackle pin	
Jacking equipment		
◀ 4Q/2533428	Adapter head, special	Aircraft jacking at main plane
4Q/2141391	Body, 15 tonne hydraulic jacking	
4Q/2141393	Trestle, Mk.2 ▶	
4Q/2659	Trolley, transporter	
4Q/2627	Adapter head, Mk.49	Aircraft jacking at nose wheel
4Q/2232	Body, 5-ton hydraulic jacking	
4Q/2266	Trestle, Mk.2	Jacking for main-wheel changing used with bracket, EA3.88.307
4Q/2321	Adapter head, Mk.27	
4Q/2657	Jack, 15-ton hydraulic pillar	
4Q/2666	Trolley, transporter	
Trestling equipment		
4GB/-	Trestle, U.J. No.1 c/w Type A brackets	Rear fuselage support
4GB/-	Trestle, U.J. No.7 c/w Type A brackets	
4Q/1245	Gantry, lifting, comprising:—	For main-plane changing
4Q/2309	Upright, Type A	
4Q/2310	Beam, Type A	
4Q/2311	Beam, Type B	
Engine-changing equipment		
4GC/4783 or	Sling, Avon engine universal Mk.1	
4GC/5348	Sling, Avon engine universal Mk.2	
40B/1030 or	Stand, Avon, universal	
40B/1166 or	Stand, Avon, universal	
40B/1214 or	Stand, Avon, universal	
40B/1220	Stand, Avon, universal	
4G/4858	Trolley, E.C.U. Mk.2 servicing	
4GC/5377	Sling, transit/servicing stand c/w E.C.U. lifting	

continued . . .

TABLE 2 Standard ground equipment — *continued*

Ref. No.	Description	Application
<i>Tools — continued</i>		
1C/6658	Pliers	
1C/6660	Pliers	
1C/6452	Screwdriver, automatic spiral	
1C/7001	Wrench, 5-30 lb ft x 1/2 in. S.D. torque	
1C/7003	Wrench, 3-140 lb ft x 1/2 in. S.D. torque	
27BA/8782	Spanner, air brakes	
✂		

TABLE 1

FRONT FUSELAGE

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

TABLE 2

CENTRE FUSELAGE

TANK BAYS 1, 2, 3	NO. OF DRAIN HOLES
	1 PORT 1 STBD.
AFT CAMERA WINDOW	FWD. AFT
	1 PORT 1 STBD. 1 PORT 1 STBD.

TABLE 4

WING

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

TABLE 3

REAR FUSELAGE

LOWER SKIN, AFT OF FR.33	NO. OF DRAIN HOLES
AFT OF FR.46 IN FAIRING	1 PORT 2 1 STBD.
ANTI-COLLISION LIGHT, FR.33	1 PORT 2 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

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

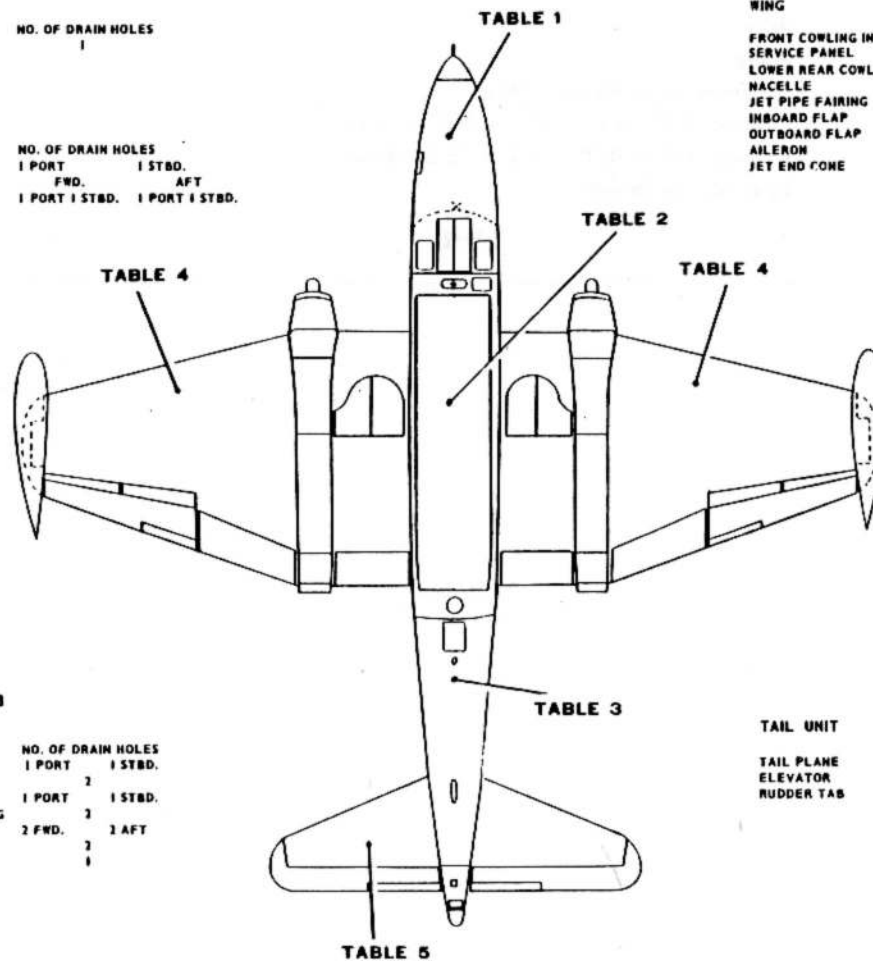


FIG.4. DRAINAGE HOLES

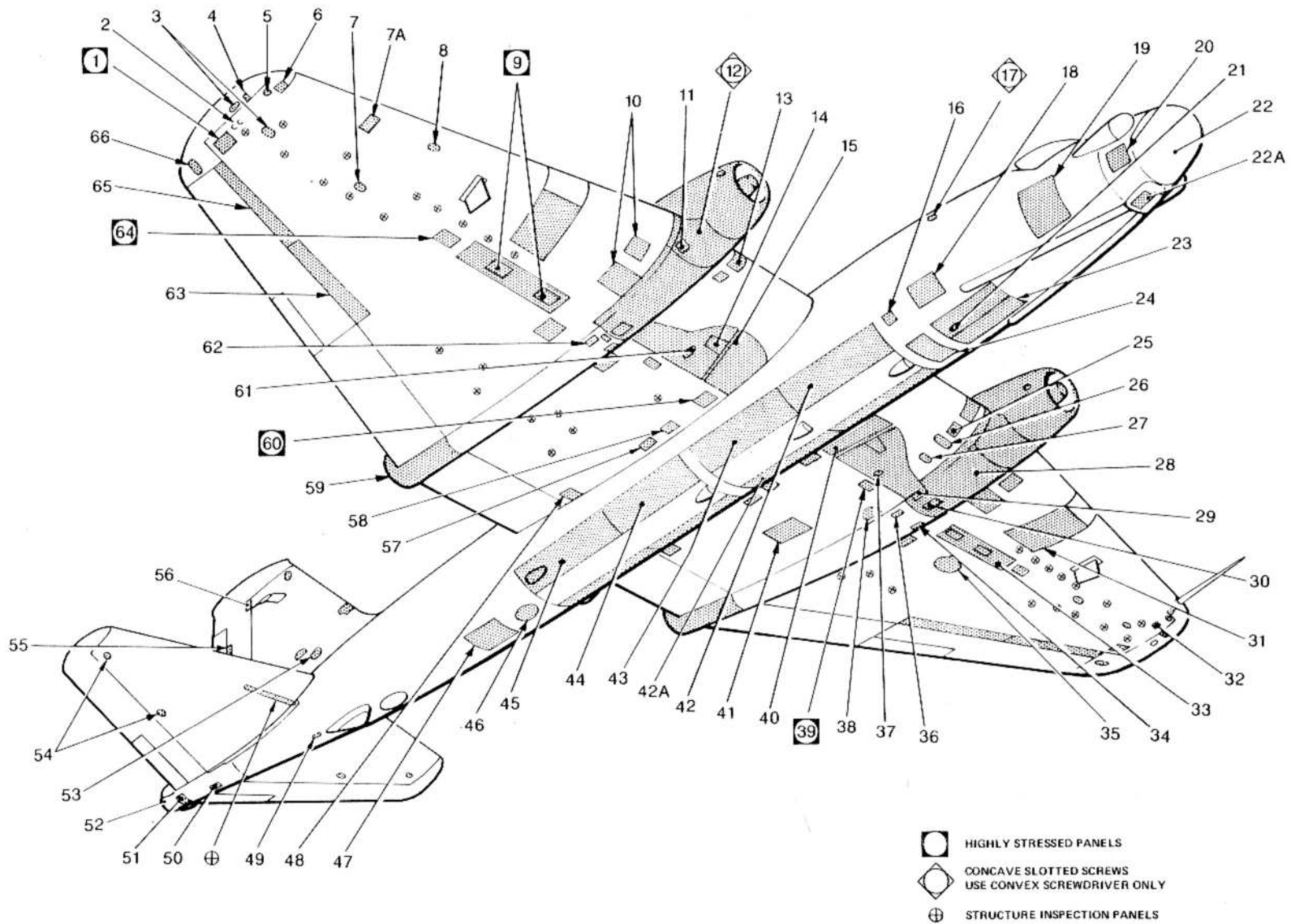


FIG.5 ACCESS PANELS, LOWER SURFACE AND STARBOARD SIDE

◀ MOD.5466 EMBODIED ▶

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

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

- | | | | |
|-----|--|-----|---|
| 1 | DETONATOR RESISTORS (STARBOARD) | 37 | PICKETING POINT |
| 2 | WING-TIP TANKS/PODS ELECTRICAL CONTACTS | 38 | MAIN UNDERCARRIAGE PIVOT PIN |
| 3 | WING-TIP TANKS/PODS EXPLOSIVE ATTACHMENT BOLTS | 39 | AILERON CONTROL TUBES, FUEL AND HYDRAULIC PIPES |
| 4 | WING-TIP TANKS FUEL AND AIR CONNECTION POINTS | 40 | MAIN UNDERCARRIAGE DOOR, DOOR JACK AND SEQUENCE VALVE, INTERCOMM. EXTERNAL CONNECTION (STARBOARD SIDE ONLY) |
| 5 | WING-TIP TANKS/PODS EXPLOSIVE ATTACHMENT BOLTS | 41 | ARI 5851 AERIAL |
| 6 | NAVIGATION AND TAXIING LAMPS | 42A | COOLING SYSTEM ACCESS IN FWD PACK BAY (POST MOD.5466) |
| 7 | PICKETING POINT | 42 | SPECIAL EQUIPMENT, HYDRAULIC SELECTOR VALVES, FUEL DRAINS
FUEL PUMPS, FUEL COCKS AND ACTUATORS, AIR BRAKE AND FLAPS
GROUND SELECTOR |
| 7A | GM4B COMPASS DETECTOR (STARBOARD SIDE ONLY) | 43 | |
| 8 | ILS GLIDE PATH AERIAL | 44 | |
| 9 | WING-TIP TANKS FUEL AND AIR PIPES | 45 | |
| 10 | RECUPERATORS (IF FITTED) | 46 | CAMERA APERTURE (NOT USED) |
| 11 | FIRE PANEL | 47 | REAR FUSELAGE HATCH, REAR DATUM BLOCKS, FLYING CONTROL TUBE COUPLINGS, PICKETING RING-BOLTS, STOWAGE, STARTER CARTRIDGE STOWAGE, NO.3 FUEL TANK, RADIO/NAVIGATION/EQUIPMENT |
| 12 | SERVICE PANEL ENGINE HIGH PRESSURE FUEL COCK COUPLING, THROTTLE VALVE COUPLING OIL SUMP FILLER CAP, OIL SUMP DRAIN, OIL FILTERS, LOW PRESSURE FUEL FILTER AND DRAIN OIL COOLER PIPES TO SUMP, OIL PRESSURE TRANSMITTER, OIL COOLER | | |
| 13 | HYDRAULIC PUMP | | |
| 14 | WHEEL JACKING POINT | | |
| 15 | MAIN UNDERCARRIAGE DOOR LATCHING MECHANISM EXTERNALLY-OPERATED EMERGENCY RELEASE | | |
| 16 | ARMAMENT SAFETY BREAK | | |
| 17 | HYDRAULIC RESERVOIR FILLER CAP | | |
| 18 | MAIN ELECTRICAL PANEL GROUND/FLIGHT SWITCH, GROUND SUPPLY SOCKETS, AIRCRAFT DESTRUCTOR STOWAGE | | |
| 19 | MAIN ENTRANCE DOOR | | |
| 20 | SPECIAL EQUIPMENT, NITROGEN PURGING | | |
| 21 | NOSE UNDERCARRIAGE DOORS LATCHING MECHANISM EXTERNALLY-OPERATED EMERGENCY RELEASE | | |
| 22 | SPECIAL EQUIPMENT, AERIALS | | |
| 22A | 'D' BAND AERIAL (POST MOD.5466) | | |
| 23 | NOSE UNDERCARRIAGE DOORS | | |
| 24 | DOWNWARD IDENTIFICATION LAMPS | | |
| 25 | ACCESSORIES GEARBOX DRAIN | | |
| 26 | CONSTANT FLOW VALVE (PORT SIDE ONLY) | | |
| 27 | AIR MILEAGE UNIT (PORT SIDE ONLY) | | |
| 28 | ENGINE LOWER REAR COWLING | | |
| 29 | UNDERCARRIAGE COWLING FLAP | | |
| 30 | UNDERCARRIAGE COWLING FLAP ACTUATING LINK | | |
| 31 | TURBINE-GEARED ALTERNATOR | | |
| 32 | PITOT BOOM ATTACHMENT POINTS | | |
| 33 | AIR-BRAKE JACK AND OPERATING MECHANISM | | |
| 34 | AILERON CONTROL TUBE COUPLING | | |
| 35 | LANDING LAMP (PORT SIDE ONLY) | | |
| 36 | AILERON CONTROLS, FUEL, AIR AND HYDRAULIC PIPES | | |
| | | 48 | MAIN PLANE REAR WALL ATTACHMENT |
| | | 49 | AFT PICKETING POINT |
| | | 50 | NAVIGATION LAMP |
| | | 51 | REAR CONE ATTACHMENTS |
| | | 52 | SPECIAL EQUIPMENT AERIALS AND NITROGEN PURGING |
| | | 53 | RUDDER OPERATING LEVER |
| | | 54 | ELEVATOR HINGE PINS INSPECTION |
| | | 55 | RUDDER TAB CONTROL TUBE |
| | | 56 | RUDDER SLINGING POINT |
| | | 57 | WING ROOT PLUG BREAKS |
| | | 58 | CABLE BREAKS TURBINE-GEARED ALTERNATOR AND POD |
| | | 59 | JET PIPE REAR CONE, JET PIPE ADJUSTMENT POINTS, THERMOCOUPLES |
| | | 60 | MAIN SPAR ATTACHMENT |
| | | 61 | MAIN UNDERCARRIAGE FIXED FAIRING, HYDRAULIC ACCUMULATOR CHARGING VALVE AND GAUGE (STARBOARD SIDE ONLY) |
| | | 62 | MAIN JACKING POINT |
| | | 63 | AILERON INBOARD SHROUD SCREEN |
| | | 64 | AILERON CONTROL TUBE COUPLING |
| | | 65 | AILERON OUTBOARD SHROUD SCREEN |
| | | 66 | AILERON OUTBOARD HINGE PIN |

Note . . .

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

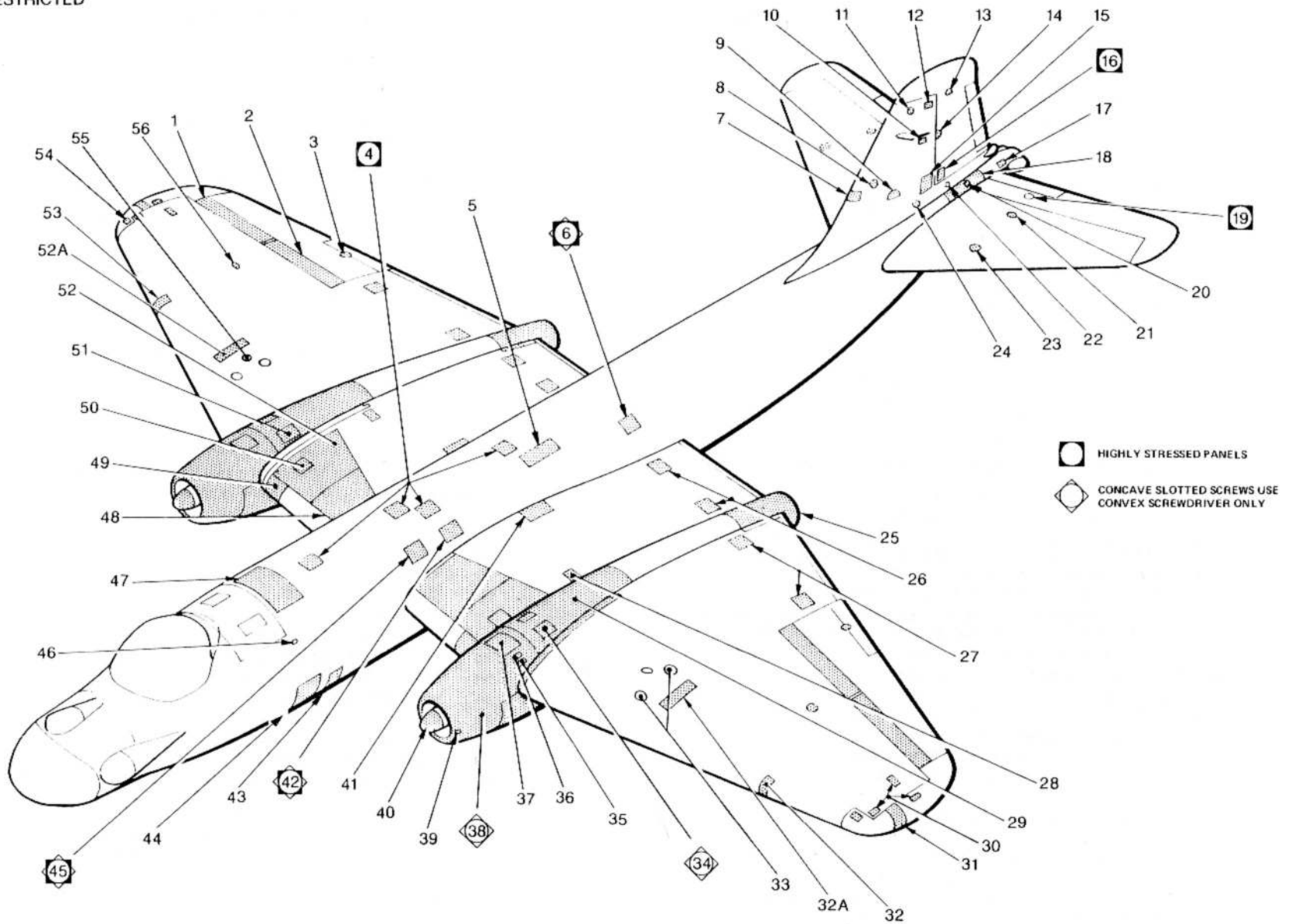


FIG. 6 ACCESS PANELS, UPPER SURFACE AND PORT SIDE

◀ MOD 5466 EMBODIED ▶

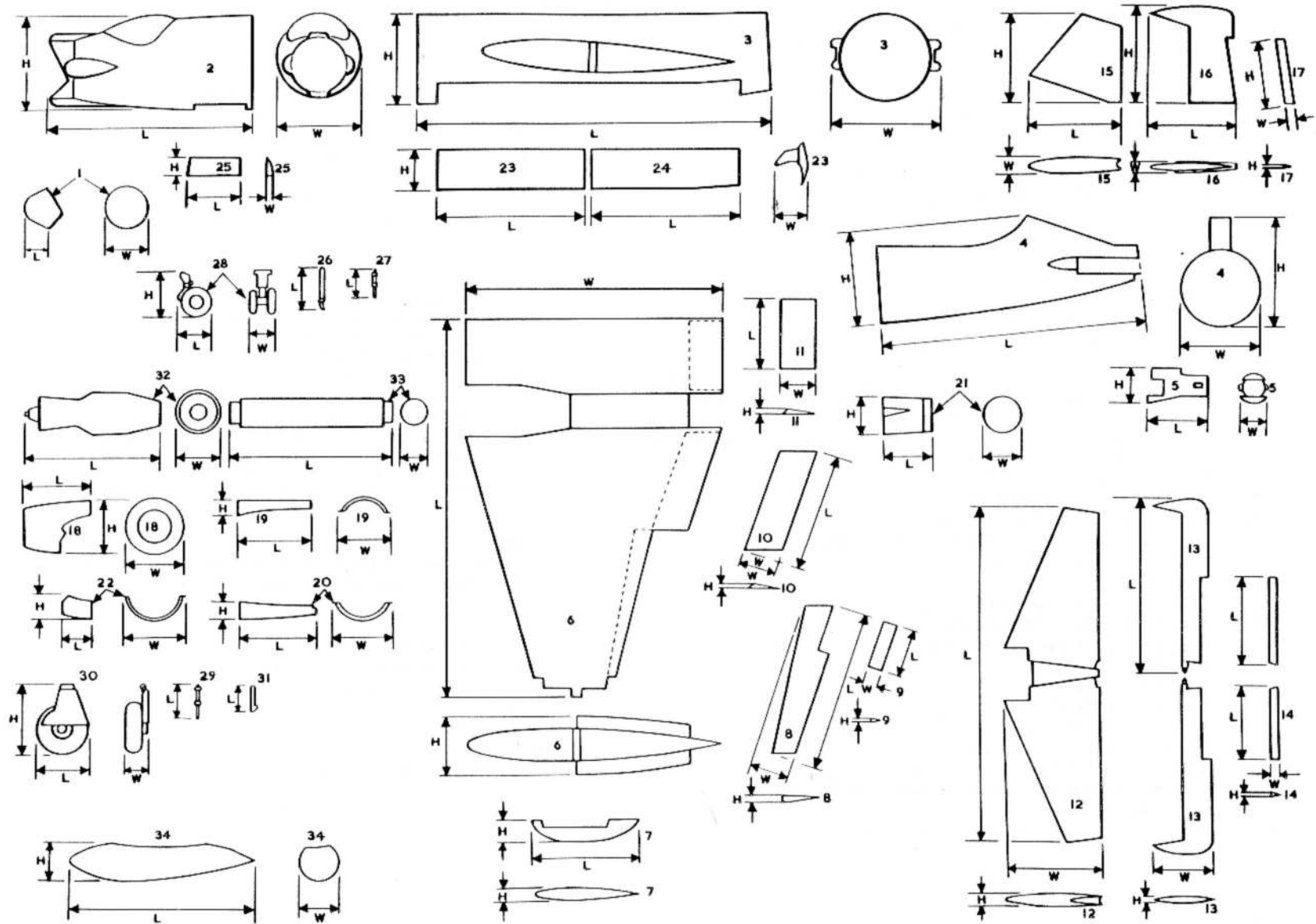


FIG. 7. COMPONENT WEIGHTS AND DIMENSIONS

KEY TO FIG. 7 (COMPONENT WEIGHTS AND DIMENSIONS)

Item No.	Component	Length (L)	Width (W)	Height (H)	Tare weight (lb)	Equipped weight (lb)
1	Nose fairing	1 ft 3½ in.	2 ft 7 in.	2 ft 7 in.	22	-
2	Front fuselage	17 ft 1 in.	6 ft 6 in.	6 ft 6 in.	1100	3350
3	Centre fuselage	25 ft 11 in.	7 ft 7 in.	6 ft 6 in.	2000	3500
4	Rear fuselage	19 ft 1 in.	5 ft 10 in.	7 ft 11 in.	550	650
5	Rear fairing	4 ft 10 in.	2 ft 5 in.	2 ft 9 in.	40	-
6	Main plane	29 ft 0 in.	19 ft 0 in.	4 ft 3 in.	2073	3000
7	Wing tip	1 ft 8 in.	7 ft 8 in.	10 in.	16	-
8	Aileron	12 ft 6 in.	1 ft 3 in.	9 in.	93	-
9	Aileron tab	4 ft 2 in.	8 in.	2 in.	4	-
10	Flap, outboard	8 ft 11 in.	2 ft 9 in.	3 in.	31	-
11	Flap, inboard	5 ft 7 in.	2 ft 6 in.	3 in.	22	-
12	Tail plane	26 ft 0 in.	7 ft 9 in.	1 ft 6 in.	495	-
13	Elevator	13 ft 11 in.	4 ft 5 in.	5 in.	85	110
					(with balance weights)	
14	Elevator tab	5 ft 7 in.	8 in.	2 in.	7	-
15	Fin	6 ft 4 in.	1 ft 6 in.	6 ft 9 in.	94	-
16	Rudder	7 ft 1 in.	1 ft 3 in.	7 ft 0 in.	132	-
17	Rudder tab	9 in.	2 in.	5 ft 5 in.	7	-
18	Engine front cowling	4 ft 9½ in.	3 ft 10 in.	3 ft 10 in.	55	-
19	Engine top rear cowl	5 ft 5 in.	2 ft 0 in.	1 ft 3 in.	30	-
20	Engine bottom rear cowl	5 ft 5 in.	2 ft 0 in.	1 ft 3 in.	33	-
21	Jet pipe cowling	3 ft 8 in.	2 ft 8 in.	2 ft 7 in.	21	-
22	Engine service panel	2 ft 2 in.	2 ft 0 in.	1 ft 9 in.	15	-
23	Equipment pack (forward)	11 ft 0 in.	5 ft 2½ in.	1 ft 5 in.	209	-
24	Equipment pack (rear)	10 ft 10 in.	5 ft 2½ in.	1 ft 5 in.	200	-
25	Nose U/C doors	4 ft 2 in.	1 ft 5 in.	3 in.	10	-
26	Nose U/C radius rod	3 ft 11 in.	4 in.	8 in.	20	-
27	Nose U/C jack	2 ft 2 in.	5 in.	6 in.	10	-
28	Nose U/C wheel and leg	2 ft 2 in.	1 ft 7 in.	3 ft 7 in.	230	-
29	Main U/C jack	1 ft 11 in.	4 in.	7 in.	15	16
30	Main U/C wheel and leg	3 ft 11 in.	2 ft 1 in.	6 ft 3 in.	600	-
31	Main U/C side stay	2 ft 9 in.	8 in.	8 in.	36	-
32	Engines	11 ft 0 in.	3 ft 6 in. (diameter)	-	2460	-
33	Jet pipe	12 ft 3 in.	2 ft 2 in. (diameter)	-	184	-
34	Wing-tip tank/pod	14 ft 7 in.	1 ft 11 in.	1 ft 10 in.	120	-

Chapter 4A EXTERNAL FINISH AND MARKINGS◀ *(completely revised)* ▶**Introduction**

1. For data on external paint finish and markings, reference should be made to A.P.119A-0601-0 – AIRCRAFT PAINTING AND MARKINGS, BAe Drg. EG7-00-309.

2. In service, care must be taken to maintain all servicing, safety and 'break-in' markings in a legible condition. This is essential to

permit the correct replenishment of systems and safe emergency entries.

3. Any removal or deterioration of the external finish must be restored as soon as possible.

4. The static vent plates on the front fuselage are not to be painted or polished. They must be kept clean.

Chapter 6 PROCEDURES FOLLOWING HAZARDOUS INCIDENTS*(Completely revised)***LIST OF CONTENTS**

	<i>Para.</i>		<i>Para.</i>
<i>General information</i>	<i>1</i>	<i>Safety precautions</i>	<i>4</i>
<i>Hazardous incidents</i>	<i>2</i>	<i>Servicing notes</i>	<i>5</i>
<i>Examination following hazardous incidents</i>	<i>3</i>	<i>Definitions</i>	<i>6</i>

LIST OF APPENDICES

	<i>App.</i>		<i>App.</i>
<i>Heavy landings</i>	<i>1</i>	<i>Lightning strikes</i>	<i>6</i>
<i>Overweight landings</i>	<i>2</i>	<i>Violent braking</i>	<i>7</i>
<i>Excess G</i>	<i>3</i>	<i>Over-running of paved surfaces</i>	<i>8</i>
<i>Flight turbulence</i>	<i>4</i>	<i>Abnormal ground handling incidents</i>	<i>9</i>
<i>Buffeting/vibration during flight</i>	<i>5</i>		

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 720 series of a hazardous incident.

Hazardous incidents

2. The term 'hazardous incident' means an occurrence apparent to an aircrew member or other individual in which an aircraft has, or may have, exceeded limits stated in its Release to Service document, or in which the aircraft structure or controls may have been damaged by abnormal operational conditions or loadings; the meaning of the term is further amplified in AP100A-01 Leaflet 316.

This class of damage can arise from:-

- (1) A heavy landing.
- (2) Overweight landings.
- (3) Flight in excessive g conditions.
- (4) Flight through turbulent air.
- (5) Buffeting/vibration during flight.
- (6) A lightning strike.
- (7) Violent braking.
- (8) Over-running of paved surfaces.
- (9) Abnormal ground handling incidents.

Examination following hazardous incidents

3. Following a hazardous incident an examination is to be carried out as detailed in the appropriate appendix.

Safety precautions

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

Servicing notes

5.

- (1) The examinations 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 720 series. Discretion is to be used in regard to the extent to which the relevant instructions are applied.

- (5) Details of new or serviced components fitted during the servicing must be entered in the relevant columns of Form 720 series.
- (6) The tradesmen responsible must sign for the completed servicing in the relevant columns of Form 720 series.

Definitions

6. The definitions of technical operations mentioned in this chapter are contained in A.P.101B-0400-5A2, Sect.1.

Appendix I HEAVY LANDINGS

LIST OF TABLES

	<i>Table</i>
<i>Airframe</i>	<i>1</i>
<i>Engines</i>	<i>2</i>
<i>Electrical system... ..</i>	<i>3</i>
<i>Instrument installation... ..</i>	<i>4</i>
<i>Radar installations</i>	<i>5</i>
<i>Wireless installations</i>	<i>6</i>

RESTRICTED

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
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.5A Sect.3, Chap.5A Sect.3, Chap.5A
2	NOSE UNDERCARRIAGE (a) Shock-absorber strut	(i) Examine for normal extension (ii) Examine for oil leaks Note... <i>The white line painted on the shock-absorber strut will be obscured if the pressure is low.</i>	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.5A Sect.3, Chap.5A Sect.3, Chap.5A
		Jack and trestle aircraft. Support 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 clearance of 0.001 in. to 0.004 in.	Sect.3, Chap.5A
				Note... <i>Serious deviation indicates a twisted torque link - renew torque link</i>	

continued...

TABLE 1 Airframe - continued

ITEM NO.	ITEM	OPERATION	A. P. REFERENCE	RECTIFICATION	A. P. REFERENCE
		(iii) Remove centre pivot pin and examine for bowing, cracks and shear		(iii) Renew pivot pin	
	(b) Torque links, side stay, and main attachment lugs	} Examine for damage }	1803P, Vol.2 Pt.3, Sect.6	Renew if necessary	Sect.3, Chap.5A
	(c) Side stays and stay links				
	(d) side stay upper attachment brackets	(i) Examine for damage	101B-0400-6, Pt.1, Chap.3	(i) Renew if necessary	
		(ii) Examine securing nuts for movement, and bolts for shearing		(ii) Renew if necessary	
		(iii) Examine spar web in vicinity of brackets for damage			
	(e) Retraction jacks	(i) Examine attachment fitting for damage	1803P, Vol.2, Pt.3, Sect.6	Renew jacks	
		(ii) Examine rams for damage			
	(f) Shock-absorber strut attachment brackets	(i) Examine for damage	101B-0400-6, Pt.1, Chap.3		
		(ii) Examine for cracks in web and flanges, and in vicinity of bolt holes			
		Note... <i>Access to the internal parts of brackets can be obtained through lightening holes in the web of the inboard plate.</i>			
		(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... <i>When removing or refitting a wheel, it must be fully supported to prevent damage to the oil seal housing.</i>			

continued...

RESTRICTED

TABLE 1 Airframe - continued

ITEM NO.	ITEM	OPERATION	A. P. REFERENCE	RECTIFICATION	A. P. REFERENCE
		Remove, and examine:-			
	(i) Tyres for casing fracture		2337	(i) Fit serviced wheels and check tyre pressures. Secure valve caps	1018-0417-5
	(ii) Wheels for symmetry: spin wheel casting on dummy axle			(ii) Renew wheel casting	
	(iii) brake unit		2337	(iii) Fit serviced brake units	
	Note... <i>Damage to the wheel and brake unit is to be suspected if the brake unit is difficult to remove from the wheel.</i>				
4	NOSE UNDERCARRIAGE				
	(a) Torque links	Examine for damage		} If defects exist, change complete strut.	Sect.3, Chap.5B
	(b) Stay link attachment lugs	Examine for damage			
	(c) Main attachment lug	Examine for damage			
	(d) Retraction jack	(i) Examine attachment fittings for damage (ii) Examine ram for damage	1803E, Vol.2, Pt.3	(i) Renew jack (ii) Renew jack	Sect.3, Chap.5B Sect.3, Chap.5B
	(e) Shock-absorber strut attachment bracket	(i) Examine for damage (ii) Examine structure in vicinity for damage	1018-0400-6, Pt.1, Chap.2		
	(f) Attachment bracket top securing bolts	(i) Examine for signs of shearing Note... <i>Damage is more likely to occur to the top bolts but, if damage is suspected, all four bolts must be removed for examination.</i>		(i) Renew as necessary	

Note...

The following two items are applicable if damage has been found elsewhere in the nose undercarriage or surrounding structure.

continued...

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
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.5A Sect.3, Chap.5A Sect.3, Chap.5A
2	NOSE UNDERCARRIAGE (a) Shock-absorber strut	(i) Examine for normal extension (ii) Examine for oil leaks Note... <i>The white line painted on the shock-absorber strut will be obscured if the pressure is low.</i> Jack and trestle aircraft. Support rear fuselage with No.7 universal jacking trestle and former, at frame 42.	Sect.2, Chap.2 1803E, Vol.1, Sect.6 Sect.2, Chap.4	(i) Recharge strut (ii) Slight leaks - recharge strut (iii) Serious leaks - indicate gland failure - renew strut	Sect.3, Chap.5A Sect.3, Chap.5A Sect.3, Chap.5A
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 clearance of 0.001 in. to 0.004 in. Note... <i>Serious deviation indicates a twisted torque link - renew torque link</i>	Sect.3, Chap.5A

continued...

Appendix I HEAVY LANDINGS

LIST OF TABLES

	<i>Table</i>
<i>Airframe</i>	<i>1</i>
<i>Engines</i>	<i>2</i>
<i>Electrical system... ..</i>	<i>3</i>
<i>Instrument installation... ..</i>	<i>4</i>
<i>Radar installations</i>	<i>5</i>
<i>Wireless installations</i>	<i>6</i>

TABLE 1 Airframe - continued

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
	(g) Main pivot bolt	Remove and examine for damage	1803E, Vol.2, Pt.3	Fit new bolt	Sect.3, Chap.5B
	(h) Radius rod top and bottom attachment bolts	Remove and examine for damage		Fit new bolts	Sect.3, Chap.5B
	(j) Radius rod stay link	Examine for damage		Fit new stay link	Sect.3, Chap.5B
	(k) Nose wheels	Remove, and examine tyres for casing fractures	2337	(i) Renew tyres (ii) Check tyre pressure- secure valve caps	101B-0417-5
5	ALIGHTING GEAR FUNCTIONING TEST				
	(a) Hydraulic fluid reser- voir	Replenish with oil OM-15			Sect.3, Chap.6
	(b) Functioning test	Refer to Sect.3, Chap.6, and:-			
		(i) Check accumulator pressure		Leading Parti- culars	
		(ii) Check cut-out valve operation		Leading Parti- culars	
		(iii) Raise and lower alighting gear five times, and ensure that mechanical up and down locks function correctly		Sect.3, Chap.6	
		(iv) Check operating times UP 14 sec DOWN 8 sec			
		(v) Check warning device		Sect.5, Chap.1	
		(vi) Examine fairings and doors for correct fitting		Sect.3, Chap.5	
		(vii) Operate undercarriage emergency control, then reset		Sect.3, Chap.11	
		(viii) Check UP and DOWN locks		Sect.3, Chap.5	
		(ix) Fit undercarriage down locks		Sect.2, Chap.1	
		(x) Prime and bleed system		Sect.3, Chap.6	
		Lower aircraft to ground, and remove jacks and trestle			

continued...

RESTRICTED

TABLE 1 Airframe - continued

ITEM NO.	ITEM	OPERATION	A. P. REFERENCE	RECTIFICATION	A. P. REFERENCE
6	MAIN PLANES	Remove following access panels:-			
		1. Main spar attachment	Sect.2, Chap.4		
		2. Aileron control tubes			
		3. Undercarriage pivot pin			
		4. Engine upper, and lower rear cowls			
		5. Uplock hook			
		6. Hydraulic pipes self-sealing couplings			
		7. Main plane rear attachment fitting			
		8. Main plane front attachment fitting			
	(a) Main spar in vicinity of undercarriage attachment bracket	Examine for:-			
		(i) Buckling, distortion and wrinkling			
	(b) Skin in vicinity of attachment brackets, and ribs No.6 and 7	(ii) Pulled or sheared rivets			
	(c) No.6 and 7 ribs	(i) Examine for damage			
		(ii) Examine cleat fittings each side of ribs immediately behind main spar for damage			
		(iii) Examine bolt heads and nuts securing cleat fittings for shearing and signs of movement			
	(d) Main-plane attachment fittings	(i) Examine for damage			
		(ii) Examine bolts for shearing and signs of movement			
	(e) Spar web and fuselage skin in vicinity of attachment fittings	Examine for damage.			
			101B-0400-6 Pt.1, Chap.3	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

continued...

RESTRICTED

TABLE 1 Airframe - continued

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
	(f) Main-plane rear attachment fittings (frame 27)	Examine for cracks, and signs of movement or shearing of attachment bolts.		101B-0400-6, Pt.1, Chap.3	
	(g) Main-plane forward attachment fittings	Examine for cracks, and signs of movement or shearing of attachment bolts.			
	(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			
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 in vicinity of bracket are damaged, or if defects are found in (i) and (ii) above, then:- (iii) Cut 3 in. dia. hole in cabin floor at mid point between two beams (starboard side of navigator's seat). (iv) Examine beams for damage (v) Carry out repairs	101B-0400-6, Pt.1, Chap.2		101B-0400-6, Pt.2
	(b) Nose-wheel well:-	Examine for damage			101B-0400-6, Pt.1, Chap.2
	(i) Vertical beam carrying radius rod rear attachments				
	(ii) Rear bulkhead				
	(iii) Side walls				
	(iv) Roof				
	(v) Horizontal beam on roof				

continued...

TABLE 1 Airframe - continued

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
	(c) Fuselage skin immediately aft of wheel well at bottom curve of transport joint	Examine for damage. Small wrinkles may have existed before heavy landing occurred and, as skin in this area is unstressed, they are to be ignored.	101B-0400-6, Pt.1, Chap.2		
	(d) Fuselage skin at frame 17 (Main-plane forward attachment point)	Examine for damage	101B-0400-6, Pt.1, Chap.2		
	(e) Tail-plane attachment bolts	Examine for damage	101B-0400-6, Pt.1, Chap.4		
	(f) Tail-plane attachment fittings	Examine for damage	101B-0400-6, Pt.1, Chap.4		
	(g) Tail-protecting pad	Examine pad and fuselage in vicinity for buckling and damage			
	(h) Fire extinguishers	Examine for signs of discharge	Sect.4, Chap.5	Discharge indicated by plunger protruding through cap.	
8	AIRCRAFT GENERALLY Carry out rigging check		Sect.2, Chap.4		

◀ Note ...

1. If rigging dimensions are found to be correct, this cannot be assumed to indicate that no defects exist.

2. 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 720 series.

▶ 9 DELETED

TABLE 1 Airframe - continued

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION	A.P. REFERENCE
(d)	Centre section forging	Examine for damage	101B-0417-5A3, S.P.463 (S.I./Canberra/105A)		
(e)	Centre section forging	Examine for damage	101B-0417-5A3, S.P.604 (S.I./Canberra/107B)		
(f)	Centre section forging	Examine for damage	101B-0417-5A3, S.P.605 (S.I./Canberra/108)		
(g)	Engine ribs and associated structure	Examine for damage	101B-0417-5A3, S.P.464 (S.I./Canberra/116)		
(h)	Outer wing shear web attachment forging	Examine for damage	101B-0417-5A3, S.P.738 and 609 (S.I./Canberra/139C)		
(j)	Spar booms at rib 6	Examine for damage	101B-0417-5A3, S.P.610 (S.I./Canberra/140E)		
(k)	Fin attachment lugs	Examine for damage	101B-0417-5A3, S.P.427 (S.I./Canberra/143)		
(l)	Undercarriage tie strut-top bolt hole	Examine for damage	101B-0417-5A3, S.P.449 (S.I./Canberra/147)		
◀(m)	Tail plane centre section - vertical stiffeners	Examine for damage	101B-0417-5A3, S.P.550 (S.I./Canberra/154)		
(n)	Main undercarriage - side stay attachment bracket on main spar	Examine for damage	101B-0417-5A3, S.P.526 (S.I./Canberra/155B)		
(o)	Elevator inboard hinges - bearing housings	Examine for damage	101B-0417-5A3, S.P.551 (S.I./Canberra/156)		
(p)	Engine rib cleats	Examine for damage	101B-0417-5A3, S.P.813 (S.I./Canberra/171A, pre Mod. 4933 and 4960)		
(q)	Outer wing main spar lower booms - adjacent engine outboard rib	Examine for damage	101B-0417-5A3, S.P.815 (S.I./Canberra/173B)		
(r)	Nose undercarriage pivot fork	Examine for damage	101B-0417-5A3, S.P.816 (S.I./Canberra/177B)		
(s)	Fuselage longerons between frames 13 and 29	Examine for damage	101B-0417-5A3, S.P.823 (S.I./Canberra/187A)		
(t)	Outer wing spar web attachment forging	Examine for damage	S.I./Canberra/193A (Not yet issued as S.P.) ▶		

Refit, or replace with new or serviced parts, all components removed and make 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.

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 servicing is commenced.
- (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) If the engine fails to light up when the first cartridge is fired, a second cartridge may be loaded when the compressor has stopped rotating. If two cartridges are fired consecutively the starter must be allowed to cool for a period of not less than 10 minutes before loading a third cartridge. If the engine fails to light up at the third attempt a period of 45 minutes must elapse before reloading the breech.
- (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 of OFF before connecting an external electrical supply.

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
	ENGINE MOUNTINGS			
	(a) Forward outboard mounting bracket	Examine for cracks		Renew if necessary
	(b) Forward outboard mounting support diaphragm brackets	Examine for cracks with aid of torch probe and mirror attachment through forward lightening hole in rib 1A in outer wing		
	(c) Inner mounting brackets	Examine for damage		Renew if necessary
	(d) Rear mounting brackets	Examine for damage		Renew if necessary
	(e) Engine mounting brackets attachment bolts	Examine for damage. Check for fatigue cracking using N.D.T. in accordance with the appropriate N.D.T. procedure. Note . . . The bolt damage data should be recorded, collated and periodically sent to, BAe, Stress Office, Warton; for evaluation.	119A-20001-1	Renew if necessary
	If engine damage is suspected, refer to A.P.102C-1522-6A, Part 1, Sect.1, Chap.10. Refit, or replace with new or serviced parts, all components removed and make 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.			

UK RESTRICTED

TABLE 3

Electrical system

(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) 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 the 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 the external electrical supply.
- (6) Functioning 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 function-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
1	BATTERY (a) Main lead acid battery stowage and adjacent structure (b) Emergency lead acid battery stowage and adjacent structure	Before carrying out functioning tests, plug in external electrical supply and switch ON. On completion of tests, switch OFF and disconnect external supply. 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 instructed by airframe N.C.O.	
2	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.4, Chap.5	Reset inertia switches, and carry out full functioning test of circuit. Connect serviced fire extinguishers after fitting.	
3	UNDERCARRIAGE MICROSWITCHES	Examine for damage		Renew if necessary	
Refit all access panels, and remove all tools and other materials used during the servicing of the electrical systems. Sign for completed servicing on Form 700E.					

TABLE 4

Instrument installation

*(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) 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 all Breeze plugs have been refitted.
- (3) All electrical circuits affected by disconnection of Breeze plugs are to be function tested after the Breeze plugs have been refitted.

Item No.	Item	Operation	A.P. Reference	Rectification	A.P. Reference
		Note . . . <i>Examine the bonding of all components for serviceability and good connection during the course of this servicing.</i>			
	PRESSURE CABIN				
	(a) Flight instruments	Examine for damage and carry out functioning tests	112G series	Renew items as necessary	101B-0417-1B, Sect.7
	(b) Engine instruments				
	(c) Miscellaneous instruments				
	Refit, or replace with new or serviced parts, all components removed and make necessary adjustments and repairs. Remove all tools, rags and other materials used during servicing. Refit access panels. Sign for completed servicing on Form 700E.				

TABLE 5

Radar installations

(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) 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 all Breeze plugs have been refitted.
- (3) All electrical circuits affected by disconnection of Breeze plugs are to be function tested after the Breeze plugs have been refitted.

Item No.	Item	Operation	A.P. Reference	Rectification	A.P. Reference
		<p>Note . . . <i>Examine the bonding of all components for serviceability and good connection during the course of this servicing.</i></p>			
◀ 1	GREEN SATIN (pre Mod.5466) (A.R.I. 5951)	Examine for damage and carry out a functioning test	2890R, Vol.1	Renew items as necessary	101B-0417-1B, Sect.9, Chap.1
2	I.F.F. (A.R.I. 23134)	Examine for damage and carry out a functioning test	114J-0101-6	Renew items as necessary	101B-0417-1B Sect.9, Chap.2 and Supplement
3	TACAN (A.R.I. 18107/4) (pre Mod.5466) (A.R.I. 18107/18) (post Mod.5466)	Examine for damage and carry out a functioning test	116B-0304-1	Renew items as necessary	101B-0417-1B, Sect.9, Chap.3 and Supplement
4	E.C.M. EQUIPMENT	Examine for damage and carry out a functioning test	116F-0106 series 116F-6105-JACD	Renew items as necessary	101B-0417-1B, Sect.9, Chap.4 and Supplement
5	SPECTRUM ANALYSER AND COMPUTER/CONTROLLER (A.R.I. 23361/0 Mod.5466)	Examine for damage and carry out a functioning test	116F-0233 series	Renew items as necessary	101B-0417-1B Supplement
6	I/J BAND JAMMER SYSTEM – (A.R.I. 23363 Mod.5466)	Examine for damage and carry out a functioning test	116F-0137 series	Renew items as necessary	101B-0417-1B Supplement
7	AERIALS	Examine for damage		Repair or renew as necessary	▶

Refit, or replace with new or serviced parts, all components removed and make necessary adjustments and repairs. Remove all tools, rags and other materials used during servicing. Refit access panels. Sign for completed servicing on Form 700E.

TABLE 6

Radio installations

*(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) 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 all Breeze plugs have been refitted.
- (3) All electrical circuits affected by disconnection of Breeze plugs are to be function tested after the Breeze plugs have been refitted.

Item No.	Item	Operation	A.P. Reference	Rectification	A.P. Reference
		Note . . . <i>Examine the bonding of all components for serviceability and good connection during the course of this servicing.</i>			
◀ 1	INTERCOMMUNICATION (A.R.I. 23099) (pre Mod.5466) (A.R.I. 23099/24) (post Mod.5466)	Examine for damage and carry out a functioning test	116N-0101-1	Renew items as necessary	101B-0417-1B, Sect.8, Chap.1 and Supplement
2	H.F. RADIO (A.R.I. 23090/2)	Examine for damage and carry out a functioning test	116D-0102-1	Renew items as necessary	101B-0417-1B, Sect.8, Chap.2 and Supplement
3	V.H.F. RADIO (A.R.I. 23288)	Examine for damage and carry out a functioning test	116D-0150 series	Renew items as necessary	101B-0417-1B, Sect.8, Chap.3
4	U.H.F. RADIO (A.R.I. 23301)	Examine for damage and carry out a functioning test	116D-0154 series	Renew items as necessary	101B-0417-1B, Sect.8, Chap.4 and Supplement
5	V.O.R./I.L.S. (A.R.I. 23118)	Examine for damage and carry out a functioning test	116D-0407-1	Renew items as necessary	101B-0417-1B, Sect.8, Chap.5
6	RADIO COMPASS (A.R.I. 5877)	Examine for damage and carry out a functioning test	116B-0102-1	Renew items as necessary	101B-0417-1B, Sect.8, Chap.6
7	RADIO ALTIMETER (A.R.I. 23172)	Examine for damage and carry out a functioning test	116B-0203-1	Renew items as necessary	101B-0417-1B, Sect.8, Chap.7
8	COMMUNICATIONS JAMMER (A.R.I. 23362/0 – Mod.5466)	Examine for damage and carry out a functioning test	116F-0135 series	Renew items as necessary	101B-0417-1B Supplement ▶

continued . . .

UK RESTRICTED

TABLE 6 Radio installation — continued

Item No.	Item	Operation	A.P. Reference	Rectification	A.P. Reference
◀ 9	LONG RANGE NAVIGATION SYSTEM (A.R.I. 23314 — Mod.5466)	Examine for damage and carry out a functioning test	116B-0617-1	Renew items as necessary	101B-0417-1B Supplement
10	DAVALL RECORDER (A.R.I. 23208 — Mod.5506)	Examine for damage and carry out a functioning test	116L-0113 series	Renew items as necessary	101B-0417-1B Supplement
11	AERIALS	Examine for damage		Repair or renew as necessary	
12	TOTAL HEAD THERMOMETER (Mod.5466)	Examine for damage and security		Renew as necessary	▶

Refit, or replace with new or serviced parts, all components removed and make necessary adjustments and repairs. Remove all tools, rags and other materials used during servicing. Refit access panels. Sign for completed servicing on Form 700E.

Appendix 2 OVERWEIGHT LANDINGS

(To be issued later)

Appendix 3 EXCESS G

LIST OF CONTENTS

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

LIST OF TABLES

<i>Airframe</i>	<i>Table</i> <i>1</i>
------------------------	--------------------------

General information

1. 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. 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. The limit is 5.1 'g' with the Mk.16 fatigue meter.

UK RESTRICTED

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 outboard wing upper surface aft of main spar, just outboard and inboard of rib 4 (inboard aileron hinge location) for skin buckling and rib distortion.	101B-0400-6, Pt.1, Chap.3	Repair as necessary
	(b) Leading edge	Examine the corners of the air intake slots on the wing leading edge for distortions or cracking.	101B-0400-6, Pt.1, Chap.3	Repair, or renew as necessary
2	SERVICES	Examine all wing root services, i.e., fuel, cabin air, hydraulics, engine controls, generator controls, for looseness of joints and chafing.	101B-0400-6, Pt.1, Chap.7, Sect.4, Chap.1 Sect.6, Chap.1	Repair, or renew as necessary
3	UNDERCARRIAGE	Jack and trestle aircraft and carry out undercarriage retraction checks. Examine for alignment and locking of main leg and 'D' doors, and check that projecting skin tongue on forward outboard end of 'D' door is undamaged and fits correctly into wing skin recess.	Sect.3, Chap.5	Repair, or renew as necessary
		Examine floor girder 18, in pack bay, for any distortion or buckling	101B-0400-6, Pt.1, Chap.2	Repair, or renew as necessary

Appendix 4 FLIGHT TURBULENCE

LIST OF TABLES

<i>Airframe</i>	<i>Table</i>
	<i>1</i>

TABLE 1

Airframe

WARNING . . .

Refer to the 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 inner and outer panels from upper surface, inner main planes	Chap.4, fig.6	
	(b) Inner wing diaphragm	Examine, particularly for cracks, in area adjacent to main-plane forward attachment point at frame 17 and in areas where pipes pass through diaphragm.	101B-0400-6 Part 2, Repair Leaflet C.3/17	Repair as necessary
	(c) Access panels	Refit.		

Appendix 5 BUFFETING/VIBRATION DURING FLIGHT

LIST OF CONTENTS

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

LIST OF TABLES

<i>Examination of possible sources of buffeting/ vibration</i>	<i>Table</i> <i>1</i>
--	--------------------------

General information

1. The information contained in this appendix is intended as a guide to assist in the determination of sources of buffeting/vibration experienced during flight.
2. Table 1 lists possible sources of buffeting/vibration and the examinations required, but the possibilities of other sources should not be ruled out. Sources from engine running characteristics or malfunctions are not listed.

Note . . .

- (1) *Although a diagnosis from an aircrew's report can identify the cause of buffeting/vibration, the source is more likely to be identified*

from a thorough physical inspection of the airframe and engine installation.

(2) *Generally it is not expected that airframe faults will generate any vibrations with frequencies above about 25 cycles per second. If the reported vibration approaches this frequency, it is probable that a flying control circuit problem exists and particular attention should be paid to the elevator geared tab backlash.*

(3) *If the frequency of vibrations is in excess of 25 cycles per second, the most likely cause is an engine/airframe fault, regardless of any apparent effects of applied 'G' forces.*

TABLE 1 — EXAMINATION OF POSSIBLE SOURCES OF BUFFETING/VIBRATION

WARNING . . .

Refer to the general safety precautions in para.3 of the main chapter

ITEM NO.	POSSIBLE SOURCE	OPERATION
1	Jet pipe mounting	Check movement
2	Transport joints	Ensure tight
3	Tail plane leading edge/elevator horn	Examine and particularly for lack of continuity and check for correct gap
4	Fin and tail plane root area	Examine and particularly for poor continuity of joints, oil canning or poor finish
5	Fin stub	Examine and particularly for depressions or repair strips which might affect rudder spring tab
6	Elevator tab shrouds	Ensure not bent to obtain correct gap (gap obtained by trimming)
7	Tail plane/attachment points	Examine and particularly for excessive rock due to play at attachment points at fuselage
8	Tail plane stubs and root area	Check gaps
9	Control circuit	Check backlash, particularly elevator geared tab circuit
10	Air brakes	Examine and particularly to ensure that they lay flush with main plane and are not causing local distortion of the skin
11	Flaps	Examine and particularly for trailing edge distortion due to flap jack load or, excessive looseness
12	All controls and tabs	Ensure they conform to weight and balance requirements of drawings
13	Mass balance weights	Ensure tight
14	Undercarriage doors	Ensure rigged correctly in undercarriage UP position. Ensure seals are intact and fitting correctly
15	Static vents	Examine particularly for correct contour
16	Entrance door	Check fit with and without cabin pressure
17	Bomb or flare bay doors	Ensure seals intact and fitting correctly
18	Canopy fairing	Examine particularly for correct contour and ensure fitting tightly
19	Inner main plane	Examine particularly for poor finish which might disturb air flows and eventually affect tail plane
20	Engine/airframe	Ensure no foul exists

Appendix 6 LIGHTNING STRIKES

LIST OF CONTENTS

	<i>Para.</i>
<i>General information</i>	<i>1</i>
<i>Examination procedure</i>	<i>4</i>
<i>Lightning strike responsibilities</i>	<i>5</i>

LIST OF TABLES

	<i>Table</i>
<i>Preliminary examination</i>	<i>1</i>
<i>Comprehensive examination</i>	<i>2</i>

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 in. dia., 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 in. dia. Evidence of static discharge usually appears more prevalent on trailing edges, in the lower aft fuselage area, radio aeriels 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.

Lightning strike responsibilities

5. On termination of a flight in which the Captain knows or suspects that the aircraft has been struck by lightning, reference is to be made to AP 100B-01, Order 4950 "Demagnetization of Aircraft Struck by Lightning". This order details the individual responsibilities of Aircrew, Station Engineering Personnel and Command Headquarters.

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 the Type 12A or 4AX 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.

UK RESTRICTED

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	109-0107-1	
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 or pods	Examine	101B-0400-6, Pt.2, Leaflet C5/1	Repair as necessary

continued . . .

TABLE 2 Comprehensive examination (Normal procedure) — continued

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
9	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
10	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
11	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
12	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
13	(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.	104 series 1803E, Vol.1	Renew as necessary
14	Aircraft generally	If any aerials (or other protuberances) have broken away during incident, examine for incidental damage.		Renew aerials and repair damage as necessary

continued . . .

TABLE 2 Comprehensive examination (Normal procedure) – *continued*

ITEM NO.	ITEM	OPERATION	A.P. REFERENCE	RECTIFICATION
15	ELECTRICAL (a) External lighting (b) Cockpit lighting	Operate, and check for correct functioning	Sect.5, Chap.1, Group L	Renew as necessary
16	ENGINES Fire extinguisher indicator	Check by feel, mechanical indicator pin at base of extinguisher for protrusion. If pin protrudes renew extinguisher. On Type 4AX extinguishers examine the tell-tale windows in the discharge adapter for colour change.	Sect.4, Chap.5	Renew as necessary
17	Deleted.			
18	Aerials	Examine	Sect.6, Chap.2	Renew as necessary
19	All connectors (aerials to trans/rec.)	(1) Disconnect. (2) Examine, particularly end connections (3) Check for continuity and leakage from conductor to outer screen.	Sect.6, Chap.2	Renew as necessary
20	Aerial switch units	(1) Examine, particularly connections and contacts. (2) Check for continuity and leakage from conductor to outer screen in both energized and de-energized conditions.	Sect.6, Chap.2	Renew as necessary
21	All connectors	Reconnect.		
22	Installation	Operate, and check for correct functioning	Sect.6, Chap.2	
23	RADIO Aerials	Examine.	Sect.6, Chap.1	Renew as necessary
24	All connectors (aerials to trans/rec.)	(1) Disconnect. (2) Examine, particularly end connections. (3) Check for continuity and leakage from conductor to outer screen.	Sect.6, Chap.1	Renew as necessary
25	Aerial switch unit	(1) Examine, particularly connections and contacts. (2) Check for continuity and leakage from conductor to outer screen in both energized and de-energized conditions.	Sect.6, Chap.1	Renew as necessary
26	All connectors	Reconnect.		
27	Installation	Operate, and using test equipment, check for correct functioning.	Sect.6, Chap.1	

Appendix 7 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.

Appendix 8 OVER-RUNNING OF PAVED SURFACES

(To be issued later)

Appendix 9 ABNORMAL GROUND HANDLING INCIDENTS

(To be issued later)

This file was downloaded
from the RTFM Library.

Link: www.scottbouch.com/rtfm

Please see site for usage terms,
and more aircraft documents.

