

VENOM FB Mc.4 AIRCRAFT

ADVANCE INFORMATION
LEAFLETS

This marker card is to be inserted immediately in front of the Amendment Record Sheet at the beginning of the book. Advance Information Leaflets are to be inserted, as received, in numerical order following this card.

The information contained in Advance Information Leaflets will be incorporated by normal amendment list action in due course. In the meantime, appropriate action is to be taken in accordance with any instruction contained therein.

If, after the receipt of a leaflet, an Amendment List with a prior date and conflicting information is received, the information in the leaflet is to take precedence.

(Nov. 55)

AMENDMENT RECORD SHEET

Incorporation of an Amendment List in this publication is to be recorded by signing in the appropriate column and inserting the date of making the amendments.

A.L. No.	Amended by	Date
1		25.10.54
2		" "
3		" "
4		25.10.54
5	G. E. Read	12.11.54
6	G. E. Read	12.11.54
7	G. E. Read	12.11.54
8	G. E. Read	22.11.54
9	G. E. Read	6.12.54
10	G. E. Read	22.11.54
11	G. E. Read	6.12.54
12	G. E. Read	2.2.55
13	G. E. Read	2.2.55
14		14.2.55
15		18.2.55
16		18.2.55
17		18.2.55
18		18.2.55
19	G. E. Read	11.3.55
20	G. E. Read	11.3.55
21	G. E. Read	8.11.55
22	G. E. Read	3.8.55
23	G. E. Read	8.11.55
24	G. E. Read	8.11.55

A.L. No.	Amended by	Date
25	G. E. Read	23.11.56
26	G. E. Read	15.2.57
27	G. E. Read	7.2.57
28	G. E. Read	18.9.57
29	G. E. Read	25.6.57
30	G. E. Read	15.5.57
31	G. E. Read	8.5.57
32	G. E. Read	15.5.57
33	G. E. Read	16.10.57
34	G. E. Read	14.11.57
35	G. E. Read	16.12.57
36	G. E. Read	31.12.57
37	G. E. Read	3.2.58
38	G. E. Read	18.3.58
39	G. E. Read	18.3.58
40	G. E. Read	18.3.58
41	G. E. Read	21.8.58
42	G. E. Read	25.9.58
43	G. E. Read	14.5.59
44	G. E. Read	14.5.59
45	G. E. Read	8.11.59
46	A. Jenkins	14.3.60
47	A. Jenkins	14.10.60
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(Continued overleaf)

(July, 54)

LETHAL WARNING

EJECTION SEATS AND CANOPY JETTISON MECHANISMS

1. Ejection seats and canopy jettison mechanisms are sources of potential danger to personnel and of damage to the aircraft. Serious injury (possibly fatal) may result if any firing mechanisms are inadvertently operated whilst the aircraft is on the ground.

2. The following instructions are to be obeyed :—

R.N. Safety precautions contained in A.P.(N.)140—Naval Aircraft Maintenance Manual.

R.A.F. ALL PERSONNEL before entering the cockpit or cabin of an aircraft fitted with an ejection seat are to report to the N.C.O. immediately in charge of airframe servicing who is to ensure that all safety pins (or other safety devices) are correctly positioned to render the seat and canopy jettison firing mechanisms safe. On completion of servicing, tradesmen are to report to the N.C.O.

3. Full instructions for rendering the firing mechanisms safe are contained in the A.P.4288 and A.P.(N.)1023 series, in Aircraft Servicing Schedules and in the A.D.5037 series.

AILERONS

4. Personnel must take special care to keep their hands away from the vicinity of the ailerons when these are being power-operated.

PAINT REMOVERS

5. Paint removers which contain either ethylene dichloride or methylene dichloride must not be used for paint stripping or cleaning any part of the aircraft as they have an adverse effect on reduced joints.

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NOTE TO READERS

The subject matter of this publication may be affected by Air Ministry Orders, or by "General Orders and Modifications" leaflets in this A.P., in the associated publications listed below, or even in some others. If possible, Amendment Lists are issued to correct this publication accordingly, but it is not always practicable to do so. When an Order or leaflet contradicts any portion of this publication, the Order, or leaflet is to be taken as the overriding authority.

The inclusion of references to items of equipment does not constitute authority for demanding the items.

Each leaf bears the date of issue and, when applicable, the number of the Amendment List with which it was issued. New or amended technical information on new leaves which are inserted when this publication is amended will be indicated by solid triangles, positioned in the text. The triangles are placed thus ◀.....▶ to show the extent of amended text, and thus ▶◀ to show where text has been deleted. The triangles merely denote a change and are not marks of emphasis. When a Section or Chapter is issued in a completely revised form, the triangles will not appear.



LIST OF ASSOCIATED AIR PUBLICATIONS

	A.P.
◀ Aircraft hydraulic equipment, Lockheed	1803B
Aircraft hydraulic and undercarriage equipment, miscellaneous	1803P
Aircraft undercarriage equipment, Lockheed	1803C ▶
Aircraft operation and servicing under low-temperature conditions	1441A
Concise details of radio equipment (airborne)	2276A
Ejection equipment, aircraft	4288A
Ejection seats, R.A.F. aircraft, Mk. 2 series	4288B
Electrical manual	4343 series
External and internal finish of aircraft	2656A
Ghost Mk. 10300 Series, Engine Change Units	4320A
Instrument manual	1275 series
Pneumatic equipment, aircraft, Hymatic	4303C
◀ Powered flying control units and equipment, Lockheed	4602A ▶

LIST OF ASSOCIATED AIR DIAGRAMS

	A.D.
Electrical installation	6052
Flying controls and lubrication	6422
Fuel system	6420
Ghost Mk. 10301, Mk. 10302 and Mk. 10304 engine change unit (installation)	5282
Hydraulic system (2 sheets)	6421
Lubrication	5124
Pneumatic system	6423

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LAYOUT OF A.P.4335D

VENOM FB Mk. 4 AIRCRAFT

Volumes and Parts printed below in heavy type are being issued as separate books and, when issued, will be listed in A.P.113

VOLUME 1	...	...	...	...	...	...	...	...	...	...	General and technical information
VOLUME 2	...	...	...	...	...	...	...	...	...	...	General Orders and Modifications
VOLUME 3, Part 1	...	...	...	...	...	...	...	...	...	...	Schedule of spare parts
Part 2	...	...	...	...	...	...	...	...	...	...	Appendix "A"
Part 3	...	...	...	...	...	...	...	...	...	...	Scales of unit equipment
Part 4	...	...	...	...	...	...	...	...	...	...	Scales of servicing spares
VOLUME 4	...	...	...	...	...	...	...	...	...	...	Inapplicable
VOLUME 5	...	...	...	...	...	...	...	...	...	...	Basic servicing schedules
VOLUME 6	Repair and reconditioning instructions

Ground Handling
Notes
A.P.4335D—G.H.N.

Pilot's Notes
A.P.4335D—P.N.

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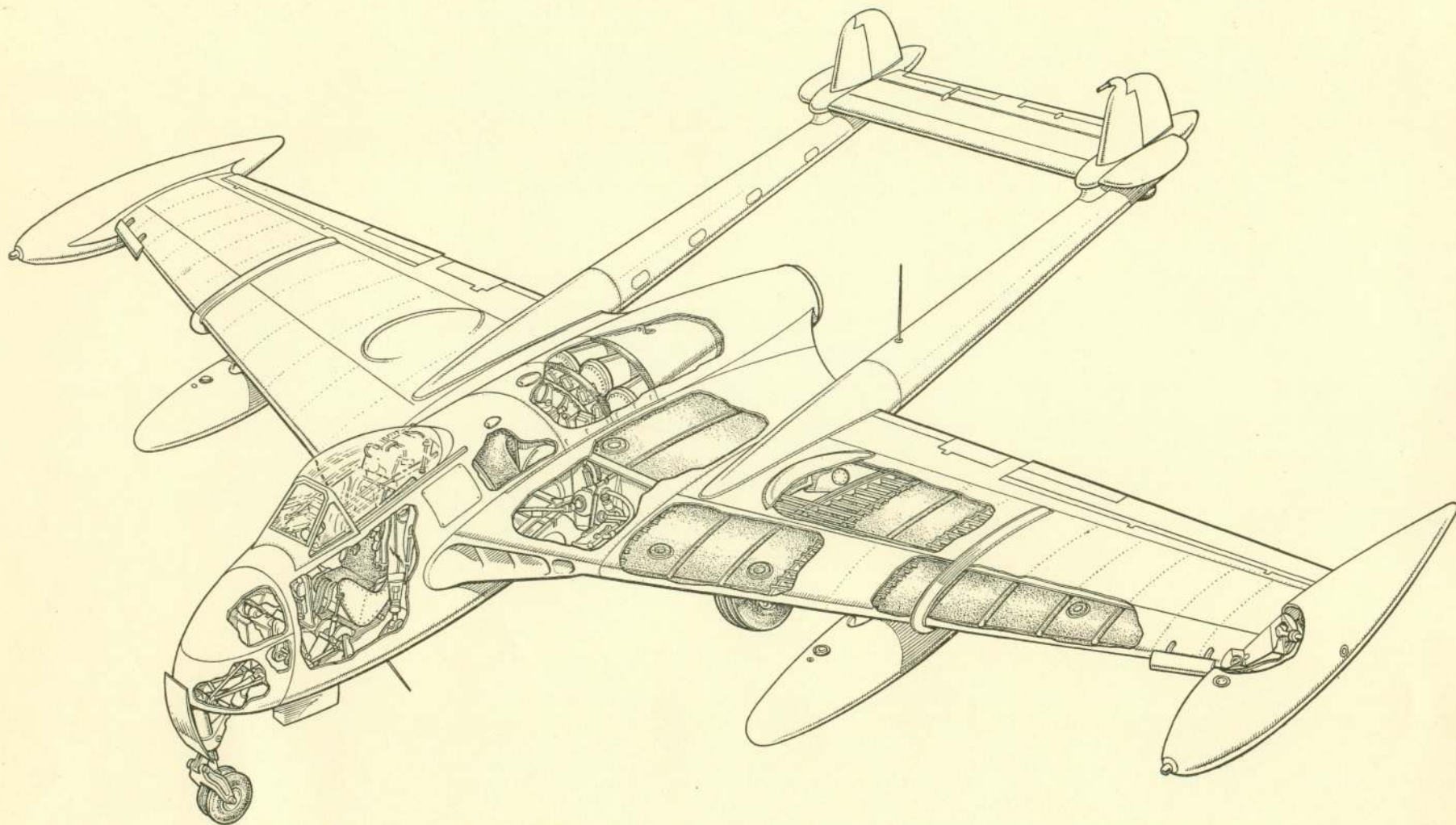
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LUBRICATION DETAILS

In order to avoid repeating Stores References and N.A.T.O. Code Numbers throughout the book, details of the lubricants used in routine servicing are given below.

<i>Nomenclature</i>	<i>Stores Ref.</i>	<i>N.A.T.O. Code No.</i>
Grease, XG-273	34B/9423151	—
Grease, XG-275	34B/9100512 (4 oz.)	G-350
Oil, OM-150	34B/9100550	O-140



Venom FB Mk. 4

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(July, 54)

INTRODUCTION

1. The VENOM FB Mk. 4, which is a development of the Venom FB Mk. 1, is a single-seater, interceptor-fighter with the alternative role of a ground-attack, fighter-bomber. It is a mid-wing monoplane powered with a single Ghost engine mounted at the rear of the fuselage. The cabin is pressurised from the impeller casing of the engine and the air conditioning is regulated by a differential pressure control valve and a cold-air unit.

2. Four 20 mm. guns comprise the armament of the interceptor version. Additionally, either two 1,000 lb. bombs, or two 500 lb. bombs and eight 60 lb. R.P.'s, may be carried for fighter-bomber duties.

3. The fuselage, or nacelle, oval in cross-section, is of balsa-plywood sandwich construction. A Mk. 2F (fully automatic) ejection seat is fitted, which is enclosed in the cabin by a transparent plastic canopy.

4. The port and starboard main planes, which are metal cantilever structures secured

to the fuselage at three points, are swept back at the leading edge. Each plane consists of a main spar and a false rear spar, joined by ribs, this structure being covered by a light-alloy skin stiffened by lateral stringers.

5. Extending aft from the main plane are twin tail booms, the forward portions of which are integral with the main planes. Each boom carries a single fin and rudder assembly, and mounted between the aft ends of the booms is a light-alloy tail plane and elevator assembly.

6. The hydraulically-operated alighting gear comprises two main wheels, retracting outboard into the wings and a nose wheel retracting rearwards into the nose of the fuselage. Pneumatic brakes are fitted to the main wheels only.

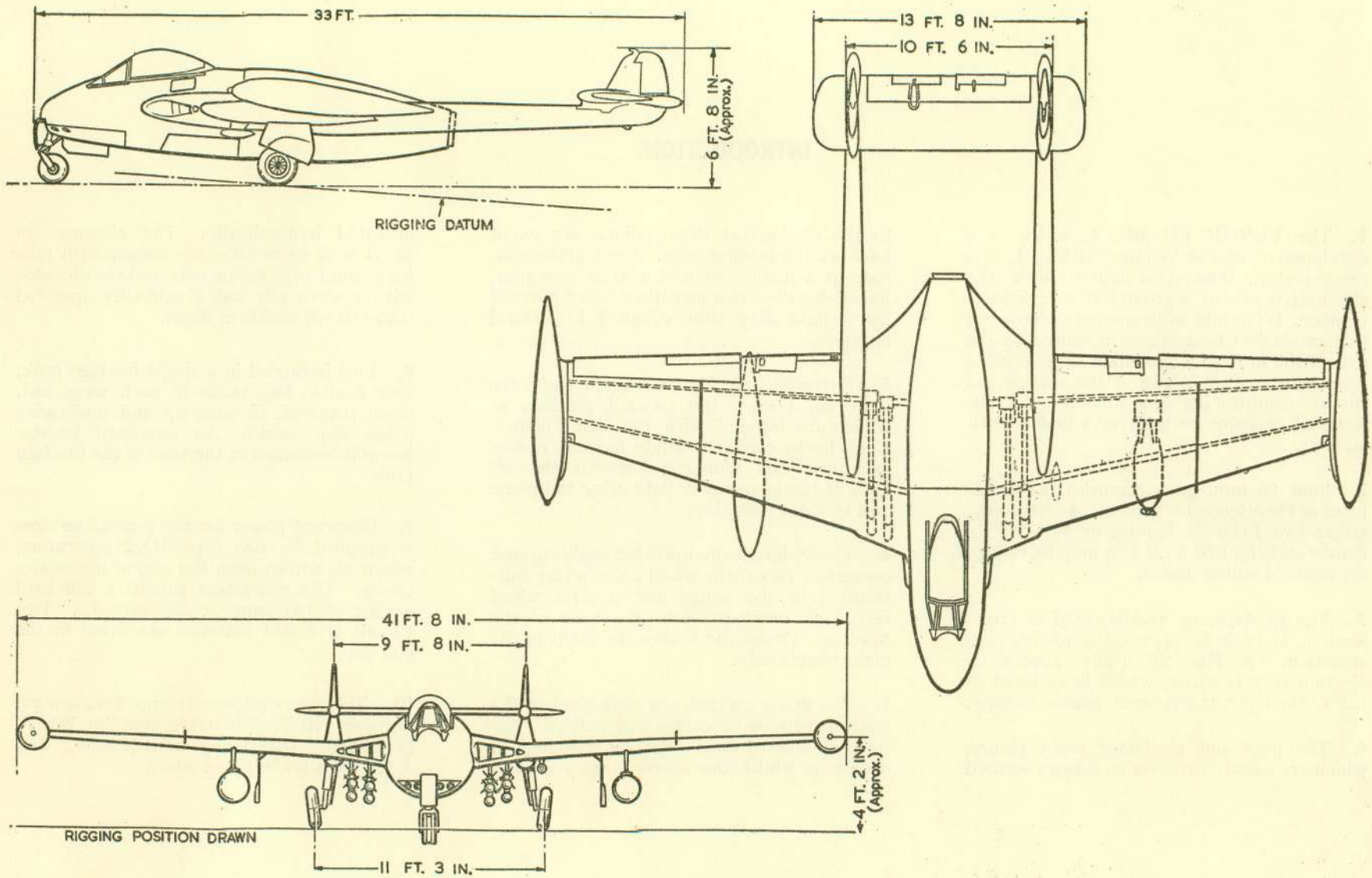
7. The flying controls are connected to the control surfaces by cables and pulleys. The rudders and elevators are conventional in operation whilst the ailerons are normally

operated hydraulically. The ailerons are fitted with servo tabs, the rudder with tabs for ground adjustment only and the elevator with a servo tab and a manually operated trim tab adjustable in flight.

8. Fuel is carried in a single fuselage tank, four flexible bag tanks in each wing and, when required, in wing-tip and underwing pylon drop tanks. An immersed booster pump is contained in the base of the fuselage tank.

9. Electrical power for the general services is supplied by two type HX2 generators, which are driven from the engine accessories casing. The generators supply a full load output of 100 amp. at 28 volts d.c. Two 12-volt lead-acid batteries are fitted in the gun bay.

10. The radio equipment comprises a general purpose V.H.F. (TR.1934), standby V.H.F. (TR.2002), telebriefing, A.R.I.5489, and A.R.I.5848 (to be fitted later).



RIGGING DATUM

RIGGING POSITION DRAWN

General Arrangement Diagram

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LEADING PARTICULARS

NAME VENOM FB Mk. 4
TYPE SINGLE-SEATER, SINGLE-ENGINE,
 JET-PROPELLED, MID-WING MONOPLANE
DUTY INTERCEPTOR OR GROUND-ATTACK
 FIGHTER-BOMBER
MAXIMUM ALL-UP WEIGHT ... Refer to Sect. 2, Chap. 3
Note . . . For principal dimensions refer to the General Arrangement
 illustration on opposite page.

MAIN PLANE DATA

Aerofoil section Symmetrical section, 10 per cent T.C. ratio
 Maximum thickness 0.4C
Incidence Zero to fuselage datum
Dihedral 3 deg. at chord datum
Sweep back (at leading edge) 17 deg. 6 min

TAIL PLANE DATA

Chord 34 in.
Incidence Zero to fuselage datum

AREAS

Main plane with ailerons, each 116.62 sq. ft.
Total wing area 279 sq. ft.
Aileron with tab, each 7.82 sq. ft.
Aileron tab, each 0.77 sq. ft.
Flaps, total 20 sq. ft.
Dive brakes, each 3 sq. ft.
Tail plane, including extensions 39.7 sq. ft.
Elevator with tabs 10.5 sq. ft.
Elevator tab (each) 0.66 sq. ft.
Fin, each 4.55 sq. ft.
Rudder, with tab, each 2.82 sq. ft.
Rudder tab, each 0.077 sq. ft.

ALIGHTING GEAR

Main Undercarriage

Type Two, interchangeable single-wheel units, sideways retraction
Shock-absorber struts Lockheed oleo-pneumatic, AIR. 65880 and 65881
Fluid ... OF-4 (Ref. No. 34B/9100565, N.A.T.O. Code No. H-534)
Note . . . This fluid differs from that used in the hydraulic system.
Air pressure Refer to Sect. 2, Chap. 2
Wheels Dunlop AH.9422
Tyres Dunlop DR.09 20, 27 × 6-15
Tubes Dunlop DT.0902
Pressure Refer to Vol. 5
Brakes Dunlop AH.9074/1

NOSE UNDERCARRIAGE

Type Fully castering, self-centring, rearward retraction
Shock-absorber strut Lockheed AIR.65138
Fluid ... OF-4 (Ref. No. 34B/9100565, N.A.T.O. Code No. H-534)
Air pressure Refer to Sect. 2, Chap. 2
Wheel Dunlop AHO.17219
Tyre Dunlop NF.R-31, 6.50 × 5½
Tube Dunlop N.F.2
Pressure Refer to Vol. 5

ENGINE

Name Ghost Mk. 103
Type Single stage centrifugal compressor, straight-flow
 combustion, single-stage axial-flow turbine
Thrust 4850 lb.
Starter Twin breech, cordite turbine
Type Rotax C.T.0101/2 (Ref. No. 37F/10008)
Cartridges No. 8, Mk. 1 (Ref. No. 12K/1198)
Accessories Refer to A.P.4320A & C, Vol. 1
Fuel Aviation turbine gasoline, AVTAG (Ref. No. 34A/9100448,
 N.A.T.O. Code No. F-40) or
 Aviation turbine fuel, AVTUR (Ref. No. 34A/9100449,
 N.A.T.O. Code No. F-30)
Oil OEP-71 (Ref. No. 34A/9100540, N.A.T.O. Code No. O-136)
 OX-38 (Ref. No. 34A/9100591, N.A.T.O. Code No. O-149).
 Refer to A.P.4320A & C, Vol. 1

FUEL AND OIL CAPACITIES

Fuel tanks

	pre-Mod.	post-Mod.
	983	983
Fuselage	92 gall.	92 gall.
Wing tank No. 1 (two off)	110 gall.	108 gall.
Wing tank No. 2 (two off)	55 gall.	54 gall.
Wing tank No. 3 (two off)	47 gall.	46 gall.
Wing tank No. 4 (two off)	29 gall.	28 gall.
Wing-tip drop (two off)	156 gall.	156 gall.
Pylon drop (two off)	160 gall.	160 gall.
Total	649 gall.	644 gall.

Note . . . Of this total, 10 gall. are unusable at up to 10 deg. angle of incidence.

Oil (in engine sump only) ... Refer to A.P.4302A & C, Vol. 1

HYDRAULIC AND PNEUMATIC SYSTEMS

Hydraulic System

Services operated:—	Alighting gear, flaps, dive brakes, ailerons					
Pump	...	...	...	...	...	Lockheed Mk. 6 (Ref. No. 37J/263) or Mk. 7 (Ref. No. 37J/264)
Fluid	...	...	...	...	...	OM-15 (Ref. No. 34B/9100572, N.A.T.O. Code No. H-515)
Note . . .	This fluid differs from that used in the shock-absorber struts.					
Reservoir capacity	...	...	...	...	...	1½ gall.
Accumulator pressures:—						
Initial air pressure	...	...	...	...	...	1250 p.s.i.
Operating pressure (cut-out valve)	...	...	...	...	2500	+ 0 p.s.i. — 100
Thermal relief valve	...	...	...	...	...	3000 p.s.i.

PNEUMATIC SYSTEM

Services operated	...	Alighting gear brakes, anti 'G' system				
Compressor	...	Hymatic, SH.6/2A, Ref. No. 37G/505				
Pressure regulating valve	...	AR.5/450-2 (Ref. No. 27VB/3247)				
Relief valve	...	R.V.10 (Ref. No. 27VB/3179)				
Oil and water trap	...	OWT.46/8 (Ref. No. 27VB/2960)				
Pressures:—						
In air reservoir	...	...	...	...	...	450 p.s.i.
After reducing valve (brakes)	...	...	...	...	...	200 p.s.i.
At brakes (max.)	...	...	...	...	...	150 p.s.i.
Anti 'G' valve, max. 'in' pressure	...	...	...	...	...	20 p.s.i.
max. 'out' pressure	...	...	...	...	...	7½ p.s.i.

OXYGEN AND DE-ICING SYSTEMS

Oxygen System

Cylinders (2 off)	...	...	...	...	...	Mk. 5D (Ref. No. 6D/1383)
Regulator (1 off)	...	...	...	...	...	Mk. 16A (Ref. No. 6D/1587)

DE-ICING SYSTEM (windscreen only)

Fluid, aclohol	...	...	...	...	...	AL-8 (Ref. No. 34B/9100475, N.A.T.O. Code No. S-738)
Reservoir capacity	...	...	...	...	...	3 pints
Pump (hand-operated)	...	...	...	...	...	Rotax M.2601

PRESSURE CABIN

Control valve	...	...	...	...	...	Normalair No. 501820 (Ref. No. 27H/2896)
Cold air unit	...	...	...	...	...	Acre 8, Mk. 1A (Ref. No. 27U/272)
Differential pressure (max.)	...	...	...	...	...	3 p.s.i.

SEAT

Ejection type	...	...	...	...	...	Martin Baker Mk. 2F
Cartridge, seat ejection	...	...	...	...	...	Ref. No. 12K/1150
Cartridge, drogue gun ejection	...	...	...	...	...	Ref. No. 12K/1171

ELECTRICAL INSTALLATION

D.C. Generators (two)	...	...	...	...	...	Type HX2 (Ref. No. 5U/4184)
Voltage	...	...	...	...	...	24
Voltage regulator cut-out (two)	...	...	...	...	...	Type A2 (Ref. No. 5U/3830)
Batteries (two)	...	...	...	...	...	Lead acid, type C, 12v., 25 amp./hr. (Ref. No. 5J/3254)

RADIO INSTALLATION

General purposes (V.H.F.)	...	...	...	...	...	TR.1934 (Ref. No. 10D/17693)
Standby (V.H.F.)	...	...	...	...	...	TR.2602
Telebriefing	...	...	...	...	...	A.R.I.18012
Rebecca Mk. 7	...	...	...	...	...	A.R.I.5489

ARMAMENT INSTALLATION

Guns	...	...	...	...	...	Hispano 20 mm., Mk. 5, No. 2 (Ref. No. 7G/786)
Belt-feed mechanism (Mk. 5)	...	...	...	...	...	Left-hand (Ref. No. 7G/924) Right-hand (Ref. No. 7G/925)
Firing unit	...	...	...	...	...	Maxiflux 24v. (Ref. No. 5D/1489)
Ammunition (600 rounds)	...	...	...	...	...	20 mm. Hispano (Ref. No. 12C/-)
Rocket projectiles	...	...	...	...	...	Mk. 8
Bombs (short tails)	...	...	...	...	...	Two 1000 lb. or two 500 lb.
Gun sight	...	...	...	...	...	Mk. 4E, long spigot (Ref. No. 8B/2908)
Cine camera	...	...	...	...	...	G.45B, Mk. 3 (Ref. No. 14A/1380)

PRESSURE HEAD SETTINGS

Position of head	Port fin leading edge
Note . . .	Refer to Sect. 5, Chap. 2 details for of setting the pressure head.					

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