

Chapter 3

EMERGENCY CONTROL EQUIPMENT AND EXIT

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WARNING

AIRCREW EJECTION SEATS ARE FITTED TO THIS AIRCRAFT.

Before attempting to enter the cabin ensure that the instructions detailed on the **LETHAL WARNING** marker card at the front of this handbook have been complied with.

Introduction

1. This chapter describes the controls and equipment which are provided for use in an emergency, together with the precautions necessary before and after their use. In an emergency, it is essential that the appropriate control be operated without delay. In the interests of safety, therefore, personnel concerned with the handling of this aircraft should familiarize themselves with all these controls. For further information on the operation and function of these controls, and the circumstances in which they are to be used, reference should be made to the Pilot's Notes for this aircraft.

Jettisoning hood

2. The hood jettison gear is interconnected with the seat jettison mechanisms, and as jettisoning of the hood with the cabin pressurized will result in a rapid change of pressure which will impose a great strain on the pilots, the sequence of operations of the jettison mechanism is so arranged that depressurization of the cabin occurs slightly in advance of hood jettisoning. The jettison mechanisms operate as follows:-

- (1) Pulling either ejection seat face-screen handle operates the hood jettison release unit and starts the time delay mechanism of the seat concerned. The jettison release unit releases the hood locks and then fires the hood ejection gun which ejects the hood upwards and backwards over the hood fairing. The seat gun fires after a short delay and ejects the seat.
- (2) Pulling the alternative firing handles, located one on each seat pan, duplicates the function of the ejection seat face-screen handles, but the pilots are ejected without protection of the face blind.

3. Should it be desired to jettison the hood only, this can be done by pulling the hood jettison handle, situated at the rear of the anti-'G' control panel located between the seats. Operation of this control fires the hood gun to eject the hood, but does not operate the time delay mechanism or eject the seat, which, if necessary, must be ejected by pulling the face-screen or alternative seat pan firing handles in the normal manner, after the hood has cleared the aircraft.

Note ...

When the hood gun has been fired the firing components and piping must be replaced.

Emergency access to cabin

4. Access to the cabin in an emergency may be obtained by breaking a transparent panel on the port side of the fuselage below the cabin and pulling the enclosed ring. Pulling the ring operates the hood jettison release unit which releases the locks and fires the hood gun which ejects the hood upwards and backwards over the hood fairing.

WARNING

Before pulling the ring, ensure that no personnel are in the vicinity of the hood.
After pulling the ring, the operator should immediately stand clear.

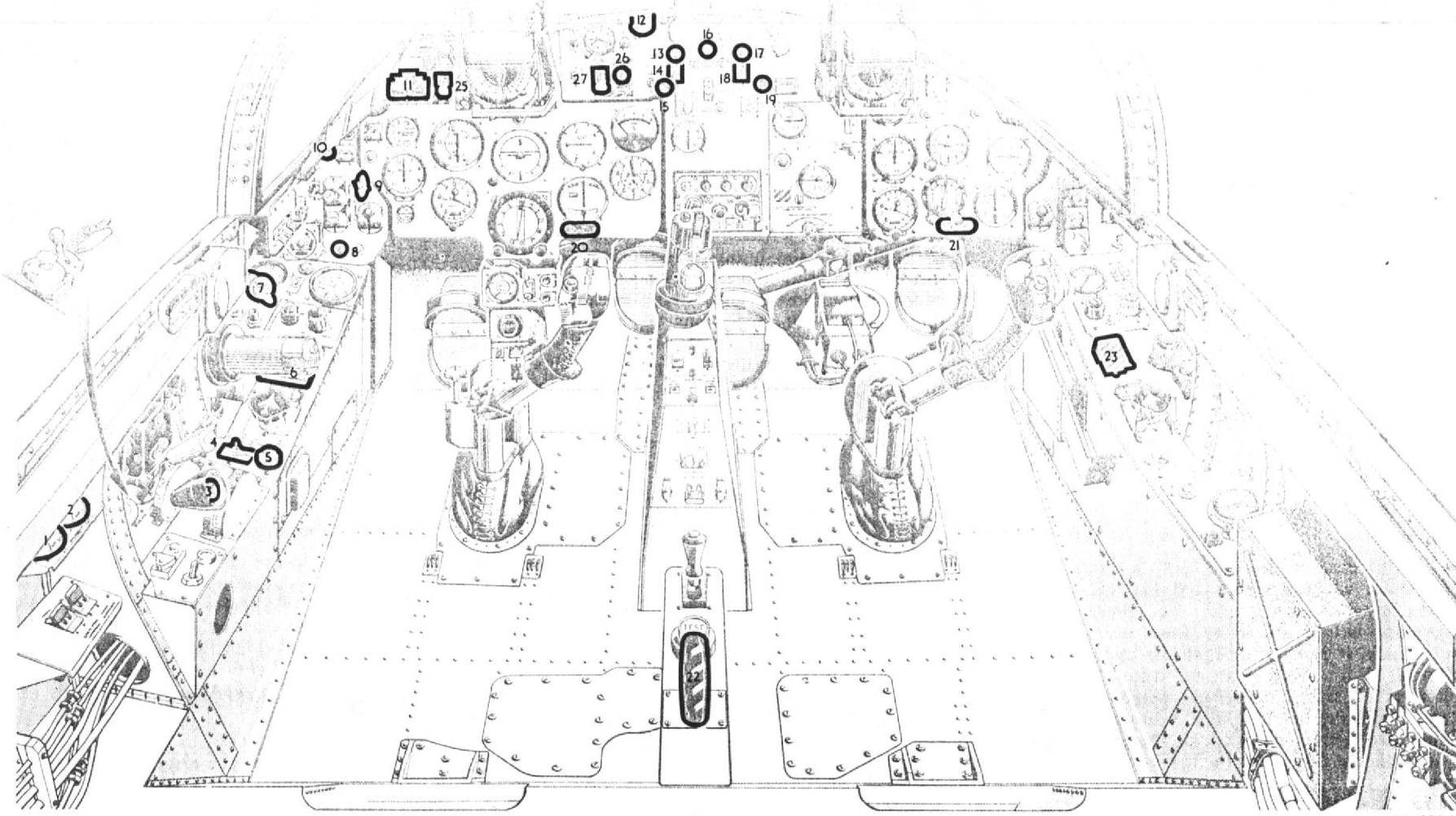


Fig.1 Emergency controls-Mk.8

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RESTRICTED

KEY TO FIG. 1

(Emergency controls and instruments-MK.8)

- | | | | |
|----|--|----|---|
| 1 | AIR GAUGE-UNDERCARRIAGE EMERGENCY SYSTEM | 12 | FIRE EXTINGUISHER PUSH SWITCH AND WARNING LAMP |
| 2 | AIR GAUGE-FLAPS EMERGENCY SYSTEM | 13 | FUEL TRANSFER FAILURE INDICATOR-PORT |
| 3 | ENGINE RELIGHT SWITCH | 14 | FUEL BOOSTER PUMP SWITCH-PORT |
| 4 | FUEL PUMP ISOLATING SWITCH
<i>Normally wire locked. Broken wire indicates use</i> | 15 | FUEL BOOSTER PUMP FAILURE WARNING LIGHT-PORT |
| 5 | FUEL PUMP ISOLATED WARNING LAMP | 16 | FUEL LOW PRESSURE WARNING LIGHT |
| 6 | TAIL PLANE STANDBY CONTROL
<i>Lift cover fully to operate switch. When cover is fully lifted it automatically trips the circuit breaker of the tail plane actuator main motor</i> | 17 | FUEL TRANSFER FAILURE INDICATOR-STARBOARD |
| 7 | UNDERCARRIAGE EMERGENCY CONTROL | 18 | FUEL BOOSTER PUMP SWITCH-STARBOARD |
| 8 | UNDERCARRIAGE WARNING LIGHT
<i>Lights when throttle is approximately $\frac{1}{3}$ open and the undercarriage is not locked down</i> | 19 | FUEL BOOSTER PUMP FAILURE WARNING LIGHT-STARBOARD |
| 9 | FLAPS EMERGENCY CONTROL | 20 | TURN AND SLIP STANDBY SWITCH |
| 10 | HYDRAULIC FAILURE WARNING LAMP | 21 | TURN AND SLIP STANDBY SWITCH |
| 11 | JETTISON SWITCHES FOR STORES ON INBOARD AND OUTBOARD PYLONS AND 'CLEAR AIRCRAFT' SWITCH BAR | 22 | HOOD JETTISON CONTROL |
| | | 23 | TAIL PLANE TRIM CUT-OUT SWITCH |
| | | 24 | EXTERNAL CONTROL FOR HOOD RELEASE |
| | | 25 | ARRESTER HOOK SELECTOR SWITCH |
| | | 26 | ARRESTER HOOK WARNING LAMP |
| | | 27 | ARRESTER HOOK SELECTOR SWITCH |

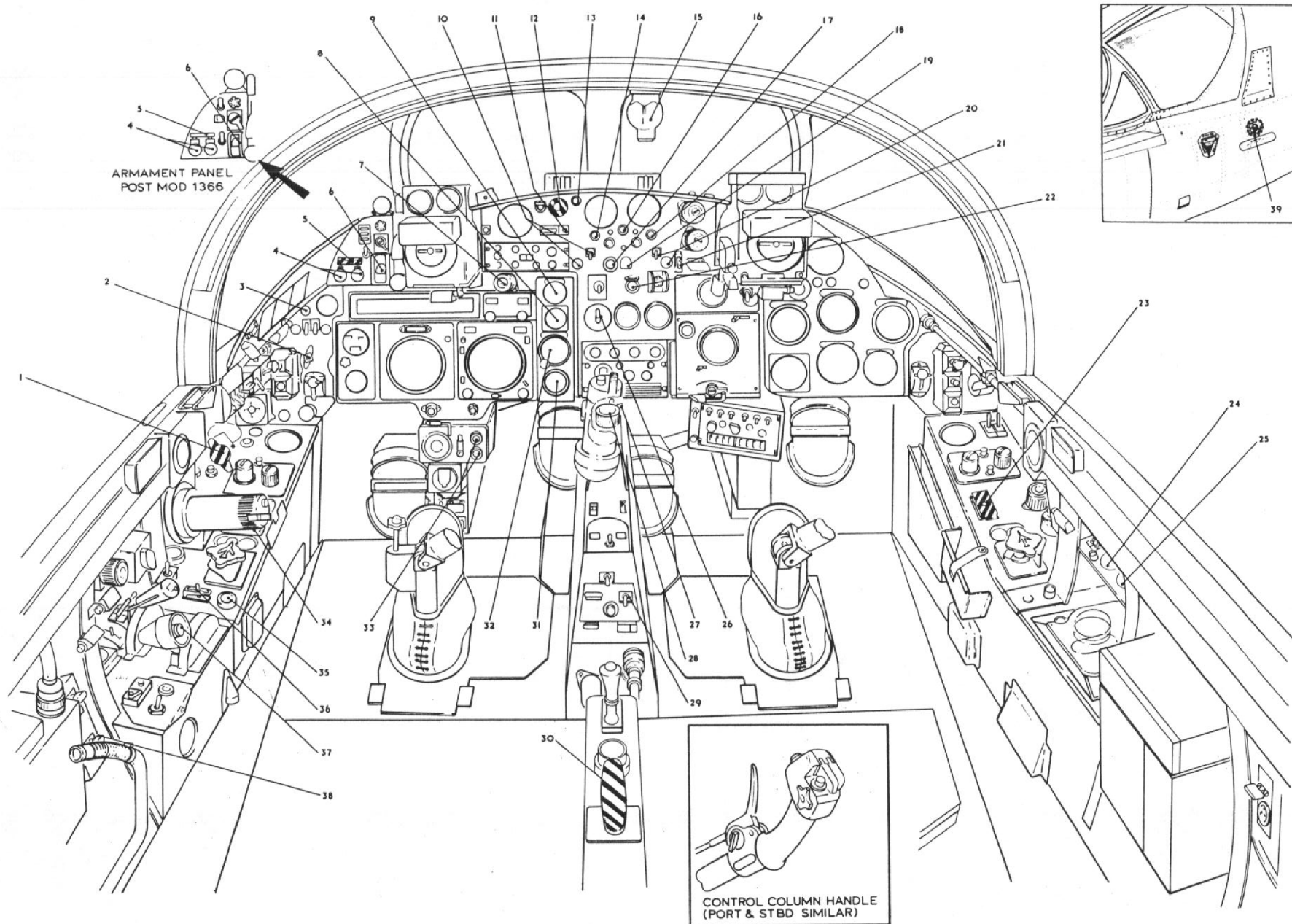


Fig. 2 Emergency controls and instruments — Mk. 8B

◀ (Completely revised) ▶

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KEY TO FIG 2

(Emergency controls and instruments - Mk.8B)

- 1 UNDERCARRIAGE EMERGENCY CONTROL
To operate, grasp control between fingers, depress centre button with thumb and pull
- 2 FLAP EMERGENCY CONTROL
To operate, grasp control between fingers, depress centre button with thumb and pull
- 3 HYDRAULIC FAILURE WARNING LAMP
- 4 PYLON STORES JETTISON SWITCHES
- 5 'CLEAR AIRCRAFT' JETTISON SWITCH BAR
- 6 ARRESTING HOOK SELECTOR SWITCH
- 7 STANDBY INSTRUMENTS LIGHTING DIMMER SWITCH
- 8 STANDBY ALTIMETER
- 9 STANDBY AIRSPEED INDICATOR
- 10 FUEL BOOSTER PUMP SWITCH AND PUMP FAILURE WARNING LAMP - PORT
- 11 CABIN EMERGENCY LIGHTING SWITCH
- 12 FIRE WARNING LAMP AND EXTINGUISHER PUSH SWITCH
- 13 FIRE WARNING LAMP TEST PUSH SWITCH
- 14 FUEL TRANSFER FAILURE INDICATOR - PORT
- 15 STANDBY COMPASS
- 16 FUEL LOW PRESSURE WARNING LAMP
- 17 ARRESTING HOOK WARNING LAMP
- 18 FUEL TRANSFER FAILURE INDICATOR - STARBOARD
- 19 ARRESTING HOOK SELECTOR SWITCH
- 20 FUEL BOOSTER PUMP SWITCH AND PUMP FAILURE WARNING LAMP - STARBOARD
- 21 HYDRAULIC FAILURE AUDIO WARNING CUT-OUT SWITCH
- 22 CABIN PRESSURE WARNING LAMP
- 23 TAIL PLANE TRIM CUT-OUT SWITCH
- 24 UNDERCARRIAGE EMERGENCY AIR PRESSURE GAUGE
- 25 FLAP EMERGENCY AIR PRESSURE GAUGE
- 26 STANDBY FLIGHT INSTRUMENTS SYSTEM NORMAL/EMERGENCY POWER SWITCH
Wire locked in NORMAL position
- 27 STANDBY COMPASS LIGHTING SWITCH
- 28 STANDBY COMPASS LIGHTING DIMMER SWITCH
- 29 STANDBY INVERTER SWITCH
- 30 HOOD JETTISON CONTROL HANDLE
Pull to jettison hood
- 31 STANDBY DIRECTION INDICATOR
- 32 STANDBY ARTIFICIAL HORIZON
- 33 GENERATOR POWER FAILURE WARNING LAMPS
- 34 TAIL PLANE TRIM STANDBY CONTROL SWITCH
Lift cover fully to operate switch. When cover is fully lifted it automatically trips the circuit breaker of the tail plane actuator main motor
- 35 ENGINE-DRIVEN FUEL PUMP ISOLATED WARNING LAMP
- 36 ENGINE-DRIVEN FUEL PUMP ISOLATION SWITCH
Normally wire locked. Broken wire indicates use
- 37 ENGINE RELIGHT SWITCH
- 38 CABIN PRESSURE WARNING LAMP TEST SWITCH
- 39 HOOD EXTERNAL RELEASE CONTROL
To operate, break perspex and pull cable ring

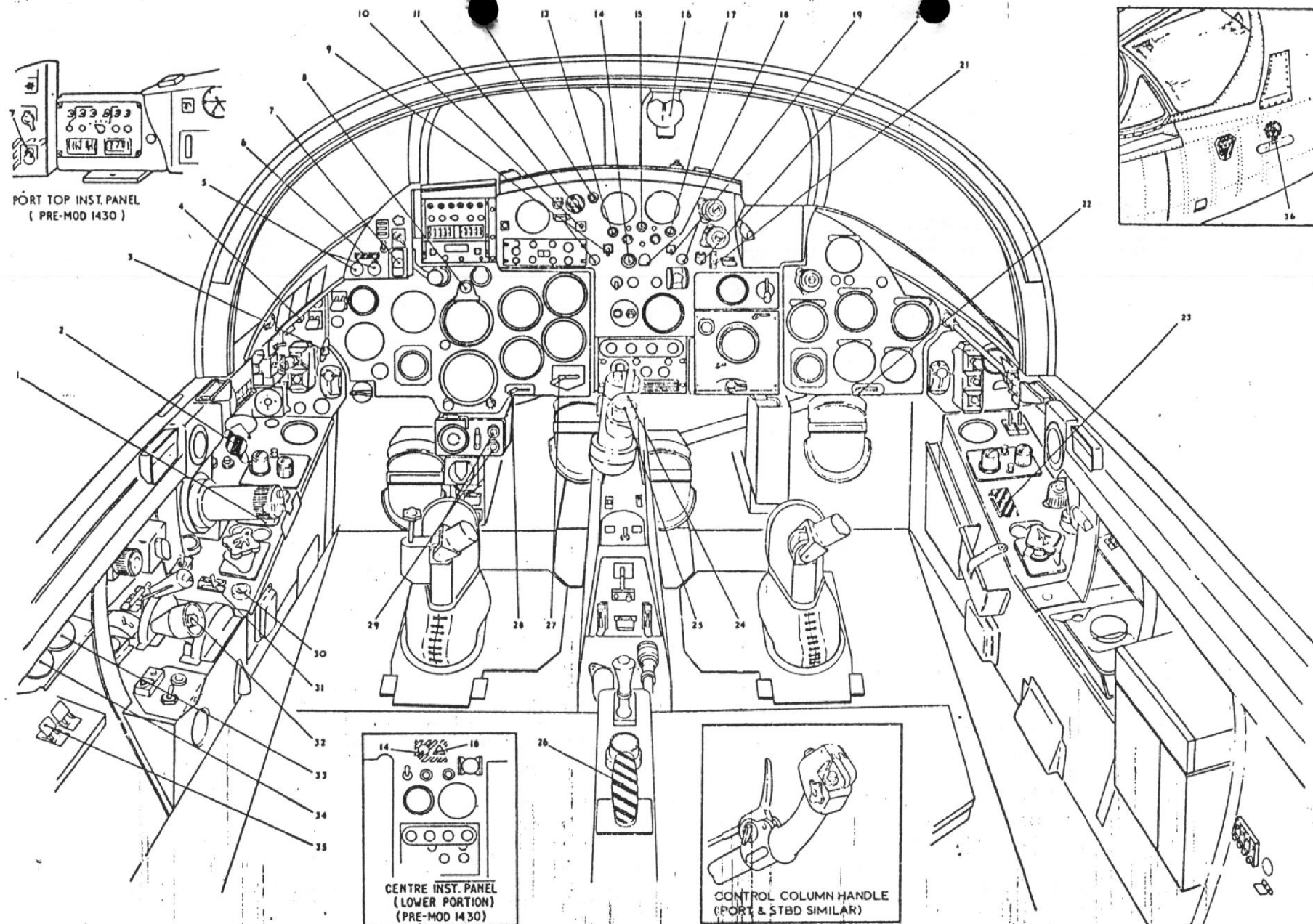


Fig.3 Emergency controls and instruments — Mk.8C
 ▶ (Mods 1380 and 1430 added) ◀

KEY TO FIG. 3

(Emergency controls and instruments — Mk. 8C)

◀ (Completely revised) ▶

- | | |
|---|---|
| <p>1 TAIL PLANE TRIM STANDBY CONTROL SWITCH
Lift cover fully to operate switch. When cover is fully lifted it automatically trips the circuit breaker of the tail plane actuator main motor</p> <p>2 UNDERCARRIAGE EMERGENCY CONTROL
To operate, grasp control between fingers, depress centre button with thumb and pull</p> <p>3 FLAP EMERGENCY CONTROL
To operate, grasp control between fingers, depress centre button with thumb and pull</p> <p>4 HYDRAULIC FAILURE WARNING LAMP</p> <p>5 PYLON STORES JETTISON SWITCHES</p> <p>6 'CLEAR AIRCRAFT' JETTISON SWITCH BAR</p> <p>7 ARRESTING HOOK SELECTOR SWITCH</p> <p>8 STANDBY INVERTER INDICATOR</p> <p>9 FUEL BOOSTER PUMP SWITCH AND PUMP FAILURE WARNING LAMP — PORT</p> <p>10 CABIN EMERGENCY LIGHTING SWITCH</p> <p>11 FIRE WARNING LAMP AND EXTINGUISHER PUSH SWITCH</p> <p>12 FIRE WARNING LAMP TEST PUSH SWITCH</p> <p>13 FUEL TRANSFER FAILURE INDICATOR — PORT</p> <p>14 ARRESTING HOOK WARNING LAMP</p> <p>15 FUEL LOW PRESSURE WARNING LAMP</p> <p>16 STANDBY COMPASS</p> <p>17 FUEL TRANSFER FAILURE INDICATOR — STARBOARD</p> <p>18 ARRESTING HOOK SELECTOR SWITCH</p> <p>19 FUEL BOOSTER PUMP SWITCH AND PUMP FAILURE WARNING LAMP — STARBOARD</p> | <p>20 CABIN PRESSURE WARNING LAMP</p> <p>21 HYDRAULIC FAILURE AUDIO WARNING CUT-OUT SWITCH</p> <p>22 TURN AND SLIP INDICATOR STANDBY SWITCH</p> <p>23 TAIL PLANE TRIM CUT-OUT SWITCH</p> <p>24 STANDBY COMPASS LIGHTING SWITCH</p> <p>25 STANDBY COMPASS LIGHTING DIMMER SWITCH</p> <p>26 HOOD JETTISON CONTROL HANDLE
Pull to jettison hood</p> <p>27 ALTIMETER NORMAL/EMERGENCY POWER SWITCH</p> <p>28 TURN AND SLIP INDICATOR STANDBY SWITCH</p> <p>29 GENERATOR POWER FAILURE WARNING LAMPS</p> <p>30 ENGINE-DRIVEN FUEL PUMP ISOLATED WARNING LAMP</p> <p>31 ENGINE-DRIVEN FUEL PUMP ISOLATION SWITCH
Normally wire locked. Broken wire indicates use</p> <p>32 ENGINE RELIGHT SWITCH</p> <p>33 FLAP EMERGENCY AIR PRESSURE GAUGE</p> <p>34 UNDERCARRIAGE EMERGENCY AIR PRESSURE GAUGE</p> <p>35 CABIN PRESSURE WARNING LAMP TEST SWITCH</p> <p>36 HOOD EXTERNAL RELEASE CONTROL
To operate, break perspex and pull cable ring</p> |
|---|---|

Ejection seats

5. For details of the ejection seats installed in this aircraft, reference should be made to A.P.109B-0131-1 and to the Pilot's Notes for this aircraft.

Hydraulic system

General

6. Essential hydraulic services are provided with an emergency means of operation for use in the event of hydraulic failure, and loss of hydraulic main pressure is indicated by an aural note in the pilot's headphones, as well as by means of a red warning lamp on the port instrument panel. The aural warning, and the red lamp when illuminated, warn the pilots that only a few power operations of the ailerons and elevators may be made before they go into manual, and that emergency action must be taken when lowering the alighting gear and landing flaps. For a description of the hydraulic system, reference should be made to Sect. 3, Chap. 6.

Alighting gear and landing flaps

7. In the event of hydraulic failure, the alighting gear and landing flaps may be lowered by the introduction of high-pressure air into the hydraulic jacks which operate them, the high-pressure air being obtained from a pair of high-pressure air bottles which are mounted, adjacent to the anti-G air bottles, behind the seats. Gauges to indicate the pressure in the air bottles are located in the cabin. The emergency control for the alighting gear is mounted on the cabin port shelf, and that for the landing flaps projects through the port instrument panel. To operate the controls, it is first necessary to grasp the control between the fingers, depress the central button in the control knob with the thumb, and then pull out the control which will remain in the operated position as a warning to the ground crew that the emergencies have been used, that the valves must be re-set, the system bled of air, and the high-pressure air bottles re-charged before the next take-off. It should be noted that:-

- (1) The use of the emergencies does not render the aileron and elevator power controls inoperative.
- (2) When the landing flaps emergency control is used, there is no pre-selector control in operation and the flaps will, in consequence, be extended to their full travel.
- (3) Once the undercarriage and flap emergencies have been operated, the position of the controls cannot be changed except by the ground crew.

Wheel brakes

8. In the event of hydraulic failure, the wheel brakes may be operated by means of energy stored in hydraulic accumulators in the circuit. These accumulators come into operation automatically when hydraulic failure occurs and will give approximately 40 applications of the brakes before the accumulators are exhausted. The accumulators are also used when the aircraft is being towed and hydraulic power is not available.

Cabin Hood

9. In the event of hydraulic failure, or when the aircraft is on the ground the hydraulic power is not available, the cabin hood may be opened and closed by means of energy stored in an hydraulic accumulator in the circuit. This accumulator, which is located in the hood fairing on the port side of the aircraft and comes into operation automatically when hydraulic power is not available, will enable the hood to be opened and closed approximately three times before it is exhausted. Should the electrical system fail while the aircraft is on the ground and the hood is closed, the hood may be raised manually after the locks have been released by the operation of a handle on the hood jettison release unit located behind the port seat, care being taken to ensure that the hood ejection gun connection is first disconnected by pulling out the pip pin in accordance with the instructions given in the warning

notice on the guard over the handle of the release unit. When raised in this manner, the hood should be retained in the open position by the jury strut provided.

Aileron and elevator power controls

10. In the event of hydraulic failure, warning will be given as in para. 6 and an accumulator in each circuit will come into operation automatically to give a few control column reversals before the accumulators are exhausted. When once these accumulators are exhausted, the power controls are automatically disengaged and revert to manual. Magnetic indicators, located on the instrument panels, will show white to indicate that this has occurred.

Emergency retraction of alighting gear

11. Under normal circumstances the alighting gear cannot be retracted while the aircraft is on the ground because of the UP switch solenoid lock. It is possible, however, to retract the alighting gear and belly land the aircraft to avoid an obstruction during take-off by turning the UP button of either undercarriage control in a clockwise direction and then depressing it. This method of retraction over-rides all sequence valves and may damage the leg fairings should these not be fully extended, it should therefore only be used in an absolute emergency. Should the normal control fail to retract the undercarriage in flight, the aircraft should be brought into land for examination.

Note . . .

To re-set the solenoid lock over-ride, after emergency use, insert the Dowty re-setting tool (Ref. 27Q/12407) into the small hole in the face of the UP button, press lightly and turn the knurled ring back to its original position.

Engine*Fuel pump isolating switch*

12. As a safeguard against failure of the servo side of the engine fuel system, which, owing to the fact that the engine driven fuel pumps are connected in parallel, could result in them going into *no stroke*, a switch marked ISOLATE and NORMAL is located on the cabin port shelf. When placed in the ISOLATE position, this switch cuts out the barometric pressure control, thus isolating the pumps from each other and a warning lamp, adjacent to the switch, illuminates to give indication that this has occurred. The switch is normally locked in the NORMAL position, with one strand of 28 s.w.g. copper wire, which, if broken serves as an indication to the ground crew that the emergency has been operated in flight.

Note . . .

It is important that only one strand of copper wire is used to lock the switch dolly in the NORMAL position.

Emergency balancing of fuel contents

13. The electrically-driven fuel booster pumps in the front tanks, which feed all the fuel to the engine-driven fuel pumps via a fuel flow proportioner, are controlled by the engine master switch on the leg panel in the cabin and by individual switches mounted on the fuel control panel. Normally, the two pumps are running continuously throughout flight, but the provision of the individual switches enables either pump to be stopped to balance the fuel levels should an emergency render such action necessary. Indicators to give indication of fuel transfer failure and warning lamps to indicate tank pump failure and low pressure are all located on the fuel control panel in the vicinity of the tank pump switches.

Mechanical failure of engine

14. In the event of the mechanical failure of the engine, the low-pressure and high-pressure fuel cocks must be turned OFF and the throttle closed. The fuel tank booster pump switches must also be turned OFF and *no attempt must be made to relight the engine.*

Fire extinguisher and warning lamp

15. A combined fire extinguisher push-button switch and warning lamp is situated centrally at the top of the centre instrument panel, and a test switch for checking the serviceability of the lamp is mounted on the panel. In the event of the engine catching fire in flight, the low-pressure and high-pressure fuel cocks, and fuel booster pumps must be turned OFF, the throttle closed, the aircraft's speed reduced to a minimum, and the fire extinguisher push button switch depressed. The extinguisher is operated automatically by the inertia switch if a crash landing occurs.

Note . . .

The engine must not be re-started after operating the fire extinguishing system owing to the possibility of the fire restarting after the fire extinguishing resources are exhausted.

Electrical system*Tail plane emergency circuit*

16. The incidence of the tail plane is varied by means of an electric actuator, the normal, high-speed movement being controlled by a switch on each control column handgrip. In the event of a breakdown of the normal system, an emergency, low-speed movement can be introduced by operating the guarded switch on the cabin port shelf. The pupil's high-speed (*normal control*) on the control column handgrip can be

overridden by the instructors' control, and a tail plane trim cut-out switch (*killer switch*) is provided for the instructor's use in an emergency. This switch, which is mounted on the cabin starboard shelf, is provided with a guard cover to prevent inadvertent operation.

Emergency lighting

17. *Cabin.*— Should the normal cabin lighting fail, three red lamps, located one below the port gun sight and two below the starboard gun sight, may be brought into use by the operation of the EMERGENCY LIGHTS switch on the centre instrument panel. These lamps are not connected to the normal electrical system but obtain their supply from two standby batteries in the radio bay.

17A. *Standby compass.*— The switch for the standby compass light is marked MAIN, OFF and EMERGENCY. It is mounted at the forward end of the throttle box on the centre console. Should the normal electrical supply fail, the compass can be illuminated by moving the switch dolly to the EMERGENCY position which brings into use the standby batteries.

Jettisoning external stores

18. The drop fuel tanks, or other external stores carried on the pylons under the wings may be jettisoned by first placing the fuzing selector switch to the DEFUZE position and then depressing the jettison push switches on the same panel, after lifting the guard plates. In an emergency, simultaneous jettisoning of stores can be effected by pulling down a bar from above the switches, but as in the case of normal jettisoning, the fuzing selector switch must first be placed in the DEFUZE position.

Survival equipment (fig. 4)*Dinghy and survival pack*

19. A dinghy for emergency use is housed in each pilot's personal survival pack. On aircraft Post Mod. 755, additional survival packs are located within the fuselage, two on each side, immediately forward of frame 16. These are only accessible from outside the fuselage after removing the appropriate access panels, port or starboard, from the fuselage skin. A screwdriver for the access panel screws is clipped to the lid of the main fuse box on the forward face of the flying control casing, behind the ejection seats.

First aid kit (fig. 4)

20. A first aid kit is carried in a stowage above the main fuse box on the flying control casing behind the ejection seats.

Emergency oxygen

21. An emergency oxygen set which is mounted on the back of each seat is automatically brought into action by static lines when ejection action is taken, or may be manually operated in flight by pulling the manual control handles which are located on the right-hand side of each seat pan.

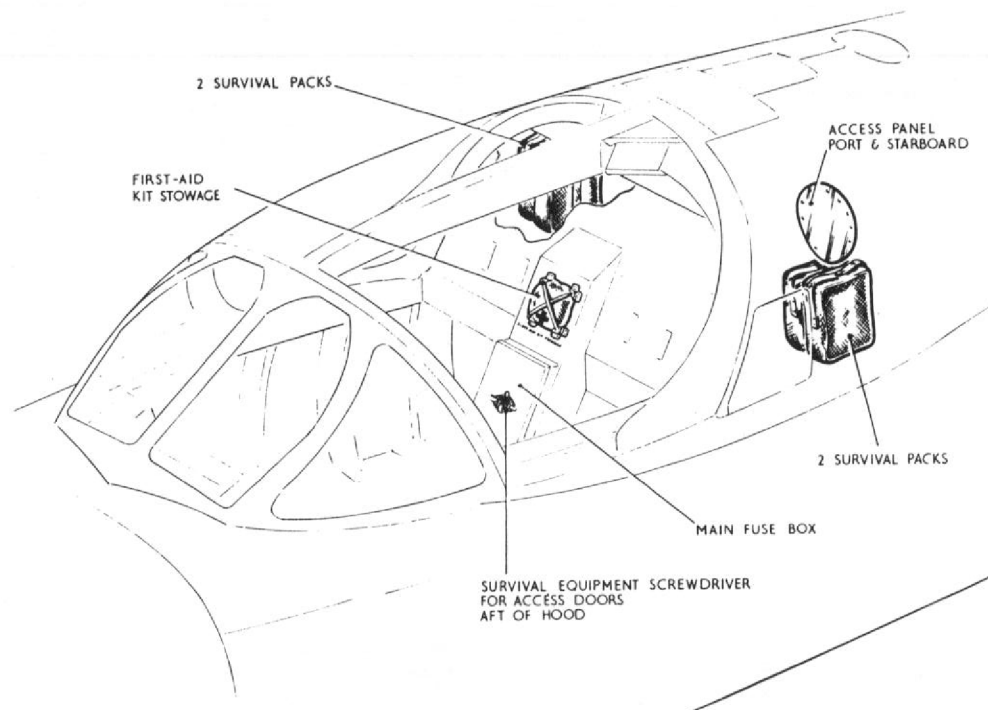


Fig. 4 Location of additional survival equipment

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