Chapter 4 GENERAL SERVICING

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WARNING

EJECTION SEAT

This equipment is a source of potential danger to personnel and of damage to the aircraft. If the firing mechanism is operated while the aircraft is on the ground, the seat will be ejected, damage will be done to the aircraft and injury may be caused to any person in, or leaning into, the cabin.

Before any individual is allowed to enter the cabin, therefore, the N.C.O. i/c airframe servicing is to ensure that the safety strap is in position over the blind handle of the ejection seat and secured with the safety pin, or that the safety pin is fitted in the hole of the sear.

ENGINE

It is essential to ensure that the air-intake safety guards (Sect. 2, Chap. 1) are fitted at all times when the engine is ground run and that personnel are instructed to keep well clear of the air-intakes and jet exhaust.

Introduction

1. This chapter contains information on the general servi ing of the complete aircraft, together with tables listing the Standard and Special Ground Equipment and the Special Tools required for the operations described. This special equipment has been designed to eliminate any possibility of damage and distortion occurring during servicing and should, therefore, be used in preference to other types of similar equipment, as otherwise the efficiency of the aircraft may be seriously impaired. When carrying out servicing operations, ensure that the air-intake and jet pipe blanking boards are in position. Other covers or protective devices should also be fitted, provided that they do not impede the progress of the work in hand. Servicing, dismantling and lubricating information applicable to particular assemblies and installations is covered in the appropriate chapters of Sections 3, 4, 5, 6 and 7. The servicing procedure for the standard components installed in this aircraft will be found in the relevant Air Publications listed at the beginning of this volume or mentioned in the text.

Standard and special ground equipment

2. The ground equipment provided for use when servicing this aircraft is listed in Table 1 overleaf:—

TABLE 1

Standard and special ground equipment

Subject	Stores Ref.	Part No.	Description	Application	No. off
TOWING AND STEERING EQUIPMENT	4G/4175	—	Arm, towing short	Towing from spools on nose wheel...	1
	4G/3070	—	Arm, steering short	Steering from spools on nose wheel...	1
	4G/4176	—	Adjustable fork unit, Mk. 2	Used with 4G/4175 and 4G/3070	2
	4G/4137	—	Bridle, towing	Backward towing from main undercarriage	1
JACKING EQUIPMENT	4Q/2617	—	Jacks, lifting, 5-ton		3
	4Q/2620	—	Trestle legs, Mk. 3	Main jacking under wing used with 4Q/2617	2
	4Q/2618	—	Trestle legs, Mk. 1	Main jacking under nose, used with 4Q/2617	1
	4Q/2305	—	Jack adapter head, Mk. 13	For use with 4Q/2617	3
	4Q/1229 or 4Q/2604	—	Jack, pillar hydraulic, 4-ton	Wheel changing, nose and main	1
	4Q/2594	—	Jack adapter head, Mk. 42	For use with 4Q/1229 or 4Q/2604	1
	26FX/95001	B.188230	Pads, jacking, wing		2
	26FX/95002	B.191156	Pads, jacking, nose		1
ENGINE REMOVAL AND REPLACEMENT	26FX/95045	E.189646	Trolley, engine		1
	26FX/95046	B.191737	Rail, engine detachable		1
RIGGING EQUIPMENT	26FX/95005	C.191642	Gauge, incidence main plane		1
	26FX/95006	A.192534	Gauge, dihedral main plane and tail plane		1
	26FX/95007	B.192491	Gauge, incidence tail plane		1
	26FX/95144	D.199059	Rigging fixture	For retaining control surfaces in neutral position	1
	26FX/95142	B.199011	Bar, levelling		1
	26FX/95143	F.198704	Spigot, levelling		2
MISCELLANEOUS SPECIAL EQUIPMENT	26FX/95024	D.192920	Guard, safety air-intake, port		1
	26FX/95025	D.192921	Guard, safety air-intake, starboard		1
	26FX/95026	D.197865	Blanking board, air-intake, port		1
	26FX/95027	D.197866	Blanking board, air-intake, starboard		1
	26FX/95028	C.192777	Blanking board, jet outlet		1
	26FX/95029	C.191636	Lock, safety, main undercarriage		2
	26FX/95030	B.188480	Lock, safety, nose undercarriage		1
	26FX/95031	Dunlop A.5321	Extractor, main wheel		1
	26FX/95032	Dunlop A.5826	Extractor, nose wheel		1
	26FX/–	Dunlop A.5322	Brake alignment fixture		1
	26FX/95034	E.190347	Trolley, tail empennage	To facilitate engine removal	1
	26FX/95136	D.202713	Pilot's ladder	Access to cockpit	1

TABLE 1—Standard and special ground equipment—*contd.*

Subject	Stores Ref.	Part No.	Description	Application	No. off
MISCELLANEOUS SPECIAL EQUIPMENT—*contd.*	27D/2916	B.194024	Weather cover, cockpit		1
	27D/2963	—	Weather cover, pressure head		1
	27D/–	B.194026	Weather cover, gun package		1
	27D/–	C.200177	Weather cover, centre fuselage, port		1
	27D/–	C.200178	Weather cover, centre fuselage, starboard		1
	27D/–	C.199120	Bungs, case chutes		1
	27D/–	C.199121	Bungs, link chutes		1
MISCELLANEOUS STANDARD EQUIPMENT	4F/1714	—	Trolley, pressure cabin testing, Mk. 1C		1
	4G/4220	—	Trolley, oxygen charging, Mk. 2		1
	4F/1719	—	Trolley, radar cooling and testing		1
	4F/1685	—	Trolley, hydraulic servicing, Mk. 2		1
	4G/4221	—	Trolley, H.P. air charging, Mk. 2		1
	4F/1690	—	Trolley, electrical testing, Mk. 1A		1
	5P/2908	—	Rectifier, metal transportable, Type 37		1
	105/11	—	Adapter, for use with Type 37 rectifier		1
	4G/3966	—	Mats, main plane		2
	4G/3360	—	Hoists, Type C	Hoisting gun package	3
	4G/	—	Trunnion attachment, No. 4	Used with 4G/3360	3
	4G/4231	—	Stand, engine preparation	Avon	1
PICKETING AND CONTROL LOCKING EQUIPMENT	26FX/	B.191910	Picketing fitting, main undercarriage	Main-picketing and rearward towing from main undercarriage (embalmed aircraft only)	2
	26FX/	A.191716	Picketing fitting, nose undercarriage	Main picketing at nose wheel (embalmed aircraft only)	1
	26FX/95203	F.159908	Picketing fitting tail	Secondary picketing	1
	26FX/95205	A.176437	Shackle, picketing, main undercarriage		2
	26FX/95204	A.176434	Shackle, picketing, nose undercarriage		1
	26FX/95135	A.188483	Flying control locking gear		1
	26FX/95003	A.188133	Bracket, nose wheel undercarriage	Nose wheel change	1
	26FX/95004	F.191165	Bracket, main wheel undercarriage	Main wheel change	1
	26FX/95137	C.189263	Aileron locking plates		2
	26FX/95139	B.189267	Rudder locking plate		1
	26FX/95138	C.192836	Elevator locking gear		2
TRESTLING EQUIPMENT	4G/–	—	U.J. trestle No. 1	Component trestling	4
	4G/–	—	U.J. trestle No. 6	Component trestling wing	4
	26FX/95041	C.190878	Cradle, trestle, forward rear fuselage		1
	26FX/95042	C.190877	Cradle, trestle, aft rear fuselage		1

TABLE 1—Standard and special ground equipment—*contd.*

Subject	Stores Ref.	Part No.	Description	Application	No. off
TRESTLING EQUIPMENT—*contd.*	26FX/95018	C.189916	Cradle, trestle, forward front fuselage ...	For use with U.J. trestle No. 1 ...	1
	26FX/95019	C.189917	Beam, aft trestle centre fuselage	For use with U.J. trestle No. 1 ...	1
	26FX/95020	C.190377	Cradle, trestle, centre fuselage	For use with U.J. trestle No. 1 ...	2
	26FX/95050	B.189929	Strut, bracing, front fuselage cradle	... ...	2
	26FX/95051	B.190944	Strut, bracing rear fuselage cradle	... ...	2
	26FX/95052	A.189921	Clip, anchorage, nose wheel leg	... ...	2
	26FX/95053	A.189922	Link, nose wheel anchorage clip	... ...	1
	26FX/95234	B.199253	Strut, bracing rear fuselage	For use when removing gun package	1
	26FX/95022	D.194044	Cradle, trestling wing, inboard	... ...	2
	26FX/95023	D.194045	Cradle, trestling wing, outboard	... ...	2
SLINGING EQUIPMENT	26FX/95011	D.188575	Sling, complete aircraft and centre fuselage	... ...	1
	26FX/95134	D.194417	Sling, aircraft salvaging	For use when installing engine ...	1
	26FX/95221	D.200201	Sling, aircraft salvaging	For use when removing engine ...	1
	26FX/95015	C.189918	Sling, front fuselage	... ...	1
	26FX/95013	C.190880	Sling, rear fuselage	Less fin, rudder and tail plane ...	1
	26FX/95014	C.188900	Sling, wing	... ...	1
	26FX/95016	B.190526	Sling, tail plane, fin and rudder	... ...	1
	26FX/95036	B.177142	Lifting spigot for gun package	... ...	2
	26FX/95037	C.177141	Sling, gun package	... ...	1
	4G/4232	—	Sling, engine	Avon	1
	26FX/95040	B.189215	Sling, tail empennage	... ...	1
	26FX/95049	C.190378	Sling, centre fuselage	... ...	1

HUNTER F Mk.4 AIRCRAFT

ADVANCE INFORMATION LEAFLET No. 3/59

Insert this leaflet to face Vol.1, Sect.2, Chap.4, para.6

The following should be read in conjunction with para.6 :-

Note . . .

Where access panels are secured by screws, the use of a screw longer than the design length can cause damage to components or pipe-lines in the vicinity of the panel. To prevent this, all screws removed from panels must be replaced by screws of the same length, after the vicinity of the panel has been inspected to ensure that fouling has not already taken place.

Note (1) The information contained in this leaflet will be incorporated by normal amendment action in due course.

(2) If, after the receipt of this leaflet, an amendment list with a prior date and conflicting information is received, the information in the leaflet is to take precedence.

Special tools

3. The special tools provided for use when servicing this aircraft are given in Table 2 below:—

TABLE 2

Special tools

Stores Ref.	Part No.	Description	No. off
26FX/95058	A.191552	Extractor, main spar joint pins	1
26FX/95059	A.191655	Extractor, rear spar joint pins	1
26FX/95140	B.198963	Extractor for front spar wing joint bush	1
26FX/95141	B.198962	Extractor for rear spar wing joint bush	1
26FX/95080	B.191654	Tool for undercarriage up lock	
26FX/2726	A.195020	Adapter union for pressure gauge	1
26FX/95086	A.194464	Guide for fuel tank vent connector (also used as bung when pressure testing tanks)	2
26FX/95390	A.212332	Key for hydraulic reservoir	1
26FX/95083	A.195014	Alignment jig for gate valve	1
26FX/95087	A.194634	Spanner for Dunlop brake adjustment	1
26FX/95085	A.194578	Spanner for inverted-flight valve connection	1
26FX/95081	B.194717	Spanner for re-fuelling valve, forward	1
26FX/95082	B.194718	Spanner for re-fuelling valve, centre	1
26FX/95084	A.194729	Spanner for fuel system extension, rear fuselage ...	1
26FX/95163	A.197766	Spanner for hydraulic system	1
26FX/95165	A.197767	Spanner for hydraulic system	1
26FX/95166	A.197768	Spanner for hydraulic system	1
26FX/95164	F.199124	Spanner for hydraulic system	1

Note . . .

Special tools for gun servicing are listed in Sect. 7, Chap. 3.

Order of dismantling and assembly

4. The breakdown points for dismantling the aircraft are shown in fig. 2. The recommended order of dismantling is as follows:—

(1) Jack up the aircraft (*fig.* 4) and retract the alighting gear.

(2) Position the component trestles to fully support the aircraft.

(3) Remove the outer wings (*Sect.* 3, *Chap.* 2) after removing any external stores which may be fitted.

Note . . .

The flaps, ailerons, and universal pylons, if fitted, may be removed after the wings have been dismantled from the fuselage.

(4) Remove the rear fuselage (*Sect.* 3, *Chap.* 1).

Note . . .

The rudder, elevators and tail plane (Sect. 3, Chap. 3) may be removed before or after the rear fuselage is removed from the centre fuselage.

(5) Remove the engine (*Sect.* 4, *Chap.* 1).

(6) Remove the front fuselage (*Sect.* 3, *Chap.* 1).

(7) Remove the fuselage nose portion if necessary (*Sect.* 3, *Chap.* 1).

5. The assembly of the principal components is, in general, a direct reversal of the above procedure.

Access doors and panels

6. The positions of the access doors and removable panels are shown in fig. 3, the components to which they give access being given in the key. When handling the doors and panels, care should be taken to ensure that they are not damaged or distorted in any way. When re-fitting them, ensure that they fit flush with the surrounding surface and that they are secure and effectively locked.

Toggle fasteners

7. Certain removable panels are secured in position by toggle fasteners (*fig.* 1). To open these fasteners, the catch lever (1) marked PUSH is depressed with the forefinger, causing the hook integral with this lever to disengage from pin (2) in the toggle lever (3), withdrawing it from the housing and thus disengaging the fastener. For re-engagement, the hooks on the end of the toggle lever are engaged in the recess and the lever pressed

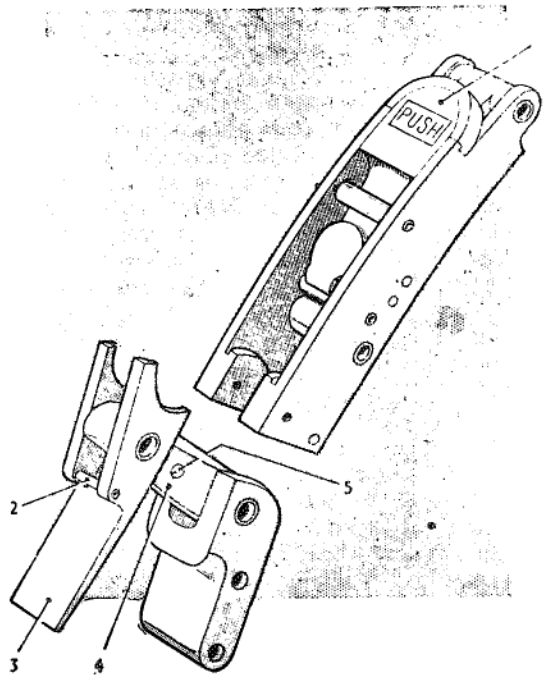


Fig. 1. Toggle fastener

home with the palm of the hand. Adjustment is accomplished by screwing up or unscrewing the links (4), after first slackening off the grub screw (5) on the side face of the links. One turn of the thread on the links gives 0·036 in. of adjustment, and the total adjustment available is 0·5 in. When adjustment is satisfactory, the grub screw must be re-tightened.

Note . . .

The grub screw must be slackened off before adjustment, as otherwise the threads will be damaged. The grub screw must be re-tightened after adjustment.

Jacking, trestling and slinging

8. The methods to be employed and the jacks, trestles and support beams, etc., to be used when jacking, trestling and slinging the complete aircraft for servicing are illustrated in fig. 4. It should be noted that the fuselage jacking pad has a concave bearing surface and must not be interchanged with the wing jacking pad which has a flat bearing surface.

Note . . .

Before lowering the aircraft off the jacks, the procedure given in Sect. 3, Chap 5, fig. 14 must be carried out. This is important.

Rigging of fixed surfaces

9. When checking the alignment of the structure by means of the diagonal dimensions given in fig. 5, there is no need to trestle the aircraft. When the incidence and dihedral are being checked, the aircraft must be trestled in the flying position, with the equipment shown in fig. 4. The procedure for rigging is as follows:—

(1) Check the alignment of the structure.
(2) Jack up the aircraft and level it transversely, by means of the levelling bar (Stores Ref. 26FX/95142) and spirit level placed across the hood rails.
(3) Place a levelling spigot (Stores Ref. 26FX/95143) into each of the levelling points attached to the fuselage structure in the port wheel bay and level the aircraft longitudinally with a straight edge and spirit level placed across these two spigots.
(4) Check the incidence and dihedral of the wings, using the gauges quoted in Table 1.

TABLE 3

Packing dimensions (fig. 2)

Component	Height (ft. in.)	Width (ft. in.)	Length (ft. in.)	Weight (lb.)
Nose piece	2 7½	2 4½	2 5½	15
Front fuselage	5 6¾	4 8½	12 7	480
Centre fuselage	5 0	10 0	16 0	1,425
Rear fuselage	6 9	4 2½	15 0	—
Tail cone	3 6½	3 2	3 6½	40
Wing	2 1	11 4	19 8	—
Rudder	5 2	8	2 0	35
Fin	6 0	7½	4 10	60
Tailplane	6½	7 11	11 10	206
Elevator	9	1 11	7 8	67½
Aileron	5	2 7	8 8	75
Flap	5	2 7	7 6	70
Wing tip	7	10½	5 4	6
Hood	1 10	2 4	4 1½	75
Gun package	3 6	3 9	3 10	315
Bullet fairing	10½	9	3 5½	5

Note . . .

Dimensions given are to the nearest quarter of an inch. The weight of a component is for a single item only.

(5) Check the incidence and dihedral of the tail plane, using the gauges quoted in Table 1.

10. The adjustment of the individual control surfaces is described in Sect. 3, Chap. 4.

Miscellaneous drain points

11. A series of small holes, extending from frame 19 (*Sect. 3, Chap. 1*) to the tail end, are provided in the undersurface of the fuselage to allow any moisture and surplus fuel which may accumulate between these frames to drain away. Surplus fuel from the high-pressure cock, combustion chambers and the exhaust unit is conducted through pipes to eject at the bottom of the fuselage adjacent to frames 34, 40A and 45 respectively. All the above drain holes should be inspected periodically to ensure that they are not blocked, otherwise an accumulation of fuel, with its resultant fire risk, may arise. Small cocks are provided at the lowest points of the fuel system, together with a drain plug in the engine fuel filter casing, to enable any water or sediment to be drained from the fuel; for their location and method of use, reference should be made to Sect. 2, Chap. 2. Moisture drain traps are also provided in the pressure head installation and these are described in Sect. 5, Chap. 2 of this publication.

Cleaning sliding hood

12. When cleaning or polishing the sliding hood, care must be taken to ensure that no rags that have been in contact with trichlorethylene are used, as rags so contaminated will cause serious damage to the surface. Refer to A.P.1464D, Vol. 1, Part 2, Sect. 5, Chap. 5, for detailed instructions on the care of transparent plastic panels.

Cleaning cockpit

13. When wiping over those portions of the cockpit instrument panels, shelves, etc., that contains labels, only clean dry rags should be used. Many of these labels will be damaged if rags impregnated with fuel, grease solvent or thinners are used.

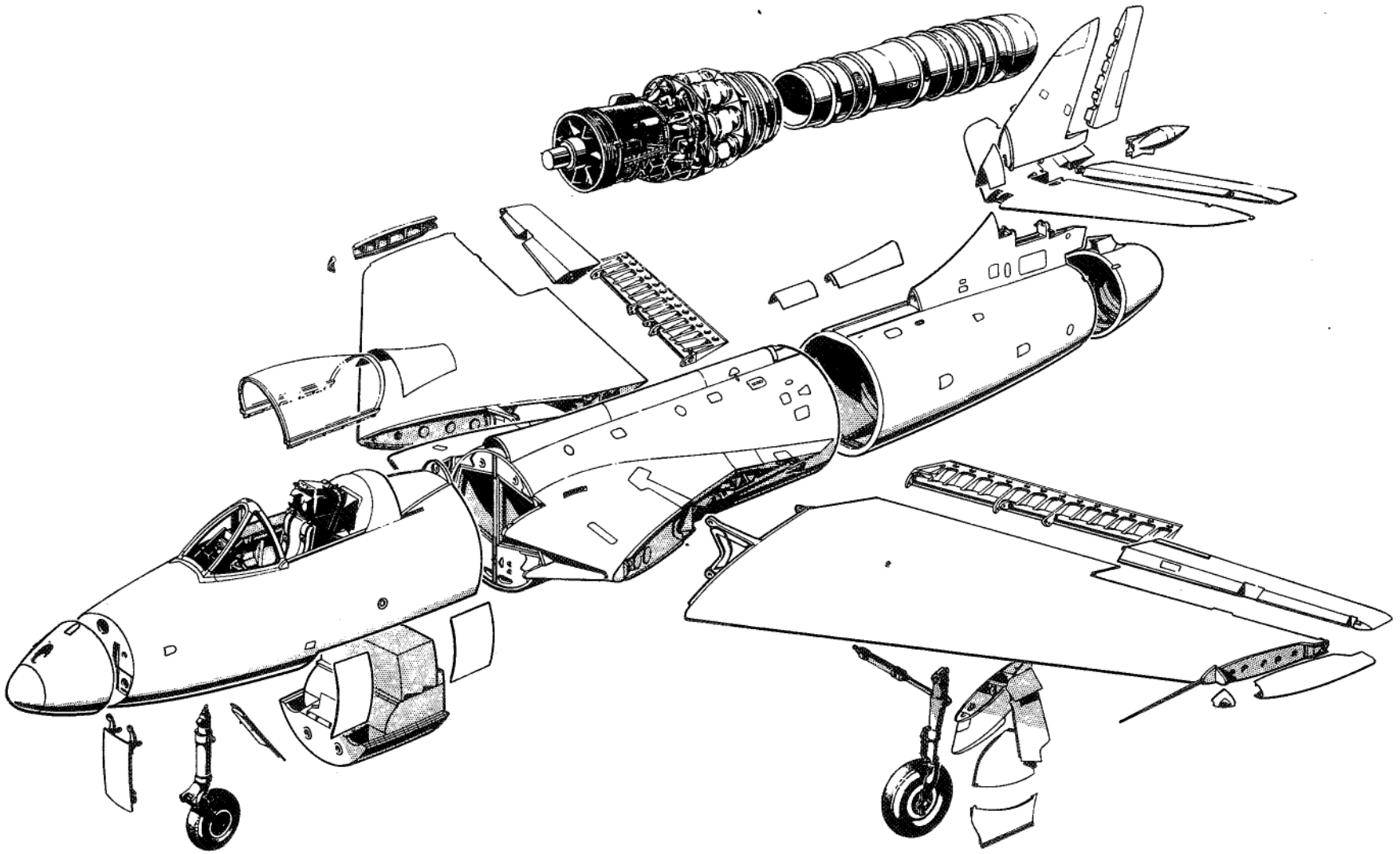
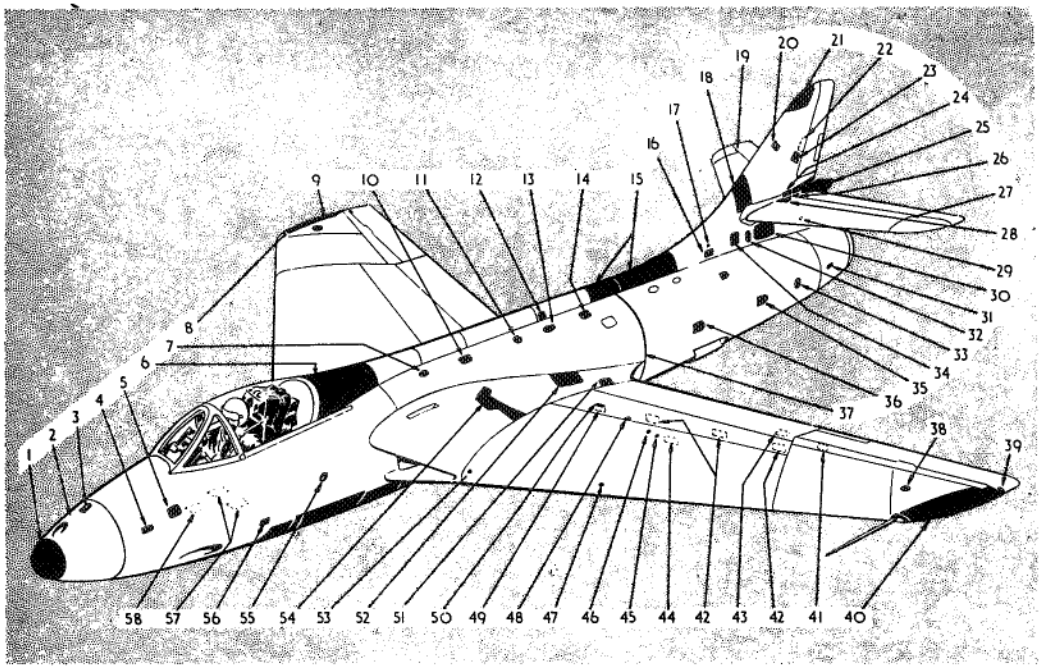


Fig. 2. Major components



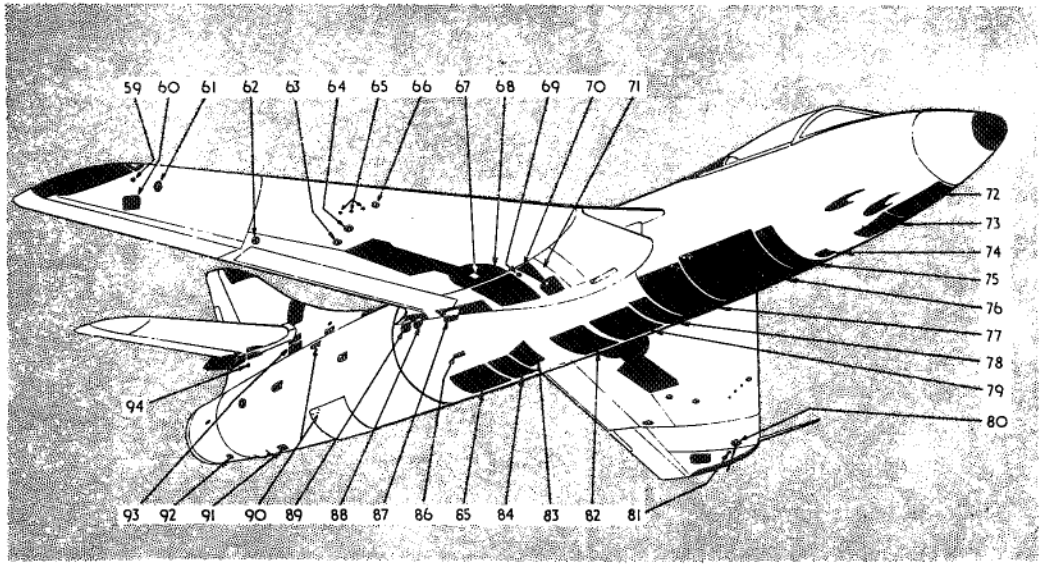
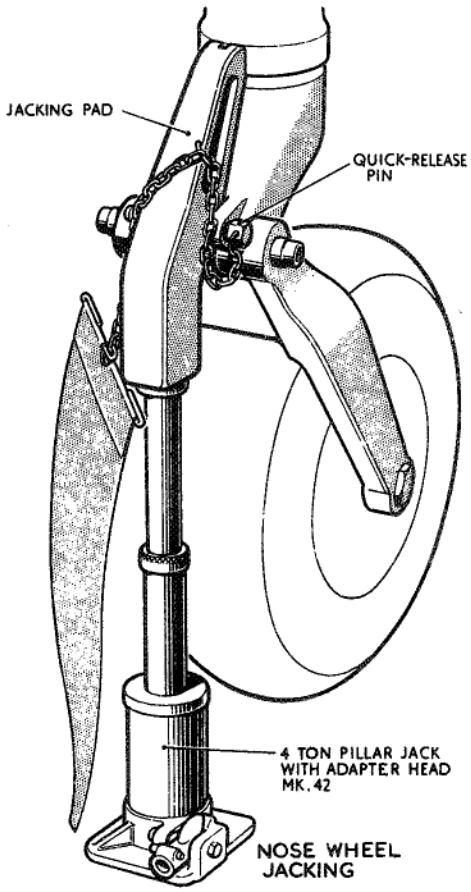


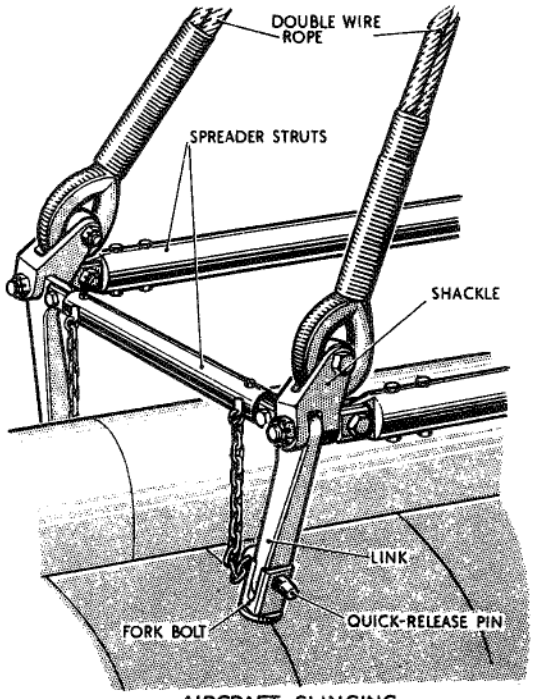
Fig. 3. Access panels

KEY TO FIG. 3 (ACCESS PANELS)

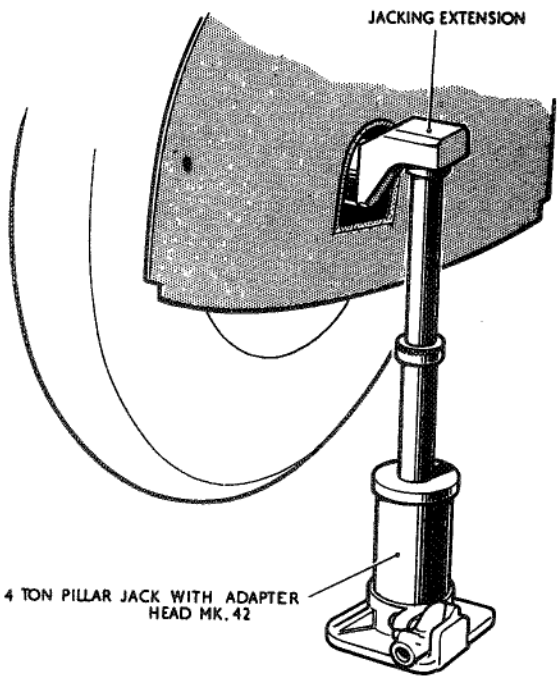
1 RADAR SCANNER
2 DETACHABLE NOSING
3 CAMERA SERVICING
4 DE-ICING TANK FILLER
5 AIRCRAFT DESTRUCTOR
6 DETACHABLE HOOD FAIRING TO FLYING CONTROLS AND CABIN PRESSURISING EQUIPMENT
7 FUEL TANK SWITCHES
8 NAVIGATION LIGHT WINDOW
9 REMOVABLE WING TIP
10 FUEL VENT CONNECTIONS
11 SUCTION RELIEF VALVES
12 DE-FUELLING PRESSURE CONNECTION
13 DUCT TO ENGINE BLEED VALVE
14 COLD AIR UNIT AND DIPSTICK
15 DETACHABLE FAIRINGS TO FLYING CONTROLS
16 FLYING CONTROLS LEVER
17 FLYING CONTROLS PIVOT BOLT
18 DETACHABLE PANEL TO FLYING CONTROLS
19 ELEVATOR OUTER HINGE
20 RUDDER CONTROLS
21 REMOVABLE TIP
22 RUDDER TRIM TAB ACTUATOR
23 RUDDER CONTROLS
24 TAILPLANE AND ELEVATOR HINGES
25 REMOVABLE BULLET FAIRING
26 ELEVATOR INNER HINGE
27 ELEVATOR OUTER HINGE
28 TAILPLANE HINGE
29 ELEVATOR LEVER
30 SELECTOR VALVE AND ELEVATOR POWER ASSISTED CONTROL
31 JET PIPE THERMOCOUPLES
32 TAILPLANE ACTUATOR
33 JET PIPE MOUNTING
34 HYDRAULIC ACCUMULATOR, PRESSURE GAUGE AND ELECTRICAL EQUIPMENT
35 GENERAL ACCESS
36 ELECTRICAL CONNECTIONS
37 TRANSPORT JOINT BUTT STRAP
38 GENERAL ACCESS
39 AILERON OUTER HINGE
40 REMOVABLE WING TIP
41 AILERON TRIM TAB ACTUATOR
42 AILERON CONTROLS
43 ELECTRICAL CONNECTIONS
44 FLAP JACK
45 FLAP JACK ANCHORAGE
46 FLAP JACK GREASER
47 PYLON CRUTCHING
48 GENERAL ACCESS
49 ELECTRICAL CONNECTIONS
50 UNDERCARRIAGE JACK ATTACHMENT BOLT
51 HYDRAULIC RESERVOIR FILLER
52 REAR SPAR PIN JOINT AND FLYING CONTROLS
53 WING PIN JOINT
54 MAIN SPAR PIN JOINT
55 EXTERNAL EMERGENCY HOOD RELEASE
56 PILOT'S FOOTSTEP
57 FLYING CONTROLS } IN COCKPIT FLOOR
58 CONTROL COLUMN MECHANISM } IN COCKPIT FLOOR
59 AILERON BOOSTER MICRO-SWITCH
60 AILERON BOOSTER UNIT
61 GENERAL ACCESS
62 FLYING CONTROLS
63 GENERAL ACCESS
64 ELECTRICAL CONNECTIONS
65 PYLON CONNECTIONS
66 GENERAL ACCESS
67 WHEEL BRAKE ADJUSTMENT
68 MAIN UNDERCARRIAGE DOOR AND FAIRING
69 GENERAL ACCESS
70 MAIN SPAR PIN JOINT
71 REFUELLING PRESSURE RELIEF VALVE (PORT ONLY)
72 NOSEWHEEL LEG FAIRING
73 NOSEWHEEL FAIRING
74 NOSEWHEEL JACK
75 GUN INSTALLATION
76 GUN PACKAGE
77 RADIO AND ELECTRICAL
78 FUEL PUMPS
79 FUEL SYSTEM
80 AERIAL MOUNTING
81 AILERON BOOSTER MICRO-SWITCH
82 ENGINE STARTER
83 GENERAL ACCESS
84 GEARBOX AND GEARBOX FILLER
85 ENGINE
86 ENGINE OIL SUMP FILLER
87 GEARBOX SHAFT COUPLING (PORT) AND ENGINE MOUNTING (PORT AND STARBOARD)
88 HYDRAULIC FILTER
89 IGNITER PLUG
90 JET PIPE THERMOCOUPLES
91 TELE-SCRAMBLE PLUG
92 GENERAL ACCESS
93 TAILPLANE ACTUATOR
94 ELEVATOR LEVER



NOSE WHEEL JACKING



AIRCRAFT SLINGING



MAIN WHEEL JACKING

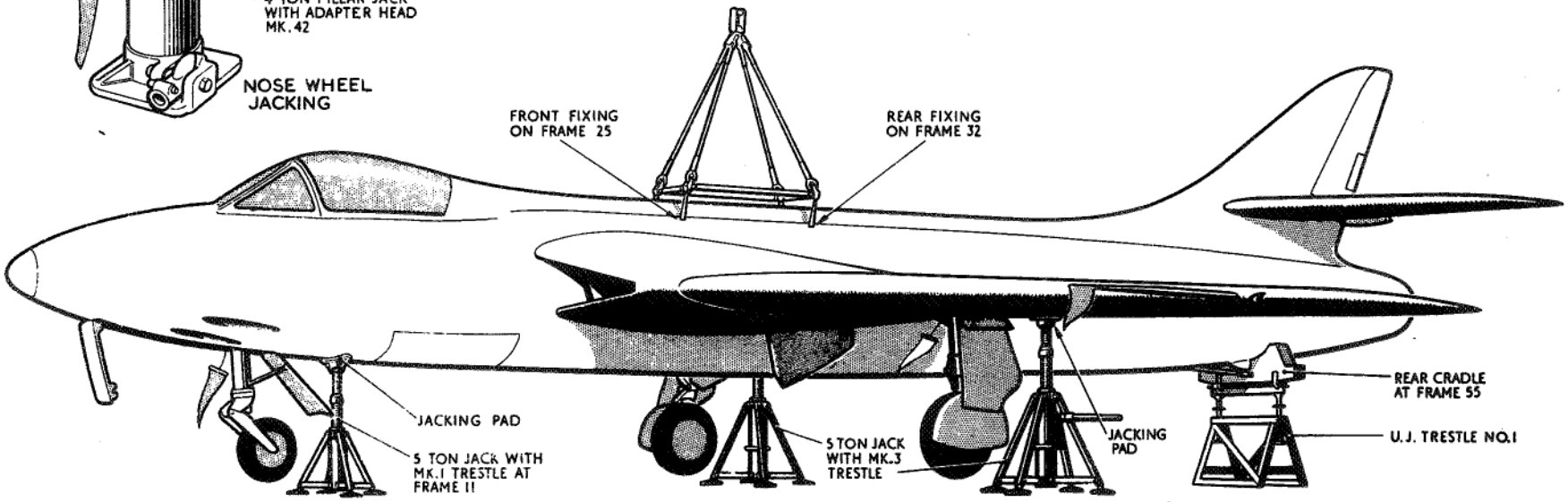


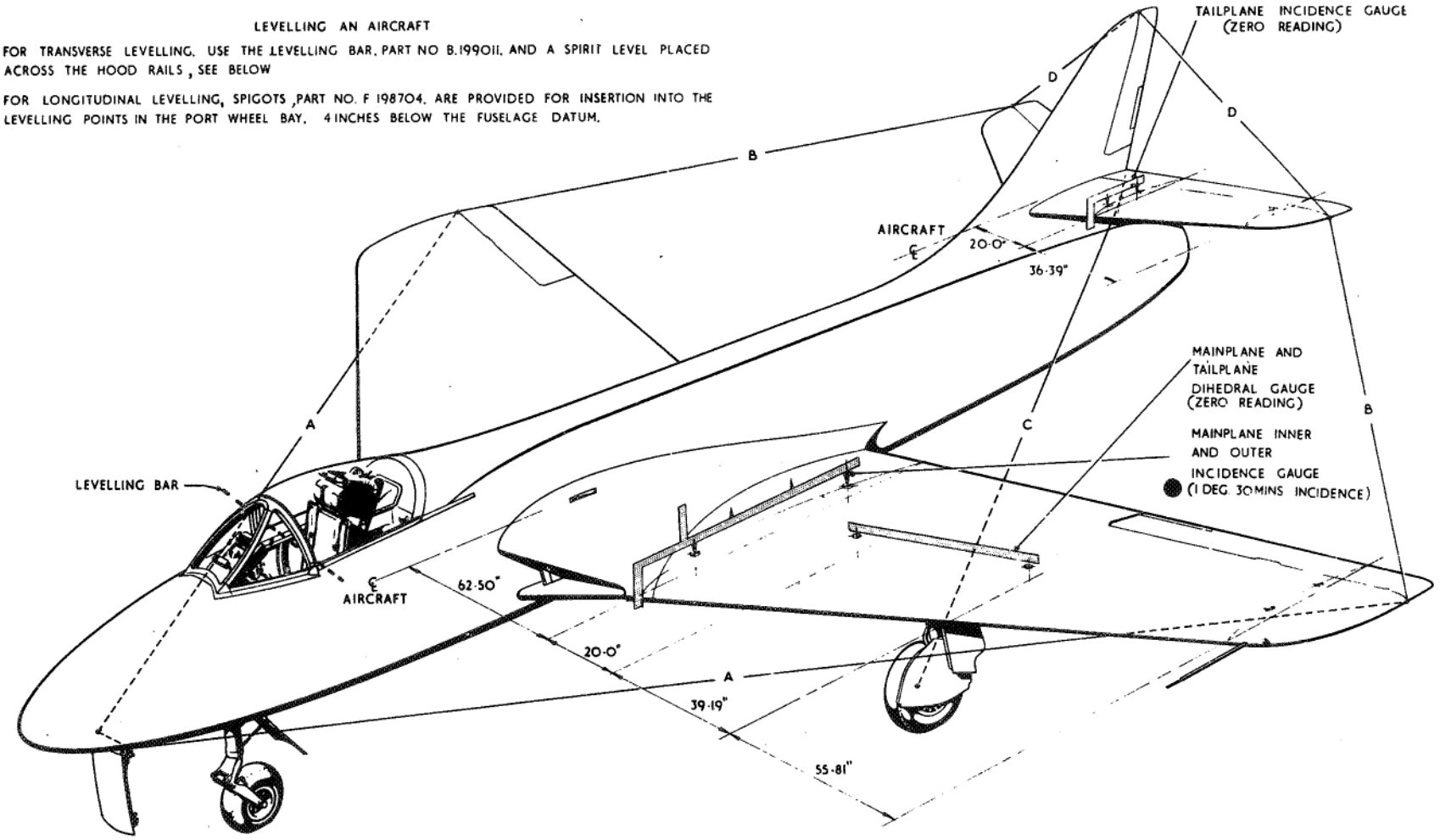
FIG. 4 JACKING, TRESTLING AND SLINGING

RESTRICTED

LEVELLING AN AIRCRAFT

FOR TRANSVERSE LEVELLING, USE THE LEVELLING BAR, PART NO B.199011, AND A SPIRIT LEVEL PLACED ACROSS THE HOOD RAILS, SEE BELOW

FOR LONGITUDINAL LEVELLING, SPIGOTS, PART NO. F 198704, ARE PROVIDED FOR INSERTION INTO THE LEVELLING POINTS IN THE PORT WHEEL BAY, 4 INCHES BELOW THE FUSELAGE DATUM.



● TOLERANCE AT WING ROOT AND TIP ± 0 DEG. 20 MIN. A COMBINATION OF A POSITIVE ERROR AT ONE WING TIP WITH A NEGATIVE ERROR AT THE OTHER MUST NOT GIVE A TWIST OF MORE THAN 0 DEG. 25 MIN.

SYMMETRY CHECK

	CHECKING POINTS	LIMITS
A	NOSE WHEEL DOOR CUT-OUT TO OUTBOARD END OF AILERON	0·50"
B	OUTBOARD END OF AILERON TO OUTBOARD END OF ELEVATOR	0·50"
C	UNDERCARRIAGE WHEEL HUB TO TRAILING EDGE OF FIN	0·50"
D	TIP OF FIN TO OUTBOARD END OF ELEVATOR	0·25"

FIG. 5 RIGGING DIAGRAM

RESTRICTED