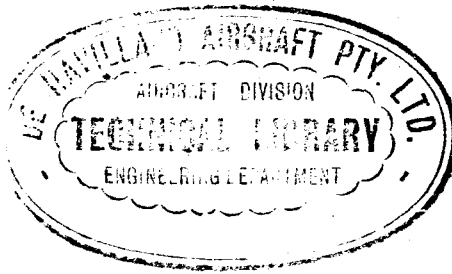


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VAMPIRE MK. 30 & 31

DESCRIPTIVE AND SERVICING MANUAL

NENE 2—V.H. AUST.

ISSUED FOR THE INFORMATION
AND GUIDANCE OF ALL CONCERNED
BY COMMAND OF THE AIR BOARD

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SECRETARY.

AIR FORCE HEADQUARTERS, MELBOURNE, S.C.1.

PREPARED BY DE HAVILLAND AIRCRAFT PTY. LTD., SYDNEY, AUSTRALIA

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LIST OF ASSOCIATED PUBLICATIONS

	SECTION	CHAPTER
A.P.1095A, Vol. 1:		
Fire Extinguisher Circuits	6	8
Flame Switches	7	9
Insulation Testing of Electrical Installations	3	4
Two-Pole Wiring Systems	3	14
A.P.1275A, Vol. 1:		
Gauges, Brake Pressure	3	10
Gauges, Fuel Contents, Electrical	3	12
Gauges, Oil Pressure	3	5
Gyro, Horizon HL.5 Sperry Mk. 3	2	9
Indicator, Direction	2	1
Indicator, Engine Speed Electrical	1	5
Indicator, Rate of Climb	1	8
Thermometers, Jet Pipe	4	8
Thermometers, Oil Temperature	4	1
Valve, Normalair Cabin Pressure Control, Mk. 11	10	3
A.P.1275B, Vol. 1:		
Altimeters	2	4
Compass, Magnetic, Type E2A	3	13
Machmeters	1	2
A.P.1275E, Vol. 1:		
Gyro Gunsights, Mk. 4E	5	3
A.P.1275G, Vol. 1:		
Oxygen Equipment	2	—
A.P.1275T, Vol. 1:		
Calibrators, Airspeed Indicators	3	5 & 6
Calibrators, Altimeter	3	2
Calibrator, Pressure Gauge	3	8
Test Apparatus, for Pressure and Vacuum Instruments	3	2
Tester, Desynn Transmitter and Indicator	4	6
Tester, Oxygen Economiser	6	1
Test Set, for Engine Speed Indicators	1	3
Test Set, for Exhaust Gas Pyrometer	4	5
A.P.1664A, Vol. 1:		
Bomb Carrier Units	1	8
A.P.1803B, Vol. 1:		
Lockheed Mk. 6 Pump, Engine Driven	2	2

	SECTION	CHAPTER
All Jacks	11	18
Cut-Out Valves	10	2
Hydraulic Accumulator	5	1
Non-Return Valves	10	18
Release Valves	7	7
Selector Valves	7	4
Thermal Relief Valves	10	14
A.P.1803C, Vol. 1:		
Lockheed Oleo Struts		
Main Wheel Unit	2	10 Apdx. 1
Nose Wheel Unit	6	1
A.P.1803P, Vol. 1:		
Hand Pump, Type U.M.C.501	3	1
A.P.2240A, Vol. 2, Part 2:		
A.P.2240A, Vol. 6, Part 2:		
Rotol Auxiliary Gearbox and Drive		
A.P.2337, Vol. 1:		
Aircraft Tyres	2	—
Dunlop Pneumatic Brake System	3	1
Dunlop Wheels and Bearings	1	1
		Apdx. 1 & 50
A.P.4288B, Vol. 1:		
Ejection Seat, Martin Baker Type 2F(A)	4	—
A.P.4303, Vol. 1:		
Hymatic Compressor SH6/5A/1-SH6/5B	8	1
Hymatic Oil and Water Trap	2	1
Hymatic Regulating Valve	4	1
A.P.4343, Vol. 1:		
Electrical Equipment Manual		
A.P.4343A, Vol. 1:		
General Notes—Lead Acid Accumulators	11	1
Generator KX	3	3
A.P.4343B, Vol. 1:		
Cut-out, Type "D"	10	2
Voltage Regulators	1	1
" " "	3	2
A.P.4343C, Vol. 1:		
Dimmer Switches	1	16
Fuses and Fuse Boxes	5	7

	SECTION	CHAPTER
Magnetic Relays	3	3, 4 & 5
Master Change-over Switches	1	5
Micro Switches	1	4
Plessey Wiring System	5	1
Suppressors	5	10
A.P.4343D, Vol. 1:		
Fuel Pump BP3 Mk. 3	7	16
Inverted Flight Fuel Valve, Type BP23 Mk. 1	7	16
Rotax Starter Motor	1	—
A.P.4343E, Vol. 1:		
Cockpit Lighting Equipment	7	19 & 21
Lamps, Downward Identification	7	7
Lamps, Landing	7	3
A.P.4343X, Vol. 1:		
Auto-Selector Switches, 4 Way	3	22
Bomb Release Circuits	1	1
Bomb Carrier Wiring and Accessories	1	2
Bomb Distributor, 2-Way	3	1
Fusing Units	5	—
Gun Firing Switch	13	3
Gun Firing Units	13	1
Rocket Projectiles	16	—
Straight Stick Control Handles	7	1
A.P.2538H, Vol. 1:		
Instructions for Operating—TR.1936		
AN10-10CB-8:		
Service and Overhaul Instruction for AN-N6 G.S.A.P. Cine Camera		
A.A.P.781.20:02, Vol. 1:		
Installation, Operation and Maintenance Handbook for Radio Compass, A.D.F.-14		
A.A.P.829:		
Loading and C.G. Data		
A.A.P.839:		
Pilot's Notes—Vampire Mk. 30—31		
A.A.P.861:		
Nene—Engine Overhaul Manual		
Aeroplane Maintenance Schedule, Mk. 30-31 Vampire— Nene Part 1 and 2		

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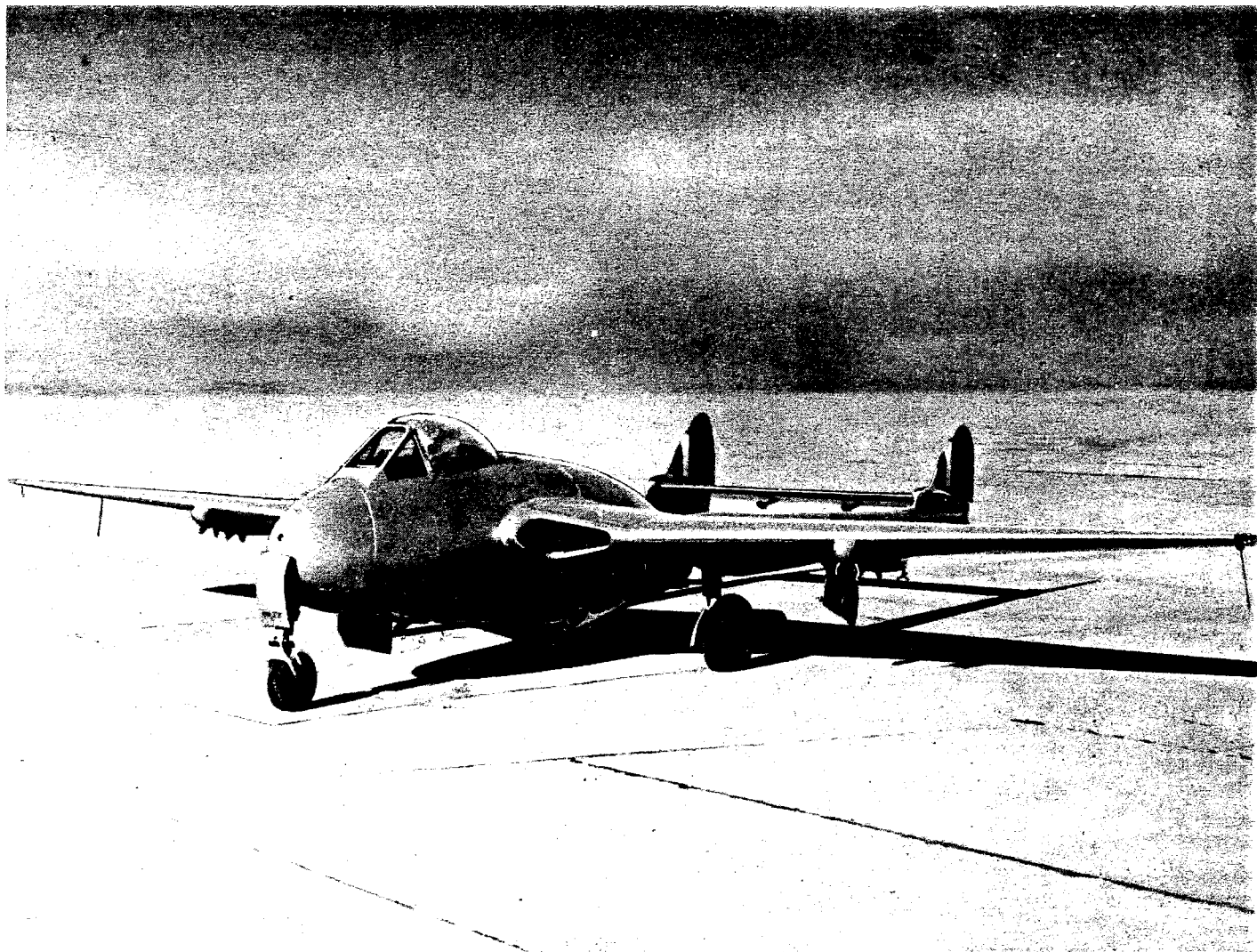
From time to time Air Board and R.A.A.F. Technical Orders and Instructions are issued and may affect the subject matter of this publication.

The Order or Instruction is the overriding authority where it contradicts this publication and these changes will be advised by amendment list to bring publication into line.

List of Sections

(A detailed Contents List is given at the beginning of each Section or Chapter)

	Page
INTRODUCTION	—
ALPHABETICAL INDEX TO PARAGRAPHS AND ILLUSTRATIONS	1
LEADING PARTICULARS	9
SECTION 1.—PILOT'S CONTROLS AND EQUIPMENT	13
SECTION 2.—EMERGENCY CONTROLS, EQUIPMENT AND EXITS	19
SECTION 3.—CONTROLS AND EQUIPMENT AT CREW STATIONS	21
(Not applicable to this Aircraft)	
SECTION 4.—INSTRUCTIONS FOR GROUND PERSONNEL	
Chapter 1.—Loading and C.G. Data	23
(See A.A. Publication No. 829)	
Chapter 2.—Ground Handling and Preparation for Flight	25
Chapter 3.—General Servicing	31
SECTION 5.—REMOVAL, ASSEMBLY, AND DISMANTLING OPERATIONS	45
SECTION 6.—ELECTRICAL AND RADIO WIRING AND SERVICING	
Chapter 1.—Electrical Servicing	59
Chapter 2.—Radio Servicing	69
SECTION 7.—DESCRIPTION OF STRUCTURE	
Chapter 1.—Fuselage	71
Chapter 2.—Mainplane	73
Chapter 3.—Tail Unit	75
Chapter 4.—Flying Controls	77
Chapter 5.—Landing Gear	81
SECTION 8.—ENGINE INSTALLATION	85
SECTION 9.—HYDRAULIC AND PNEUMATIC SYSTEMS	89
SECTION 10.—(See Section 6)	93
SECTION 11.—EQUIPMENT INSTALLATIONS	95
SECTION 12.—ARMAMENT INSTALLATIONS AND SERVICING	97



VAMPIRE MK. 31

INTRODUCTION

1. The VAMPIRE Mk. 30 and Mk. 31 are both mid-wing, single-engined, jet propelled single-seater fighters with twin tail booms and a tricycle landing gear. Each is powered by a Nene 2 V.H. AUST. turbo-jet engine, mounted at the rear of the fuselage. Both carry four 20 mm. guns. The Mk. 31 has provision for carrying eight Rocket Projectiles and two 1,000 lb. bombs.

2. Good all-round vision is provided by a perspex bubble-type sliding canopy which is jettisonable. A Martin Baker Mk. 2F(A) Ejector Seat is provided, and the pilot is protected by armour plate on bulkhead No. 2, a complete armour plate bulkhead forward of the instrument panel and a front windscreen of bullet-proof glass. The canopy and front windscreen are made with a dry-air sandwich to reduce frosting.

3. The flying controls are conventional in operation, the rudder pedals being of the pendulum type and adjustable fore and aft in flight. The controls are operated by means of cables and pulleys.

4. The ailerons and elevator are provided with servo tabs and, in the case of the elevator, the tab is also used for trimming, the trimming wheel being mounted on the engine control box in the cockpit. The rudder trim tabs are not servo operated, they may be adjusted on the ground to suit flying irregularities.

5. The fuselage is of oval cross-section which is tapered off into a cone shape by a metal fairing aft of the engine bulkhead. The construction is of balsa wood sandwiched between plywood sheets, and is made in two halves and joined down the top and bottom centres. The nose portion forward of the

armour-plate bulkhead No. 1 is constructed of alclad sheet.

6. The wing of the Mk. 30 aircraft is a metal cantilever structure with a channel section main spar and a false spar joined by alclad ribs and alclad skin covering. Extending aft from each wing is a metal tail boom, the front portion of which is built integrally with the wing structure. Each wing is attached to the fuselage by three bolts, two at the main spar end fittings at the (engine) No. 4 bulkhead, and one at the drag fitting at bulkhead No. 3. All attachment bolts are accessible by removing the wing root fairings.

Split flaps, dive brakes and ailerons are fitted to the wings.

The Mk. 31 aircraft is equipped with a strengthened clipped wing in order to provide for the larger loads involved due to the introduction of R.P. and Bomb Installations. The overall length of the wing is 12 inches shorter: this shortening also affects the length of the ailerons. The navigation lights and the V.H.F. radio aerial, which were positioned in the wing tip, are now installed between ribs 13 and 14.

7. The tail unit consists of metal-covered fins and rudder attached to each tail boom, with a metal cover tailplane and elevator attached between the two fins.

8. The landing gear is a tricycle undercarriage consisting of two wheels which retract outward into the wing, and the nose wheel which retracts into the nose of the fuselage. The undercarriage and nose wheel are retracted and lowered hydraulically, and are mechanically locked in both positions. The brakes on each main undercarriage wheel are pneumatically operated. A larger diameter undercarriage jack is fitted to the Mk. 31 aircraft to allow the undercarriage to be retracted at the higher "take-off" speed caused by the increased weight. However, it may be noted that the above jack is desirable also for the

Mk. 30 aircraft and is now being fitted retrospectively throughout.

9. The power unit is mounted on a tubular steel structure and attached with four bolts. The unit drives a Rotol gearbox mounted on the engine bulkhead, and this auxiliary gearbox in turn drives a 2,300 watt generator, Heywood compressor and Lockheed hydraulic pump.

10. Fuel is supplied to the power unit from an immersed fuel pump mounted in a collector box built inside (but accessible from underneath) the main fuselage tank, through a low-pressure cock and filter to the fuel pumps on the right-hand side of the engine wheel case.

11. The 24-volt, 2,300-watt generator supplies current for general services through the two 12-volt accumulators mounted in front of the engine bulkhead.

12. Cold air ventilation, cabin heating and pressurising are installed.

13. The radio equipment comprises a TR-1936 V.H.F. set and an A.D.F.-14 Radio Compass. The TR-1936 radio is installed in the ammunition bay behind the pilot's seat, and is accessible through a door on the port side of the fuselage above the leading edge of the wing. The controller for the TR-1936 set is mounted in the centre of the left-hand instrument panel, and the mic-tel socket is mounted on the centre seat pressing of bulkhead No. 2. The control unit for the A.D.F.-14 is mounted on the forward end of the starboard canopy rail. The tuner is situated on the floor to the left of the pilot's seat, while the amplifier is mounted on the port ammunition bay door. The D.F. loop is installed in the nose beneath the detachable nose panel and the sense aerial is attached to the rear fairing of the sliding canopy.

ALPHABETICAL INDEX

ALPHABETICAL INDEX

"A"	Fig.	Para.	"B" (continued)	Fig.	Para.
Accelerometer	2	—	Bulkhead Plugs	—	193
Access Doors (Inspection Panels)	14	85	Butt Tests, Guns	—	322
Access to Electrical and Radio Components	57, 58	225			
Accessories, Engine	—	272	"C"		
Accumulator, Electrical, Circuit	59	198	Cabin Altimeter or Air Pressure Gauge	5	20
Accumulator, Hydraulic	40	77	Cabin Air Control	5	132
A.D.F.-14. Lear Radio Compass	108, 109	45	Cabin Air Ventilation	5	19
Adjustment to Landing Lamp	—	206	Cabin Pressure Control Valve	42	134
Adjustments to U/C Door Lock	24, 25	178	Cabin Pressure Warning Light Circuit	65	209
Aileron Area. See Leading Particulars	—	—	Cabin Pressurising	42	20
Aileron, Controls	90	251	Cabin Pressurisation, Test of	42	135, 137 140, 141
Aileron Differential Unit	20	89	Cabin Seal	42	131
Aileron Mass Balancing	—	94	Cabin Seal Control	5	17
Aileron, Removal	—	159	Camera Gun	—	308
Aileron, Setting	20	89	Camera Gun Control	4	43
Aileron, Structure	85	240	Camera Gun Circuit	71	204
Aileron Trim Tabs	85, 20	90	Camera Recorder	4	307
Air Charging	35	78	Canopy	50	233
Air Compressor	35, 98	287	Canopy, Assembly	50	148
Air Drier System	43	142	Canopy Jettison	5, 50	59
Air Filter	35	289	Canopy Release	5	15
Air Reservoir	35	288	Canopy, Removal	50	147
Air Speed Indicating System	54	129	Canopy, Removal Rails	50	149
Air Speed Indicator System, Test	—	138	Canopy Seal	42, 107	17, 131
Air Speed Indicator System, Drain Traps	—	129	Centre of Gravity, refer to A.A.P. 829	—	—
Air Speed Indicator Circuit	73	220	Chutes Ammunition Ejection	102	302
Alighting Gear. See Under-carriage	—	—	Chutes, Ammunition Feed	102	301
Ammunition Bins	101, 102	300	Cine Camera	71	308, 204
Ammunition Ejection Chutes	102	303	Circuits	—	195
Ammunition Feed Chutes	101, 102	301	Circuit, Accumulator	59	198
Auxiliary Gearbox-General	106	272	Circuit Breakers	—	189
Auxiliary Gearbox-Removal	—	184	Circuit, Cabin Pressure Warning Light	65	209
Axle, Nose Wheel Removal	30	171	Circuit, Camera Gun	71	204
			Circuit, Cockpit Lighting, Emergency	73	223
"B"			Circuit, Cockpit Lighting, Red	69	216
Balance Tabs. See Tabs	—	—	Circuit, Cockpit Lighting, Ultra Violet	70	216
Barrel Guide—undercarriage door	24, 88	178	Circuit, Detonator Supply	70	217
Bins, Ammunition	101, 102	300	Circuit Diagrams	59-77A	198-224
Blast Tubes	101	305	Circuit Diagrams, Interpretation of	—	196
Blind Flying Instrument Panel	2	—	Circuit, Downward Identification Light	65	207
Bomb and R.P. Firing Circuit	74	224	Circuit, Fire Extinguisher	70	217
Bomb Carriers	110	324	Circuit, Fire Warning Light	70	217
Bomb Carriers—Fitting	110	330	Circuit, Flap Position Indicator	64	205
Bomb Carriers—Jettison	12	332	Circuit, Fuel Gauge	68	213
Bomb Carriers—Removal	110	331	Circuit, Functioning	—	197
Bomb Selection and Fusing	—	327	Circuit, Generator	61	201
Bomb Firing Switch	4, 88	328	Circuit, G3F Compass	63, 63A	201
Bonding	—	194	Circuit, G.S.A.P. Camera	71	204
Boom, Tail Removal	—	164	Circuit, Gun Firing	66, 66A	210
Boom, Tail Structure	86	244	Circuit, Gunsight Gyro and Camera Recorder	72, 72A, 75	218
Boom, Wing, see Spar	—	—	Circuit, Hydraulic Power	97	280
Boost Coils	—	199	Circuit, Landing Light	65	208
Booster Pump, Fuel	97	126, 275	Circuit, Magnesyn Compass	71	202
Booster Pump — non-Return Valve	—	128	Circuit, Navigation Light	73	220
Bottles, Oxygen, Removal	99	182			
Brake, Differential Unit	35, 98	293			
Brake, Pneumatic System	35	286			

ALPHABETICAL INDEX (continued)

"C" (continued)	Fig.	Para.	"D"	Fig.	Para.
Circuit, Oil Pressure Indicator ...	69	215	"D"		
Circuit, Oil Thermometer	64	206	Datum Point, Refer A.A.P.829	—	—
Circuit, Pitot Head	73	222	Deflating Shock Absorber Struts	—	101
Circuit, Positive and Negative Feeders ...	59, 60	198	De-icing Hand Pump	2, 100	295
Circuit, Pyrometer	69	214	De-icing System	100	295
Circuit, R.P. and Bombs Firing	74	224	De-icing Tank	100	80, 295
Circuit, R.P.M. Indicator	73	221	De-icing Windscreen	100	295
Circuit, Starter	61	199	De-misting (silica-gel) Container	44	79
Circuit, Turn and Slip Indicator	62	200	De-misting Tube, Test	45	142
Circuit, Undercarriage Lever Lock	66	211	Detachable Nose Panel	108	231
Circuit, Undercarriage Position Indicator	67	212	Diagram—Fuel and Air System	107	—
Circuit, Electrical, Generator ...	59	198	Diagram—Rigging	18	88
Clock, Flight	2	—	Diagram—Wiring, Electrical ...	57, 77A	196
Cocks, Fuel Control	3	34	Di-electric Housing	109	45
Cocking Unit	104	304	Differential Brake Unit	35, 98	293
Cockpit, Entry	—	15	Dive Brakes, Adjustment to	53	163
Cockpit, Heating	5	18	Dive Brakes Control Lever	2	27
Cockpit Hood, Jettison ...	5, 50	59	Dive Brakes Hydraulic Circuit ...	38	285
Cockpit Lighting	5	21	Dive Brakes, Removal	53	162
Cockpit Lighting Circuits	69, 70	216	Dive Brakes, Structure	53	242
Cockpit Seal, see Cabin Seal	42	17	Door Mechanism, Removal	—	177
Cockpit Ventilation	5	19	Door Retraction Frame	23	175
Communication Equipment	—	227	Door Up-lock Micro Switch	23	263
Compass, A.D.F.-14 Lear Radio	109	45	Doors, Gun Bay	104	232, 320
Compass, E2A	4	49	Doors, Main Wheel Adjustment	24	178
Compass, Indicator, A.D.F.14 ...	2	45	Doors, Main Wheel Removal	23	175
Compass, Magnetic	4	49	Doors, Nose Wheel Removal	54	175
Compass, Magnesyn, Circuit	71	202	Drag Member	84	238
Compass, Stand by	4	49	Draining Fuel Tanks	97	151
Components, Electrical and Radio, Access to	57, 58	225	Draining Fuel Tanks—Condensation	—	70
Components, Hydraulic	40	115	Draining Oil Sump (Engines) ...	—	73
Compressor, Air	35, 98	287	Drainage Holes	105	—
Contents Gauges, Fuel	3	35	Drain Traps—A.S.I. System	—	129
Control Box, Engine	89	24	Drier Tube, Windscreen	44	142
Control Column	89	24	Drier Tube, Test	45	142
Control Column Rigging	88	—	Drop Tanks, Fitting	12	71
Control Column Structure	88	250	Drop Tanks, Removal and Fitting ...	—	156
Control Friction Damper ...	4, 93	31, 276	Drop Tanks, Fuel System	96	37
Control, Gun-Firing	4, 88	42	Drop Tanks, Jettison Lever	5, 6	55
Control, Gunsight Recorder	4	44	Drop Tanks, Pressurisation	12, 107	273
Control, Locking	10	63			
Control, Oxygen Supply	4	22	"E"		
Control Undercarriage Selector	2	29	Ejection Chutes, Ammunition ...	101, 102	302
Controls, Aileron	90	251	Ejector Seat	6	16, 57
Controls, Dive Brakes	2	27	Elect. and Radio Components, Access to	57, 58	225
Controls, Elevator	91	253	Electrical Diagrams	60, 75	197
Controls, Engine	94	123, 276	Electrical Equipment Location ...	57	—
Controls, Engine Starting	3	32, 123	Electrical System (General)	—	41
Controls, Engine Rigging	95	125	Elevator Area. See Leading Particulars ...	—	—
Controls, Flying, In Cockpit	2, 89	24	Elevator Controls	21, 91	253
Controls, Flying, Structure of ...	—	249	Elevator Mass Balancing	21	94
Controls, Fuel Cocks	94	34	Elevator, Removal	87	167
Controls, Rigging of. See Rigging ...	—	—	Elevator Setting	—	91
Controls, Rudder	92	255	Elevator Structure	87	248
Controls, Throttle	94	31	Elevator Trim Tabs	21, 91	92
Controls, Trim Tab (Elevator)	2	25	Elevator Trim Tab Servo Adjustment	—	92
Controls, Wheel Brakes	88	28	Emergency, Cockpit Lighting ...	5, 6	21
Controls, Wing Flap	2	26	Emergency, Equipment	6	50-59
Covers	—	65	Emergency Hydraulic Circuit ...	—	284
Covering, Fuselage	—	234			
Cowlings, Engine	46	269			
Cowling, Removal	46	144			
Creeper, Gun Servicing	—	317			
Crowbar	6	56			

ALPHABETICAL INDEX (continued)

[illegible]

ALPHABETICAL INDEX (continued)

"H" (continued)	Fig.	Para.	"L" (continued)	Fig.	Para.
Hydraulic Circuit, Under-carriage	36	282	Lever, Throttle	3	31
Hydraulic Components	40	115	Lights, Cockpit	5	21
Hydraulic Functioning, Tests	40	122	Lights, Identification	4	46
Hydraulic Fault Chart	41	—	Lights, Identification Circuit	65	207
Hydraulic Hand Pump	6	51	Lights, Navigation	2	47
Hydraulic Jacks, Removal	—	179	Lock, Undercarriage Selector Lever	—	264
Hydraulic Reservoir	40	281	Lock, Undercarriage Selector Lever Circuit	66	211
Hydraulic Reservoir, Filling	—	76	Locking, Control Column	10	63
Hydraulic Reservoir, Removal	—	180	Locking, Rudder Pedals	10	63
Hydraulic System (General)	40	114, 279	Locking, Undercarriage, Stowage	104	67
Hydraulic System, Charging	—	121	Loop Antenna, ADF-14	108	45
Hydraulic System, Nose Wheel and Undercarriage	33	—	Low Pressure Fuel Cock	3	34
Hydraulic System, Pressures	—	120	Lubrication	15, 17	86
Hydraulic System, Testing	40	122	Lubricating System, Engine	—	277
			Lubricating System, Accessories	—	278
"I"			"M"		
Identification Lights	4	46	Machmeter	2	—
Indicator, Turn and Slip	62	200	Master Switch, R.P. and Bomb	4	325
Indicator, Undercarriage Position	2	30	Master Switch, Starter	3	32
Inflation Diagram, Main Wheel Shock Absorber—Long Stroke	27	—	Magazine Tie Rods	101	306
Inflation Diagram, Nose Wheel Shock Absorber	33	—	Magnetic Compass	4	49
Inspection Panels	14	85	Magnesyn Compass, Circuit	71	202
Installation of 20 mm. Guns	101	297	Mainplane, Structure	79-82	235
Inverted Flight, Duration of	—	33	Main Wheel	23	265
Isolating Switch, Ignition	3	199	Main Wheel Unit, Removal	23	174
			Mass Balancing	21	94
			Miscellaneous Lubrication	17	86
			Mounting Front (Guns)	103	298
			Mounting Rear (Guns)	103	299
			Mountings, Engine	48	270
"J"			"N"		
Jack, Undercarriage Adjustment	28	98	Navigation Lights	2	47
Jack, Undercarriage Removal	—	179	Navigation Lights, Circuit	73	220
Jack, Undercarriage Replacement	23	97	Negative "G" Valve	97	126, 128
Jacking	9	66	Non-Return Valve, Booster Pump	—	128
Jettison Lever, Canopy	5, 6	236	Nose Panel	108	231
Jettison Lever, Drop Tanks	5, 6	55	Nose Wheel	29, 30	266
Joints, Wing	83, 84	236	Nose Wheel Details	30, 31	—
Junction Box 1	77	187A	Nose Wheel Door—Removal	31	175
Junction Box 2	77	187B	Nose Wheel Radius Rod, Removal	29, 31	169
Junction Boxes, General	—	187	Nose Wheel Self-Centring Unit	34	113
Junction Box, Gyro Compass	77A	187D	Nose Wheel Shock-Absorber Removal	32	170
Junction Box, R.P. and Bombs	77A	187C			
"L"			"O"		
Landing Gear. See Under-carriage	—	—	Oil and Water Trap	35, 98	290
Landing Lights	2	48	Oil Sump Capacity (Engine)	—	72
Landing Lights Circuit	65	208	Oil Sump Draining (Accessories)	—	75
Landing Wheels. See Wheels	—	—	Oil Sump Draining (Engine)	—	73
Leading Particulars. See Front Pages	—	—	Oil Sump Filling (Accessories)	—	74
Lear Amplifier	109	45	Oil Sump Filling (Engine)	—	72
Lear Radio Compass, ADF-14	109	45			
Lear Tuner	2, 109	45			
Legs, Undercarriage. See Undercarriage	—	—			

ALPHABETICAL INDEX (continued)

"O" (continued)	Fig.	Para.	"R" (continued)	Fig.	Para.
Oil System (Engine)	—	38	Removal, Assembly and Dis-	—	143
Oil Temperature Gauge ...	3	40	mantling Operations	—	—
Oleo Shock Absorber. See	—	—	Removal of Rockets	110	329
Undercarriage Units	—	—	Replenishing Oil Sump ...	—	72
Oxygen Bottles, Removal	99	182	Reservoir, Compressed Air	35, 98	288
Oxygen Supply Control ...	4	22	Reservoir, De-icing Fluid	100	295
Oxygen System	99	294	Reservoir, Hydraulic	36, 40	76, 281
			Retraction, Undercarriage Units	23	96
			Ribs, Wing Structure	79, 81	239
			Rigging, General	18	87
			Rigging, Ailerons	18	89
			Rigging, Airframe ...	18	87
			Rigging, Elevator	18	91
			Rigging, Engine Controls	95	125
			Rigging, Rudder,	18	93
			Rocket Selection	4	326
			R.P./Bombs Firing, Circuit	74	224
			R.P./Bombs Firing, Switch	4, 88	328
			R.P. Installation	110	323
			R.P./Bombs Master Switch	4	325
			R.P./Bombs Junction Box	77A	187C
			Rubbing Strips on Flaps and	—	—
			Flap Shrouds ...	—	160A
			Rudder Area. See Leading Par-	—	—
			ticulars ...	—	—
			Rudder Controls	92	93
			Rudder Pedals	2, 89	24
			Rudder, Removal	87	165
			Rudder, Locking	10	63
			Rudder Structure	87	246
			Rudder Trim Tab ...	87	256
			"S"		
			Sear Release Units, Installation	—	312
			Sear Release Units, Removal ...	—	311
			Seat; Pilot's	—	16
			Selector Lever, Undercarriage ...	2	29
			Shock Absorber. See Under-	—	—
			carriage Unit ...	—	—
			Silica-Gel	—	79
			Slinging, Aircraft	13	62
			Spar Structure	83	237
			Speed Indicating System	54	129
			Starting Button	3	32, 49A
			Starting Circuit	61	199
			Starting Panel	61	188
			Starting System	—	271
			Stowage of Crowbar	6	56
			Sump, Oil (Engine)	—	72
			Switch, Ignition Isolating	—	199
			Switch, Camera Gun	4	43
			Switch, Emergency Under car-	—	—
			riage Retraction	6	52
			Switch, Fire Extinguisher	3, 6	54
			Switch, Ground/flight	2	191
			Switch, Gunsight and Recorder	4	218
			Switch, Identification Lights ...	4	46
			Switch, Landing Lights ...	2	48
			Switch, Navigation Lights	4	47
			Switch, Starting	3	32
			Switch, Undercarriage Down ...	—	262
			Switch, Undercarriage up	—	263
			System, Cabin Air Pressure	42	132
			System, De-icing	100	295
			System, De-misting'	43	79
			System, De-misting, Test	45	142

"S" (continued)

"S" (continued)	Fig.	Para.	"T" (continued)	Fig.	Para.
System, Electrical	—	41	Trim Tab, Elevator Setting	87	92
System, Fuel	96, 97	273	Trim Tab, Rudder	87	256
System, Hydraulic	40	114, 279	Turn and Slip Indicator	62	200
System, Hydraulic Emergency Operation	—	51			
System, Lubrication, Engine	—	277	"U"		
System, Oil	—	38	Undercarriage (General)	—	257
System, Oxygen	99	294	Undercarriage, Emergency Re- traction Switch	2, 6	52
System, Pneumatic	35, 98	286	Undercarriage, Hand Pump	2, 6	51
System, Pneumatic Charging	98	287	Undercarriage, Hydraulic Cir- cuit Main and Nose Wheel	36	282
System, Speed Indication	54	129	Undercarriage Indicator	2	30
System, Starting	—	271	Undercarriage Indicator Circuit	67	212
			Undercarriage Jack, Main Unit Adjustment	28	98
"T"			Undercarriage Jack, Nose Unit Adjustment	29	98
Tab Trim, Aileron Servo	20	252	Undercarriage Jack, Replace- ment	23	97
Tab Trim, Elevator Adjustable Servo	87	254	Undercarriage Lever Lock Cir- cuit	66	211
Tab Trim, Rudder	87	256	Undercarriage Main Unit Lock- ing	11	67
Tail Boom, Removal	9	164	Undercarriage Main and Nose Wheel, Lubrication	16	86
Tail Boom, Structure	86	244	Undercarriage Main Shock Absorber	26	101
Tail Trim Indicator	2	25	Undercarriage Main Units, Construction	26	258
Tail Unit	87	243	Undercarriage Main Units, Dis- mantling Shock Absorber	26	101
Tail Unit Details	19	243	Undercarriage Main Doors, Re- moval	23	175
Tailplane Area. See Leading Particulars	—	—	Undercarriage Main Door, Mechanism Removal	23	177
Tailplane Incidence	—	88	Undercarriage Main Door, Mechanism Adjustment	24, 25	178
Tailplane Removal	87	166	Undercarriage Main Units, Inflation	27	105
Tailplane Structure	87	247	Undercarriage Main Units, Jack Removal	—	179
Tank, De-icing Fluid	100	80	Undercarriage Main Units, Jack Installation	—	97
Tank, Fuel, Removal (Fuse- lage)	—	152	Undercarriages Main Wheel Units, Removal	23	172
Tank, Hydraulic Fluid	36, 40	76	Undercarriage Main Units, Filling and Testing	26	101
Tank, Oil (Engine)	—	72	Undercarriage Nose Wheel Unit	29	168
Tanks, Fuel	96	33	Undercarriage Nose Shock Absorber	32	107
Tanks, Fuel-Wing	96	33A	Undercarriage Nose Shock Absorber Assembly	32	107
Tanks, Fuel Draining	97	70, 151	Undercarriage Nose Units Con- struction	30, 31	259
Tanks, Fuel Removal (Wing)	—	152, 153 154, 155	Undercarriage Nose Shock Absorber Dismantling	32	107
Tanks, Wing Drop Fitting	12	71	Undercarriage Nose Shock Absorber Removal	29	170
Tanks, Wing Drop (Long Range)	12	37	Undercarriage Nose Shock Absorber Testing	32	107
Tanks, Wing Drop Removal	12	156	Undercarriage Nose Wheel Units, Removal	29, 31	168
Tare Weight of Aircraft. Refer A.A.P.829	—	—	Undercarriage Nose Units, Wheel and Axle Removal	30	171
Target Towing Gear	—	49A			
Temperature, Oil Gauge	3, 206	40, 64			
Terminal Blocks	—	192			
Test, A.S.I. System	—	138			
Test, Butt Guns	101	322			
Test, Pressure Cabin	42	137, 140			
Test, Shock Absorber Main	26	101			
Test, Shock Absorber Nose	32	107			
Test, Windscreen Drier Tube	45	142			
Tests, Functioning Hydraulic	40	122			
Throttle Control	3	31			
Tie Rods, Magazine	101	306			
Tools and Equipment, Ground Handling	—	82			
Towing	8	61			
Trap, Oil and Water	35, 98	290			
Trestling	9	84			
Trim Tab, Aileron	85	252			
Trim Tab, Aileron Setting	20	90			
Trim Tab Control (Elevator)	2	25			
Trim Tab, Elevator	87	254			

"T" (continued)

Trim Tab, Elevator Setting	87	92
Trim Tab, Rudder	87	256
Turn and Slip Indicator	62	200

"U"

Undercarriage (General)	—	257
Undercarriage, Emergency Retraction Switch	2, 6	52
Undercarriage, Hand Pump	2, 6	51
Undercarriage, Hydraulic Circuit Main and Nose Wheel	36	282
Undercarriage Indicator	2	30
Undercarriage Indicator Circuit	67	212
Undercarriage Jack, Main Unit Adjustment	28	98
Undercarriage Jack, Nose Unit Adjustment	29	98
Undercarriage Jack, Replacement	23	97
Undercarriage Lever Lock Circuit	66	211
Undercarriage Main Unit Locking	11	67
Undercarriage Main and Nose Wheel, Lubrication	16	86
Undercarriage Main Shock Absorber	26	101
Undercarriage Main Units, Construction	26	258
Undercarriage Main Units, Dismantling Shock Absorber	26	101
Undercarriage Main Doors, Removal	23	175
Undercarriage Main Door, Mechanism Removal	23	177
Undercarriage Main Door, Mechanism Adjustment	24, 25	178
Undercarriage Main Units, Inflation	27	105
Undercarriage Main Units, Jack Removal	—	179
Undercarriage Main Units, Jack Installation	—	97
Undercarriages Main Wheel Units, Removal	23	172
Undercarriage Main Units, Filling and Testing	26	101
Undercarriage Nose Wheel Unit	29	168
Undercarriage Nose Shock Absorber	32	107
Undercarriage Nose Shock Absorber Assembly	32	107
Undercarriage Nose Units Construction	30, 31	259
Undercarriage Nose Shock Absorber Dismantling	32	107
Undercarriage Nose Shock Absorber Inflation	33	112
Undercarriage Nose Shock Absorber Removal	29	170
Undercarriage Nose Shock Absorber Testing	32	107
Undercarriage Nose Wheel Units, Removal	29, 31	168
Undercarriage Nose Units, Wheel and Axle Removal	30	171

ALPHABETICAL INDEX (continued)

"U" (continued)	Fig.	Para.	"V" (continued)	Fig.	Para.
Undercarriage Radius Rod, Construction	28	260	Valve, Drop Tanks Fuel Transfer	96, 97	273
Undercarriage Radius Rod, Nose Wheel Removal	29, 31	169	Valve, Negative "G"	—	128
Undercarriage Radius Rod, Main Wheel Removal	28	173	Ventilation Fuel Tanks	96, 97	36
Undercarriage Retraction Mechanism	28	96	Ventilation, Pilot's Cockpit	5	19
Undercarriage Selector Lever ..	2	29			
Undercarriage Selector Lever, Lock	—	264	"W"		
Undercarriage Self - Centring Unit, Nose Wheel	34	113	Warning Light, Fuel Pressure ..	—	199
Undercarriage Switch, Down	28	262	Water and Oil Trap	35, 98	290
Undercarriage Switch, Up	28	263	Wheel Brakes, Control	88	28
Undercarriage Wheel, Main	—	265	Wheel Doors, Main and Nose, Removal	23, 29	175
Undercarriage Wheel, Nose	—	266	Wheel Door, Main, Fairing, Removal	—	176
			Wheel Main Unit, Construction ..	26	258
"V"			Wheel Main Unit, Removal	23	174
Valve, Air Pressure Reducing, Brakes	35	292	Wheel, Nose, and Axle Removal ..	30	171
Valve, Air Pressure Reducing, Cabin Seal	—	135	Wheel Nose Unit, Construction ..	29	259
Valve, Air Pressure Reducing, Drop Tanks Fuel Transfer ..	97	273	Wheel Nose Unit, Removal	29	168
Valve, non-Return Booster Pump	—	128	Windscreen, De-icing	100	295
Valve, Cabin Air Temperature Control	5	132	Windscreen, De-misting	43	79
Valve, Cabin Pressure Control ..	5	134	Windscreen, De-misting Tube ..	44, 45	142
Valve, Compressed Air Relief ..	35	291	Windscreen, Removal of	—	150
Valve, De-icing Fluid Regulation	100	295	Wing (General)	79, 82	235
			Wing Area. See Leading Particulars ..	—	—
			Wing, Assembly	79	158
			Wing to Fuselage Joints	83, 84	236
			Wing Flaps, Control	2	26
			Wing Joints	83, 84	236
			Wing, Removal	—	157
			Wing Slings	51	157
			Wing Tanks	12, 96	151

Leading Particulars

NOTE: The Leading Particulars should be read in conjunction with Fig. 1, "General Arrangement."

Name Vampire Mk. 30 & 31
 Type Single-seater, single-engined, jet propelled mid-wing monoplane.
 Duty Interceptor fighter.

PRINCIPAL DIMENSIONS:

(Aircraft dimensions relative to fuselage datum except where stated.)

	Mk. 30	Mk. 31
Span	40 ft. 0 in.	38 ft. 0 in.
Length, overall	30 ft. 9 in.	
Height, above static ground line and over fin and rudder	6 ft. 2 in.	

Wings:

Aerofoil Section	Thickness grading EC1240 series Camberline: Constant load up to 0.4 Chord, Linear decrease to zero at T.E.
Chord, at fuselage side 4.68 ft. from fuselage centre line	102.17 in.
Chord, at Tip, 18 ft. from fuselage centre line	42.79 in.
Incidence	Zero to fuselage datum.
Dihedral, measured on top skin at front span	1° 15'.
Sweepback	48 in 240 (11° 19').

Tail Plane:

Span	9 ft. 4 in.
Chord, without elevator	34.00 in.
Chord, including elevator	47.50 in.
Incidence	Zero to fuselage datum.

Fuselage:

Width (maximum)	4 ft. 6 in.
Height (maximum)	4 ft. 6 in.
Length, over jet orifice fairing	19 ft. 2 in.

Areas:

	Mk. 30	Mk. 31
Wing, mainplane gross	266 sq. ft.	262 sq. ft.
Ailerons	15.8 sq. ft.	15 sq. ft.
Aileron Trim Tabs, each surface 0.746 sq. ft. (Total)	1.492 sq. ft.	1.492 sq. ft.
Flaps, each surface 10.4 sq. ft. (Total)	20.8 sq. ft.	20.8 sq. ft.
Dive Brakes, each surface 2.96 sq. ft. (Total)	5.92 sq. ft.	5.92 sq. ft.
Tailplane, with elevator	37.00 sq. ft.	37.00 sq. ft.
Tailplane	26.5 sq. ft.	26.5 sq. ft.
Elevator, with tab	10.5 sq. ft.	10.5 sq. ft.
Elevator	9.835 sq. ft.	9.835 sq. ft.
Elevator Tab	0.665 sq. ft.	0.665 sq. ft.
Fins, each surface 4.66 sq. ft. (Total)	9.32 sq. ft.	9.32 sq. ft.
Rudders, with tab, each surface 2.31 sq. ft. (Total)	4.62 sq. ft.	4.62 sq. ft.

SETTINGS AND RANGES OF MOVEMENT OF CONTROL SURFACES:

Aileron	.....	15° 36' up, 10° 31' down. ± 1° 18'.
Aileron Tab	.....	.85 in. up, 1.2 in. down.
Flaps	.....	80° up ± 3°.
Dive Brakes	.....	73° up ± 3°.
Elevator	.....	19° up, 10° 20' down. ± 1° 7'.
Elevator Tab	.....	6° up, 18° down. Pre D.H. Aust. Mod. V.90. 8° up, 22° down. Post D.H. Aust. Mod. V.90.
Rudder	.....	24° 36' each way ± 1°.
Rubber Tab		Ground trim only.

LANDING GEAR:

Type		Tricycle, all wheels retracting.
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MAIN UNDERCARRIAGE:

Track		11 ft. 3 in.
Brakes		Dunlop pneumatic.
Shock Absorber Units		Lockheed A.I.R. 51756 L.H., 51757 R.H. with synthetic rubber seals for oil OM-15. Inflation 350 lb./sq. in.
Wheels	.....	Dunlop AH 9139.
Brake Units	.....	Dunlop AH 9140.
Tube, Inner	.....	Dunlop FC 7.

NOSE UNDERCARRIAGE:

Shock Absorber Unit	.....	Lockheed A.I.R. 40012. Infla- tion 500 lb./sq. in.
Wheel	.....	Dunlop A.H.O. 17219/9.
Tyre	.....	Dunlop N.R.F. 30: 6.5 x 5.5 T.C.
Tyre Pressure	.....	Inflation 60 lb./sq. in.

POWER PLANT

Engine	.....	Rolls Royce Nene 2-V.H. Aust.
Type	.....	Turbo jet.
Fuel	.....	Aviation kerosene to Specifica- tion D. Eng. R.D. 2482 (Ident. No. K1/10019).
Engine Oil	.....	Spec. D. Eng. R.D. 2490 OM-11 (Ident. No. K2/248).
Auxiliary Gear Box Oil	.....	Spec. D.E.D. 2479/1 OEP-71 (Ident. No. K2/214).

TANK CAPACITIES:

Fuel Tanks:

Fuselage Tank	.....	96 gall.
Wing Tanks No. 1	(2 x 52 gall.)	104 gall.
Wing Tanks No. 2	(2 x 65 gall.)	130 gall.
Wing Tanks No. 3		
Wing Tanks No. 4		
Wing Drop Tanks	(2 x 100 gall.)	200 gall.
TOTAL (with 2 x 100 gall. drop tanks)		530 gall.
Oil (in Power Unit Sump only)	.....	10 pints.
Hydraulic Tank	.....	1 gall.
De-icing Fluid Tank, to R.A.A.F. technical requirement Spec. K22 (Ident. No. K4/10332)	.....	3 pints.

HYDRAULIC AND PNEUMATIC PRESSURES:

Hydraulic System:

Fluid	.....	Spec. D.T.D. 585, OM-15 (Ident. No. K2/138).
Accumulator Initial Air Pressure	.....	1,250 lb./sq. in.
Cut-out Valve	.....	2,400-2,500 lb./sq. in. - 100 + nil.

Pneumatic System:

At Air Compressor and Cylinder	.....	450 lb./sq. in.
After First Reducing Valve	.....	200 lb./sq. in.
At Each Brake	.....	120-150 lb./sq. in.

PRESSURE HEAD SETTINGS:

Position (Pressure Head)	.....	L/E of port fin.
Incidence	.....	Zero to fuselage datum.
Distance from Centre-Line of Aircraft	.....	58 in.
Distance ahead of Leading Edge	.....	11.9 in.
Distance from top of Fin to Centre-Line of Cover		3.0 in.
Tolerance on Angular Setting		± 2 deg.

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