# CHAPTER 3

## GENERAL SERVICING

### LIST OF CONTENTS

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Para.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance cradles</td>
<td>2</td>
</tr>
<tr>
<td>Safety belt</td>
<td>3</td>
</tr>
<tr>
<td>Jacking trestles</td>
<td>4</td>
</tr>
<tr>
<td>Filling jacking trestle oil reservoir</td>
<td>5</td>
</tr>
<tr>
<td>Storage of jacking trestles</td>
<td>6</td>
</tr>
<tr>
<td>Fin maintenance ladder</td>
<td>7</td>
</tr>
</tbody>
</table>

### JAPPING AND TRESTLING

Jacking for symmetry checks ... 8

### AIRFRAME

Checking symmetry ... 9
Checking aerofoils ... 10
Checking flap movement ... 11

### FLYING CONTROLS

Identification of control runs ... 12
Control surface settings ... 13
Auto-control couplings ... 14
Setting aileron ... 15
Setting aileron trimming tabs ... 16
Setting rudder and elevator trimming tabs ... 17
Tensioning rudder and elevator controls ... 19
Tensioning rudder and elevator trimming tab controls ... 20

### ENGINE INSTALLATION

Draining fuel tanks ... 21
Draining oil tanks ... 22
Oil tank filter ... 23
Hand turning gear ... 24
Fuel tanks No. 1, 2, 3, 4 and 5 ... 25
Fuel tanks No. 6, 7 and 8 ... 26
Tensioning controls ... 29

### MISCELLANEOUS

Re-setting flap gear (after manual operation) ... 30
Lubrication ... 31
Checking oil level in gearboxes ... 32
Bonding ... 33
Re-setting bomb carriage traversing gear (after manual operation) ... 34
Beaching gear wheel changing ... 35
Beaching gear removal ... 36

---

1. This Chapter describes the procedure for certain servicing operations and inspections, but does not cover all the operations that may be involved; it is intended only to implement the Inspection Schedule, Vol. II, Part 2, of this Publication. For information and servicing notes on equipment not dealt with in this Chapter, reference should be made to the relevant Air Publications, a list of which precedes the Leading Particulars. In armament publications, servicing notes are given in Vol. II and not Vol. I as for other publications. The location of inspection and servicing panels is given in fig. 1 and 2. Ground equipment available is illustrated in fig. 3.

## EQUIPMENT

### Maintenance cradles

2. For servicing engines and propellers, four cradles of tubular construction are provided...
to fit on the main plane leading edge maintenance platforms. For access to the propellers and lower cylinders, extensions to carry light-alloy platforms can be fitted to the maintenance cradles. This equipment is illustrated in fig. 4.

Safety belt
3. Personnel working on engines and propellers should fit the safety belt (stowed on the bulkhead aft of the engineer’s panel) to their person and attach the straps to eye-bolts provided on the engine cowling (fig. 4).

Jacking trestles
4. Fig. 5 illustrates one of the two hydraulic jacking trestles used for removing the beaching gear. The following should be observed when using the trestles:

(i) Warning.—Only strengthened trestles incorporating Mods. 1032 and 1152 are to be used (see note on fig. 5).

(ii) The conditions of weight must be as defined in Sect. 4, Chap. 2

(iii) The port and starboard trestles must be operated simultaneously as far as possible, to keep the aircraft on an even keel

(iv) When attaching the beaching gear, the tail trolley must be fitted first and then the main struts

(v) When detaching the beaching gear, the main struts must be removed first and then the tail trolley.

Filling jacking trestle oil reservoir
5. With the hydraulic ram in the fully down position, fill the reservoir thus:

(i) Open the tap at each end of the supply pipe

(ii) Open the release valve

(iii) Remove the vent plug from the side of the pump body

(iv) Remove the filler cap from the top of the reservoir and fill with oil, type 10HD (Stores Ref. 34A/161), until it exudes from the vent hole

(v) Replace the vent plug and then completely fill the reservoir

(vi) Replace the filler cap and screw home the release valve

The oil filter in the filler orifice can be removed for cleaning after detaching the trestle bracing member immediately above the filler cap.

Storage of jacking trestles
6. The taps in the oil pipe between the reservoir and the pump body should be closed when the trestles are in storage.

Fin maintenance ladder
7. Attachments are provided on the fin for fitting a tubular ladder to facilitate servicing operations. The method of fitting the ladder is shown in fig. 6.

JACKING AND TRESTLING

Jacking for symmetry checks
8. The method of jacking to bring the aircraft datum line horizontal for checking aerofoil settings, etc., is illustrated and described in fig. 7. In circumstances where jacking equipment is limited, the hull need not be set as shown in the fig, the alternative method is to first measure the attitude of the hull datum to the horizontal by means of straightedges placed on the datum brackets (fig. 7) and to add or subtract this angle to or from the applicable normal angles of incidence and dihedral given in fig. 9.

AIRFRAME

Checking symmetry
9. The symmetry of the main planes and tail planes about the hull can be checked by taking diagonal measurements as shown in fig. 8. The measurements should be within the limits given.

Checking aerofoils
10. The method of checking the setting and dihedral of the main planes and tail planes is illustrated in fig. 9.

Checking flap movement
11. With the flap fully “in” set an inclinometer on a straight portion of the flap, and observe the angle. Fully extend the flap and again observe the angle, setting the inclinometer in the same position as for the first reading. The difference between the two readings should be within the limits given in fig. 10. If the combined angles are outside the capacity of the inclinometer it will be necessary to use the latter on a wedge-shaped board.

FLYING CONTROLS

Identification of control runs
12. To ensure the correct rigging of control runs, identification symbols are marked on all
JACKING TRESTLE

- Movable Balance Weight
- Roller Fittings Engage in Seating Pads which fit on main plane underside
- The seating pads are normally stowed in trestle tool box

- Hydraulic Ram
- Retaining Collar
- Pump Body Centralising Adjusters
- Oil Reservoir
- Gauge Rod to Determine Permissible Ram Extension
- Operating Handle
- Release Valve
- Handwheel

- JACKING POST
- TRACKING WHEELS can be fitted to upper section for handling purposes
- STOWED POSITION OF DRAW-BAR

- Important
- Only trestles with the following mods. embodied are to be used:
  MOD.1032 - Addition of strengthening plate.
  MOD.1152 - Underslung Balance-weight beam.

- SEE DETAIL A
- SEE DETAIL B
- SEE DETAIL C

FIG. 5
CHAPTER 2

HANDLING AND PREPARATION FOR FLIGHT

LIST OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>PARA.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight limits</td>
<td>2</td>
</tr>
<tr>
<td>Beaching gear</td>
<td>3</td>
</tr>
<tr>
<td>Towing and side tracking</td>
<td>4</td>
</tr>
<tr>
<td>Filling fuel tanks</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>5</td>
</tr>
<tr>
<td>Using the fuel pump in the A.P.U.</td>
<td>6</td>
</tr>
<tr>
<td>Using the hand re-fuelling connection on the A.P.U.</td>
<td>7</td>
</tr>
<tr>
<td>Using the fillers in the top of the tanks</td>
<td>8</td>
</tr>
<tr>
<td>Filling A.P.U. tank</td>
<td>9</td>
</tr>
<tr>
<td>Oil tanks</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>10</td>
</tr>
<tr>
<td>Filling tanks</td>
<td>11</td>
</tr>
<tr>
<td>Filling A.P.U. engine-amp and gearbox</td>
<td>13</td>
</tr>
<tr>
<td>Bomb loading</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>14</td>
</tr>
<tr>
<td>Moisture drain cocks</td>
<td>15</td>
</tr>
<tr>
<td>Bilging hull</td>
<td>16</td>
</tr>
<tr>
<td>Bilging wing-tip floats</td>
<td>17</td>
</tr>
<tr>
<td>Flying controls locking gear</td>
<td>18</td>
</tr>
<tr>
<td>Awnings and covers</td>
<td>19</td>
</tr>
<tr>
<td>Picketing</td>
<td>20</td>
</tr>
</tbody>
</table>

LIST OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Illustration</th>
<th>FIG.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaching gear main strut</td>
<td>1</td>
</tr>
<tr>
<td>Beaching gear tail trolley</td>
<td>2</td>
</tr>
<tr>
<td>Beaching (1)</td>
<td>3</td>
</tr>
<tr>
<td>Beaching (2)</td>
<td>4</td>
</tr>
<tr>
<td>Towing</td>
<td>5</td>
</tr>
<tr>
<td>Side tracking</td>
<td>6</td>
</tr>
<tr>
<td>Bomb loading</td>
<td>7</td>
</tr>
<tr>
<td>Moisture drain controls (starboard)</td>
<td>8</td>
</tr>
<tr>
<td>Moisture drain controls (port)</td>
<td>9</td>
</tr>
<tr>
<td>Bilging</td>
<td>10</td>
</tr>
<tr>
<td>Flying controls locking gear</td>
<td>11</td>
</tr>
<tr>
<td>Awnings and covers</td>
<td>12</td>
</tr>
<tr>
<td>Picketing</td>
<td>13</td>
</tr>
</tbody>
</table>
*Picketing                             |      |

1. This chapter gives information on handling the aircraft on the ground or in the water and on preparing it for flight. Equipment for handling and servicing is listed in the appropriate M leaflet of Vol. II, Part 1. Special gear and tools are included in the Schedule of Spare Parts, Vol. III of this publication.

Weight limits

2. When using the beaching gear or jacking trestles (the latter are dealt with in Sect. 4, Chap. 3) the following are the limiting conditions of the weight:
   (i) There must be no bombs on board.
   (ii) There must be no personal effects on board.
   (iii) Fuel must not exceed 1,100 gall.
   (iv) Personnel should be limited to one, but if it is essential that more than one person be on board, the quantity of fuel allowed in sub-para. (iii) must be reduced accordingly, i.e. 25 gall. per person.

Beaching gear

3. For beaching, the aircraft is supported amidships by two main struts, positioned under the main-plane front spar trusses and at the aft end of the planing bottom by a tail trolley. Fig. 1 and 2 illustrate the main struts and the tail trolley, respectively, and fig. 3 and 4 the method of attaching the gear to the aircraft.

Towing and side tracking

4. The aircraft should be towed to the slipway by means of a cable shackled to the eye at the rear step. This cable can then be used to haul the aircraft up the slipway, steering by the tail trolley when necessary. Fig. 5 and 6 illustrate the method of towing and side tracking, respectively, when on land.
Filling fuel tanks

General
5. The fuel system is described and illustrated in Sect. 8. For the specification of fuel to be used, reference should be made to the Leading Particulars. The individual tank cocks and the inter-engine balance cocks are operated from the engineer's station, while the inter-system balance cocks at the wing-roots are operated direct. The tanks can be filled by any one of the three methods described below, depending upon the equipment available. Access to the auxiliary power unit is described in Sect. 11.

Using the fuel pump in the A.P.U.
6. (i) Remove the cap from the inlet side of the fuel pump and connect up the supply pipe from the tanker.

(ii) Open the inter-engine balance cocks and ensure that the inter-system balance cocks are closed; open the isolating valve(s) on the A.P.U.

(iii) Open No. 1 tank cock(s) and commence filling, checking the contents periodically by means of the fuel gauges of the tanker.

(iv) Proceed as above for the other tanks, opening each cock just before closing the preceding tank cock. When the last tank is full, close the isolating valves on the A.P.U. and immediately afterwards disengage the drive to the pump.

(v) Stop the A.P.U., disconnect the tanker, and replace the cap on the inlet connection of the A.P.U.

Using the hand re-fuelling connection on the A.P.U.
7. This connection is fitted between the non-return valve in the fuel pump outlet, and the isolating valves. The cocks should be operated as in para. 6.

Using the fillers in the top of the tanks
8. The combined spanner and filler extension (Stores Ref. 26AL/6904) is required; this is stowed in the tool locker in the aft compartment and a fuel funnel is stowed in the full roof at the centre-section.

(i) Remove the small cover plate from the tank lid (see Chap. 3, fig. 1). Each cover is held by a central screw.

(ii) Unscrew the filler cap and fit the filler extension. Fill the tank, checking from the contents gauge and the tanker.

Filling A.P.U. tank
9. The tank for the A.P.U. can be filled through the standard filler in the tank, or from the main fuel system by means of the starboard carburettor priming pump, an additional cock being fitted for the purpose.

Oil tanks
General
10. The oil system is described and illustrated in Sect. 8. For the specification of the oil to be used, refer to the Leading Particulars.

Filling tanks
11. The filler-cap key (Stores Ref. 26AL/51188) is stowed in the tool locker in the aft compartment. Two covers in the top of each nacelle give access to the filler cap and circulating chamber respectively; the latter should not be used for filling purposes.

Note . . . When filling a tank after a new engine has been installed, or the oil system has been drained, ensure that there is oil at the oil pump before the engine is started. The oil feed connection on the rear cover of the engine should be slackened off until oil exudes from this end of the pipe; the connection should then be tightened up and re-locked.

12. For the hydromatic propellers, an additional one gallon per tank should be added over and above the amount of oil calculated for a given range.

Filling A.P.U. engine-summer and gearbox
13. The sump filler and breather are located on the top of the engine, and the gearbox filler is on the rear of the crankcase.

Bomb loading
General
14. Bomb hoisting is effected by manually-operated winches fitted in the bomb carriages (Sect. 11). Reference should be made to Sect. 3, which deals with the manual operation of the traversing gear and the loading of stores to the carriages. The carriers employed are Universal type EM/EF—No. 1, Mk. I, and No. 2, Mk. I or Mk. III. They are used to carry the stores set out below:—

(i) No. 1 carrier:—
(a) One 8½ lb. practice bomb, Mk. I, smoke.
(b) One 10 lb. practice bomb, Mk. III, flash.
(c) One 10 lb. practice bomb, Mk. I, smoke.
(d) One 11½ lb. practice bomb, Mk. I, smoke.
(e) One 11½ lb. practice bomb, Mk. I, flash.
(f) One 100 lb. A.S.
(g) One 100 lb. smoke, Mk. I or Mk. II.
(h) One 250 lb. A.S., G.P., S.A.P., or B., Mk. III.
(i) One 250 lb. depth charge, Mk. XI.
(j) One 250 lb. small bomb container, Mk. IA.
(l) One supply dropping apparatus.
(ii) No. 2 carrier.—In addition to those for the No. 1 carrier the following stores can be carried:
(m) One 500 lb. A.S., G.P., S.A.P.
(n) One 600 lb. A.S.
(iii) Mk. III carrier.—This will carry any of the stores set out for the No. 1 and the No. 2 carriers.

Bomb loading is described and illustrated in fig. 7.

Moisture drain cocks
15. A moisture drain pipe and cock is fitted to each fuel tank sump (see fig. 8 and 9). The cocks for No. 1 and No. 6 tanks are operated from the hull centre-section but the remainder are remotely controlled by cables from the maintenance platforms. All controls are spring-loaded to the OFF position.

Bilging hull
16. The A.P.U. can be employed to remove bilge water from the watertight compartments in the planing bottom by means of a flexible hose (see fig. 10). The hose, stowed on the starboard side of the bomb compartments rear bulkhead, connects to a twin filter unit below the upper deck at the starboard side of the galley. Provision is also made for hand bilging with a portable bilge pump which is stowed at the starboard side of the bomb compartment. The discharge hose fits a connection on the starboard side.

Bilging wing-tip floats
17. Bilge water can be removed from the floats by means of the hand pump (see fig. 10). Pipes from the watertight compartments are carried up through the float struts to connections in the main-plane upper surface.

Flying controls locking gear
18. When the aircraft is moored, the controls should be locked, with the ailerons and rudder normal and the elevators down. The locking gear (see fig. 11) consists of a handle with six projecting pins. To lock the controls, the handle is fitted into the sockets situated in the floor forward of the radio bulkhead to engage eye-links interposed in the control runs. A tube, fitted to the handle extends forward into the first pilot's seat, access to the latter being impossible until the gear is removed. The gear is stowed at the starboard side of the cockpit floor.

Awnings and covers
19. Fig. 12 illustrates and references the awnings for the hull roof, covers for the coupe, engines, propeller spinners, pressure head and gun turrets.

Note . . . The roof awnings are supplied to special order only.

Picketing
20. (This para. to be issued later.)
**PREPARATION OF AIRCRAFT**

1. Fit ring bolt, and attach block and tackle.
2. Insert fixing pin, and secure with reversible nut.
3. Screw up knurled cap against undersurface of the main plane (hand-tight).
4. Screw out the attachment lugs to their fullest extent.

**PREPARATION OF CHASSIS**

5. Remove transport castor wheel.
6. Float chassis to aircraft and manoeuvre it alongside with strut inclined forward as shown, remove footstep temporarily.

**ATTACHMENT OF MAIN STRUTS**

7. Couple block and tackle to ring on strut.
8. Hoist to vertical position.
10. Insert bottom and top fixing pins, using footstep for access to latter.
11. Attach outrigger strut.
12. Remove block and tackle.
1. Ensure that locking pins are in position with the wheels fore-and-aft.

2. Float the trolley to the aircraft and manoeuvre it under the rear step so that the hook attachment fittings can be engaged in the eyes in the hull.

3. Turn hand screws clockwise to secure trolley.

**Fig. 4**

**Beaching (2)**
TOWING

TO STROP ROUND STARBOARD MAIN STRUT

ENSURE THAT THE WHEELS OF THE MAIN STRUTS AND THE TAIL TROLLEY ARE LOCKED IN POSITION.

TOWING GEAR COMPLETE - STORES REF 286/58685
LOADING STORES INTO HULL.

i. Open the thermal trip switches - for this on panel 1 C and for the starboard motor.

**WARNING.**

Failure to carry out the above operation will result in the carriages moving to the release position.

ii. Lower the bomb doors by pressing the release plunger on the E.M. unit having elastic cords from pulleys at ends of beam carriage outboard so that the outer adapter clears the hull side. The position should be reached from inside the hull.

iii. Load the outer adapter beam (see sect. 3) carriage out so that the inner adapter is in the hull side and load in a similar manner.

iv. Move the carriage to the stowed position by moving the platform (A) directly below.

v. Remove the clamps (B) from the storage place the crutches (C) in position to support stores being loaded.

vi. Lower the stores into the crutches and the carriers. Replace the clamps and tighten screws until the former register firmly in place.

vii. Hoist the adapter beams to the carriage and the hinged platform.

Repeat the foregoing operations to load stores on the other side of the hull.

**WARNING.**

When the stowage cradles have been loaded the carriages can also be loaded as already returned to the stowed positions, and then closed. Close the thermal trip switches.

LOADING STORES TO CARIAGUES.

Ensure that before closing the thermal trip switches the carriages are in the stowed position and doors closed and secured.
FIG 8  MOISTURE DRAIN CONTROLS (STBD) FIG 8
FIG 9 MOISTURE DRAIN CONTROLS (PORT) FIG 9
SECTION 2

EMERGENCY CONTROLS, EQUIPMENT AND EXITS

LIST OF CONTENTS

CONTROLS
Isolation of engines ........ 2
Fuel jettisoning .......... 3
Propeller feathering ...... 4
Manual operation of flaps .. 5
Manual operation of bomb carriage ... 6
Bomb jettisoning .......... 7

EQUIPMENT
Fire extinguisher systems ... 8
Hand fire extinguishers ... 9
Signal pistol ............ 10
Distress signals .......... 11
First-aid outfits ......... 12
Crash axe ................ 13
Radio demolition .......... 14
Aircraft demolition ....... 15
Dinghies ................ 16
Leak stopping ............ 18
Lighting ................ 19

EXITS
Location and operation ... 20

LIST OF ILLUSTRATIONS

Emergency controls, equipment and exits ........................ 1
Fuel jettison system ............................................. 2
Fire extinguisher systems ................................. 3

1. This Section describes the emergency controls, equipment and exits (see fig. 1) and the methods of use. For additional information, reference should be made to the List of Associated Air Publications which precedes the Leading Particulars. Emergency drills are given in the Pilots’ Notes and certain Air Diagrams.

AIR PUBLICATION 4100A
September, 1946
V0ume 1

CONTROLS

Isolation of engines
2. To isolate any engine quickly, pull back to off the appropriate CARBURETTOR COCK control lever in the cockpit roof (see Sect. 1).

Fuel jettisoning
3. Fuel can be jettisoned from No. 1 tanks only, port and starboard. Fig. 2 illustrates the system and gives the method of operation.

Propeller feathering
4. The feathering buttons are fitted at the lower centre of the pilots' instrument panel. To feather:—

Press the appropriate button(s), then immediately close the throttle(s), and if necessary cut off fuel and switch off ignition.

Manual operation of flaps
5. If the electrical system fails, the flaps can be operated manually as follows:—

(i) Disengage the motor by pulling the knurled barrel (on the port shaft) away from the gearbox and rotating the top of the barrel aft.

(ii) Fit the operating handle (stowed on the starboard side near the gearbox) on the squared shaft provided, and turn as required; e.g., clockwise to wind the flaps IN.

Manual operation of bomb carriage
6. If the electrical system fails, the bomb carriages can be traversed manually in the following manner:—

(i) Disengage the motor by setting the clutch lever on the gearbox to DISENGAGED.

(ii) Fit the winding handle (stowed on the starboard side nearby) to the square-ended shaft at the top of the gearbox and wind anti-clockwise to move the carriage out.
Bomb jettisoning
7. When a mixed load of bombs and containers is carried, the containers should be jettisoned first, by closing the type-H switch fitted beside the selector switchbox. The main bomb load can be jettisoned by pressing the switch at the forward end of the selector switchbox (see Sect. 1).

**EQUIPMENT**

**Fire extinguisher systems**
8. Fig. 3 illustrates the Graviner systems fitted in the port inner engine nacelle which is typical of all four engines. When any one of the four fire warning lamps on the pilots' instrument panel lights, and it is required to feather the propeller, press the appropriate button. If it is not required to feather the propeller, bottles 1, 2 and 3 can be discharged simultaneously by pressing the extinguisher switches; they are also discharged automatically, on a crash landing, by an impact switch fitted on the port side of the rear bulkhead in the galley. The No. 4 bottle (carburettor air intake) is operated automatically by either of two thermostatic switches fitted in the intake. A lamp on the engineer's panel indicates when the No. 4 bottle at any one of the four engines has been operated, and remains on until the relay switch, controlling the lamp, is reset (see Sect. 3).

**Hand fire extinguishers**
9. The positions of the hand fire extinguishers are shown in fig. 1.

**Signal pistol**
10. The pistol is stowed at the top of the 2nd pilot's seat, and the firing sleeve is fitted in the roof just aft of the 1st pilot's seat (fig. 1). Cartridges are provided as follows:

(i) 20 signal and 8 illuminating, stowed on the back of the 2nd pilot's seat.

(ii) 2 illuminating, stowed on the starboard side of the cockpit.

**Distress signals**
11. Three distress signals are stowed—two at the starboard side just aft of the rear entrance door, and one high up on the port side at the wireless operator's station.

**First-aid outfits**
12. Three first-aid outfits are stowed on the port side of the hull opposite the engineer's station.

**Crash axe**
13. This is stowed in the roof at the front spar frame, just aft of the wireless operator's station.

**Radio demolition**
14. Provision is made for the demolition of A.R.L.5025/A. Two push switches, which must be operated together, are fitted under a spring-loaded cover, on a panel at the port side of the cockpit. The system is also operated automatically, upon a heavy or crash landing, by an inertia switch fitted on the starboard side above the upper deck aft of the centre-section.

**Aircraft demolition**
15. Two incendiary bombs are stowed high up on the port side at the wireless operator's station.

**Dinghies**
16. On early aircraft, a "J" type dinghy is carried in a blow-out stowage near the trailing edge of the starboard wing, and a "D" type dinghy, emergency packs, and a projectible kite for a dinghy radio are stowed on the starboard side aft of the rear entrance door. Oars, foot bellows, and radio for the "D" type dinghy are stowed on the port side opposite. The "J" type dinghy can be released, either electrically from a switch on the 1st pilot's electrical panel, or manually by cable from a hand grip fitted in the roof at the starboard side of the hatch forward of the centre section. The handgrip is also accessible from outside after removing a transparent cover.

17. On later aircraft a "J" type dinghy is fitted in each wing. The starboard dinghy carries a type 7 pack and a T.3180 oscillator, the port dinghy carries a type 7 and type 4 pack and a radio transmitter with aerial kites. The release handgrips are fitted one on each side of the hatch in the hull roof, and the release switches are fitted on the 1st pilot's electrical panel, together with a test socket.

**Leak stopping**
18. A box of hull leak stoppers is stowed below the floor at the rear entrance door. Should the hull be badly holed, the output of the A.P.U. bilge pump can be increased by removing the pin and sealing wire from the engine control quadrant and moving the control lever to the FULL position.
Lighting

19. The cockpit emergency lamp on the instrument panel screen (see Sect. 1) is controlled from a switch at the port side of the panel. Current is supplied by a 2.4 volt accumulator stowed at the port side forward of the pilots' instrument panel.

EXITS

Location and operation

20. Fig. 1 gives the location of the emergency exits which are opened as follows:—

(i) Front and rear entrance doors, opening inwards.
   Release three clamps and door latch.

(ii) Drogue hatches, hinged at the top, opening inwards.
    Release two catches.

(iii) Beam gunners' hatches, hinged at the top, opening inwards.
     Release two catches.

(iv) Tail gunner's hatch, hinged at the bottom, opening inwards.
     Operate central release bar.

(v) Engineer's hatch, opening inwards.
    Release four clamps.
FIG. 2  FUEL JETTISON SYSTEM

DETAIL A

NO. 1 TANK (PORT)

TURNBUCKLES

TO OPEN

HANDLES FOR LOWERING EXTENSION PIPES - LOCATED AT AFT SIDE OF REAR SPAR-FRAME

DETAIL B

OUTLET PIPE IN RETRACTED POSITION

CHAIN GUARD

SPRING-LOADED GUARD

LEVER CONTROLLING PORT VALVE COUPLED TO UPPER SPROCKET

LEVER CONTROLLING STARBOARD VALVE COUPLED TO LOWER SPROCKET

CABLE PASSES THROUGH HOLE IN BOTTOM OF CENTRE GROOVE, THEN THROUGH WEB OF DRUM

NOTE

TELESCOPIC EXTENSIONS MUST BE LOWERED BEFORE OPERATING THE CONTROL LEVERS IN THE COCKPIT

JETTISON VALVE IN OPEN POSITION

OUTLET PIPE IN EXTENDED POSITION

TO OPEN

TO OPEN
A) FLAME SWITCHES (FOUR) ON FORWARD FACE OF FIREWALL
B) AIR PIPE CONNECTION FOR CLEANING PURPOSES
C) FLAME SWITCHES (FIVE) IN NOSE OF NACELLE
D) THERMOSTATIC SWITCHES IN AIR INTAKE
E) NOZZLE IN CARBURET TOR AIR INTAKE
F) NOZZLE IN BASE OF CARBURET TOR
G) DISCHARGE INDICATOR

IDENTIFICATION NUMBERS OF THE BOTTLES ARE MARKED ON THE AIRFRAME BESIDE MOUNTINGS.

1 — TO NOZZLE AT BASE OF CARBURET OR
2 — TO REAR SPRAY RING
3 — TO FRONT SPRAY RING
4 — TO NOZZLE IN CARBURET OR AIR INTAKE

FIG. 3 FIRE EXTINGUISHER SYSTEMS
CHAPTER 3

GENERAL SERVICING

LIST OF CONTENTS

EQUIPMENT
- Maintenance cradles ........................................ 2
- Safety belt ..................................................... 3
- Jacking trestles .............................................. 4
- Filling jacking trestle oil reservoir ....................... 5
- Storage of jacking trestles ................................ 6
- Fin maintenance ladder .................................... 7

JACKING AND TRESTLING
- Jacking for symmetry checks ............................... 8

AIRFRAME
- Checking symmetry ........................................... 9
- Checking aerofoils .......................................... 10
- Checking flap movement .................................... 11

FLYING CONTROLS
- Identification of control runs ............................ 12
- Control surface settings ..................................... 13
- Auto-control couplings ...................................... 14
- Setting aileron ............................................... 15
- Setting aileron trimming tabs .............................. 16
- Setting rudder and elevator trimming tabs .............. 17
- Tensioning rudder and elevator controls ................ 19
- Tensioning rudder and elevator trimming tab controls 20

ENGINE INSTALLATION
- Draining fuel tanks ......................................... 21
- Draining oil tanks ........................................... 22
- Oil tank filter ................................................ 23
- Hand turning gear ........................................... 24
- Fuel tanks No. 1, 2, 3, 4 and 5 ........................... 25
- Fuel tanks No. 6, 7 and 8 .................................. 26
- Tensioning controls ......................................... 29

MISCELLANEOUS
- Re-setting flap gear (after manual operation) ........ 30
- Lubrication .................................................... 31
- Checking oil level in gearboxes ............................ 32
- Bonding ....................................................... 33
- Re-setting bomb carriage traversing gear (after manual operation) 34
- Beaching gear wheel changing ............................. 35
- Beaching gear removal ..................................... 36

LIST OF ILLUSTRATIONS

- Servicing panels (1) ........................................ 1
- Servicing panels (2) ........................................ 2
- Servicing equipment ........................................ 3
- Maintenance cradles ....................................... 4
- Jacking trestle .............................................. 5
- Fin maintenance ladder (To be issued later) ............ 6
- Rigging position ............................................. 7
- Checking symmetry ......................................... 8
- Checking aerofoils (To be issued later) ................ 9
- Control surface ranges ..................................... 10
- Auto-control couplings ..................................... 11
- Vent valve (Tanks No. 1, 2 and 3) ....................... 12
- Vent valve (Tanks No. 4 and 5) ........................... 13
- Vent valve (Tanks No. 6, 7 and 8) ....................... 14
- Tank sumps (1) .............................................. 15
- Tank sumps (2) .............................................. 16
- Re-setting flap gear ......................................... 17
- Lubrication points (1) ...................................... 18
- Lubrication points (2) ...................................... 19
- Beaching gear wheel changing ............................ 20
- Beaching gear removal ..................................... 21

1. This Chapter describes the procedure for certain servicing operations and inspections, but does not cover all the operations that may be involved; it is intended only to implement the Inspection Schedule, Vol. II, Part 2, of this Publication. For information and servicing notes on equipment not dealt with in this Chapter, reference should be made to the relevant Air Publications, a list of which precedes the Leading Particulars. In armament publications, servicing notes are given in Vol. II and not Vol. I as for other publications. The location of inspection and servicing panels is given in fig. 1 and 2. Ground equipment available is illustrated in fig. 3.

EQUIPMENT

Maintenance cradles
2. For servicing engines and propellers, four cradles of tubular construction are provided
to fit on the main plane leading edge maintenance platforms. For access to the propellers and lower cylinders, extensions to carry light-alloy platforms can be fitted to the maintenance cradles. This equipment is illustrated in fig. 4.

**Safety belt**

3. Personnel working on engines and propellers should fit the safety belt (stowed on the bulkhead aft of the engineer's panel) to their person and attach the straps to eye-bolts provided on the engine cowling (fig. 4).

**Jacking trestles**

4. Fig. 5 illustrates one of the two hydraulic jacking trestles used for removing the beaching gear. The following should be observed when using the trestles:

   (i) The conditions of weight must be as defined in Sect. 4, Chap. 2
   (ii) The port and starboard trestles must be operated simultaneously as far as possible, to keep the aircraft on an even keel
   (iii) When attaching the beaching gear, the tail trolley must be fitted first and then the main struts
   (iv) When detaching the beaching gear, the main struts must be removed first and then the tail trolley.

**Filling jacking trestle oil reservoir**

5. With the hydraulic rams in the fully down position, fill the reservoir thus:

   (i) Open the tap at each end of the supply pipe
   (ii) Open the release valve
   (iii) Remove the vent plug from the side of the pump body
   (iv) Remove the filler cap from the top of the reservoir and fill with oil, type 10HD (Stores Ref. 34A/161), until it exudes from the vent hole
   (v) Replace the vent plug and then completely fill the reservoir
   (vi) Replace the filler cap and screw home the release valve

The oil filter in the filler orifice can be removed for cleaning after detaching the trestle bracing member immediately above the filler cap.

**Storage of jacking trestles**

6. The taps in the oil pipe between the reservoir and the pump body should be closed when the trestles are in storage.

**Fin maintenance ladder**

7. Attachments are provided on the fin for fitting a tubular ladder to facilitate servicing operations. The method of fitting the ladder is shown in fig. 6.

**JACKING AND TRESTLING**

**Jacking for symmetry checks**

8. The method of jacking to bring the aircraft datum line horizontal for checking aerofoil settings, etc., is illustrated and described in fig. 7. In circumstances where jacking equipment is limited, the hull need not be set as shown in the fig, the alternative method is to first measure the attitude of the hull datum to the horizontal by means of straightedges placed on the datum brackets (fig. 7) and to add or subtract this angle to or from the applicable normal angles of incidence and dihedral given in fig. 9.

**AIRFRAME**

**Checking symmetry**

9. The symmetry of the main planes and tail planes about the hull can be checked by taking diagonal measurements as shown in fig. 8. The measurements should be within the limits given.

**Checking aerofoils**

10. The method of checking the setting and dihedral of the main planes and tail planes is illustrated in fig. 9.

**Checking flap movement**

11. With the flap fully "in" set an inclinometer on a straight portion of the flap, and observe the angle. Fully extend the flap and again observe the angle, setting the inclinometer in the same position as for the first reading. The difference between the two readings should be within the limits given in fig. 10. If the combined angles are outside the capacity of the inclinometer it will be necessary to use the latter on a wedge-shaped board.

**FLYING CONTROLS**

**Identification of control runs**

12. To ensure the correct rigging of control runs, identification symbols are marked on all...
levers and adjacent to all pulleys and sprockets, the following code being used:—
- Aileron control A.1 and A.2
- Elevator control E.1 and E.2
- Rudder control R.1 and R.2
- Elevator tab control ET.1 and ET.2
- Rudder tab control RT.1 and RT.2

**Control surface settings**

13. The settings and range of movement of the flying control surfaces are given in fig. 10. Notes on setting the controls and the automatic controls in conjunction with them are given in the following paragraphs. With the control locking handle in position (Sect. 4, Chap. 2) the control surfaces are in the neutral position.

**Auto-control couplings**

14. The stops on the servo motors must always come into operation before the main stops. Adjustment to the flying controls should be made aft of the main stops if possible, but if adjustment has been made fore of the main stops it should be checked that the coupling of the automatic controls to the main controls has not been disturbed (fig. 11). If the coupling has been altered, it should be re-set by slackening one adjuster and tensioning the other.

**Setting aileron**

15. The method of setting the aileron is as follows:—

(i) Move the main plane flap out one complete turn of the hand winding gear.

(ii) With the control locking handle in position, adjust the aileron control runs so that the trailing edge of the aileron, at the inboard end rib, is \( \frac{1}{2} \) in. above the upper surface of the flap.

(iii) Return the flap to the “in” position.

**Setting aileron trimming tabs**

16. The trimming tabs are set at flight trials and should normally need no further adjustment. For the first test flight after fitting an aileron or ailerons, the trimming tabs of both ailerons should be set in the neutral position. If the test flight shows that the aircraft is flying one wing low, the inner tab on the wing should be set upwards an arbitrary amount; after further trials the setting should be increased or decreased as necessary until level flight is obtained.

**WARNING**

In no circumstances is downward droop permissible.

After the original setting, the inner tabs should not be altered (unless an aileron is changed), all incidental trimming being carried out with the outer tabs.

**Setting rudder and elevator trimming tabs**

17. The settings of these tabs are individual for each aircraft and are recorded in the log book, to which reference should be made. Provided the elevator or rudder has not been changed, the following is the method of checking and setting the tabs. The same instructions also apply when fitting a new tab:—

(i) Set the appropriate indicator in the cockpit to zero

(ii) Measure the angle of the tab

**Note . . .** An alternative method of checking the setting is to wind the control handle until the tab is in line with the control surface and then take the indicator reading.

(iii) If the setting angle thus found is different from that given in the log book (it should not be unless the adjustment of the tab push-rod has been disturbed), adjust the tab push-rod until the correct angle is obtained.

18. Before attempting to set the tabs when a new rudder or elevator has been fitted, it should first be checked that, when the indicators in the cockpit are set to zero, the control runs are rigged so that the tab actuating worm gear is in the mid-position. The tab should then be set to the “old” angle given in the log book, by adjusting the push-rod, and the aircraft flown under the following conditions:—

(i) All-up weight ... 53,000 to 57,000 lb.

(ii) C.G. position ... 2\( \frac{1}{2} \) in. to 5 in. forward of datum

(iii) Altitude ... ... 500 to 5,000 ft.

(iv) Engine speed ... ... 2,000 r.p.m.

(v) Boost pressure ... ... zero

Ensure that the engines are synchronised, trim the aircraft to straight and level flight (feet of rudder pedals), and note the readings on the tab position indicators. Each reading will be the difference between the “old” and the required “new” setting angle, and should be added to or subtracted from the “old” angle, dependent on the conditions.
found during flight. If this “new” setting angle is outside the limits given in fig. 10, the rigging of the rudder or elevator should be checked and, if necessary, a new rudder or elevator fitted and the test repeated. The tab should then be set to the resultant “new” angle, and the angle recorded in the log book.

**Tensioning rudder and elevator controls**

19. Adjustment is provided in the fork joints at the ends of each tie-rod in the circuits. If available, an S.M.E.-type tension meter (Stores Ref. 1.C/6136) should be used for checking the tension of the controls and should be applied to the cable inset in the runs in the hull roof just forward of the tail unit. The correct tension for these controls is 70 lb., and the tension-meter should be run backwards and forwards a few times along the cable before use to ensure a correct reading. When tensioning the controls they should be locked in the neutral position by the locking gear (Sect. 4, Chap. 2) and checks made to ensure that the control surface settings are not disturbed.

**Tensioning rudder and elevator trimming tab controls**

20. Turnbuckles are provided in each of the main runs and an adjuster is fitted in each of the closed circuits driving the elevator-tab actuating gearboxes. For the position of these adjusters, see illustration in Sect. 7, Chap. 4.

---

**ENGINE INSTALLATION**

**Draining fuel tanks**

21. The A.P.U. can be utilised to drain the tanks individually by connecting a hose from a stand pipe, placed in the tank filler, to the suction side of the A.P.U. fuel pump and connecting another hose from the hand-refuelling connection on the A.P.U. to a receptacle. Care should be taken to ensure that the refuelling valves are closed before operating the pump. If it is necessary to completely drain a tank, use can be made of the moisture drain cock (Sect. 4, Chap. 2) for fuel remaining in the sump.

**Draining oil tanks**

22. A hose connector is fitted to each sump and a hole is provided in the nacelle undersurface through which to pass a length of hose. Access to the tank sump can be obtained by removing the panel in the main-plane upper surface, just aft of the nacelle. The oil is released by slackening the nut of the hose connector.

**Oil tank filter**

23. After removing the screw cap from the circulating chamber, withdraw the dipstick. The filter, attached to a centre tube, can then be withdrawn through the top of the chamber.

**Hand turning gear**

24. An engine can be turned manually while servicing by a handle which can be fitted through the nacelle skin to engage with a stub shaft on the starter motor. This shaft is located on the upper starboard side of each nacelle and the handle (two of which are stowed on the radio bulkhead) has a loose bearing plate which attaches to the nacelle by two thumbscrews.

**Fuel tanks No. 1, 2, 3, 4 and 5**

25. Fig. 12 and 13 illustrate the dismantling of the vent valve for the replacement of damaged components, and fig. 15 illustrates and gives the necessary instructions for the removal of the sump for filter cleaning.

**Fuel tanks No. 6, 7 and 8**

26. When carrying out an inspection of the tanks they should be drained (para. 21) and the sump area inspected through the filler above. If water has polluted the fuel, a yellow sludge and also some free chromates will be found in the region of the sump. These need not be removed as their presence is beneficial rather than otherwise.

27. The areas round the sump fixing studs should be closely examined, and, if corrosion is found, the tank must be removed from the main plane, the inspection cover and contents gauge unit removed, and a detailed internal inspection carried out. Any corrosion found should be dealt with as described in Vol. II, Part 3, of this Publication. It is important that only zinc-coated iron wire be used for locking components, since the use of tin-coated copper wire induces corrosion.

28. The chromate cartridges in the tank sump should be examined, and where the bags have lost more than 50 per cent of their contents (this can be estimated visually) they must be replaced. To ensure that the cartridges are wetted by any moisture present in the fuel, they should be dipped in distilled water before fitting, surplus water being removed by shaking. A special spanner (fig. 16) is required for removing the inhibitor from tank No. 6. Fig. 14 illustrates the dismantling of the vent valve for replacement of damaged components.
Tensioning controls

29. Adjustment is provided in the throttle and propeller controls by the fork joints at
the ends of each tie-rod. When tensioning control runs the throttle control levers should
be in the E.C.B. position, and the propeller control levers in the DECREASE R.P.M. position.
The positions of turnbuckles in the following control runs are given in the relevant illustra-
tions of Sect. 8:—

(i) Tank cock controls
(ii) Carburettor cock controls
(iii) Slow-running cut-out controls
(iv) Oil cooler louvre controls

MISCELLANEOUS

Re-setting flap gear (after manual operation)

30. To re-engage the motor, the spring-
loaded knurled barrel close to the gearbox
should be operated as shown in fig. 17.

Lubrication

31. Lubrication points and the positions of
all gearboxes are given in fig. 18 and 19. The
following special points should be noted:—

(i) All sprockets are fitted with sealed
bearings packed with grease during assembly
and do not require further lubrication

(ii) Control pulleys of the fabric-reinforced
bakelite type and those of the Tufnol type do
not need lubrication

(iii) For access to lubrication points in
the main plane and tail unit, reference should
be made to fig. 1 and 2

Checking oil level in gearboxes

32. The gearboxes for the flap motor and
bomb hoisting winches are replenished by
filling level with the filler plugs. The flap
worm-drive gearboxes and the bomb-carriage
traversing gearboxes are replenished by filling
to the level plugs.

Bonding

33. For servicing notes on bonding, reference
should be made to Sect. 6.

Re-setting bomb carriage traversing gear
(after manual operation)

34. Re-engage the motor by setting the clutch
lever on the gearbox to the ENGAGED position.
Remove and stow the winding handle.

Beaching gear wheel changing

35. Fig. 20 illustrates and gives the necessary
operating instructions for jacking the main
struts and the tail trolley for the removal
of the wheels.

Beaching gear removal

36. Fig. 21 illustrates and describes the method
of jacking the aircraft for the removal of the
main struts and the tail trolley.
JACKING TRESTLE

ROLLER FITTINGS ENGAGE ON SEATING PADS
WHICH FIT ON MAIN PLANE UNDERSURFACE.

* THE SEATING PADS ARE USUALLY
STOWED IN TRESTLE TOOL BOX

HYDRAULIC RAM

RETAINING COLLAR

PUMP BODY CENTRALISING ADJUSTERS

OIL RESERVOIR

GAGE ROD TO DETERMINE
PERMISSIBLE RAM EXTENSION

OPERATING HANDLE

RELEASE VALVE/HANDWHEEL

SEE DETAIL 'A'

SEE DETAIL 'B'

JACKING POST

TRACKING WHEELS CAN BE FITTED
TO UPPER SECTION FOR
HANDLING PURPOSES

STOWED POSITION OF DRAW-BAR

TOOL BOX

SEE DETAIL 'C'

WHEEL LOCKING CATCH

DRAW-BAR

C C JacIc FOR INITIAL LIFTING
AND LEVELLING OFF
Rigging Position

1. Operate jack to raise trailer a further 6/4 in and extend jacks.
2. Position trailer jacks on 8 in. jack blocks (Jircles Ref. 76/7023).
3. Operate jack to raise trailer 6/4 in.
4. Air bags of struts (see Detail D) and extend jacks to take load.
5. Screw down jack and replace in block by 1 in. block (Jircles Ref. 76/7023).
6. Operate jack to raise trailer a further 6/4 in and extend jacks.

The aircraft should then be in the correct rigging position.

This can be checked by a straight-edge & level used on the hull drain brackets, and the jack and jacks should be adjusted if necessary.
FIG. 8  CHECKING SYMMETRY
CLINOMETER

STRAIGHT EDGE

DIHEDRAL $0^\circ-30^\circ$ measured along top front spar boom (15%/ord.)

DATUM MARKS ON TOP SURFACE OF AEROFOIL

REAR SPAR BOOM

FRONT SPAR BOOM

15 3/4 APPROX.

25 3/4 APPROX.

INCIDENCE BOARDS

TOP OF INCIDENCE BOARD LEVEL WITH AIRCRAFT BASE LINE HORIZONTAL

INCIDENCE BOARDS

INCIDENCE BOARDS

INCIDENCE BOARDS

AIRCRAFT BASE LINE HORIZONTAL

ALONG UPPER SURFACE

TOP OF STRAIGHT EDGE LEVEL WITH AIRCRAFT BASE LINE HORIZONTAL

MAIN PLANE SETTING $5^\circ \pm 15'$

TAIL PLANE INCIDENCE $4^\circ \pm 15'$

INCIDENCE BOARDS

MAIN PLANE

TAIL PLANE

<table>
<thead>
<tr>
<th>INCIDENCE BOARDS</th>
<th>MAIN PLANE</th>
<th>TAIL PLANE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PART NO</td>
<td>STORES REF.</td>
</tr>
<tr>
<td>PORT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INBOARD</td>
<td>525 A 29102</td>
<td>26 AL / 14534</td>
</tr>
<tr>
<td>OUTBOARD</td>
<td>29100</td>
<td>/14533</td>
</tr>
<tr>
<td>STBD.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INBOARD</td>
<td>29103</td>
<td>/14535</td>
</tr>
<tr>
<td>OUTBOARD</td>
<td>29101</td>
<td>/14532</td>
</tr>
</tbody>
</table>

WIRE PIN CENTRES

<table>
<thead>
<tr>
<th>WIRE</th>
<th>PIN CENTRES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7' - 6 9/32</td>
</tr>
<tr>
<td>B</td>
<td>7' - 11 1/8</td>
</tr>
<tr>
<td>C</td>
<td>8' - 1 3/2</td>
</tr>
<tr>
<td>D</td>
<td>8' - 11 15/32</td>
</tr>
<tr>
<td>E</td>
<td>8' - 6 15/16</td>
</tr>
<tr>
<td>F</td>
<td>9' - 5 1/16</td>
</tr>
</tbody>
</table>

FIG. 9 CHECKING AEROFOILS
FIG. 11  AUTO-CONTROL COUPLINGS  FIG. 11

CHAIN LENGTHS EQUAL ON EACH SIDE WITH SERVO-MOTOR IN MID-STROKE POSITION.

NEUTRAL POSITION WITH DATUM LINE HORIZONTAL

ELEVATOR SERVO-MOTOR

AILERON SERVO-MOTOR

RUDDER LOCKING UNIT (SECT. 7, CHAP. 4, FIG. 5)

VIEW IN DIRECTION OF ARROW "A"

TENSION ADJUSTERS EQUALISED WITH SERVO-MOTOR IN MID-STROKE POSITION.

-------- CHAIN
--------- TIE-ROD
FIG 12 VENT VALVE (TANKS Nº 1, 2 & 3)
When fitting a new spring (A) or adjusting screw (B), the latter should be adjusted so that the valve (C) lifts at 1-1/2 lbs. ID

**FIG. 13 VENT VALVE (TANKS NO. 4 & 5) **
FIG. 14 VENT VALVE (TANKS NO 6,7 & 8)

- ADJUSTING SCREW: STORES REF 26AL/21139
- LOCK NUT: STORES REF 28M/5670
- NUTS: STORES REF 28M/5675
- COVER: PT NO P7/150
- SPRING HOUSING: STORES REF 26AL/21137
- SPRING: STORES REF 26AL/20227
- BOLT: STORES REF 28D/7041
- VALVE: STORES REF 26AL/21141
- PLUG: STORES REF 26AL/21138
- NUT: (SIMMONDS) STORES REF 28M/5857
- FLOAT VALVE: STORES REF 26AL/21142
- FLOAT: STORES REF 26AL/21136
- GUIDE TUBE: STORES REF 26AL/21140
- RIVETS: A.C.S.500/F8
- SPRING: C
- ADJUSTING SCREW: A
- VALVE: B
- RIVETS: 28Q/7141
- LANGITE WASHER
- BOLT: STORES REF 28D/5633
- VALVE BODY: PT NO P7/142

When fitting a new spring (C) or adjusting screw (A), the latter should be adjusted so that the valve (B) lifts at 1-1/2 lbs. O"
PORT TANK NO 3 SUMP SHOWN — OPERATIONS TYPICAL FOR TANKS NO 1-5

1. REMOVE ACCESS COVER
2. DISCONNECT DRAIN PIPE
3. SLACKEN OFF NEAREST TURNBUCKLE IN DRAIN COCK AND FUEL FEED COCK CONTROL RUNS
4. DISCONNECT CABLES FROM OPERATING LEVERS
5. DISCONNECT FUEL FEED PIPE
6. REMOVE RETAINING NUTS FROM SUMP

FIG. 15

TANK SUMPS(1)
MAIN STRUT

1. Position jacks, one on each side of the axle.

2. Place the lifting beam on jacks and position so that seating on beam is directly under spherical projection on strut.

3. Operate jacks to raise strut to required height.

4. Remove bolts and wheel retaining collar.

TAIL TROLLEY

(a) With one tyre flat

5. Place jacks and lifting beam under trolley strut, and position as for the main strut (see 2 above).

6. Operate jacks to required height and remove bolts and wheel retaining collar.

(b) With two tyres flat on same axle

7. Place a jack under the central jacking post and raise trolley about 2 inches.

8. Place jacks and lifting beam in position (see 2) and proceed as above.
Figure 21

Beaching Gear Removal

1. Bolt the jacking pads (stowed in trestle tool box) to main plane undersurface (see detail A).
2. Balance pivoted beam by adjustment of movable weight.
3. Wheel trestles into position so that rollers on beam are directly below pads on main plane.
4. Screw up tracking wheels so that trestles rest on adjustable feet (see detail B).
5. Operate screw jacks at base to raise and level off (see detail B).
6. Operate pump handle to raise ram, ensuring that rollers on beam enter pads on main plane. Raise ram to just take the load off beaching gear main struts.
7. Attach block and tackle to ring bolt in main plane and couple to ring on strut. Take up slack in chain.
8. Remove outrigger and top and bottom fixing pins. Ease strut away from hull and lower to ground.
9. Swing gauge rod into position (see detail C) and operate jack to raise aircraft to the required height.

Note: The ram has reached the maximum permissible extension when the gauge rod just fits beneath the shoulder of the top fork.

10. Insert the safety pins into lowest holes in ram and screw up retaining collar until it touches the pins (see detail C).

Warning: The retaining collar should never be raised to fully expose the red line above the top casting.

11. Position jacking post beneath socket at aft end of beam and operate upper jack until ball end enters socket. Insert locking pin and screw down lock nut (see detail C).
12. Operate lower jack until the load is just felt.

Jacking trestle ram may now be lowered gradually until tail of aircraft is clear of tail trolley.
SECTION I
PILOTS' CONTROLS AND EQUIPMENT

LIST OF CONTENTS

Entry to cockpit .................................................. 3  
Coupé ................................................................. 4  
Pilots' seats .......................................................... 5  
Accommodation ...................................................... 6  
Flight engineer's controls, etc. ................................. 7

LIST OF ILLUSTRATIONS

Aircraft controls and instruments ............................... 1  
Equipment ............................................................. 2  
Pilot's electrical panel ............................................. 3

1. This Section is a general guide to the location of all controls, equipment and instruments in the cockpit. The method of operating controls is described where this is not obvious. The main systems are fully covered in other Sections.

2. To assist identification, the items on the key pages of the illustrations are grouped under various headings. The groups are arranged in alphabetical order.

Entry to cockpit

3. This is by the front entrance door and the stairway in the bow compartment.

Coupé

4. A sliding window is provided on each side of the coupé and adjustable wind deflectors are fitted.

Pilots' seats

5. Both seats can be adjusted vertically by a lever on the outboard side of the seat, the locking catch is released by pressing the plunger in the end of the lever. Safety belts are fitted to the seats. Armour plate shields are fitted on the back of the 1st pilot's seat and at the top of the seat support structure, in addition armour plate shields are fitted just forward of the instrument panel.

Accommodation

6. Bunks are provided, one on each side of the wardroom, and a removable table with folding leaves is fitted in the centre of the compartment.

Flight engineer's controls, etc.

7. The following controls and instruments are under the supervision of the engineer and full information is given in Sect. 3:—

(i) Ground/flight switch
(ii) Engine and fuel system priming
(iii) Carburettor air intake shutters
(iv) Cowling gills
(v) Booster coils
(vi) Cylinder temperature gauges
(vii) Tank cocks
(viii) Fuel contents gauges
(ix) Fuel flowmeters
(x) Fuel pressure warning lamps
(xi) Oil temperature gauges
(xii) Oil pressure gauges
(xiii) Oil cooler shutters
(xiv) Vacuum system cocks
(xv) Aerofoil de-icing
(xvi) Propeller de-icing
FLYING INSTRUMENTS

2. Fuel Pressure Indicator—Lights up when position indicator is in.
3. Fuel Pressure Switch—Switch on to obtain reading on indicator (if)
4. Fuel Pressure Lamp—Remains on for long as fields are more than.

FLYING CONTROLS


EMERGENCY CONTROLS

23. Turn Indicator.
22. Altimeter.
13. Limit Indicator Lamps.
7. Fuel Indicating Lamp—Lights up when position indicator is in.
6. Fuel Indicating Switch—Switch on to obtain reading on indicator (if)
5. Fuel Indicating Lamp—Remains on as long as fields are more than.

ENGINE CONTROLS

24. Fuel Pressure Indicator—Lights up when position indicator is in.
3. Fuel Pressure Switch—Switch on to obtain reading on indicator (if)
4. Fuel Pressure Lamp—Remains on as long as fields are more than.

EMERGENCY CONTROLS

24. Fuel Pressure Indicator—Lights up when position indicator is in.
3. Fuel Pressure Switch—Switch on to obtain reading on indicator (if)
4. Fuel Pressure Lamp—Remains on as long as fields are more than.

ENGINE CONTROLS

24. Fuel Pressure Indicator—Lights up when position indicator is in.
3. Fuel Pressure Switch—Switch on to obtain reading on indicator (if)
4. Fuel Pressure Lamp—Remains on as long as fields are more than.

EMERGENCY CONTROLS

24. Fuel Pressure Indicator—Lights up when position indicator is in.
3. Fuel Pressure Switch—Switch on to obtain reading on indicator (if)
4. Fuel Pressure Lamp—Remains on as long as fields are more than.

ENGINE CONTROLS

24. Fuel Pressure Indicator—Lights up when position indicator is in.
3. Fuel Pressure Switch—Switch on to obtain reading on indicator (if)
4. Fuel Pressure Lamp—Remains on as long as fields are more than.
PILOT'S ELECTRICAL PANEL

AP41003 VOL. 1 SECT.
KEY TO FIG. 3

1. Terminal block
2. Bomb trolley position lamps
3. Bomb fuse switch—reel
4. Bomb fuse switch—fuse
5. Bomb trolley control switch
6. W/T demolition switches
7. Pilot head lighting switch
8. Panel lamp dimmer switch
10. Flare release push-button

11. Panel lamp
12. On-off switch. "D" (A.R. 1.5025A)
13. Visual indicator dimmer switch
14. Windscreen wiper control switch
15. "F" type display release switch and tests socket
16. 1/C switch
17. W/T control panel switch
18. Junction switch
19. Call light receiver unit
20. Bomb selector switchbox, type H
FIG. 1

GENERAL ARRANGEMENT

FUEL TANKS