

## PART IV

# EMERGENCY HANDLING

### 74. **Engine failure on take-off**

- (i) The safety speed is 140 knots.
- (ii) At weights below about 33,000 lb., if corrective action is taken quickly, control may be maintained at speeds as low as 125 knots and the aircraft will accelerate and climb away comfortably from this speed.
- (iii) Raise the undercarriage, trim as necessary and build up speed to 150 knots.
- (iv) Close the H.P. cock and throttle of the failed engine.
- (v) Switch off the L.P. cocks and pumps of the failed engine.

### 75. **Engine failure in flight**

In the event of failure due to an obvious mechanical defect the immediate action should be:—

H.P. cock and throttle      Closed

L.P. cocks and pumps      OFF

Shed all non-essential electrical load and land as soon as possible.

### 76. **Single-engine flying**

- (i) An engine should be stopped by closing the throttle and then shutting the H.P. cock; at least one L.P. cock and pump should be left on. The generator should be switched off and all non-essential electrical load shed.

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- (ii) The aircraft has a very good single-engine performance and the rudder trimmer is powerful enough to trim out all foot loads at normal cruising speeds. At 7,400 r.p.m. a single engine will maintain a speed of about 330 knots in level flight below 5,000 feet.

### **77. Relighting an engine in flight**

- (i) Engine relighting is practicable at heights up to 20,000 feet and at speeds up to 200 knots. Relighting becomes progressively more certain with reduction of altitude and airspeed; therefore relighting above 15,000 feet is not recommended. Successful relighting is more certain if high energy ignition (engine Mod. 174) is fitted.
- (ii) Ensure that the H.P. cock is closed, then:—
  - (a) Reduce speed to 200 knots or less until the wind-milling r.p.m. are 1,000-1,200.
  - (b) Ensure that at least one L.P. cock and pump switch is on and that the fuel pressure warning light is out.
  - (c) Check that the master starting and ignition switches are on.
  - (d) Close the throttle fully.
  - (e) Keeping the H.P. cock closed, press the relight pushbutton.
  - (f) After 3 seconds move the H.P. cock to the fully open position.

NOTE.—If high energy ignition is fitted, the H.P. cock may be opened immediately before pressing the relight pushbutton.

- (g) When the r.p.m. start rising, release the relight button.
- (h) When the r.p.m. have stabilised at the correct idling r.p.m. for the particular altitude, the engine may be opened up slowly to the desired figure.

- (i) If the engine r.p.m. fail to build up within 30 seconds of opening the H.P. cock, the relight button should be released and the H.P. cock closed immediately. NOTE.—60 seconds, if high energy ignition is fitted.

- (j) A further attempt may be made after descending to a lower altitude; an interval of about two minutes should be allowed, to let the engine dry out.

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#### **78. Action in the event of fire**

When an engine fire warning light comes on, or a fire is suspected, the L.P. and H.P. cocks must be closed immediately. Speed should be reduced as much as possible and the fire-extinguisher pushbutton pressed. The warning lights will go out when the fire is extinguished.

#### **79. Single engine landing**

- (i) Maintain a speed of 140 knots while positioning the aircraft with the flaps up.
- (ii) Lower the undercarriage in the normal position on the circuit; after turning on to the final approach reduce speed to 125 knots and lower the flaps. Maintain this speed until the final decision to land has been made.
- (iii) After lowering the flaps reduce speed and cross the airfield boundary at the speed recommended for a normal landing.

#### **80. Going round again on one engine**

- (i) This can be done comfortably provided that the speed is at least 125 knots.
- (ii) Raise the undercarriage and carefully increase the power on the live engine to 7,600 r.p.m. At a safe height raise the flaps; up to 200 feet of height may be lost while the flaps are retracting but, with care, little or no height need be lost.
- (iii) Allow the speed to build up to 150 knots before commencing to climb away.

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- (iv) In an emergency, and at light weights, going round again is possible from speeds down to 110 knots. If this has to be done, the engine must be opened up very slowly and carefully as the aircraft accelerates, until the speed reaches 125 knots. Mishandling of the throttle will quickly produce large amounts of yaw and consequent errors in the airspeed reading. The rolling motion due to yaw is pronounced. About 200 feet of height will be lost during the period while the aircraft is accelerating to 125 knots.

### **81. Emergency operation of the undercarriage**

Failure of the undercarriage to lower normally may be caused through either a hydraulic, mechanical or electrical fault. Action to be taken is as follows:—

- (a) Check changeover lights on u/c position indicator (52).
- (b) Check fuses No. 67 and 68 in main electrical control panel.
- (c) Operate hydraulic hand pump and check pressure build-up on wheel brake gauge. Continue pumping until hand pump becomes solid.
- (d) If hydraulic pressure does not build up, an hydraulic fault is probable and an attempt should be made to lower the undercarriage by further hand pumping. This may take a considerable time.
- (e) If hydraulic pressure does build up and pressure is felt on the handpump, reselection of the undercarriage may overcome any slight sticking sequence valves, doors or latches.
- (f) If there is no evidence of selection, an electrical fault may be assumed and the hydraulic selector valve can be operated by pulling the red toggle handle (37) fitted above the selector pushbuttons.
- (g) After the emergency toggle handle has been pulled it is not possible to retract or unlock the undercarriage.

**82. Flapless landing**

- (i) A slight increase in drag and thus a slightly steeper angle of approach may be obtained by carrying out the final approach and landing with the bomb doors open. The weight should be reduced as much as possible before landing by using excess fuel.
- (ii) (a) Turn on to the final approach at 130 knots thereafter reducing speed to 115 knots. The approach, which should be longer than that for a normal landing, will be very flat.
- (b) Open the bomb doors.
- (c) Throttle back early aiming to cross the airfield boundary at a speed of 100-105 knots.
- (d) Lower the nosewheel immediately after touchdown and use as much brake as possible without actually locking the wheels.
- (e) On a 2,000 yard runway a flapless landing may be carried out comfortably following a correctly executed approach.

**83. Landing with a defective hydraulic system or wheel brakes**

- (i) If the handpump has had to be used to lower the under-carriage for landing, it may be found that the wheel brake hydraulic pressure is low and shows no signs of building up. Should this occur, or at any other time that the brake pressure remains low, an attempt may be made to raise the brake pressure by means of the handpump. If this is unsuccessful, the landing should be made as follows:—
  - (a) Reduce the weight as much as possible by using excess fuel.
  - (b) Cross the airfield boundary at as low a speed as practicable and, after touchdown, close the H.P. cocks.

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- (c) If some brake pressure is available lower the nose-wheel on to the ground early in the landing run and use the brakes up to a maximum without actually locking the wheels. After applying the brakes do not release them until the aircraft has come to rest, otherwise pressure will be lost from the system. If possible, the crew member should operate the hand-pump while the brakes are in use.
- (ii) If no brake pressure is available, the touchdown should be made as slowly as possible and the H.P. cocks closed immediately afterwards. Hold the nosewheel well off for as long as possible to obtain the greatest aerodynamic braking.

### **84. Cabin pressurisation failure at altitude**

In the event of cabin pressurisation failure occurring at heights above 44,000 feet the following emergency drill should be used:—

- (a) Captain warns crew “Immediate descent” and orders “Masks HIGH, Emergency Oxygen”. Crew acknowledge.
- (b) Throttle right back.
- (c) Air brakes OUT.
- (d) Bomb doors open.
- (e) Descend at .81 Mach.
- (f) Level out at 40,000 feet, and if power can be applied and air temperature permits, continue flight at this altitude. The rate of descent using the above drill is approximately 11,000 feet per minute.

### **85. Abandoning the aircraft in flight**

- (i) The navigator’s roof hatch should, where possible, be jettisoned before the canopy. This should be done at a speed above 150 knots.

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- (ii) After speed has been reduced as much as possible the navigator and air bomber should eject themselves independently. The navigator must double-fold his chart table forward before ejection. The canopy jettison and control column snatch unit lever should then be pulled and the pilot's seat ejected.
- (iii) To avoid difficulty in grasping the ejection seat firing handle at high speeds or high "g" after the canopy has been jettisoned, the right hand should be placed on the firing handle before the canopy is jettisoned.

### **86. Jettisoning wing tip tanks**

- (i) Reduce speed to a maximum of 300 knots or .75M.
- (ii) Jettison both tanks by pressing the FUEL JETTISON pushbutton (49) on the cockpit port side.

### **87. Forced landing**

- (i) If a forced landing has to be made, the navigator's roof hatch should be jettisoned at a speed above 150 knots and while electrical power is still available.
- (ii) With engine power available.
  - (a) Make a normal approach and landing but keep the undercarriage retracted.
  - (b) Close the H.P. cocks before touchdown.
- (iii) With no engine power available.
  - (a) Glide at 165 knots.
  - (b) While positioning for the landing reduce the speed to 130 knots and maintain this speed until the final approach is commenced.
  - (c) Keep the undercarriage retracted but use the flaps if possible and reduce speed to 95-105 knots.
- (iv) Before touchdown switch off the battery isolating switch.
- (v) After landing, if necessary, the canopy should be jettisoned by operating the canopy jettison switch.

### **88. Ditching**

Pending further investigation of the ditching characteristics it is advisable to abandon the aircraft in flight.