

AD. 2184-114

PILOTS' NOTES
FOR
SPITFIRE F XII
GRIFON III OR IV ENGINE



PROMULGATED BY ORDER OF THE AIR COUNCIL

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AMENDMENTS

Amendment lists will be issued as necessary and will be printed for placing in the ready book shown on these pages. Each amendment list will, where applicable, be accompanied by a printed slip for sticking in the appropriate places in the ready book. The completion of an amendment list must be certified by marking date of incorporation and initials below.

AM. NO.	INITIALS	DATE	AM. NO.	INITIALS	DATE
1			2		
3			4		
5			6		
7			8		
9			10		
11			12		
13			14		
15			16		

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 from A.P.F.S., Fulham Road, S.W.3, by application on R.A.F. Form 294A, in duplicate, quoting the number of this publication in full—A.P. 1565K—P.N.

Comments and suggestions should be forwarded through the usual channels to the Air Ministry (D.T.F.).

SPITFIRE F XII PILOT'S NOTES

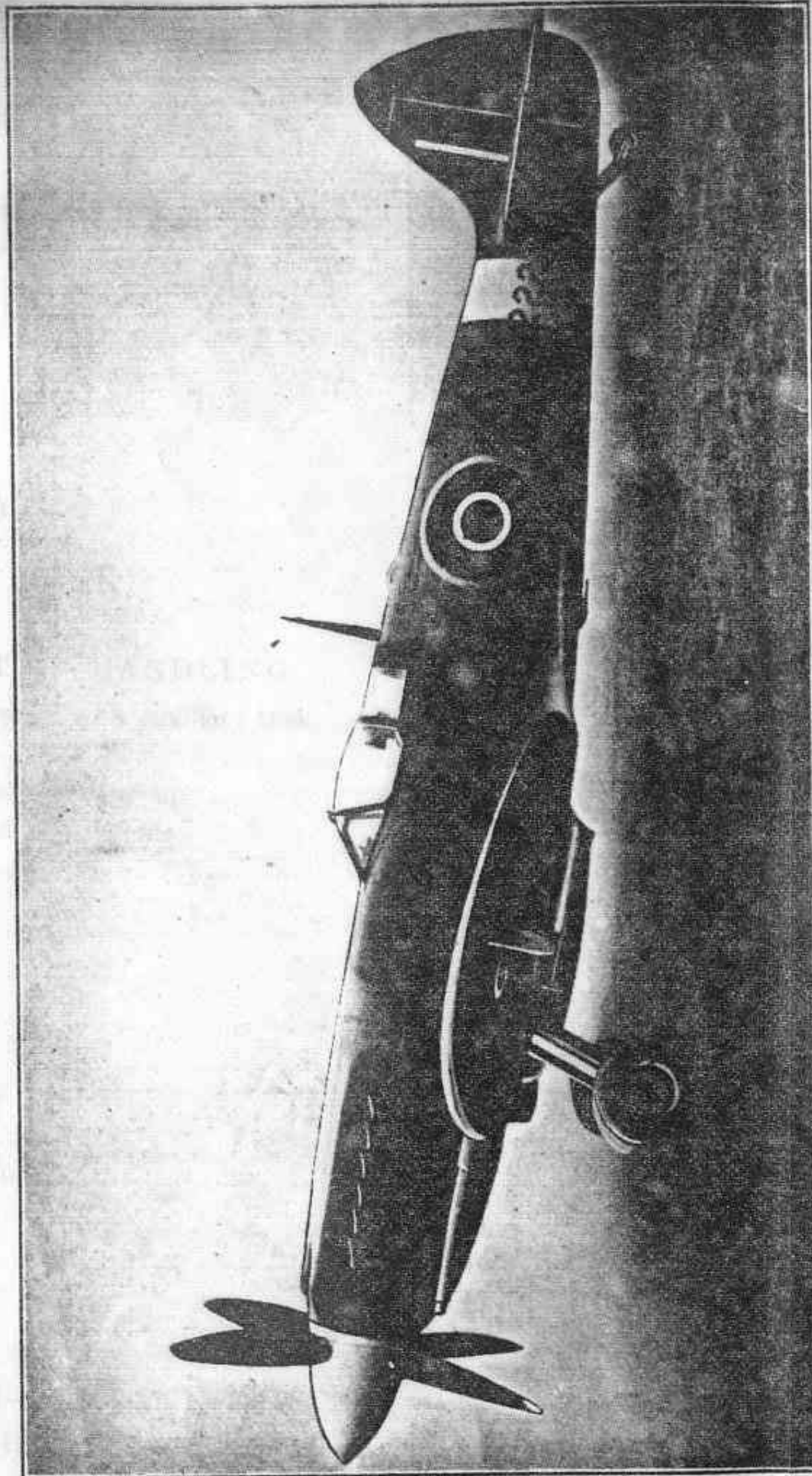
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PART I

DESCRIPTIVE

INTRODUCTION

1. **The Spitfire F Mark XII** is fitted with a Griffon III or IV engine and a Rotol 35° four-bladed propeller. The aircraft controls, including the undercarriage, flaps and brakes, are identical with those on earlier Marks.

FUEL, OIL AND COOLANT SYSTEMS

2. **Fuel tanks** (see Fig. 4).—Fuel is carried in two tanks mounted one above the other (the lower one is self-sealing) forward of the cockpit. The top tank feeds into the bottom tank and fuel is delivered to the carburettor, through a filter, by an engine-driven pump. The de-aerator in the carburettor is vented to the top tank.

The main tank capacities are as follows:

Top tank	.. .. .	36 gallons
Bottom tank	.. .. .	49 gallons
		<hr/>
		85 gallons

An auxiliary drop tank of 30-gallons capacity can be fitted under the fuselage. On early aircraft, with the oil tank in the rear fuselage, the tank capacities are:

Top tank	.. .. .	48 gallons
Bottom tank	.. .. .	37 gallons
		<hr/>
		85 gallons

3. **Fuel cocks.**—The cock control for the main tanks is a lever (24) fitted below the engine starting push-button and the cock control (65) and jettison lever (64) for the auxiliary drop tank are mounted together on the right-hand side of the cockpit, below the undercarriage control unit. The jettison lever is pulled up to jettison the drop tank, but cannot be operated until the cock control is moved forward to the OFF position.

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4. **Fuel contents gauge and pressure warning light.**—The contents gauge (20) on the instrument panel indicates the combined contents of the main tanks when the adjacent pushbutton is pushed. The fuel pressure warning light (15) comes on when the pressure drops to 6 lb./sq.in. and is switched off by the undercarriage DOWN indicator switch (34) on the throttle quadrant.
5. **Oil system.**—Oil is supplied by a tank of 7 gallons oil capacity, and 2 gallons air space, housed between the upper fuel tank and the fireproof bulkhead, and passes through a filter before entering the engine. The tank is pressurised to 2½ lb./sq.in. An oil cooler is fitted in the underside of the port wing and oil pressure (19) and temperature (18) gauges are fitted on the instrument panel. On early aircraft the oil tank is behind the cockpit and has an oil capacity of 6 gallons and 3 gallons air space.
6. **Coolant system.**—The system is thermostatically controlled, the under-wing radiator being by-passed until the coolant reaches a certain temperature. The header tank is mounted above the reduction gear casing and is fitted with a relief valve. The radiator flap is operated by a lever in the cockpit. There is a coolant temperature gauge (17) on the instrument panel.

MAIN SERVICES

7. **Hydraulic system.**—Oil is carried in a reservoir on the fireproof bulkhead and passes through a filter to an engine-driven pump for operation of the undercarriage.
8. **Electrical system.**—A 12-volt generator supplies an accumulator which in turn supplies the whole of the electrical installation. A voltmeter (12) across the accumulator is fitted at the top of the instrument panel and a red light (46), marked POWER FAILURE, to the left of the pilot's seat is illuminated when the generator is not delivering current to the accumulator.
9. **Pneumatic system.**—An engine-driven air compressor feeds two storage cylinders for operation of the flaps, brakes and guns. The cylinders each hold air at 300 lb./sq.in. pressure.

PART I—DESCRIPTIVE

AIRCRAFT CONTROLS

10. **Flying controls.**—The control column is of the spade-grip pattern and incorporates the brake lever and gun and cannon firing control. The rudder pedals have two positions and are adjustable for leg reach by rotation of star wheels on the sliding tubes.
11. **Trimming tabs.**—The elevator trimming tabs are controlled by a handwheel (40) on the left-hand side of the cockpit, the indicator (3) being on the instrument panel. The rudder trimming tab is controlled by a small handwheel (44) and is not provided with an indicator. The aircraft tends to turn to starboard when the handwheel is rotated clockwise.
12. **Undercarriage control.**—The undercarriage selector lever (66) moves in a gated quadrant on the right-hand side of the cockpit.

To raise the undercarriage the lever must be moved downwards and across, to disengage it from the gate, and then moved forward to the full extent of the quadrant. When the undercarriage operation is completed the lever will automatically spring into the forward gate. To lower the undercarriage the operation is reversed and the lever will spring into the rear gate when the undercarriage is down.

The lever must never be moved into either gate by hand as this will cut off the hydraulic pressure. An indicator in the quadrant shows DOWN, IDLE or UP, depending on the position of the hydraulic valve. UP and DOWN should show during the corresponding operation of the undercarriage, and IDLE when the lever is in either gate. If, when the engine is not running, the indicator shows DOWN, it should return to IDLE when the engine is started; if it does not, probable failure of the hydraulic pump is indicated.

For emergency lowering of the undercarriage see para. 53.
13. **Undercarriage indicators**
 - (a) **Electrical visual indicator.**—The electrically operated visual indicator (4) has two semi-transparent windows on which the words UP on a red background and DOWN

PART I—DESCRIPTIVE

- on a green background are lettered; the words are illuminated according to the position of the undercarriage. The switch (34) for the DOWN circuit is moved to the ON position by a striker on the throttle lever as the throttle is opened.
- (b) **Mechanical position indicators.**—A rod that extends through the top surface of the main plane is fitted to each undercarriage unit. When the wheels are down the rods protrude through the top of the main planes and when they are up, the top of the rods, which are painted red, are flush with the main plane surfaces.
 14. **Undercarriage warning horn.**—The horn sounds when the throttle lever is nearly closed and the undercarriage is not lowered. The horn cannot be silenced until the throttle is opened again or the undercarriage is lowered.
 15. **Flap control.**—The split flaps have two positions only, up and fully down. They are controlled by a finger lever (7) on the instrument panel.
 16. **Wheel brakes.**—The brake lever is fitted on the control column spade grip and a catch for retaining it in the on position for parking is fitted below the lever pivot. A triple pressure gauge (1), showing the air pressures in the pneumatic system cylinders and at each brake, is mounted on the instrument panel.
 17. **Flying control locking struts.**—Two struts are stowed on the right-hand side of the cockpit, aft of the seat. The longer strut and the arm attached to it lock the control column to the seat and to the starboard datum longeron, and the shorter strut, attached to the other strut by a cable, locks the rudder pedals. The controls should be locked with the seat in its highest position.

ENGINE CONTROLS

18. **Throttle.**—The throttle lever (33) is gated at the climbing boost position. The mixture control is automatic and there is, therefore, no pilot's control lever. There is a friction adjuster (38) on the side of the quadrant.

PART I—DESCRIPTIVE

19. **Propeller control.**—The speed control lever (36) on the throttle quadrant varies the governed r.p.m. from 2,750 down to 1,800. The friction adjuster is on the side of the quadrant.
20. **Supercharger control.**—The control lever (28) for the two-speed supercharger is on the left-hand side of the cockpit, immediately above the elevator trimming tab handwheel. Low gear (MODERATE) is in the fully aft position and high gear (FULL) in the fully forward position.
21. **Radiator flap control.**—The radiator flap is operated by a lever (39) and ratchet on the left-hand side of the cockpit. The normal minimum drag position of the lever for level flight is shown by a red triangle on the top of the map case.
22. **Slow-running cut-out.**—The control on the carburettor is operated by pulling the ring (21) below the right-hand side of the instrument panel.
23. **Cylinder priming pump.**—A Ki-gass, Type K40, pump (47) for priming the engine is fitted immediately forward of the undercarriage control quadrant.
24. **Ignition switches.**—These (2) are on the left-hand side of the instrument panel.
25. **Cartridge starter.**—The Coffman starter breech control is a pull-grip toggle (22) to the left of the slow-running cut-out. The magazine for the starter holds five cartridges which are fired by the engine-starter pushbutton (23). This also operates the booster coil.
26. **Hand starting.**—No provision is made for hand starting of the engine.
27. **Oil dilution.**—A pushbutton (45) for operating the solenoid valve is on the left-hand side of the cockpit.

OTHER CONTROLS

28. **Cockpit door.**—The cockpit door is provided with a two-position catch (27) which allows it to be partly opened and so prevent the hood from sliding shut when

PART I—DESCRIPTIVE

taking-off and landing, and in the event of a forced landing. It will be found that the catch operates more easily when the aircraft is airborne than when on the ground.

29. **Signal discharger.**—The recognition device fires one of six cartridges out of the top of the rear fuselage when the handle to the left of the pilot's seat is pulled upwards. On some aircraft a pre-selector lever is mounted beside the operating handle.

PART II HANDLING

30. Management of fuel system with auxiliary tank

(i) *Flying restrictions:*

Drop tanks should be jettisoned only in straight and level flight and then only if absolutely necessary.

(ii) *Management of tanks:*

(a) Start, warm up and take off on the main tanks and change over to the drop tank at a safe height (say 2,000 feet). Turn OFF the main tanks.

(b) When the engine cuts, turn OFF the drop tank, turn ON the main tanks, and if maximum range is required, or in other special circumstances, jettison the tank.

(c) If a tank has to be jettisoned before it is empty, first turn ON the main tanks and then turn OFF the drop tank.

NOTE.—It is necessary to ensure that the drop tank cock is in the fully OFF position when the tank is empty or jettisoned; otherwise, air may be sucked into the main fuel system.

31. Preliminaries

- (i) Check contents of fuel tanks. If fitted with a drop tank check that the cock is OFF.
- (ii) Check that the undercarriage selector lever is down; switch on indicator and see that DOWN shows green. Check voltmeter: 12 volts minm.
- (iii) Test operation of flying controls.
- (iv) In order to avoid damage to the propeller, the ground immediately below it should be cleared of any small stones or rubble before starting the engine.

PART II—HANDLING

32. Starting the engine and warming up

(i) Set fuel cock ON.

(ii) Set the controls as follows:

Throttle .. ..	..	..	½ inch open
Propeller control .. ..	..	..	Fully forward
Supercharger .. ..	..	..	MODERATE
Radiator shutter .. ..	..	..	Fully open

(iii) If an external priming connection is fitted, high volatility fuel (Stores ref. 34A/111) should be used for priming at temperatures below freezing. Work the Ki-gass priming pump until the fuel reaches the priming nozzles; this may be judged by a sudden increase in resistance.

(iv) Load the cartridge starter. The following types of cartridge should be used:

At air temperatures *above* +10°C.: No. 4 Mark I

At air temperatures *below* +10°C.: No. 5 Mark I

(v) Immediately before attempting to start, switch ON the ignition and give the following number of strokes if the engine is cold:

Air temperature °C.: +30 +20 +10 0 -10 -20

Normal fuel: 1 1 2½ 5

High volatility fuel: 1 2 3

Leave the priming pump plunger out and press the cartridge starter pushbutton. (Keep the button pressed, as it also controls the booster coil.) As the cartridge is fired, give one sharp stroke of the priming pump. If the engine fails to start on one cartridge, no further priming should be given except for one sharp stroke as each subsequent cartridge is fired.

(vi) At temperatures below freezing it will probably be necessary to continue priming after the engine has fired and until it picks up on the carburettor.

(vii) Release the starter button as soon as the engine is running satisfactorily and screw down the priming pump.

(viii) Open up slowly to 1,000 r.p.m., then warm up at this speed.

PART II—HANDLING

33. Testing the engine and installations

While warming up

- (i) Check temperatures and pressures.
After warming-up, with three men on the tail and one on the port wing-tip
- (ii) Open up to +6 lb./sq.in. boost and exercise and check operation of the two-speed supercharger. R.p.m. should fall when S ratio is engaged.
- (iii) At +6 lb./sq.in. boost exercise and check operation of the constant-speed propeller. R.p.m. should fall to 1,800 with the control fully back. Check that generator is charging; the power failure light should be out and the voltage 14 or over.
- (iv) With the propeller control fully forward, open the throttle to the gate and check take-off boost and static r.p.m. which should be 2,750 at take-off boost.
- (v) Throttle back to +7 lb./sq.in. boost and test each magneto in turn. The drop should not exceed 150 r.p.m.
- (vi) Before taxiing, check brake pressure (80 lb./sq.in.) and pneumatic supply pressure (220 lb./sq.in.).

34. Check list before take-off

T—Trimming tabs	Elevator: One division nose up
	Rudder: Fully left
P—Propeller control	Fully forward
F—Fuel	Check contents of main tanks
	Main tank cock—ON
	Drop tank cock—OFF
F—Flaps	UP
Supercharger ..	MODERATE
Radiator shutter	Fully open

35. Take-off

- (i) Open the throttle slowly up to +7 lb./sq.in. boost only. This is important, as otherwise there is a strong tendency to swing right in the initial stages (note that the swing is opposite to that of Merlin marks). +7 lb./sq.in. boost is sufficient for a normal take-off.

PART II—HANDLING

- (ii) After raising the undercarriage, see that the red indicator light—UP—comes on. It may be necessary to hold the lever hard forward against the quadrant until it does come on. Failure of the wheels to lock up may spoil the airflow through the radiator and oil cooler and result in excessive temperatures.
- (iii) Do not start to climb before a speed of 140 m.p.h. I.A.S. is attained.

36. Climbing

The speed for maximum rate of climb is 190 m.p.h. I.A.S. from sea level up to 20,000 feet.

37. General flying

- (i) *Stability.*—The aircraft is stable about all axes.
- (ii) *Controls.*—Rudder control is heavy, and changes of power and speed cause changes in directional trim which require frequent adjustment of the rudder trimming tab. Aileron control is very light.
- (iii) *Change of trim*

Undercarriage down	..	Nose down
Flaps down	.. ..	Nose down
- (iv) In bad visibility near the ground, flaps should be lowered and the propeller set to give 2,400 r.p.m. Speed may then be reduced to 130 m.p.h. I.A.S.
- (v) Pending readjustment of the carburettor, engine cutting may occur in tight turns at high boost and low r.p.m. At +4 lb./sq.in. boost at least 2,400 r.p.m. should be used to overcome this.

38. Stalling

The stalling speeds (engine off) in m.p.h. I.A.S. at normal A.U.W. (7,400 lb.) are as follows:

Undercarriage and flaps up	..	82
Undercarriage and flaps down	..	74

39. Spinning

- (i) Spinning is permitted and recovery is normal, but the loss of height involved in recovery may be very great and the following limits are to be observed:

PART II—HANDLING

- (a) Spins are not to be started below 10,000 feet.
- (b) Recovery is to be initiated before two turns are completed.

- (ii) A speed of 150 m.p.h. I.A.S. should be attained before starting to ease out of the resultant dive.
- (iii) Spinning is not permitted when fitted with a drop tank or when carrying a bomb.

40. Diving

- (i) The aircraft should be trimmed into and out of the dive.
- (ii) Any tendency to yaw should be corrected by use of the rudder trimming tab.
- (iii) When carrying a bomb, the angle of dive must not exceed 40°.

41. Aerobatics

- (i) The following speeds (m.p.h. I.A.S.) are recommended:

Loop	280-300
Roll	220-300
Half-roll off loop	320-350
Upward roll	350-400
- (ii) Flick manœuvres are not permitted.

42. Check list before landing

- (i) Reduce speed to 160 m.p.h. I.A.S. and open the cockpit hood.

U—Undercarriage ..	DOWN (Check indicator)
P—Propeller control ..	Fully forward
Supercharger ..	MODERATE
F—Flaps	DOWN
Radiator shutter ..	Fully open

NOTE.—The undercarriage operation takes considerably longer with engine off than with the engine on. The undercarriage must, therefore, be lowered early on a glide approach.

- (ii) Check brake pressure (80 lb./sq.in.) and pneumatic supply pressure (220 lb./sq.in.)

43. Approach and landing

- (i) Approach speeds in m.p.h. I.A.S. at normal load:

		(flaps up)
Engine assisted:	95	(105)
Glide:	105	(110)

PART II—HANDLING

NOTE.—In all cases speed may be reduced by 5 m.p.h. when cannon ammunition or considerable fuel has been expended.

- (ii) The aircraft is nose-heavy on the ground; the brakes, therefore, must be used carefully on landing.

44. Mislanding

- (i) Raise the undercarriage.
- (ii) Climb at about 130 m.p.h. I.A.S. with flaps fully down.
- (iii) Raise flaps at a safe height of about 200-300 feet.
- (iv) Retrim.

45. After landing

- (i) Raise the flaps before taxiing.
- (ii) To stop the engine, idle for ½ minute at 800-900 r.p.m., then pull the slow-running cut-out and hold it out until the engine stops.
- (iii) Turn OFF the fuel cock and switch OFF the ignition.
- (iv) *Oil dilution* (See A.P. 2095).

The correct dilution period for this aircraft is:

Atmospheric temperature *above* -10°C.: 1 minute
 Atmospheric temperature *below* -10°C.: 2 minutes

46. Beam approach

- (i) The recommended speeds (m.p.h. I.A.S.), r.p.m., and flap settings are:

	Maintaining height		
	Preliminary manœuvring	Manœuvring with u/c down	Final approach
Speed	170	160 110	100
Flaps	UP	UP	DOWN
R.p.m.	2,400	2,400	Fully forward

- (ii) For change of trim *see* Para. 37 (iii).
- (iii) Approach at 700 feet over the outer marker beacon, reducing to 100 feet over the inner marker beacon.

PART III OPERATING DATA

47. Engine data: Griffon III or IV.

- (i) Fuel.—100 octane only.
- (ii) Oil.—See A.P.1464/C.37.
- (iii) Engine limitations:

		R.p.m.	Boost lb./sq.in.	Temp. C. Coolant	Oil
MAX. TAKE-OFF TO 1,000 FEET	M	2,750	+12	—	—
MAX. CLIMBING ONE HOUR LIMIT	M } S }	2,600	+9	125	90
MAX. RICH CONTINUOUS	M } S }	2,400	+7	105 (115)	90
MAX. WEAK CONTINUOUS	M } S }	2,400	+6	105 (115)	90
COMBAT 5 MINS. LIMIT	M } S }	2,750	+12	135	105

NOTE.—The figure in brackets is permitted for short periods.

IMPORTANT.—When changing gear, r.p.m. must not exceed 2,600.

OIL PRESSURE:

NORMAL	60-80 lb./sq.in.
MINIMUM	45 lb./sq.in.

MINIMUM TEMPERATURE FOR TAKE-OFF:

OIL	15 C.
COOLANT	60 C.

FUEL PRESSURE	8-10 lb./sq.in.
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48. Flying limitations

(i) Maximum speeds:

Diving	450 m.p.h. I.A.S.
Undercarriage down	160 m.p.h. I.A.S.
Flaps down	160 m.p.h. I.A.S.

(ii) Restrictions:

When fitted with a drop tank or bomb, spinning is not permitted and violent manoeuvres must be avoided. The angle of dive, when carrying a bomb, must not exceed 40°.

PART III—OPERATING DATA

49. Position error corrections

From	110	130	160	190	220	260	280	320	340	m.p.h. I.A.S.
To	130	160	190	220	260	280	320	340	380	m.p.h. I.A.S.
Add	6	4	2	0	—	—	—	—	—	m.p.h.
Subtract	—	—	—	0	2	4	6	8	10	m.p.h.

50. Maximum performance

Climbing:

- (i) The speeds for maximum rate of climb are as follows:

S.L. to 20,000 feet:	190 m.p.h. I.A.S.
20,000 to 25,000 feet:	170 m.p.h. I.A.S.
25,000 to 30,000 feet:	150 m.p.h. I.A.S.
30,000 to 35,000 feet:	130 m.p.h. I.A.S.
Above 35,000 feet:	120 m.p.h. I.A.S.

- (ii) For maximum rate of climb change to S ratio when boost has dropped by 5 lb./sq.in.
- (iii) In combat S ratio should be used if the maximum obtainable boost in M ratio is less than +7 lb./sq. in.

51. Economical flying (see Curves—page 20)

- (i) Climbing: Climb at +6 lb./sq.in. boost and 2,400 r.p.m. at the speeds for maximum rate of climb. Change to S ratio when the boost in M ratio has fallen to +3 lb./sq.in.
- (ii) Cruising: To obtain any required I.A.S. the lowest possible r.p.m. should be used, provided the boost does not exceed +6 lb./sq.in. S ratio should not be used at heights at which the required speed can be obtained at 2,400 r.p.m. in M ratio.

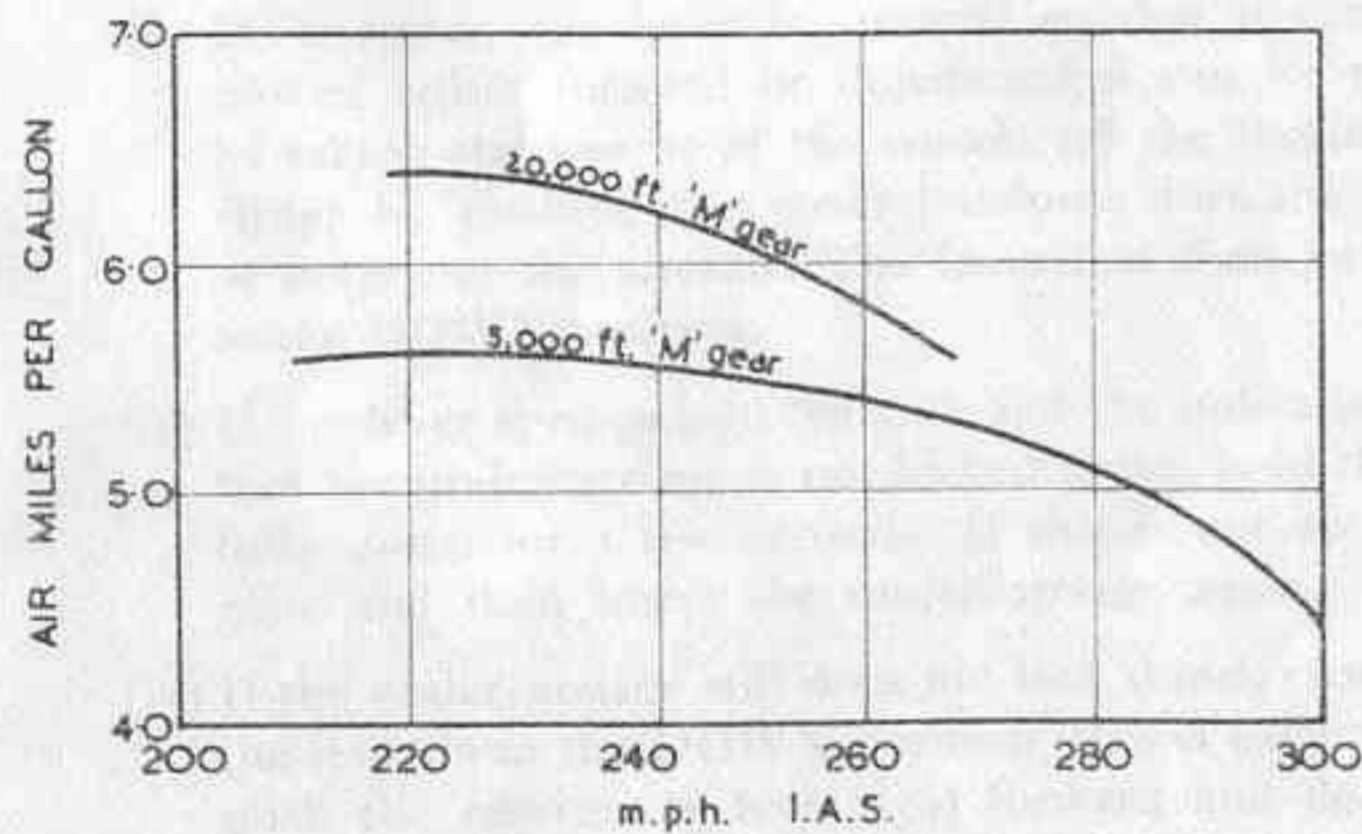
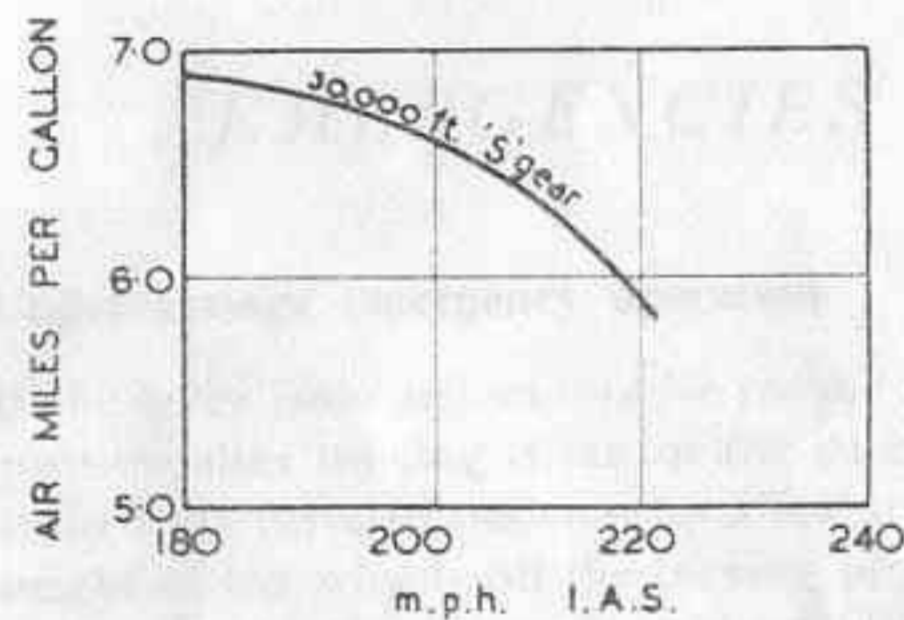
- (iii) Maximum Range: The recommended speeds are:

A.L. 1 Part III Para. 51 (iii)	S.L. to 5,000 feet:	240 m.p.h. I.A.S.
	5,000 to 25,000 feet:	220 m.p.h. I.A.S.
	Above 25,000 feet:	190 m.p.h. I.A.S.

At low altitudes set r.p.m. to as near 1,800 as possible and adjust speed by adjusting boost (within the weak mixture range). When the recommended speed cannot be obtained with the throttle at the gate, increase r.p.m. as necessary up to 2,400 to maintain the recommended speed. Do not use S ratio if the recommended speed can be obtained in M. ratio.

PART III—OPERATING DATA

RANGE CURVES



NOTE—When carrying 30-gallon drop tank, the air miles per gallon will be reduced by about 6 per cent.

PART III—OPERATING DATA

52. Fuel capacities and consumption

- (i) Normal fuel capacity 85 gallons.
- (ii) Long-range fuel capacity
With 30-gallon drop tank 115 gallons.
- (iii) Fuel consumptions (approximate gals/hr.):

(a) Weak mixture range: M ratio at 5,000 feet:

Boost lb./sq.in.	R.P.M.		
	2,400	2,200	2,000
+6	74	66	60
+4	70	62	57
+2	65	58	53
0	60	54	49
-2	54	50	45
-4	48	44	42

(b) Weak mixture range: S ratio at 20,000 feet:

Boost lb./sq.in.	R.P.M.		
	2,400	2,200	2,000
+6	75	—	—
+4	72	67	—
+2	67	63	56
0	61	57	52
-2	55	52	48
-4	50	47	43

(c) Rich mixture range at all heights:

Boost lb./sq.in.	R.P.M.	gallons/hour
+12	2,750	132
+9	2,600	104
+7	2,400	88

PART IV EMERGENCIES

53. Undercarriage emergency operation

- (i) If the lever jams and cannot be moved to the fully down position after moving it out of the gate, return the lever to the fully forward position for a few seconds, to take the weight of the wheels off the locking pins and allow them to turn freely, then move it to the DOWN position.
- (ii) If, however, the lever is jammed so that it cannot be moved either forward or downward it can be released by taking the weight of the wheels off the locking pins, either by pushing the control column forward sharply or inverting the aircraft. The lever can then be moved to the DOWN position.
- (iii) If the lever springs into the gate and the indicators show that the undercarriage is not locked down, hold the lever fully down for a few seconds. If this is not successful, raise and then lower the undercarriage again.
- (iv) If the undercarriage still does not lock down, ensure that the lever is in the DOWN position (this is essential) and push the emergency lever (59) forward and downward through 180°. It should not be returned to its original position and no attempt must be made to raise the undercarriage until the emergency bottle has been replaced.

54. Hood jettisoning

The hood may be jettisoned in an emergency by pulling the rubber knob inside the top of the hood in a forward and downward movement, and pushing the lower edge of the hood outboard with the elbows.

PART IV—EMERGENCIES

55. Forced landing

In the event of having to make a forced landing the glide may be lengthened considerably by moving the propeller speed control fully back and gliding at about 130 m.p.h. I.A.S. The cockpit hood should be opened and the door put on the catch.

56. Ditching

(See A.P.2095, Pilot's Notes General.)

- (i) In general, the pilot should if possible abandon the aircraft by parachute.
- (ii) In the event of having to ditch, the auxiliary drop tank (if fitted) should be jettisoned, but only in straight flight, and the following procedure should be observed:
 - (a) The cockpit hood should be jettisoned.
 - (b) Flaps should be lowered in order to reduce landing speed as much as possible.
 - (c) The undercarriage should be retracted.
 - (d) Safety harness should be kept on, with straps tight, and the R/T plug disconnected.
 - (e) The engine, if available, should be used to help make the touch-down in a tail-down attitude at as low a speed as possible.
 - (f) Ditching should be along the wave crests or wave tops.

57. Failure of pneumatic system

- (a) If the flaps fail to lower when the control is moved to the DOWN position, it is probably due to a leak in the pipe line, resulting in complete loss of air pressure and consequent brake failure.
- (b) Alternatively, if a leak develops in the flap control diaphragm the flaps will lower, but complete loss of air pressure will follow and the brakes will become inoperative. (In this case a hissing sound may be heard in the cockpit after selecting flaps DOWN.)
- (c) In either case the flap control should immediately be returned to the UP position in order to allow sufficient pressure to build up, so that a landing can be made with the brakes working but without flaps.

PART IV—EMERGENCIES

NOTE.—As a safeguard, pilots should always check the pneumatic supply pressure after selecting flaps DOWN.

58. **First-aid outfit**

The first-aid outfit is stowed aft of the wireless equipment and is accessible through a hinged panel on the port side of the fuselage.

59. **Crowbar**

A crowbar (26), for use in an emergency, is stowed on the left-hand side of the cockpit.

PART V INSTRUMENT PANEL

KEY TO Fig. 1

1. Pneumatic pressure gauge.
2. Ignition switches.
3. Elevator tab indicator.
4. Undercarriage indicator.
5. Oxygen regulator.
6. Navigation lights switch.
7. Flap control.
8. Instrument flying panel.
9. Sunscreen lifting ring.
10. Reflector sight switch.
11. Reflector sight base.
12. Voltmeter.
13. Cockpit ventilator control.
14. Engine-speed indicator.
15. Fuel pressure warning light.
16. Boost gauge.
17. Radiator temperature gauge.
18. Oil temperature gauge.
19. Oil pressure gauge.
20. Fuel contents gauge and pushbutton.
21. Slow-running cut-out.
22. Starter breech re-loading control.
23. Engine starter push-button.
24. Fuel cock control.
25. Cockpit floodlight switches.

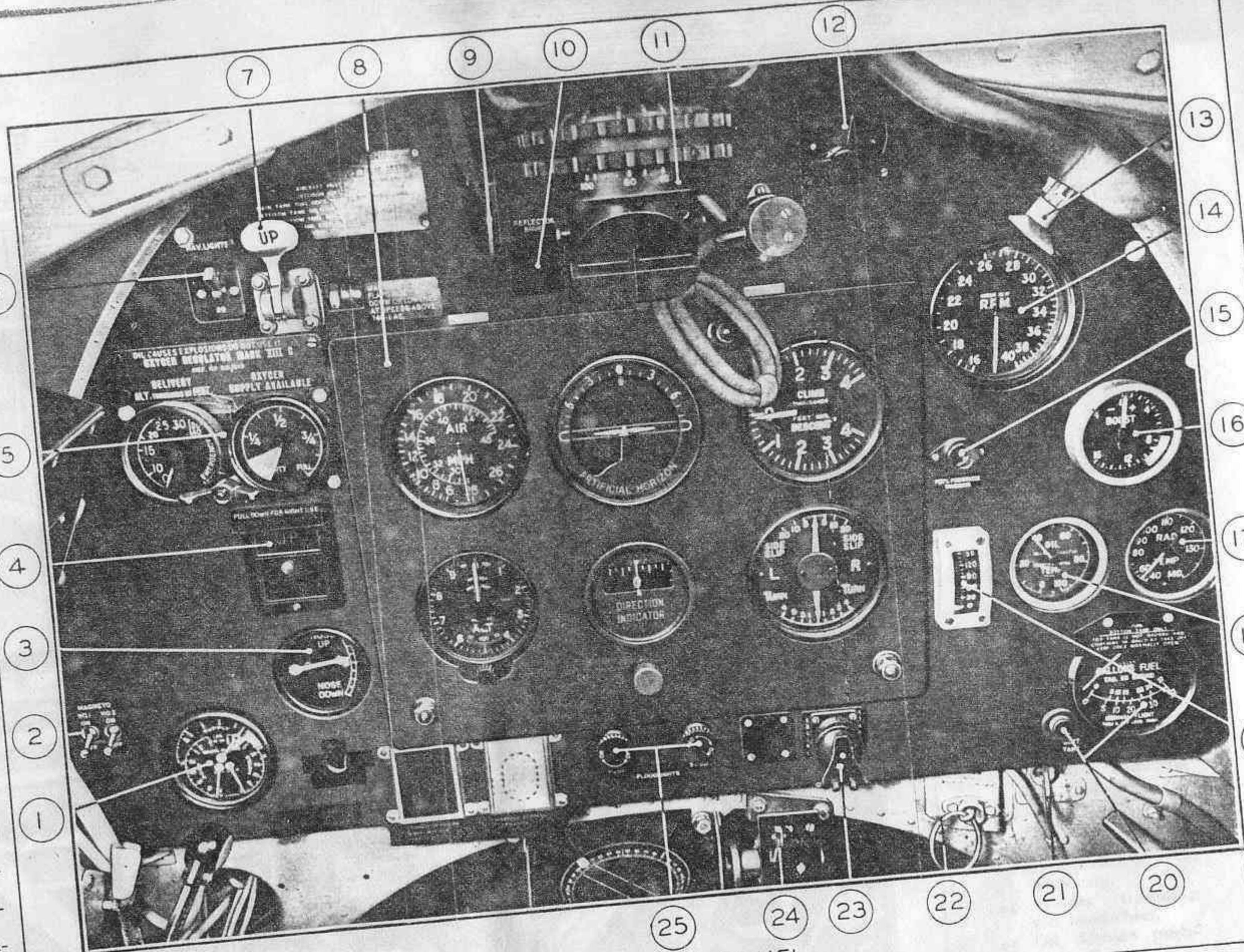
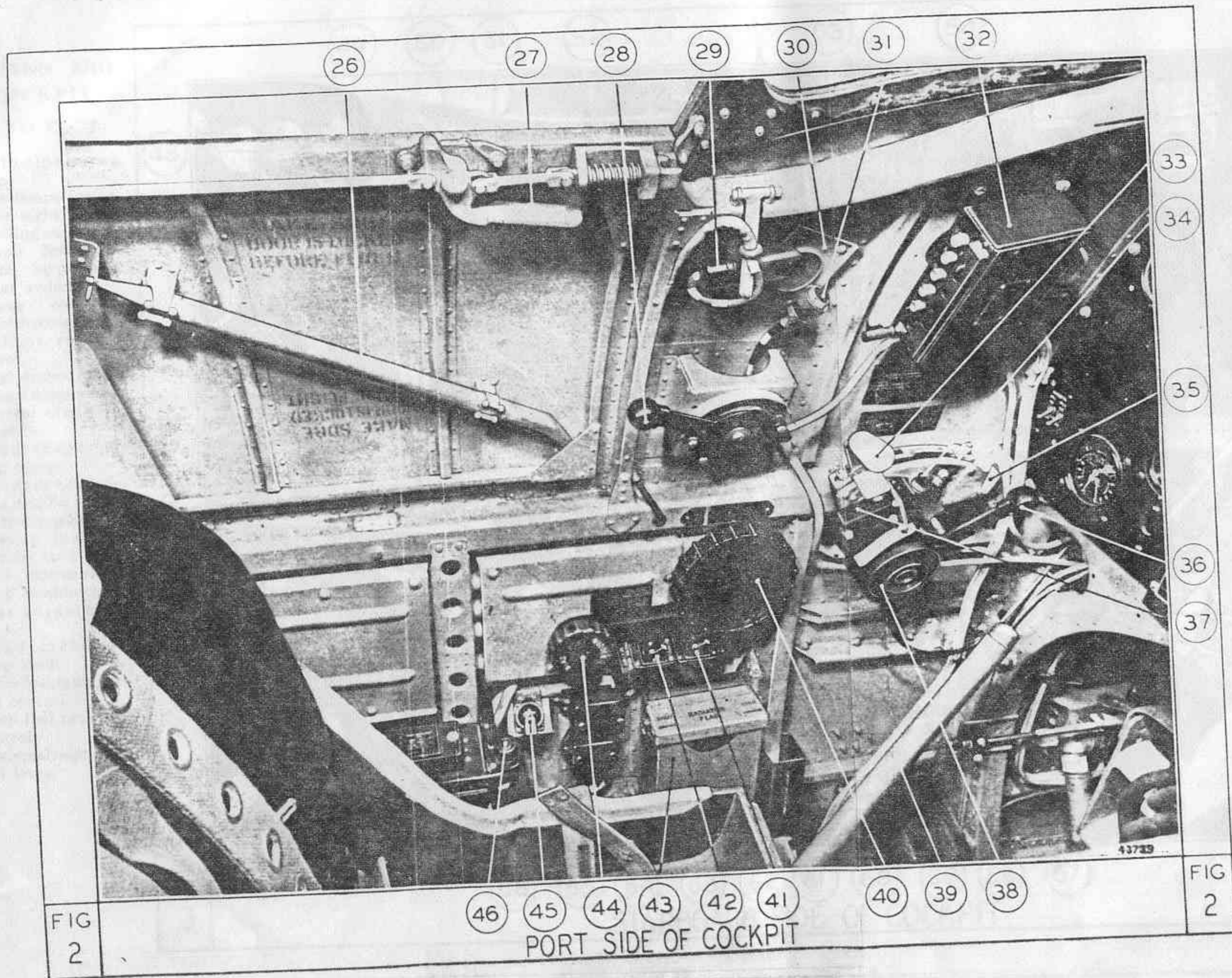


FIG.
1

INSTRUMENT PANEL

FIG.
1



PORT SIDE OF
COCKPIT

KEY TO Fig. 2

- 26. Crowbar.
- 27. Two-position door catch lever.
- 28. Supercharger control lever.
- 29. Floodlight.
- 30. Wedge plate for camera gun footage indicator.
- 31. Socket for footage indicator plug.
- 32. Radio pushbutton controller.
- 33. Throttle lever.
- 34. Undercarriage indicator master switch.
- 35. Boost control cut-out inoperative.
- 36. Propeller speed control lever.
- 37. Undercarriage warning horn switch.
- 38. Throttle and propeller control friction adjusters.
- 39. Radiator flap control lever.
- 40. Elevator trimming tab handwheel.
- 41. Camera gun master switch.
- 42. Pressure head heater switch.
- 43. Map case.
- 44. Rudder trimming tab handwheel.
- 45. Oil dilution pushbutton.
- 46. Power failure warning light.

FIG
2

PORT SIDE OF COCKPIT

FIG
2

STARBOARD SIDE
OF COCKPIT

KEY TO Fig. 3

- 47. Engine priming pump.
- 48. Spare lamps for reflector sight.
- 49. Signalling switchbox.
- 50. Cockpit floodlight.
- 51. Beam approach master switch.
- 52. Remote contactor and contactor switch.
- 53. Harness release control.
- 54. Oxygen supply tube.
- 55. Oxygen supply cock.
- 56. Heated clothing socket.
- 57. Windscreen de-icing pump.
- 58. Windscreen de-icing needle valve.
- 59. Undercarriage emergency lowering cylinder and lever.
- 60. I.F.F. master switch.
- 61. I.F.F. pushbuttons.
- 62. Seat adjustment lever.
- 63. Windscreen de-icing cock.
- 64. Drop fuel tank jettison control.
- 65. Drop fuel tank cock control.
- 66. Undercarriage control lever.

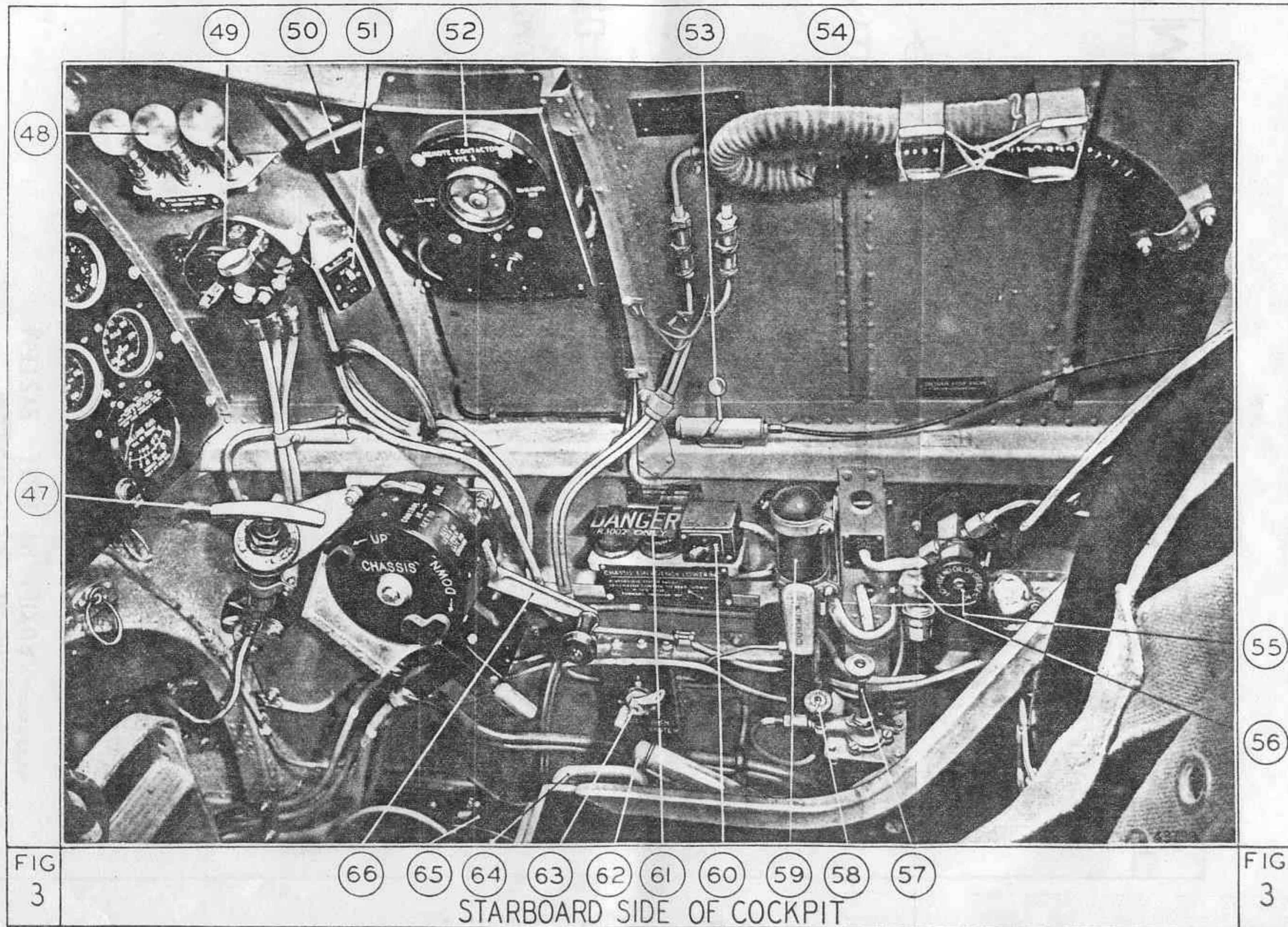


FIG
3

66 65 64 63 62 61 60 59 58 57
STARBOARD SIDE OF COCKPIT

FIG
3

——— MAIN FUEL SYSTEM
 - - - - - AUXILIARY FUEL SYSTEM

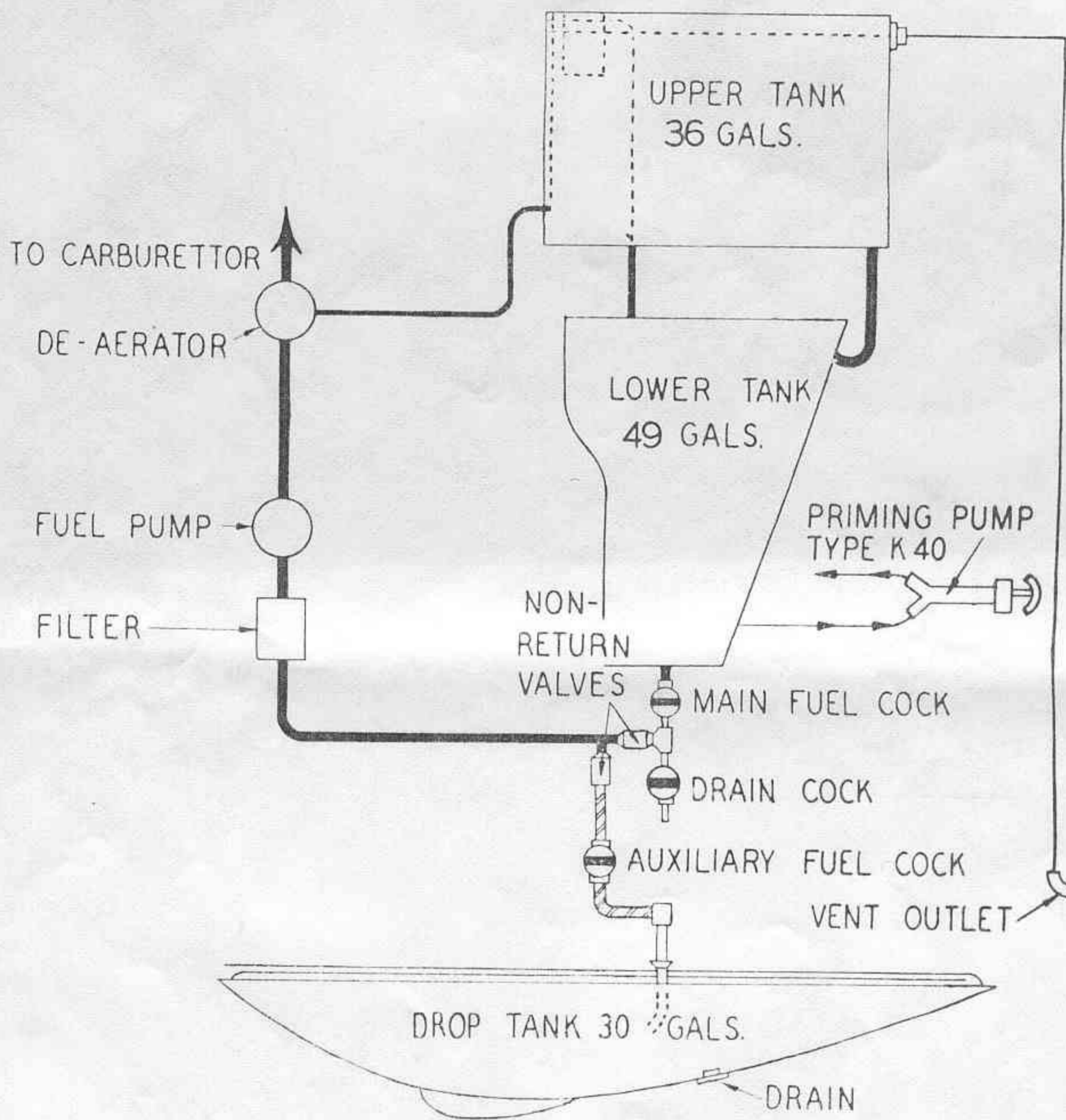


FIG. 4

SIMPLIFIED FUEL SYSTEM DIAGRAM

FIG. 4

RESTRICTED

(For Official Use Only)

Air Ministry
April 1944

Amendment List No. 1
10 A.P. 1505 K-P.N.

SPITEIRE F.XII

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.

A.L.	PART	PARA	AMENDMENT
1	II	46 (i)	Delete "110" in third column and substitute "160".
1	III	51 (ii)	Amend the recommended spectra by sticking over the amendment slip attached hereto.

Apply this Amendment List to inside back cover of notes.

Line