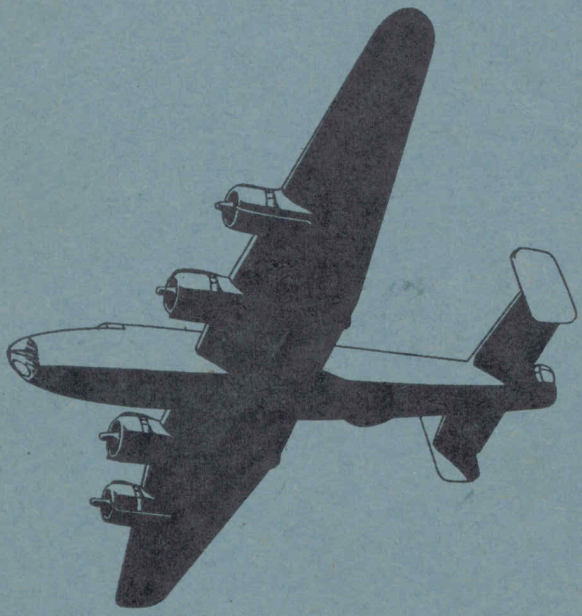
A.P. 1719F—P.N.

PILOT'S NOTES

FOR

HALIFAX B VI

FOUR HERCULES 100 ENGINES



PREPARED BY DIRECTION OF THE MINISTER OF SUPPLY

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PROMULGATED BY ORDER OF THE AIR COUNCIL

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AMENDMENTS

Amendment lists will be issued as necessary and will be gummed for affixing to the inside back cover of these notes.

Each amendment list will, where applicable, be accompanied by gummed slips for sticking in the appropriate places in the text.

Incorporation of an amendment list must be certified by inserting date of incorporation and initials below.

A.L. NO.	INITIALS	DATE	A.L. NO.	INITIALS	DATE
1	D.F.T.	25/1H/44.	7		
2	M.P.	7/6/47.	8		
3	M.P.	22/3/48	9		
4			10		
5			11		
6			12		

NOTES TO USERS

THIS publication is divided into five parts: Descriptive, Handling, Operating Data, Emergencies, and Illustrations. Part I gives only a brief description of the controls with which the pilot should be acquainted.

These Notes are complementary to A.P. 2095 Pilot's Notes General and assume a thorough knowledge of its contents. All pilots should be in possession of a copy of A.P. 2095 (*see* A.M.O. A93/43).

Words in capital letters indicate the actual markings on the controls concerned.

Additional copies may be obtained by the Station publications officer by application on Form 294A, in duplicate, to Command headquarters for onward transmission to A.P.F.S., 81 Fulham Road, S.W.3 (*see* A.M.O. A1114/44). The number of this publication must be quoted in full—A.P. 1719F—P.N.

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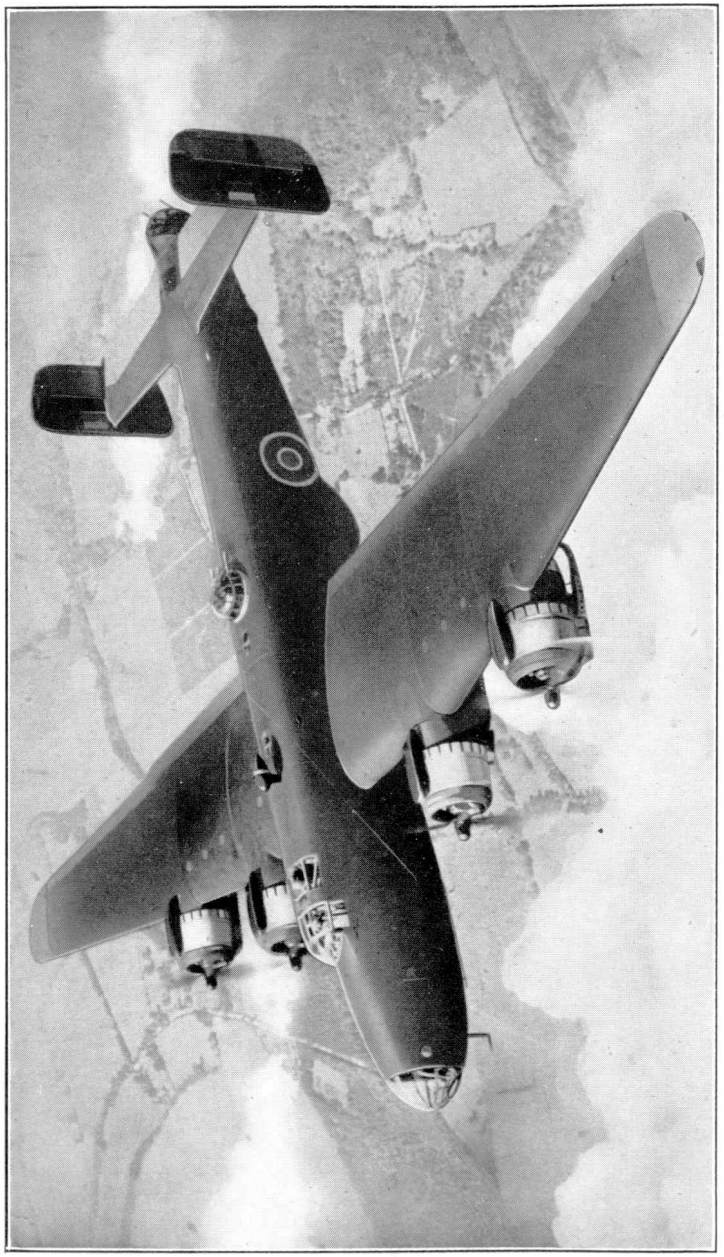


HALIFAX B VI

HALIFAX B MK. VI

LIST OF CONTENTS

PART I—DESCRIPTIVE

PART I

DESCRIPTIVE

INTRODUCTION

The Halifax B Mk. VI is a heavy bomber and the Halifax Met. VI is the meteorological version of the same aircraft. They are powered by four Hercules 100 engines driving De Havilland hydromatic three-blade fully feathering propellers.

FUEL AND OIL SYSTEMS

1. **Fuel tanks** (see page 5)

Fuel is carried in fourteen self-sealing permanent tanks, seven in each wing. These seven tanks are connected in two groups of three, one group feeding each engine ; the remaining tank being used as a replenishing tank for either of the two groups.

The capacities are :

Inboard group (Tanks 1, 3 and 4)	...	497 gal.
Outboard group (Tanks 5, 6 and 7)	...	448 gal.
Replenishment tank (Tank 2) ...	...	150 gal.
Total (each wing)	...	1,095 gal.
Total (both wings)	...	2,190 gal.

Provision is made for fitting three self-sealing, 230-gallon, long-range tanks in the fuselage bomb bay. A nitrogen fire protection system for all tanks is installed ; nitrogen being fed into the tanks automatically as fuel is used, so that no inflammable petrol-air mixture is present in the tanks. The control valve is on the port side of the fuselage at the rest station and must be opened before any petrol is used.

With Mod. 1099 incorporated the fuselage tanks can be jettisoned, either one at a time or all together, by means of the bomb release controls—see paras. 29, 58, and 59.

2. **Fuel cocks**

(i) The layout of tanks and cocks is symmetrical about the centre line of the aircraft and the system in each wing should be operated independently with the main cross-feed cock on the aft face of the rear spar kept closed. Each group of tanks is controlled by one ON-OFF cock ; a cross-feed cock is fitted in the gallery pipe between the inner and outer groups and when this crossfeed cock is closed the inboard group of tanks feeds the inner engine and the outboard group the outer engine. Controls (71) and (72) for all these cocks are provided at the flight engineer's station.

(ii) Three-way cocks are provided at the rear of the front spar to select the group of tanks into which the fuel is to be transferred from the replenishment tanks. These cocks are also used when transferring fuel from the bomb-bay tanks. The arrangement of the non-return valves is such that when both cocks are open (either group can be selected) the fuel will be transferred to both wings simultaneously from the long-range, bomb-bay tanks whereas fuel can only be transferred from the replenishment tanks (No. 2) into a group in the same wing.

(iii) Four carburettor cut-out cocks are mounted at the forward end of the flight engineer's station and are marked CUT-OFF and NORMAL. They should be kept in the CUT-OFF position at all times when the engines are not running.

(iv) Four master engine fuel cocks are mounted on the bulkhead aft of the pilot and accessible to his right hand. The cocks are moved to the " on " position by pushing the levers up.

3. **Electric pumps**

(i) Each group of tanks is provided with an electric booster pump. A by-pass valve on each pump limits the pressure in the feed pipe to 10 lb./sq. in., returning to the tank the excess fuel being pumped. The by-pass valve also allows fuel to be drawn direct to the fuel injector carburettor if the electric pump is not working.

(ii) Electric transfer pumps are provided in each replenishment tank and each long-range tank and are used to transfer fuel to a selected group or groups of tanks.

(iii) Switches (54), (66), (68), for all pumps are mounted at the bottom of the flight engineer's panel, together with the ground testing equipment (62), (65), (69).

4. **Fuel contents gauges**

The fuel contents of all wing tanks are registered on gauges (55), one for each tank, on the flight engineer's panel, but as described in para. 1, tanks 1, 3 and 4 can only be used as one unit and tanks 5, 6 and 7 as another, since no provision is made for isolating separate tanks. The actual feed lines to the engines are taken from tanks 3 and 5 so that the gauges for these tanks will indicate the last remaining fuel. An ON-OFF switch (56) is provided adjacent to the gauges. The long-range tanks are fitted with direct reading contents gauges visible through the bomb-bay hatches in the fuselage floor.

5. **Fuel pressure warning lights**

(i) Four fuel pressure warning lights (61) are mounted on the flight engineer's panel and indicate low fuel pressure at the carburettors.

(ii) A fuel pressure warning light (63) for each replenishment tank and one (51) for the three long-range tanks are mounted on the lower portion of the flight engineer's panel. These lights come on when a tank is empty and the relevant pump should then be switched off.

6. **Priming**

A handpump for induction priming is mounted on a bracket on the left-hand side of the fuselage at the flight engineer's station, the feed being taken from Tank 1 in the port wing for all engines. Provision is made for the use of high volatility fuel to facilitate starting in cold weather; the cock and connection is adjacent to the priming pump. There is no handpump for priming the carburettor and this must be done by operating the booster pump in the relevant group of tanks. The pumps should not be left running if for any reason there is a delay in starting the engines.

7. **Oil system**

(i) Four self-sealing oil tanks, one for each engine, are fitted in the leading edge between the engine nacelles. Capacities are 39 gallons of oil with 5.3 gallons air space for each inner engine and 32 gallons of oil with 9.7 gallons air space for each outer engine.

(ii) The oil cooler flaps are controlled electrically, the motor switches, warning lights which show when the motors are operating, and the flap indicators (70) are mounted together on the flight engineer's panel.

(iii) Four oil dilution pushbuttons (67) are fitted on the flight engineer's panel.

MAIN SERVICES

8. **Hydraulic system**

(i) A Lockheed pump fitted on the starboard inner engine supplies power for the following services :

Undercarriage and tailwheel.
Flaps.
Bomb doors.
Air-intake
Landing lamps

A feature of the undercarriage, flaps and bomb-doors circuits is the use of the pump to operate the jacks in one direction only (*i.e.*, to raise the undercarriage and flaps and to close the bomb doors); the fluid above the piston is thereby forced into an accumulator, increasing the air pressure in the accumulator and thus storing energy which is used to operate the jack in the reverse direction when required. The air-intake and landing lamp circuits differ from the main circuits in that the pump operates the jacks in both directions.

IMPORTANT NOTE.—The undercarriage, flaps or bomb door levers, after having been operated, should be returned to the " neutral " position thereby closing the distributor. Should a lever be left in its operating position and the pipe lines from the distributor to the jacks be damaged, fluid would be automatically discharged through the

damaged pipe, thus leaving no fluid for the operation of the remaining undamaged circuits. The undercarriage lever should be left in the " down " position at all times when the undercarriage is down and the bomb doors should be operated on the descent as described in para.28(iii).

(ii) A hydraulic handpump is provided on the front spar on the port side of the fuselage, and should be used to operate the system through the normal pipe lines and controls, when the engine-driven pump is not working.

(iii) Emergency circuits operated by the flight engineer are provided to lower the undercarriage and open the bomb doors. Control is by means of emergency cocks mounted on the front face of the front spar, and these cocks when opened, allow the engine-driven pump or handpump to perform the functions normally carried out by the accumulators.

(iv) Isolating valves are provided in the bomb-door and flap circuits to prevent opening of the bomb doors or lowering of the flaps under pressure from the accumulators if the pump pressure line should be damaged. These valves should be closed on operational flights only and must be opened before attempting to lower flaps or open bomb doors.

9. **Pneumatic system**

A Heywood compressor for operating the wheel brakes, and an RAE compressor for operating the automatic pilot are mounted on the port inner engine. The RAE compressor also operates the Mark XIV bomb sight computer so that if the bomb sight is in use the control cock for the gyro of the autopilot must be set to OUT. A vacuum pump on the port inner engine supplies the instrument flying panel, and another pump on the starboard inner engine operates the Mark XIV bomb sight. A suction gauge and a change-over cock marked NORMAL and EMERGENCY are mounted on the instrument panel. The starboard pump can be used for the instrument flying panel by setting the change-over cock to EMERGENCY, but in this event the Mark XIV bomb sight cannot be used.

10. **Electrical system**

Two 1,500 watt D.C. generators driven by the port outer and inner engines, and the D.C. output from a tandem generator on the starboard inner engine, are connected in parallel and supply all the usual services, and mid-upper and rear turrets. An A.C. generator on the starboard outer engine in conjunction with the A.C. output from the tandem generator, supplies the special radio installations. A GROUND/FLIGHT switch is fitted on the starboard side of the fuselage at the flight engineer's station.

AIRCRAFT CONTROLS

11. **Flying controls**

(i) The dual controls are not a permanent fitment but conversion sets are supplied and can be fitted if required.

(ii) The rudder pedals can be adjusted on the ground by removing a nut and bolt from the shank of the pedal, sliding the pedal backwards or forwards as required, and refitting the bolt which should then be locked by a split pin. Finer adjustment can be made by a foot operated centrally placed starwheel.

12. **Locking of flying controls**

Before attaching the locking gear, the controls should be moved to the neutral position. The aileron control should be locked by applying the special locking plate to the first pilot's handwheel and securing it to the block on the column with the bolt provided. The plate carries a tube which crosses the pilot's seat when the plate is in position, and hinders access to the seat until the controls are unlocked. The rudder and elevator controls should be locked with the locking lever connected to the elevator and rudder control rods in the rear fuselage. The locking lever is fixed at its top end on a spigot on the elevator control rod and held in position by a fastener spring attached by a lanyard to the locking lever. At its lower end the locking lever is secured to the rudder control rod and the adjacent fuselage member by means of a special screwed pin also attached by lanyard to the locking lever.

13. **Automatic pilot**

A Mk. VIII automatic pilot is installed. The controls include the selector switch marked JINK/OFF/COURSE (26), clutch lever (80), control cock, and pitch control (74). The clutch lever and control cock are on a panel on the left-hand side of the cockpit with the pitch control mounted above. The selector switch together with a combined pressure and trim gauge (47) are on the pilot's sloping panel. For operating instructions see A.P. 2095 Pilot's Notes General, 3rd Edition, Part III—Chapter 3.

14. **Trimming tabs**

(i) The trimming tab controls and indicators for the starboard aileron (79) and rudder are on the left-hand side of the cockpit. The controls work in the natural sense.

(ii) The elevator trimming tab handwheel (43) is on the centre line of the aircraft accessible to both pilots. An indicator scale along which a pointer travels is mounted aft of the wheel. The movement of the wheel is in the natural sense.

15. **Undercarriage controls**

The hydraulic operation of the undercarriage is controlled by the lever (44) mounted immediately below the flaps and bomb doors control levers on the right of the pilot's seat. A " neutral " position is provided and after raising the undercarriage, the control lever should be returned to this position. The flight engineer has mechanical up-locks under his control, one on each side of the fuselage at the rest station. These should be engaged at all times when the undercarriage is retracted, except during local flying, and must be pulled out and the clips secured before the undercarriage is lowered. The control lever should be left in the DOWN position after lowering the undercarriage.

An electrical interlocking mechanism is provided to prevent the undercarriage being retracted until the weight of the aircraft is off the wheels. This mechanism consists of a solenoid which becomes energised when the

weight of the aircraft is off the wheels, and withdraws a lock which then allows the undercarriage lever to be moved through the " neutral " position. Should it ever become necessary to override this safety device, hold back a small lever reached through a hole in the right-hand side of the control box.

16. **Undercarriage indicators**

A single instrument (23) on the pilot's sloping panel indicates whether the undercarriage is unlocked or locked in the down position. A control knob in the centre of the instrument enables the lamps to be dimmed for night flying and may also be used to bring a duplicate set of lamps into operation.

The operation of the indicator is as follows :

Upper lamps—red ...	... Unlocked position.
Lower lamps—green	... Locked down position.
No lamps	... Undercarriage up and mechanical up-locks engaged.

17. **Undercarriage warning horn and light**

A horn (82) on the left-hand side of the cockpit and a warning light (25) on the sloping panel warn the pilot when any throttle is closed two-thirds or more and the undercarriage is not locked down.

18. **Flaps control**

The control (45) for operating the flaps is the shorter of the two small levers on the hydraulic control box on the right of the pilot's seat. The movement of the lever is in the natural sense ; it should be returned to " neutral " after each operation. In emergency the flaps can be raised by the handpump. An isolating cock is fitted between the flaps hydraulic accumulator and the jacks, and is closed by the flight engineer when the flaps are not in use. If this isolating cock is not closed and one of the hydraulic pipelines is damaged, the flaps will immediately lower under the accumulator power which is thereby released.

19. **Flap position indicator**

An electrical indicator (5) is mounted on the pilot's instrument panel immediately forward of the control column. It shows the settings of the flaps by means of a pointer which moves over a scale graduated in degrees.

20. **Brakes control**

The brake levers (27) are mounted on the first pilot's handwheel on all aircraft, and are duplicated on the second pilot's handwheel on certain aircraft when dual control sets are fitted. There is a parking catch on the underside of the control. The brakes are also operated differentially by the rudder bar. A triple pressure gauge is mounted on the right-hand side of the instrument panel.

ENGINE CONTROLS

21. **Throttle controls**

The throttle controls (36) are mounted at the top of the engine control box. A line marked in luminous paint on the quadrant indicates the ECB position. The rear faces of the throttle levers are also marked with a luminous line. A friction lever (37) on the right-hand side of the control box locks the throttles in any desired position when pulled aft.

22. **Mixture control**

Fully automatic Hobson R.A.E. injector carburettors are fitted. Weak mixture is afforded only when the throttles are at, or set behind, the ECB position on the throttle quadrant.

23. **Propeller controls**

The four propeller speed control levers (38) are mounted in the centre of the control box. The levers are moved upwards to increase, and downwards to decrease, the engine revolutions. A friction lever (39) is fitted on the right-hand side of the control box.

The four feathering buttons (30) are on the panel in the roof of the pilot's cockpit.

24. **Two-speed supercharger controls**

A single lever (41) for all four superchargers is the right-hand lever in the bottom tier of the control box. There are two positions marked F.S., (high) gear, and M.S., (low) gear.

25. **Carburettor air-intake heat control**

The control lever (40) is the left-hand lever in the bottom tier of the control box. The lever has two positions marked HOT AIR and COLD AIR. The COLD AIR position should always be used unless carburettor icing is suspected.

26. **Cowling gill controls**

The gills are controlled electrically, the gill motor switches (49) warning lights which show when the gill motors are operating, and the gills position indicators (50) are mounted together on the flight engineer's panel.

27. **Ignition and starting controls**

The ignition switches (24) are on the pilot's sloping panel. The booster-coil (52) and engine starter (53) push-buttons are on the flight engineer's panel.

OPERATIONAL CONTROLS AND EQUIPMENT

28. **Bomb doors control**

(i) The control (46) for operating the bomb doors is the longer of the two levers on the hydraulic control box. When the lever is moved to the UP position the bomb doors are opened. A " neutral " position is provided for the lever, and after the bomb doors have been opened or closed the lever must be returned to this position. An isolating cock is fitted between the bomb doors accumulator and the jacks. If this isolating cock is not closed and the hydraulic pipelines are damaged, the bomb doors will immediately open under the accumulator power which is thereby released. However, the isolating cock should be left open on the outward journey of an operational flight, and should only be closed after the bombs have been dropped and

the bomb doors closed; otherwise, the need to open the isolating cock may cause delay when jettisoning bombs in an emergency.

(ii) A selective-closing valve (located on the rear of the pilot's bulkhead) operated by the flight engineer, is incorporated in the bomb doors circuit. When this valve is closed the bomb doors may be opened in the normal manner, but the fuselage bomb doors cannot be closed again. The valve is normally left open and is only closed when large bombs are carried, which necessitate the fuselage bomb doors remaining partially open. In the latter case the bomb doors are partially closed by using the handpump before the engines are started, and then the selective-closing valve is closed and must not be opened until the large bombs have been released.

(iii) On aircraft where Mod. 1214 is not incorporated, it is necessary to relieve the pressure built up due to thermal expansion of hydraulic fluid on descending to warmer air after operating bomb doors over the target. The bomb doors lever should, therefore, be momentarily operated as follows for every 15° rise in temperature:

(*a*) Select bomb doors CLOSED.

(*b*) Select bomb doors OPEN.

(*c*) Select bomb doors CLOSED.

(*d*) Return to neutral.

29. **Bomb release controls**

The bomb jettison control (12) and bomb doors warning lights (13) are mounted on the right-hand side of the instrument panel, and the pilot's bomb firing switch (21), is on the sloping panel below it. The bomb release is inoperative until the bomb doors are open. The bomb door warning lights are duplicated at the bomb-aimer's station. The pilot is not provided with a selector switchbox, but he may release any bombs selected by the bomb-aimer by pressing the bomb firing switch button on the sloping panel. Before the bomb doors are opened the trailing aerial must be wound in. (For details of bomb jettisoning see para. 59.)

30. **Camera control**

A camera control switch is mounted in the pilot's cockpit just forward of the rudder trimming tab control and is operable only when the bomb-aimer's camera control is fully connected.

31. **Paratroop signalling switch**

A switch and two indicator lamps (15) for paratroop release are mounted on the right-hand side of the pilot's instrument panel. A similar switch and lights are duplicated at the bomb-aimer's station and also at the paratroop station in the rear fuselage.

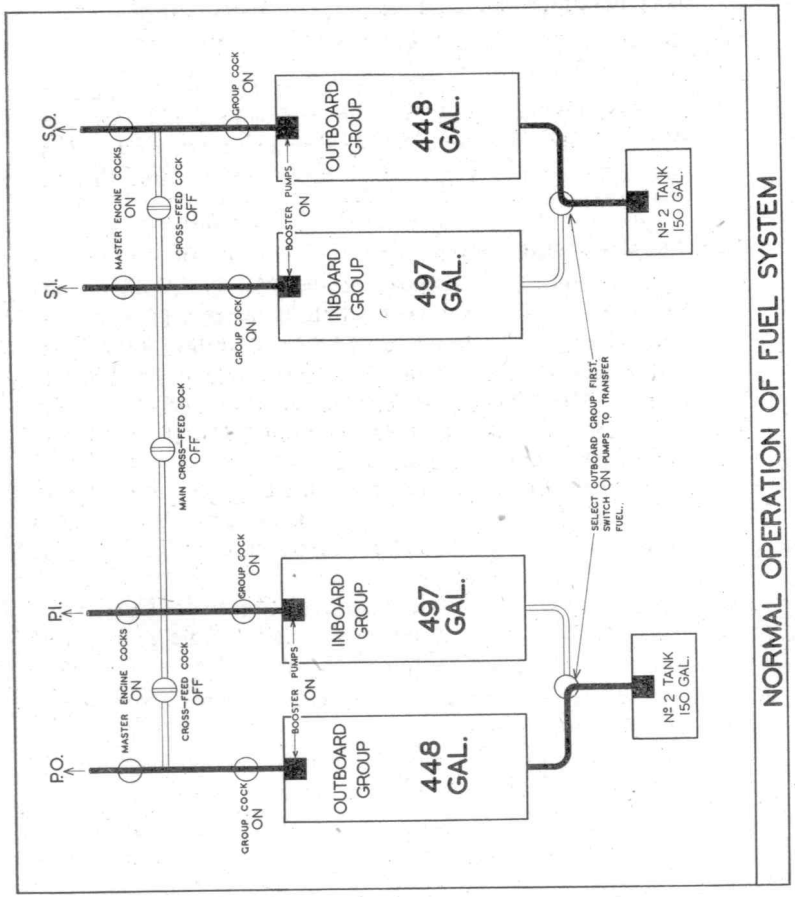
32. **Landing lamps control**

The spring-loaded selector lever (29) for dipping the landing lamps is mounted on the left-hand side of the control box. The lever must be held in the DOWN or UP position until the landing lamps reach the desired angle. The hydraulic circuit is operated in both directions by the engine-driven pump, but if necessary can be operated by the handpump.

A.L.3 Page 17

32a. **Propeller de-icing.**—

On aircraft embodying Mod. 1621 a de-icing system is fitted to the propellers. The pumps are controlled by two rheostat switches, one for each pair of engines. These regulate the rate of flow of de-icing fluid and are fitted to the left on the Flight Engineer's panel.



PART II

HANDLING

All handling speeds quoted apply when the static side of the pilot's A.S.I. is connected to the static vent on the port side of the fuselage.

33. **Management of the fuel system** (see page 18)

(i) For normal operation all the main fuel cocks should be ON and the cross feed cocks OFF ; each engine is then supplied from its own group of tanks. It must be remembered that the capacity of the outboard groups is approximately 50 gallons less than that of the inboard groups. To ensure that an equal supply of fuel is available to all engines, when transferring from the No. 2 tanks (or bomb bay tanks if used), 50 gallons extra should be pumped into the outboard groups.

(ii) When bomb-bay tanks are carried they should be used early in flight so that in the event of failure of a transfer pump the flight engineer can reassess the fuel available.

(iii) Booster pumps should be switched ON immediately after starting the engines and kept ON all the time (but see (vi) below). They should not be left running with the engine stopped.

(iv) If the aircraft is to take off with reduced fuel load it is immaterial which tanks are filled, subject to even quantities being in each tank group.

NOTE.—The priming pump draws fuel only from No. 1 port tank.

(v) The nitrogen valve must be turned on before any fuel is used.

(vi) *The main and inter-group cross-feed cocks should be off at all times except* :

(*a*) In the event of failure of one engine, exhaustion of one tank group, or loss of fuel pressure, the appropriate inter-group cross-feed cock should be opened to enable either group to feed both engines on one side. Only one group should then be used at a time, the other group cock and booster pump being turned off.

(*b*) Should all the fuel on one side be exhausted or both engines on one side fail, the main cross-feed cock should be opened. Again, only one tank group should be used at a time, the other three group cocks and booster pumps being turned off. Both inter-group cross-feed cocks should be opened.

34. **Preliminaries**

(i) Before entering the aircraft check undercarriage accumulator pressure (250 lb./sq. in. minimum).

(ii) On entering the aircraft, check should include :

All controls unlocked ; locking gear stowed.
GROUND/FLIGHT switch to FLIGHT.
Indicators and lights.
Tailwheel accumulator pressure (250 lb./sq. in.).
Flaps accumulator pressure (600 lb./sq. in., flaps up).
Flaps accumulator pressure (400 lb./sq. in., flaps down)
Flaps isolating cock unscrewed.
Up-locks disengaged.
Bomb doors accumulator pressure (1,050 lb./sq. in., doors closed).
Bomb doors accumulator pressure (700 lb./sq. in., doors open).
All crossfeed cocks OFF.
Fuel contents.
Nitrogen valve ON.

(iii) Before starting engines check should include :

Undercarriage lever DOWN.
Flaps and bomb doors levers neutral.
Brake pressure : brakes on (*see* para. 37).
Flying controls.
Oxygen.

(iv) Set petrol cocks as follows :

All group tank cocks ON.
All cross-feed cocks OFF.
Pilot's engine master cocks ON.
Carburettor cut-outs to CUT-OFF.

35. **Starting the engines and warming up**

(i) The engine starter and booster-coil switches, carburettor cut-outs, gills, oil cooler shutters, temperature gauges, pressure gauges and indicators are under the control of the flight engineer, but the pilot should be in his seat to see that the following sequence of actions is carried out.

(ii) Have ground battery plugged in and GROUND/FLIGHT switch turned to GROUND.

Set engine controls as follows :

Throttles	Just off rear stops
Propeller speed controls ...	Fully up
Superchargers	M.S. gear
Air-intake heat control ...	COLD AIR
Gills	OPEN

(iii) Have each engine turned slowly by hand for at least two revolutions, to avoid the danger of hydraulicing.

(iv) Switch on the appropriate booster pump to prime the fuel lines ; then switch it off. Turn the priming cock to the engine to be started and operate the pump until resistance is felt, indicating that the pipe line is full.

NOTE.—An engine should not be primed until its turn for starting comes.

(v) Set the carburettor cut off to " NORMAL " and switch on the ignition. Then press the starter and booster-coil pushbuttons and prime until the engine fires ; it should start after the following number of strokes if cold :

Air Temperature °C.	+30	+20	+10	0	−10	−20
Normal Fuel ...	1	1	2	3	—	—
H.V. Fuel ...	—	—	—	1	2	4

Continue priming until the engine is running smoothly at about 800 r.p.m., then release the booster-coil push-button. Turn off the priming cock. Switch on the booster pump.

(vi) If the engine fails to start, stop priming and return carburettor cut-out to CUT-OFF. If failure to start is thought to be due to overpriming have engine turned through several revolutions before again attempting to start.

(vii) Open up each engine gradually to 1,000 r.p.m. and warm up at this speed.

(viii) Turn GROUND/FLIGHT switch to FLIGHT.
Switch DR compass to ON and SETTING.

36. **Testing the engines and installations**

While warming up :

(i) Check temperatures and pressures, and test operation of all flying controls and of hydraulic system by lowering and raising the flaps. Test each magneto in turn as a precautionary check.

(ii) Switch off booster pumps and check that engine pumps are working satisfactorily.

After warming up to 120° *C.* (*cylinder*) *and* 15° *C.* (*oil*) *for each engine in turn :*

(iii) Open up to 0 lb./sq. in. boost and exercise and check the operation of the supercharger. Oil pressure should drop momentarily at each change and r.p.m. should fall when high gear is engaged. Change back to low gear.

(iv) At 0 lb./sq. in. boost exercise and check the operation of the constant-speed propeller at least twice. Return the control lever to the fully up position and check that the r.p m. are within 50 of those normally obtained.

(v) Test each magneto in turn. If the single ignition drop exceeds 50 r.p.m. the ignition should be checked at climbing power (*see* sub. para. (vii) below).

NOTE.—The following checks should be carried out after repair, inspection other than daily, or at any time at the discretion of the pilot.

(vi) Open the throttle fully and check take-off boost and static r.p.m.

FINAL CHECKS FOR TAKE-OFF

TRIM	...	ELEVATOR : 1 — 1½ DIVS. TAIL HEAVY
		RUDDER : NEUTRAL
		AILERON : NEUTRAL
PROPS.	...	MAXIMUM RPM
FUEL	...	CORRECT TANKS SELECTED
		MASTER COCKS ON
		BOOSTER PUMPS ON
FLAPS	...	30° — 35° DOWN
SUPERCHARGERS		LOW (MS) GEAR

FINAL CHECKS FOR LANDING

FUEL	...	CHECK CONTENTS
		CORRECT TANKS SELECTED
		BOOSTER PUMPS ON
SUPERCHARGERS		LOW (MS) GEAR
BRAKES	...	OFF. CHECK PRESSURES
WHEELS	...	LOCKED DOWN
PROPS.	...	2,400 RPM
FLAPS	...	AS REQUIRED

(vii) Throttle back to the climbing boost setting and check the boost pressure (+6 lb./sq. in.) and, if r.p.m. have fallen below 2,800, test each magneto in turn. If the propeller is still constant speeding throttle back until a drop in r.p.m. is apparent before testing each magneto. If the single ignition drop exceeds 50 r.p.m. the aircraft must not be flown.

37. **Check list before taxying**

Brake pressure (90 lb./sq. in.)
Supply pressure (200 lb./sq. in. min.)
DR compass switches to ON and NORMAL.
Auto-controls :

Switch	OFF
Clutch	IN
Gyro control cock	OUT
Instrument flying panel	Check vacuum on each pump.
Pitot-head heater switch... ...	ON

38. **Check list before take-off**

	At 55,000 *lb.*	*At* 65,000 *lb.*
T—Trimming tabs :		
Elevator	1½ divs. tail heavy	1 div. tail heavy
Rudder	Neutral	Neutral
Aileron	Neutral	Neutral
P—Propeller speed control	Fully up	
F—Fuel	Engineer check cock settings. Booster pumps ON.	
F—Flaps	30°–35° down	
Superchargers ...	MS gear	
Gills	½ open	
Oil cooler shutters ...	As required (normally up to ½ open)	
Air intake	COLD AIR	

39. **Take-off**

(i) Open the throttles slowly at first, then fully as the aircraft accelerates. There is a slight tendency to swing to the right, but the aircraft can be kept straight initially on the throttles, and, as the speed increases, by the rudders.

(ii) The tail comes up easily as speed develops. The forward force required on the control column is not large.

(iii) At 55,000 lb. the aircraft can be pulled off the ground at 110 m.p.h. (95 kts.) I.A.S. ; at 65,000 lb. it can be pulled off at 115 m.p.h. (100 kts.) I.A.S.

(iv) With flaps lowered 30°–35° safety speed at full load is 155 m.p.h. (134 kts.) I.A.S.

40. **Climbing**

(i) After the undercarriage and flaps have been raised (the latter not below 300 ft.) and the course has been set, the flight engineer should close the flap isolating cock and engage the undercarriage mechanical up-locks.

(ii) The speed for maximum rate of climb is 140 m.p.h. (120 kts.) I.A.S. from sea level to the aircraft ceiling (*see* para. 54 (i)).

(iii) The recommended climbing speed, gills fully closed, is 160 m.p.h. (138 kts.) I.A.S. from sea level to operational height.

(iv) A careful watch must be kept on the oil temperatures and small adjustments of the oil cooler shutters should be made to keep the temperatures as steady as possible throughout the climb.

41. **General flying**

(i) *Stability*

The aircraft is stable about all three axes at all speeds.

(ii) *Change of trim :*

Undercarriage up	...	...	Slightly nose up
Flaps up	...	...	Nose down
Bomb doors open	...	...	Slightly nose up

There is considerable change of lateral and directional trim with changes of speed and power, therefore, for accurate flying the aileron and rudder trimming tabs should be used as necessary.

(iii) *Trimming tabs*

The tabs on all three flying controls are powerful and sensitive. Mod. 1323 increases the gearing of the rudder balance tab which is also the trimming tab, making this control even more powerful so that coarse use of it may well cause the rudders to move hard over on to their stops, giving all the indications of over-balance. If this should occur, speed must not be allowed to increase. If it does, it will not be possible to move the rudders from their fully deflected position without first winding off some trim which is not easy since the trimming tab control becomes increasingly stiff as speed builds up.

(iv) *Controls.*—The rudder and elevator controls are heavy but the ailerons are very light at low speeds and remain light and effective at climbing and cruising speeds. They become progressively heavier at speeds over 230 m.p.h. (200 kts.) I.A.S.

(v) *Flying at low airspeeds.*—At speeds below 140 m.p.h. (120 kts.) I.A.S. the aircraft is pleasanter to fly with the flaps lowered 35°.

(vi) *Supercharger gear exercising.*—In order to avoid sludging of the clutch plates every endeavour should be made to change to high gear once every two hours during a long flight, and in any case just before landing. Below 5,000 ft. the change to high gear should not be made at engine conditions exceeding 2,400 r.p.m. and 0 lb./sq. in. boost.

42. **Stalling**

(i) *Characteristics of the stall.*—There is little warning of the stall except for slight snatching of the ailerons at about 5 m.p.h. above the stall, which is gentle and straight with no wing-dropping tendency. Control is regained without difficulty on pushing the control column forward.

(ii) The approximate stalling speeds engines off in m.p.h. (kts.) I.A.S. are :

	55,000 lb.	65,000 lb.
Flaps and undercarriage up	114 (100)	122 (105)
Flaps and undercarriage down	99 (86)	105 (92)

43. **Diving**

The aircraft becomes tail-heavy as speed increases and should be trimmed into the dive. There is an increasing tendency to yaw and roll to port as speed is gained and this should be eliminated by early and progressive use of the rudder and aileron trimming tabs. Retrimming is especially important if the aircraft is allowed to develop a spiral dive to the left when trimmed for the climb.

44. **Approach and landing**

(i) Check with flight engineer :

Fuel contents of tanks in use.

Undercarriage up-locks disengaged and clips secured.

Flaps-isolating cock open.

NOTE.—If there is a likelihood that the hydraulic system has been damaged, before opening the flaps-isolating cock the engineer must check with the pilot that the flaps lever is in the " neutral " position and should then turn the isolating cock half a turn. The pilot must tell him immediately if the flaps are lowering—if so, the engineer can regulate their descent with the cock.

(ii) Reduce speed to 160 m.p.h. (138 kts.) I.A.S., and lower flaps 30°–40° ; then reduce speed to 150 m.p.h. (130 kts.) I.A.S., and lower undercarriage. check brake pressure 90 lb./sq. in (Supply : 200 lb./sq. in min) Ah 2.

(iii) Check list for landing :

Auto-pilot	...	...	OUT
Superchargers	...	...	MS gear
Air-intake	...	...	COLD AIR
Gills	...	...	As required
U—Undercarriage	...	...	DOWN
P—Propellers	...	...	2,400 r.p.m.
F—Flaps	...	...	Fully down, or less in high wind

(iv) Recommended final approach speeds in m.p.h. (kts.) I.A.S. are :

	at 50,000 lb.	at 55,000 lb.
Engine assisted ...	110 (95)	115 (100)
Glide	120 (104)	125 (108)

45. **Mislanding**

The aircraft shows no change of longitudinal trim when throttles are opened with flaps and undercarriage down unless the elevator trim has been wound fully back. Climb away initially at 110 m.p.h. (95 kts.) I.A.S., raise flaps to 40° down, and then raise undercarriage. Increase speed to 145 m.p.h. (125 kts.) I.A.S. and raise the flaps fully at 300 ft.

NOTE.—Set propeller speed controls fully up should it be necessary to use full take-off power.

46. **After landing**

(i) Before taxying, raise flaps ; flight engineer opens gills.

(ii) When aircraft is taxied to dispersal the tailwheel should be left straight, thus eliminating unnecessary strain on the centralising spring.

(iii) On reaching dispersal exercise the superchargers by opening up to not more than 0 lb./sq. in. boost and then changing to high gear for 30 seconds and back to low gear.

(iv) *Shutting down procedure :*

(*a*) Close the throttles slowly and evenly, taking about 4 seconds, until speed is reduced to 800–900 r.p.m.

(*b*) Run at this speed until the cylinder temperatures have fallen below 230°C.

(*c*) Move the carburettor cut-out controls to the CUT-OFF position and when the engines have stopped switch OFF the ignition and booster pump.

NOTE.—With the throttle levers in the fully closed position the boost capsules are considerably stretched and may be damaged. It is recommended, therefore, that the levers be left in the E.C.B. position.

(v) Turn OFF all fuel tank cocks and the engine master cocks.

(vi) Switch OFF :

Pressure-head heater switch.

Fuel contents gauges.

DR compass.

Turn GROUND/FLIGHT switch to GROUND.

(vii) *Oil dilution.*—The correct dilution period for these aircraft is 4 minutes. Dilution should be carried out at an engine speed not exceeding 1,000 r.p.m.

PART III

OPERATING DATA

47. *Engine data* : Hercules 100.

(i) *Fuel.*—100/130 grade.

(ii) *Oil.—See* A.P. 1464c/4.

(iii) *Engine limitations.*—The maximum permissible r.p.m. boost and temperatures for the conditions of flight and the periods stated are :

		R.p.m.	Boost lb./sq. in.	Temp. °C. Cyl.	Temp. °C. Oil
TAKE-OFF TO 1,000 ft.	M	2,800	+8¼		
CLIMBING 1 HR. LIMIT	M, S	2,400	+6	300	90
RICH CONTINUOUS	M, S	2,400	+6	300	80
WEAK CONTINUOUS	M, S	2,400	+2½	300	80
COMBAT 5 MINS. LIMIT	M, S	2,800	+8¼	310	100

OIL PRESSURES :

NORMAL	80 lb./sq. in.
MINIMUM	70 lb./sq. in.

OIL TEMP. FOR TAKE-OFF :

RECOMMENDED	15°C.
MINIMUM	5°C.

MAX. CYLINDER TEMP. :

BEFORE TAKE-OFF	230°C.
STOPPING ENGINES	230°C.

48. **Position error correction**

The static side of the pilot's A.S.I. is connected to the static vent in all aircraft. The position error is small at all speeds.

49. **Flying limitations**

(i) The aircraft is designed for manoeuvres appropriate to a heavy bomber, and care must be taken to avoid imposing excessive loads in recovery from dives and turns at high speeds. Spinning and aerobatics are not permitted.

(ii) *Maximum speeds in m.p.h. (kts.) I.A.S. :*

Diving	320 (276)
Bomb doors OPEN	320 (276)
Undercarriage DOWN	160 (138)
Flaps DOWN	160 (138)

(iii) *Maximum weights :*

Take-off (operational)	65,000 lb.
Take-off (training)	63,000 lb.
Landing	55,000 lb.

50. **Fuel capacity**

2—Inboard groups	994 gal.
2—Outboard groups	896 gal.
2—Replenishment tanks	300 gal.
	2,190 gal.
3—Long-range tanks	690 gal.
	2,880 gal.

51. **Maximum Performance**

(i) *Climbing.*—The speed for maximum rate of climb is 140 m.p.h. (120 kts.) I.A.S. from sea level to ceiling. Change to high gear when the boost has fallen to $+2\frac{1}{2}$ lb./sq. in. At this speed gills must be fully open until temperatures begin to fall after the high gear full throttle height is passed ; they may then be partially closed (to about one-third). At this speed immediate action is necessary if an outer engine fails at full climbing power ; *see* para. 54 (i).

(ii) *Combat.* Change to high gear if the maximum obtainable boost in low gear is less than +6 lb./sq. in.

52. **Maximum range**

(i) Climb at 160 m.p.h. (138 kts.) I.A.S. to operational height at full climbing power. At this speed gills may normally be fully closed, but temperatures must be watched. Change to high gear when boost has fallen to $+2\frac{1}{2}$ lb./sq. in. The throttles should not be moved from the rated boost position while the aircraft is climbing.

(ii) *Cruising*

(*a*) Fly with the throttles at E.C.B. ($+2\frac{1}{2}$ lb./sq. in. boost) and maintain the recommended airspeed by adjusting r.p.m., which may be as low as 1,600. Change to high gear if the recommended airspeed cannot be maintained at 2,400 r.p.m. in low gear.

(*b*) The recommended speeds are :

Fully loaded	175 m.p.h. (150 kts.) I.A.S.
Lightly loaded	170 m.p.h. (147 kts.) I.A.S.

NOTE. (i) Engine vibration may be experienced at r.p.m. between 2,200 and 2,000 ; this range should be avoided.

(ii) If the throttles are advanced slightly beyond the E.C.B. position overheating may result.

PART IV

EMERGENCIES

53. **Engine failure during take-off**

(i) With flaps lowered 30°–35° the aircraft can be kept straight on any three engines at take-off power at full load provided the safety speed of 155 m.p.h. (134 kts.) I.A.S. has been attained.

(ii) In the event of an outer engine failure below safety speed, control will be lost unless the throttle of the opposite outer engine is partially closed immediately. Feather the propeller of the failed engine, retrim, and re-open the throttle of the live outer engine.

(iii) After control has been regained as described above, it will be possible to climb with flaps in the take-off position and undercarriage up on three engines at take-off power at 140 m.p.h. (120 kts.) I.A.S. at light loads. The rate of climb will be improved when the flaps are raised. They can safely be raised at 300 ft.

At heavy loads or if the engine failure has occurred at a low height immediately after take-off it will be necessary to land straight ahead, using the two inner engines to control the rate of descent.

54. **Engine failure in flight**

(i) At full load, flaps and undercarriage up, at climbing power, control can be retained with rudder and ailerons provided speed is not below 155 m.p.h. (134 kts.) I.A.S. If an outer engine fails below this speed, it will be necessary to throttle back the opposite outer engine at least partially until rudder trim can be applied and the propeller of the engine feathered. After trim has been applied, re-open the throttle of the live outer engine slowly to avoid overspeeding due to a too rapid return of power after the propeller has fined its pitch.

(ii) *One engine failed.*—At 54,000 lb. height can be maintained at 160–170 m.p.h. (138–147 kts.) I.A.S. in weak mixture at heights up to 20,000 ft. Under these conditions the aircraft can be trimmed to fly hands off.

(iii) *Two engines failed.*—With two engines failed on the same side, speed should not be allowed to fall below 150 m.p.h. (130 kts.) I.A.S. since at lower speeds foot load as well as full rudder trim will be required to keep the aircraft straight. At weights below 55,000 lb. height can normally be maintained at climbing power in high gear at heights up to 15,000 ft. If height cannot be maintained or fuel economy is required change to low gear and descend until power is sufficient to maintain level flight.

(iv) The Mk. VIII automatic pilot will perform satisfactorily in all cases of engine failure, including two engines failed on one side, provided all foot load is trimmed out before engagement. The compressor is driven by the port inner engine and if this engine has failed it should be windmilled, if possible, to obtain a minimum air pressure of 45 lb./sq. in. (*see* A.P. 2095, 3rd Edition, Part III, Chap. 3).

(v) *Landing on three engines.*—Lowering of 35° of flap and of the undercarriage may be carried out as on a normal circuit.

Flaps should not be lowered further until it is certain that the airfield is within easy reach. The three live engines should be used to regulate the rate of descent, and power and speed gradually reduced when a safe landing is assured. Aim to cross the airfield boundary at the correct engine-assisted approach speed. *See* para. 44 (iv) and A.P. 2095, 3rd Edition, Part IV, Chapter 5, para. 4.

(vi) *Landing on two engines* (*asymmetric power*).—A left-hand circuit can safely be made and is recommended irrespective of which engines have failed, but care must be exercised in the use of the rudder trimming tab controls (*see* para. 41 (iii)). While manoeuvring with the undercarriage and flaps up maintain a speed of at

least 150 m.p.h. (130 kts.) I.A.S. Aim to have the undercarriage locked down just before the final straight approach. The flaps may be lowered to 35° before the undercarriage is lowered, but should not be lowered further until it is certain that the airfield is within easy reach. The two live engines should be used to regulate the rate of descent, and speed and power gradually reduced, aiming to cross the airfield boundary at the correct engine-assisted approach speed.

(vii) *Propeller overspeeding.*—At low speeds the difficulties of control may be accentuated by an overspeeding windmilling propeller and will require special precautions. If overspeeding of any engine occurs :

(*a*) Close throttle of affected engine at once.

(*b*) Close throttle of corresponding engine on the other side in order to assist control.

NOTE.—Unless it is essential to retain height, the simplest immediate action is to close all four throttles.

(*c*) Normal corrective action should be taken (*see* A.P. 2095, 3rd Edition, Part IV, Chapter 6), but it should be noted that this may involve reducing speed below safety speed.

55. **Feathering and unfeathering**

(i) To feather a propeller :

(*a*) Close the throttle immediately.

(*b*) Hold the button in only long enough to ensure that it stays in by itself.

(*c*) Switch off the booster pump and set the carburettor cut-out to CUT-OFF. and turn off the fuel by means of the master cock.

(*d*) Switch off the ignition only when the engine has stopped.

NOTE.—If engine failure occurs immediately after take-off (*b*) may precede (*a*).

(ii) To unfeather a propeller :

(*a*) Speed should not be greater than 170 m.p.h. (148 kts.) I.A.S.

(*b*) Set the propeller control fully down and the throttle slightly open. Switch on the booster pump.

(*c*) Switch on the ignition.

(*d*) Press and hold in the feathering button until 1,000-1,300 r.p.m. is reached. As the engine starts to turn set the carburettor cut-out to NORMAL.

(*e*) If the propeller does not return to normal constant speed operation, open the throttle slightly.

56. **Undercarriage emergency operation**

(i) The mechanical up-locks must be released and the undercarriage control lever must be placed in the DOWN position.

NOTE.—The mechanism has been designed with a "weak link" so that in extreme emergency if the mechanical up-locks cannot be released or are inaccessible, the application of hydraulic power will break the lock and allow the undercarriage to lower.

(ii) If after releasing the mechanical up-locks and setting the undercarriage lever to DOWN the accumulator power will not lower the undercarriage, open the emergency cock on the front face of the front spar, leaving the undercarriage lever at DOWN. Either the engine-driven pump or handpump should then lower the undercarriage through the emergency pipelines.

(iii) In the event of complete failure of the hydraulic system the undercarriage will descend and lock down under its own weight assisted by the pull of the elastic cords fitted to each radius rod, provided speed is suitably reduced.

57. **Air-intake and landing lamps**

These hydraulic services can be operated by the hand-pump if the engine-driven pump fails. There are no separate emergency pipelines.

58. **Bomb doors emergency operation**

Should the bomb doors fail to open when the pilot selects bomb doors OPEN, close the isolating cock, then open the emergency cock on the front face of the front spar; either the engine-driven pump or hand-pump should then operate the doors.

NOTE.—It is dangerous to raise the undercarriage or close the bomb doors after using either of the emergency circuits as there may be insufficient fluid left in the system to lower the undercarriage a second time. When closing the bomb doors the isolating cock must first be opened.

A.L.3 Para. 59

59. **Bomb and fuselage tank jettisoning**

(i) The controls cannot be operated unless the bomb door warning lights are on.

(ii) Jettison bomb containers first by pressing the button (14) under the flap directly below the left-hand warning light on the instrument panel.

(iii) Jettison bombs or fuselage tanks (together) by pulling out the bomb-jettison handle (12) above the warning lights on the instrument panel.

(iv) If fuselage tanks are jettisoned together, it is recommended that this be done at a speed of about 150 m.p.h. (130 kts.) I.A.S.

(v) In the event of fire, although fuel from the wing tanks must not be jettisoned, the bomb-bay drop tanks may be released whether containing fuel or not.

60. **Parachute exits**

(i) The hatch in the floor of the nose compartment.

(ii) The main entrance door in the port side of the rear fuselage.

(iii) The opening exposed by rotating the rear turret through 90°.

(iv) The paratroop cone (if fitted).

61. **Crash exits**

(i) The opening formed by raising or jettisoning a hinged transparent panel in the roof over the first pilot's seat.

(ii) The hatch in the fuselage roof aft of the front spar.

(iii) The hatch in the fuselage roof aft of the rear spar. A folding escape ladder is fitted below this exit.

62. **Fire-extinguishers**

A semi-automatic fire-extinguisher system is installed, and is operated by gravity and impact switches. The system may be operated manually by manipulating the pilot's pushbutton switches (81) mounted on the left-hand cockpit wall. There are four such buttons, one for each engine bay. Hand-operated fire-extinguishers are stowed in the following positions:

Type No. 3 *fire-extinguishers:*

On the fuselage roof above the navigator's position. In the roof of the flight engineer's position, port side of the astro dome.

Type No. 5 *fire-extinguishers:*

On the forward face of the pilot's bulkhead below the engine master cocks. Starboard side of the fuselage forward of the main electrical panel. Above the starboard rest seat.

Starboard side of the fuselage forward of the flare launching chute. Starboard side of the fuselage just forward of the rear gun turret.

63. **Dinghy and ditching**

(i) A dinghy stowed on the port side in the centre plane is released by:

(*a*) A manual release on the port side of the rear roof escape hatch. Give the handle a half turn counter-clockwise and pull to release.

(*b*) Immersion switches under the nose of the fuselage. A signal pistol and cartridges, emergency rations, sea markers, first-aid outfit and paddles are provided in a valise attached to the dinghy by a cord.

(ii) For ditching recommendations—*see* A.P. 2095.

PART V
ILLUSTRATIONS

KEY TO *Fig.* 1

INSTRUMENT PANEL

1. Camera warning light.
2. Pilot's oxygen flow meter.
3. R.D. compass repeater.
4. Test button for A.R.I. 5122.
5. Flaps position indicator.
6. Beam approach indicator.
7. Instrument flying panel.
8. Boost gauges.
9. Landing lamp switch.
10. D.F. indicator.
11. R.p.m. indicators.
12. Bomb jettison control.
13. Bomb doors warning lights.
14. Bomb containers jettison switch.
15. Paratroop signalling lights and switch.
16. External lights master switch and indicator.
17. Air thermometer.
18. Dates card.
19. Brakes and air supply pressure gauge.
20. Oxygen regulator.
21. Bomb firing pushbutton.
22. Ignition switches.
23. Undercarriage indicator.
24. Ignition switches.
25. Undercarriage warning light.
26. Auto-pilot switch.

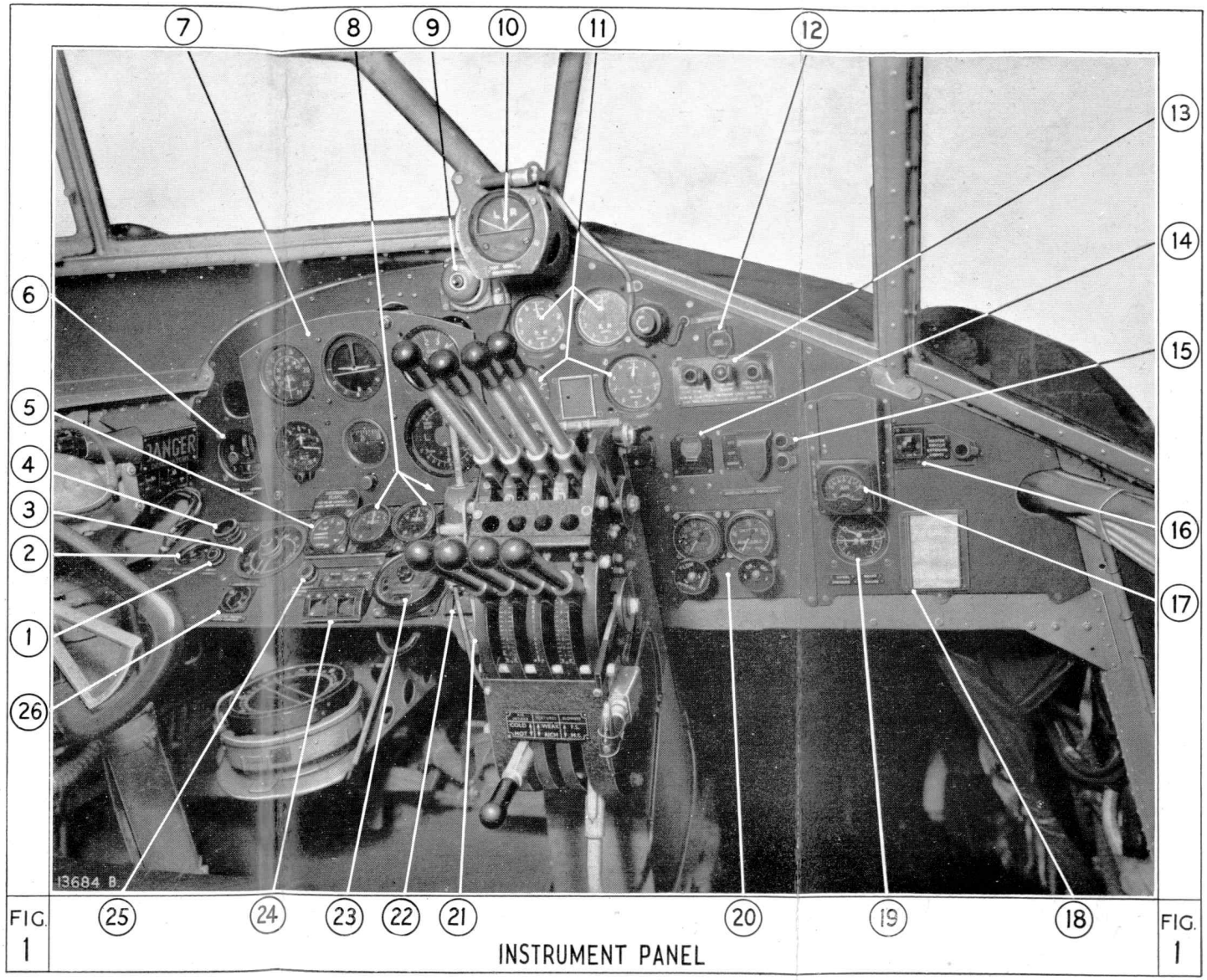
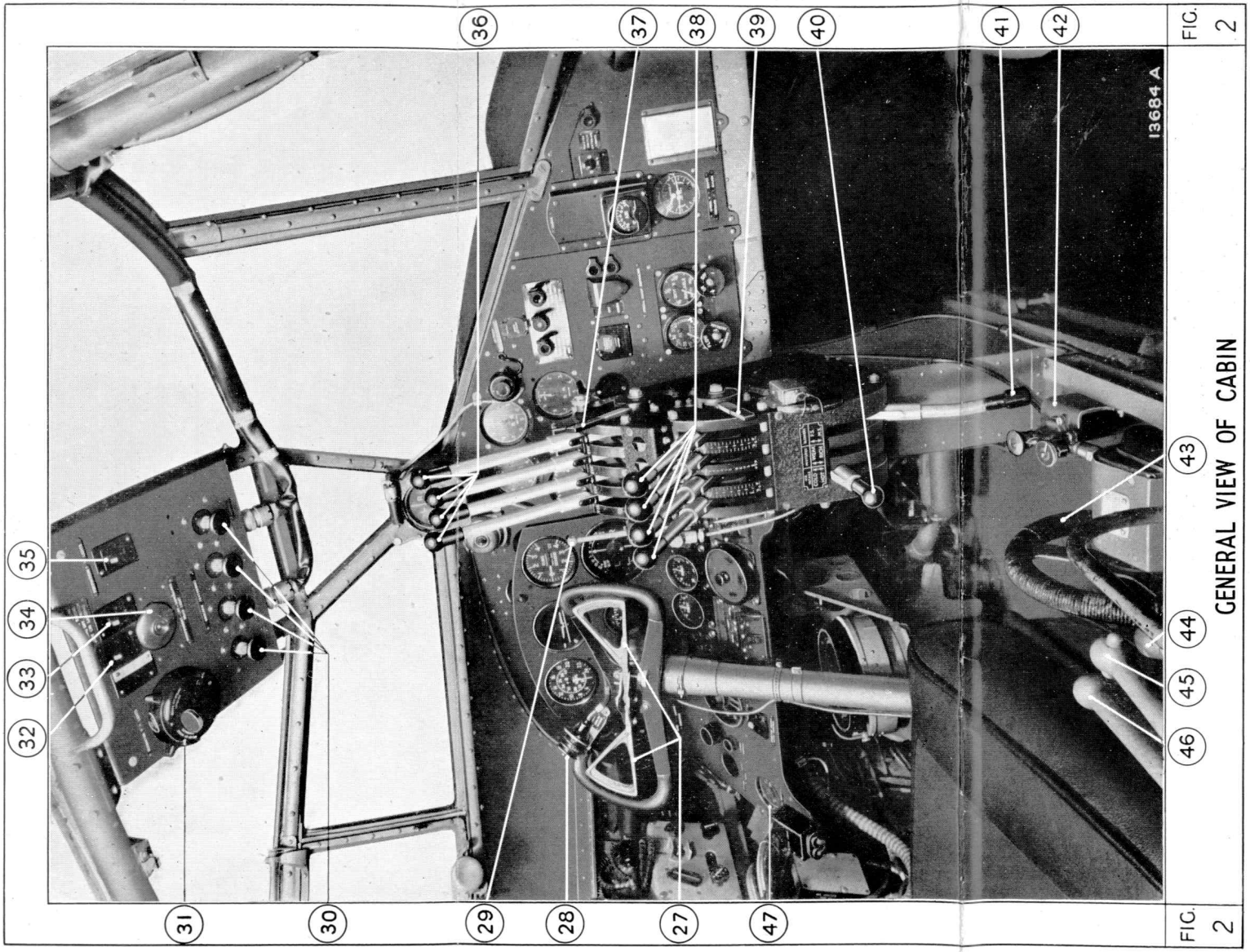


FIG. 1 INSTRUMENT PANEL FIG. 1



KEY TO *Fig.* 2

GENERAL VIEW OF CABIN

27. Wheel brakes levers.
28. Press to send pushbutton.
29. Landing light dipping lever.
30. Feathering pushbuttons.
31. Recognition lights switchbox.
32. Navigation lights switch.
33. Pressure-head heater switch.
34. Headlamp switch.
35. Formation lights switch.
36. Throttle levers.
37. Throttle friction adjuster.
38. Propeller speed control levers.
39. Propeller lever friction adjuster.
40. Air intake heat control.
41. Supercharger gear lever.
42. Windscreen de-icing pump.
43. Elevator trimming tab control.
44. Undercarriage selector lever.
45. Flaps selector lever.
46. Bomb doors selector lever.
47. Auto-pilot pressure and trim gauge.

KEY TO *Fig.* 3

FLIGHT ENGINEER'S PANEL

48. Oxygen valve.
49. Cowling gills motor controls and indicator lights.
50. Cowling gills position indicators.
51. Bomb-bay tanks transfer pumps indicator light.
52. Booster-coil pushbuttons.
53. Starter pushbuttons.
54. Bomb-bay tank transfer pump switches.
55. Main fuel tank contents gauges.
56. Fuel contents gauges switch.
57. Engine oil temperature gauges.
58. Panel light regulator switches.
59. Cylinder temperature gauges
60. Oil pressure indicators.
61. Fuel pressure warning lights.
62. Bomb-bay tank transfer pump testing pushbuttons.
63. No. 2 tanks transfer pump indicator light.
64. No. 2 tanks contents gauges.
65. No. 2 tank transfer pump testing pushbuttons.
66. No. 2 tank transfer pump switches.
67. Oil dilution pushbuttons.
68. Main tank group fuel booster pump switches.
69. Main tank group booster pump test pushbuttons.
70. Oil cooler shutter motor switches and indicators.
71. Main tank group cock controls.
72. Cross-fuel cock controls.

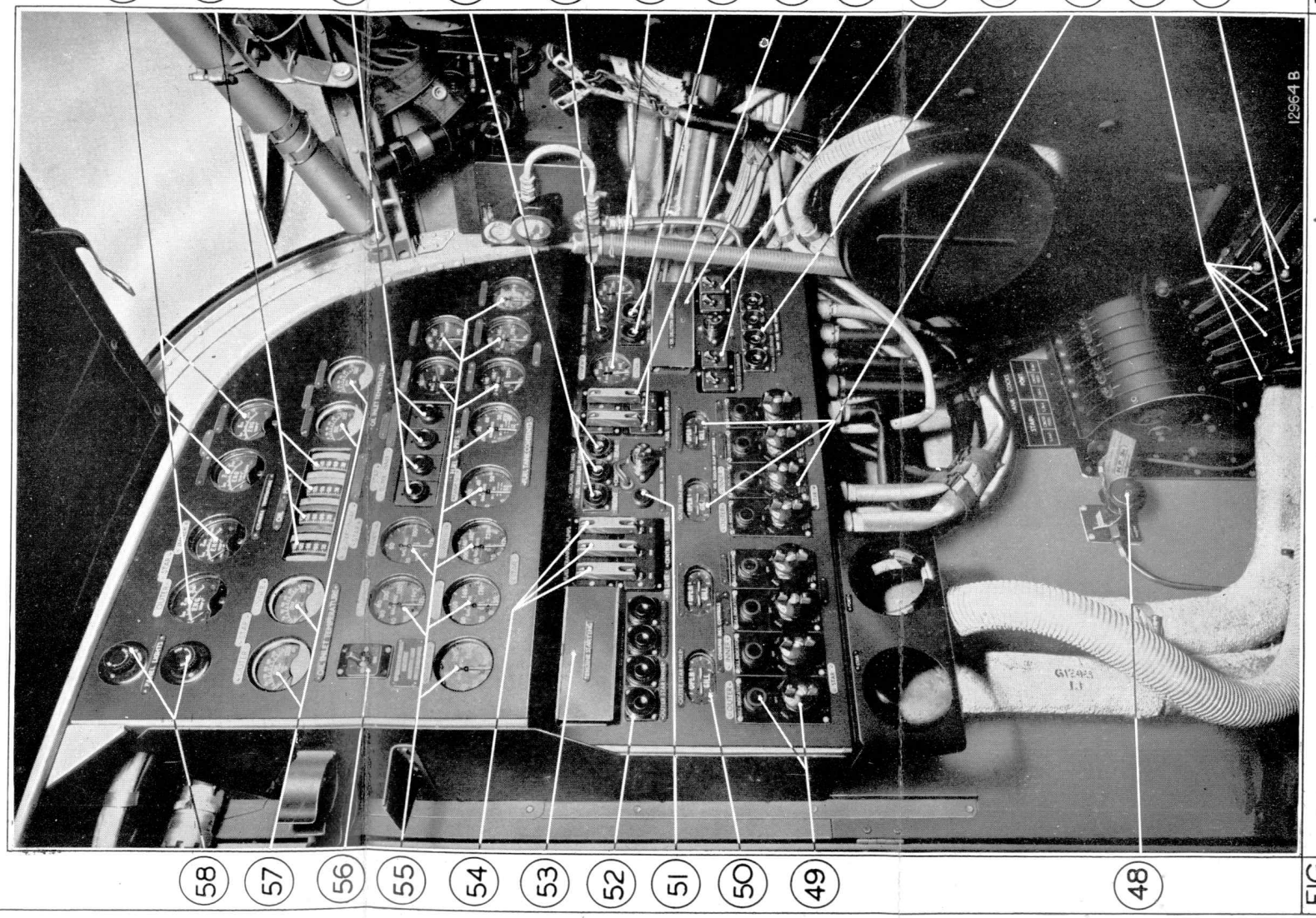


FIG. 3 FLIGHT ENGINEER'S PANEL FIG. 3

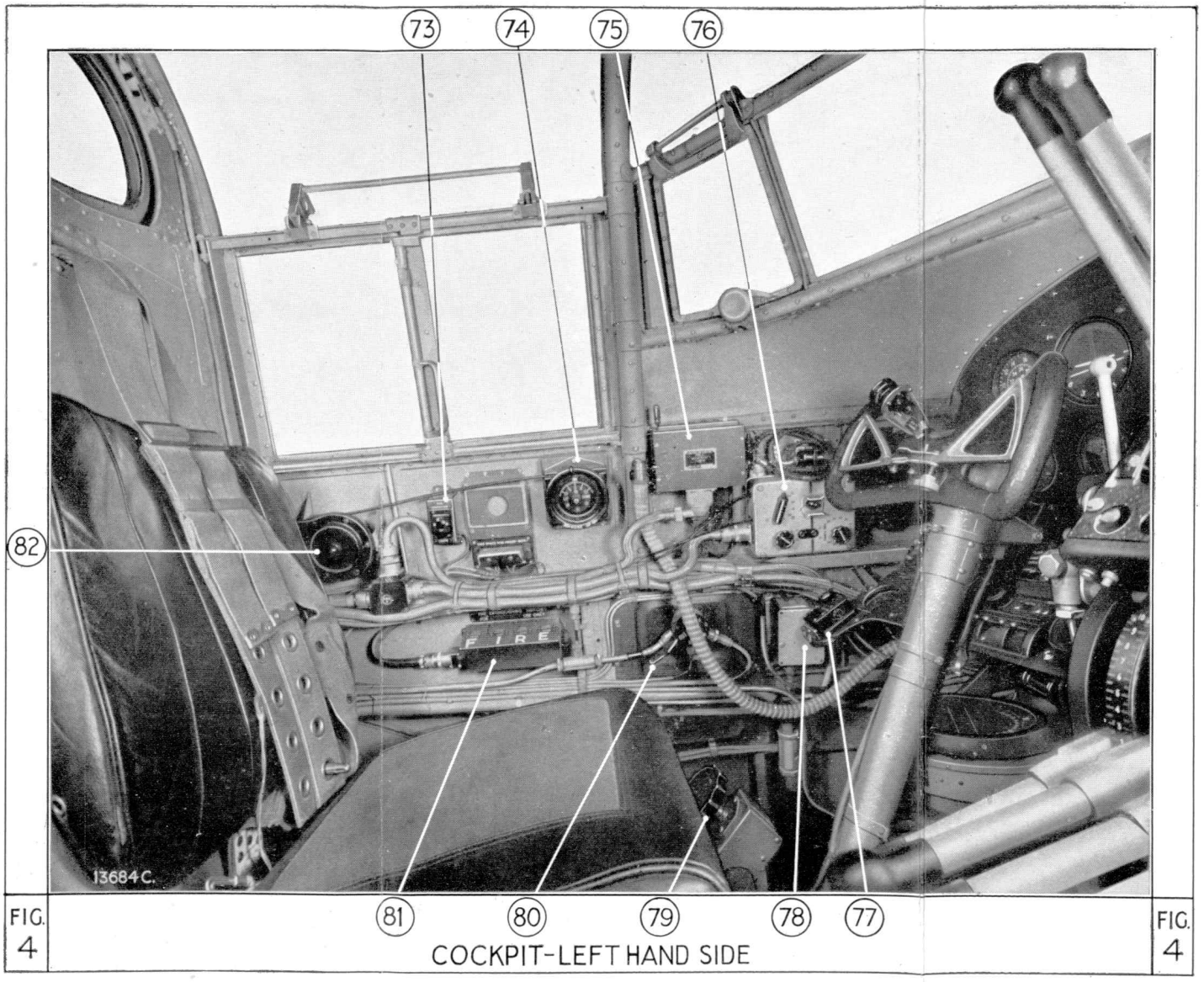


FIG. 4 COCKPIT-LEFT HAND SIDE FIG. 4

KEY TO *Fig.* 4

COCKPIT—LEFT HAND SIDE

73. Tail formation light switch.
74. Automatic pilot pitch control.
75. T.R. 1196 controller.
76. Beam approach controller.
77. Call light.
78. Beam approach mixer box.
79. Aileron trimming tab control.
80. Automatic pilot clutch lever.
81. Fire-extinguisher pushbuttons.
82. Undercarriage warning horn.

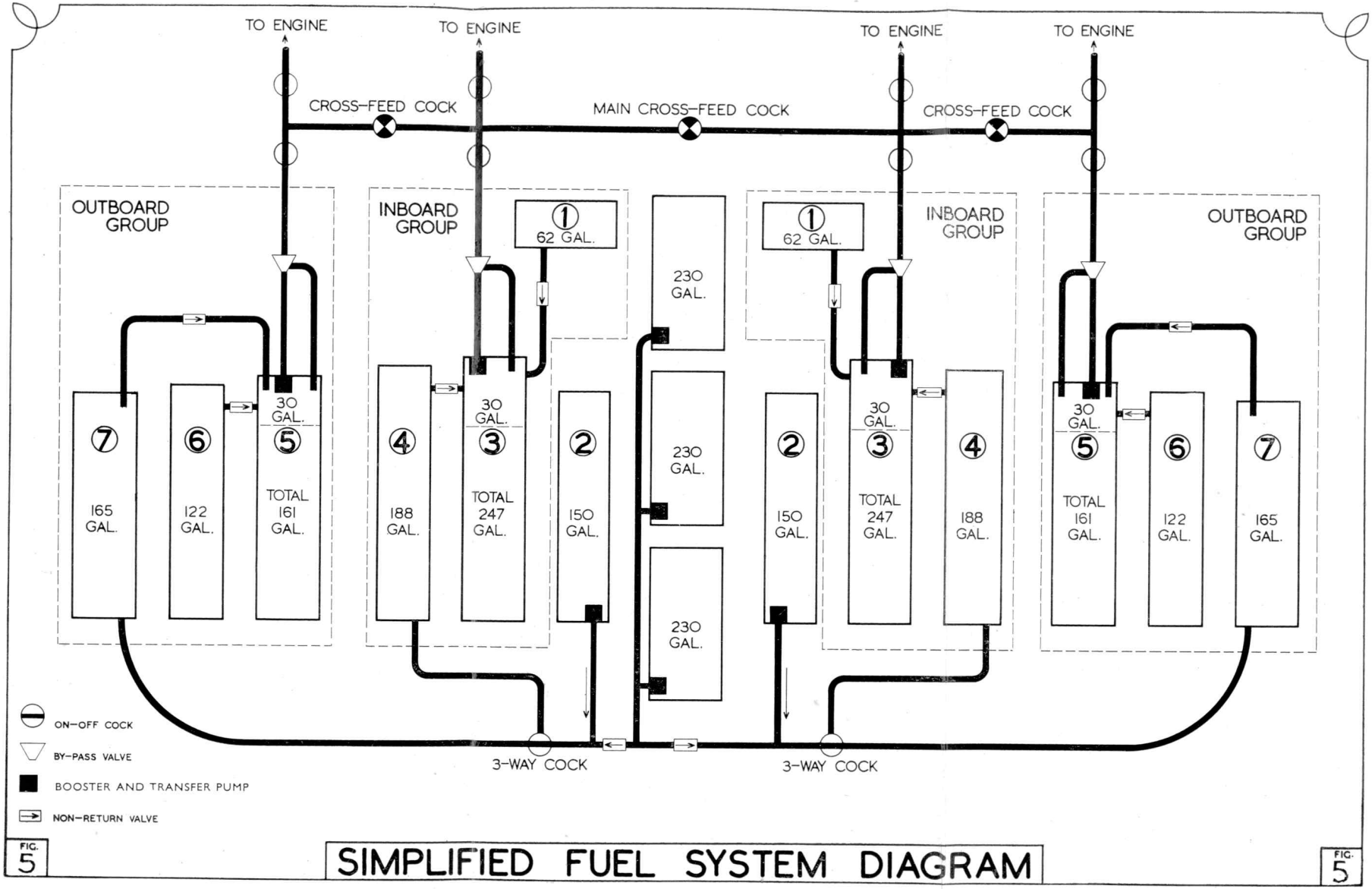


FIG. 5

SIMPLIFIED FUEL SYSTEM DIAGRAM

FIG. 5

DO NOT PRINT

RESTRICTED

AIR MINISTRY
March, 1948

Amendment List No. 3
to A.P. 1719F—P.N.

HALIFAX B VI

Incorporation of this Amendment List must be certified by inserting date of incorporation and initials in the spaces provided on the inside front cover of the Pilot's Notes.

PART	PAGE OR PARA.	AMENDMENT
	List of contents Page 4	*Add* "32a. Propeller de-icing."
I	Page 17	*Affix* gummed slip herewith, bearing new para. 32a, in space following para. 32.
II	Pages 22/23	*Insert* white-on-black check lists between pages 22 and 23 by opening the wire staples of the book to the vertical position, and fixing in the check lists so that the staples pierce the insert along its fold, and its pages register exactly with pages 22 and 23. Firmly close down the staples taking care not to damage the insert so that it is liable to pull away.
IV	Para. 59	*Amend* by gummed slip herewith.

Affix this Amendment List to the inside back cover of these Pilot's Notes retaining AL's. 1 and 2.

(12732) Wt. 8213—1102 400 12/46 G.S St. Gp. 344


These are being listed for the
benifit for people interested
in British or Commonwealth
Aircraft
While it did cost me a great
sum of money to aquire
these documents, all I ask in
return is some credit.
~JimSan