

PART III

MANAGEMENT OF SYSTEMS AND USE OF EQUIPMENT

46. Management of the fuel system

- (a) The booster pump must be switched on before starting and left on at all times when the engine is running. If the booster pump fails, the pressure warning light should come on but engine failure is unlikely. Above 20,000 ft., however, it may not be possible to obtain maximum r.p.m. and large fluctuations may be experienced.
- (b) The rate of fuel transfer should be sufficient to maintain the level in the fuselage tank at approximately 400–480 lb. (50–60 gallons) at all altitudes and engine powers. There is sufficient air pressure to transfer fuel from the tip tanks when the indicators on the instrument panel show black. If fuel is carried in the tip tanks, check that the indicators go black after take-off. The fuel gauge should show a constant reading of about 2,200 lb. until transfer from tip and/or pylon tanks is complete. If pylon tanks are carried, high speeds and high engine thrusts must be avoided below 15,000 feet, as fuel transfer may be unsatisfactory in these conditions.

NOTE.—In rapid descents, it is usual for the indicators to show white intermittently *before* transfer is complete.

- (c) When descending rapidly from high altitudes, the total contents fuel gauge will under-read but should re-adjust itself shortly after resuming level flight.
- (d) A negative G trap in the fuselage tank ensures sufficient fuel for about 10 seconds flight with negative G. Flight in attitudes near the vertical should also be restricted to 10 seconds for the same reason. If less than 480 lb. (60 gallons) remain, the aircraft should be restricted to normal flying attitudes only.
- (e) Between 80 and 225 lb. of fuel are unusable, the amount increasing with tail-down attitudes.

47. Engine handling

- (a) Although the engine r.p.m. may be within limits before take-off, forward movement of the aircraft may result in a creep-back in r.p.m. of up to 150. This will not appreciably affect the take-off. Take-off should not be attempted if the r.p.m. on run-up are less than 10,150 or if, during take-off ground run, they fall below 10,050.
- (b) During the climb, the r.p.m. show a marked tendency to increase above the limitations. Great care should be taken to avoid exceeding the r.p.m. limitations when operating at high altitudes.
- (c) At high altitudes the throttle should be moved very carefully, as the engine is sensitive to the smallest movements. Harsh movements, particularly when opening the throttle, will cause excessive jet pipe temperatures and possible flame extinction.
- (d) *H.P. pump isolating check*

At idling r.p.m., put the fuel pump isolating switch ON; there should be an increase in r.p.m. If no increase occurs, return the switch to OFF and open up to 6,000 r.p.m. Again set the switch ON; if there is still no increase the system is unserviceable and the aircraft should not be flown. Return the switch to OFF and check that r.p.m. return to the original figure.

NOTE.—If a reduction in r.p.m. occurs during either test, the aircraft must not be flown.

- (e) *Use of H.P. pump isolating switch for take-off*

The isolating valve must be switched OFF at a safe height and preferably before throttling back. With the switch ON, the maximum r.p.m. are liable to hunt between approximately 9,900 and 10,400. This hunting can be unpleasant but is not dangerous. It can be eliminated by throttling back to 10,000 r.p.m., which will take the governors out of action. If the switch is left ON whilst climbing, it will be necessary to throttle back considerably to prevent over-fuelling and a resultant increase in the j.p.t. and r.p.m. If the valve is switched OFF after the throttle has been partially closed, there will be a rapid drop of up to 2,000 r.p.m. If switched OFF with the throttle fully open, the r.p.m. drop should not exceed 50.

(f) *Use of the H.P. pump isolating switch in flight*

With the isolating switch ON, throttle movements must be made carefully. Whenever possible, and especially above 20,000 feet, engine accelerations should be so controlled that the j.p.t. does not exceed 725°C. In an emergency, below 20,000 feet, slam accelerations are permissible from 6,500 r.p.m.; they must not be attempted above 20,000 feet.

48. **Management of the pressurising and de-misting systems**

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- (a) The control wheel for regulating the supply and temperature of the pressurised air must be set to OFF, HOT or REDUCE when the aircraft is on the ground with the engine running, in order to avoid overheating the cold air unit. COLD or MIX must not be selected on the ground.
- (b) In conditions where hood misting is anticipated, the control wheel should be at HOT, the r.p.m. should be kept as high as practicable and the position of the louvre adjusted to give maximum flow through the gallery pipe.
- (c) To reduce temperature at high altitudes, the control wheel should be moved to MIX or COLD, since movement to REDUCE may result in a reduction of cockpit pressure.
- (d) When Mod. 1043 is embodied and COLD is selected, the louvre must be fully open in order to obtain pressurisation.
- (e) The hood seal cock must be OFF during take-off and landing, so that the external hood release mechanism can be operated if a crash occurs.

49. **Management of the powered ailerons**

- (a) The aircraft should normally be flown with the ailerons in Power, the Manual reversion being merely a 'get you home' safety device. Practice flying in Manual is simple and no difficulty will be experienced when re-selecting Power.
- (b) Before starting the engine, select MANUAL on the aileron power selector. To engage Power after starting the engine, first check that the aileron trim tab light is out, then pull the aileron power selector out and turn left to lock. Check that the aileron power warning light is out.
- (c) The aileron trim tab is inoperative when POWER is selected and hydraulic pressure is available. All trimming in Power is made with the spring strut adjuster on the starboard side of the cockpit floor. This has no position indicator but, to obtain the neutral position, turn fully in one direction and then 2½ turns in the other direction.

50. **Management of the electrical system**

- (a) Put on the ACC. ISOLATION switch before starting and check that the turn and slip indicator starts up. Leave the switch on at all times when the engine is running.
- (b) After starting, check that the generator warning lights go out and, if necessary, increase r.p.m. above idling to bring the generators on line. Put the flight instruments switch on and check that the artificial horizon erects, the Mk. 4F compass annunciates and the inverter failure warning light goes out. Should the inverter failure warning light come on at any time, put the flight instruments switch off and then on again, in an attempt to reset the inverter.
- (c) After stopping the engine, put the ACC. ISOLATION switch off when the generator warning lights come on. This will ensure that all electrical services, including the generator warning lights, are isolated from the battery.

51. **Use of ejection seat equipment**

WARNING.—The pilot must ensure that the safety pin is removed and stowed before flight. He must also ensure, before leaving the cockpit after flight, that the handle is locked against the possibility of accidental withdrawal on the ground by passing the safety strap through the handle and securing it with the spring safety pin. All personnel must ensure that the firing handle is locked before entering the cockpit.

The safety of the pilot on ejection depends primarily on the correct use of his equipment. The following drill should therefore be followed carefully when preparing for flight:—

- (a) Adjust the height of the seat.
- (b) Connect the dinghy lanyard to the life-saving waistcoat, ensuring that the quick release is below the parachute waist-belt. Secure the parachute harness.
- (c) Fasten the safety harness lap-straps and then, if fitted, secure the leg restraining cords as follows:—
- (i) Secure the leg straps below the knees with the D-rings to the rear.

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- (ii) Pass the left nylon cord through the right-leg D-ring under the safety harness lap straps and insert the right shoulder harness eye-piece through the loop on the cord. Secure the shoulder harness in the quick release box.
- (iii) Repeat for the other cord, passing the right cord through the left-leg D-ring, and attach the loop to the left shoulder harness. Secure the harness.
- (d) Connect the main oxygen and emergency oxygen supply tubes to the oxygen mask tube and the locating chain to the life-saving waistcoat. To prevent possible entanglement, ensure that the emergency oxygen tube is connected under the seat safety harness but above the parachute harness.
- (e) Connect the mic/tel lead.
- (f) Check that the firing handle can be reached with both hands together. *Do not pull.*
- (g) Have the ejection seat safety pin removed and stowed.



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