Chapter 3 - EMERGENCY CONTROLS, EQUIPMENT AND EXIT

(Completely revised)

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ILLUSTRATION

WARNING

AN AIRCREW EJECTION SEAT IS 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.

THIS IS VERY IMPORTANT

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 is jettisoned from inside the cabin by operating the hood release handle located at the forward inboard face of the cabin port shelf. Operation of the release handle performs the following functions :—

(1) Deflates the hood seal.

(2) Operates a microswitch to complete the gunsight retraction circuit.

(3) Operates the spring-loaded unit to release the locks of the hood rails which are jettisoned with the hood.

(4) Operates the hood gun, the gases from which operate a piston under each hood rail to eject the hood clear of the aircraft.

3. The hood jettison gear is not interconnected with the seat ejection mechanism, therefore hood jettison action should be taken before the seat is ejected. In cases of extreme emergency, however, the seat may be ejected through the canopy, canopy breakers being fitted to the seat for this purpose.

Note . . .

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

Emergency access to cabin

4. In the event of the pilot or occupant being physically unable to operate the hood control while the aircraft is on the ground and the hood is closed, access to the cabin may be obtained by breaking a transparent panel on the port side of the fuselage and pulling the enclosed ring operating the release unit, thus opening the locks securing the hood side channel members, deflating the hood seal, de-clutching the hood motor and allowing the hood to be lifted off by hand.

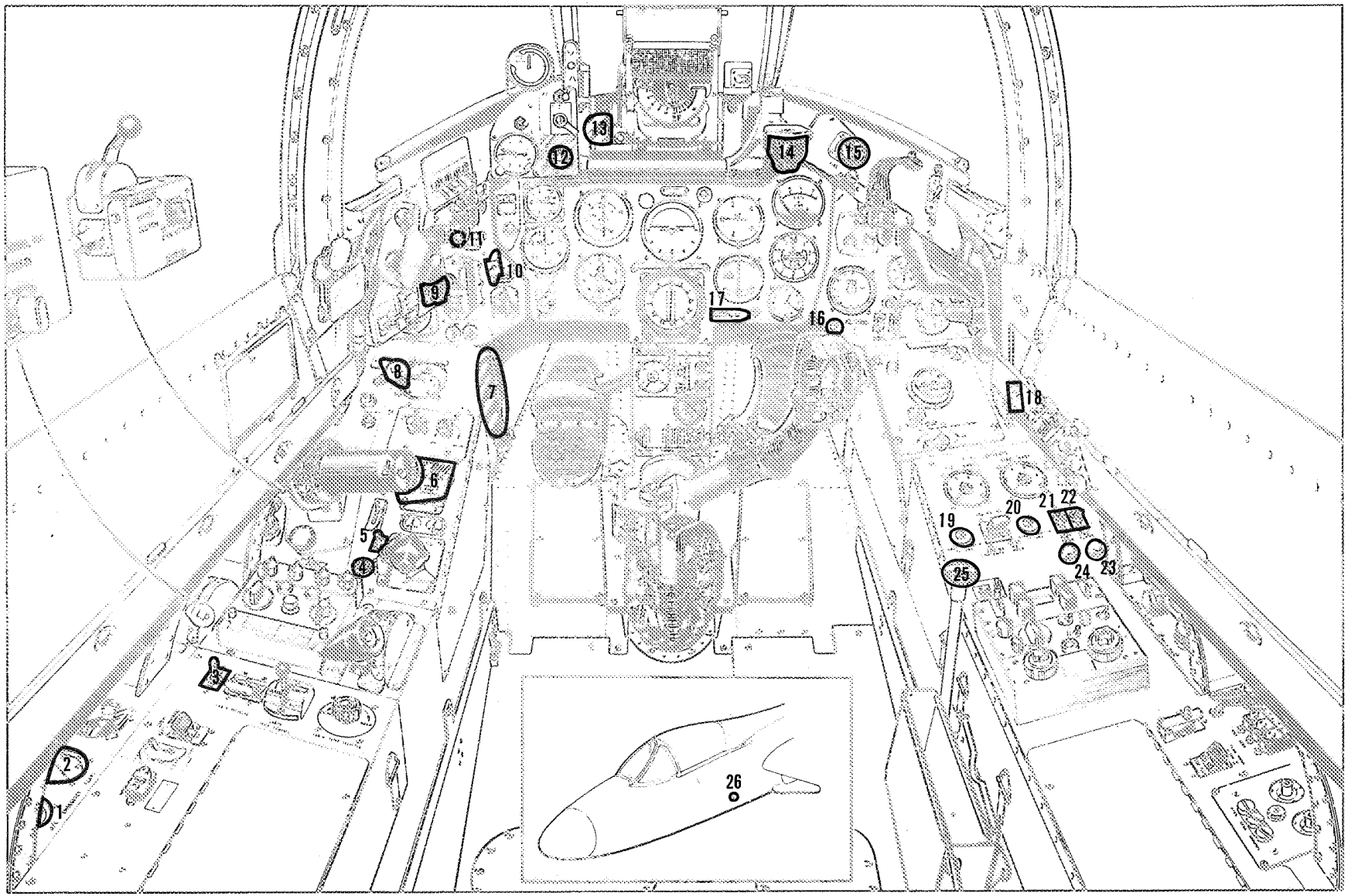

Fig.1 Emergency controls and instruments

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KEY TO FIG. 1

(Emergency controls and instruments)

1 PRESSURE GAUGE EMERGENCY AIR—UNDERCARRIAGE

2 PRESSURE GAUGE EMERGENCY AIR—FLAPS

3 FLOOD AIRFLOW SWITCH

4 FUEL PUMP ISOLATED INDICATOR

5 FUEL PUMP ISOLATE SWITCH

6 TAIL PLANE STANDBY CONTROL

7 HOOD JETTISON CONTROL
Pull to jettison hood

8 UNDERCARRIAGE EMERGENCY CONTROL
Grasp the control between the fingers, press the centre button with thumb and pull to operate

9 JETTISON SWITCH
Pre Mod. 228—All stores
Post Mod. 228—Stores on outboard pylons only

10 FLAPS EMERGENCY CONTROL
Grasp the control between the fingers, press the centre button with thumb and pull to operate

11 HYDRAULIC FAILURE WARNING LIGHT

12 JETTISON SWITCH
Post Mod. 228—All stores

13 GYRO GUNSIGHT EMERGENCY RETRACTION CONTROL

14 STANDBY COMPASS

15 FIRE WARNING LIGHT AND EXTINGUISHER PUSH-SWITCH
Light indicates when temperature in engine bay and/or accessories bay exceeds 300 ± 30 deg. C. Push to operate fire extinguishers

16 FUEL LOW PRESSURE WARNING LIGHT

17 TURN AND SLIP INDICATOR NORMAL/EMERGENCY SUPPLY SWITCH

18 EMERGENCY LIGHT SWITCH

19 FUEL TRANSFER FAILURE INDICATOR—PORT

20 FUEL TRANSFER FAILURE INDICATOR—STARBOARD

21 FUEL TANK BOOSTER PUMP SWITCH—PORT

22 FUEL TANK BOOSTER PUMP SWITCH—STARBOARD

23 FUEL BOOSTER PUMP FAILURE WARNING LIGHT—STARBOARD

24 FUEL BOOSTER PUMP FAILURE WARNING LIGHT—PORT

25 EMERGENCY OXYGEN RELEASE
Pull up to operate

26 HOOD EXTERNAL RELEASE CONTROL
Break perspex and pull cable ring to operate

Finger holes between the hood and windscreen are provided to facilitate the removal of the hood. If, however, the pilot is able to move the lever, integral with the hood control box, to the FREE position, this will release the clutch of the hood winding motor and deflate the hood seal, thus allowing the hood to be pushed open by hand.

Ejection seat

5. For details of the ejection seat installed in this aircraft, reference should be made to A.P.109A–0002–1 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 pilot 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 seat. 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.

8. 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 reset, the system bled of air, and the high-pressure air bottles recharged 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

9. 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.

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 the undercarriage control in a clockwise direction and then depressing it. This method of retraction overrides 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 reset the solenoid lock override, after emergency use, insert the Dowty resetting 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

Emergency balancing of fuel contents

12. 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 fuel low pressure, are provided in the cabin.

Fuel pump isolating switch

13. As a safeguard against failure of the servo side of the engine fuel system, which, owing to the fact that the engine-driven 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 (*Sect. 4, Chap. 2*) and a warning lamp adjacent to the switch illuminates to give indication that this has occurred. The dolly of the switch is locked in the NORMAL position with *one* strand of 30 s.w.g. copper wire, which, if broken, serves as an indication to the ground crew that the emergency has been operated in flight.

Mechanical failure of engine

14. In the event of 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 made to relight the engine.*

Fire extinguisher and warning lamp

15. A combined fire extinguisher push-button switch and warning lamp is located just above the starboard instrument panel. In the event of an engine fire in flight, the low-pressure fuel cock, the high-pressure fuel cock and the fuel booster pump switches must be turned off, the throttle closed and the aircraft speed reduced as much as possible; the fire extinguisher push-button is then depressed. The extinguisher is automatically operated by the inertia switch if a crash landing occurs.

Note . . .

The engine must not be restarted after operating the fire extinguishing system owing to the possible risk of the fire re-commencing after the fire fighting resources are exhausted.

Tail plane emergency circuit

16. The incidence of the tail plane is varied by means of a two-speed electric actuator, the normal high speed movement being controlled by a switch on the control column and the emergency low-speed movement by means of a guarded switch on the cabin port shelf. In the event of a breakdown of the normal control circuit, the emergency low-speed circuit can be brought into use by fully raising the guard and operating the shelf switch.

Survival equipment

17. A Type R personal survival pack is provided for use with the ejection seat and contains a dinghy and other survival equipment.

Emergency oxygen

18. An emergency oxygen set is mounted on the starboard beam of the pilot's ejection seat and is brought into action by a static line when ejection action is taken or may be operated, should an emergency arise, by pulling the manual control handle, which is located on the right-hand side of the seat pan.

Jettisoning external stores

19. Immediately before jettisoning external stores the fuzing selector switch must be set to DEFUZE. Subsequent action is as follows:—

Pre Mod. 229. All external stores may be released in a safe condition by depressing the jettison switch on the port glare shield.

Post Mod. 229. All external stores may be released in a safe condition by depressing the CLEAR A/C switch on the port instrument panel or stores on the outboard pylons only may be released by depressing the jettison switch on the port glare shield.

Emergency lighting

20. Should the normal cabin lighting fail, an emergency system can be brought into operation by a switch located on the starboard side of frame 9 above the cabin shelf. The emergency lighting system is supplied with current from a small battery mounted in the radio bay.

First aid kit

21. A first aid kit is contained in the pilot's personal survival pack.

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(2) Operates a microswitch to complete the gunsight retraction circuit.

(3) Operates the spring-loaded unit to release the locks of the hood rails which are jettisoned with the hood.

(4) Operates the hood gun, the gases from which operate a piston under each hood rail to eject the hood clear of the aircraft.

3. The hood jettison gear is not interconnected with the seat ejection mechanism, therefore hood jettison action should be taken before the seat is ejected. In cases of extreme emergency, however, the seat may be ejected through the canopy, canopy breakers being fitted to the seat for this purpose.

Note . . .

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

Emergency access to cabin

4. In the event of the pilot or occupant being physically unable to operate the hood control while the aircraft is on the ground and the hood is closed, access to the cabin may be obtained by breaking a transparent panel on the port side of the fuselage and pulling the enclosed ring operating the release unit, thus opening the locks securing the hood side channel members, deflating the hood seal, de-clutching the hood motor and allowing the hood to be lifted off by hand.

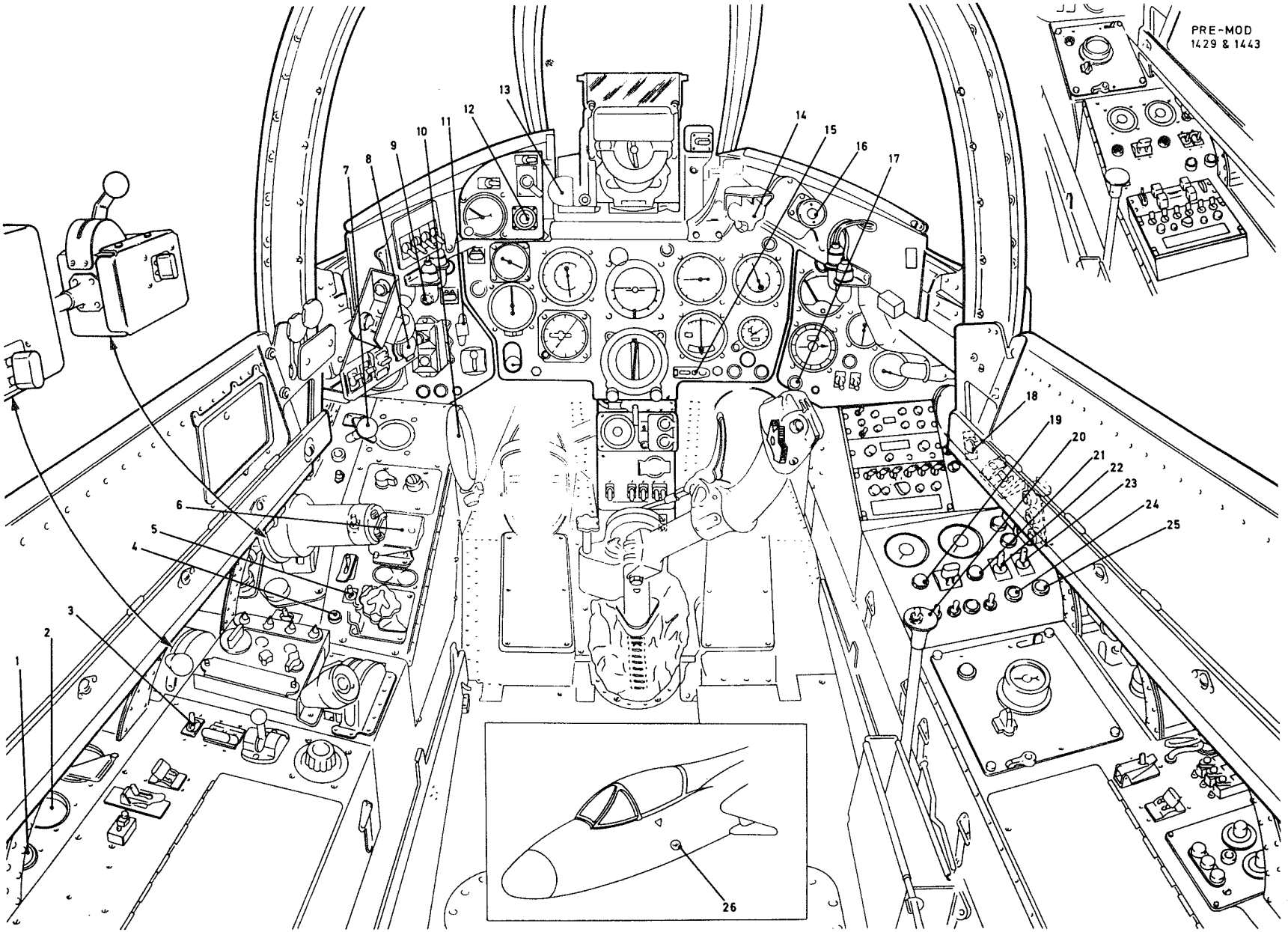

Fig.1 Emergency controls and instruments

▶ **(Completely revised)** ◀

KEY TO FIG. 1

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▶ (Completely revised) ◀

1 UNDERCARRIAGE EMERGENCY AIR PRESSURE GAUGE
2 FLAPS EMERGENCY AIR PRESSURE GAUGE
3 FLOOD AIRFLOW SWITCH
4 FUEL PUMP ISOLATED INDICATOR
5 FUEL PUMP ISOLATE SWITCH
6 TAIL PLANE STANDBY CONTROL SWITCH
7 UNDERCARRIAGE EMERGENCY CONTROL
To operate, grasp control between fingers, depress centre button with thumb and pull
8 JETTISON SWITCH
Pre-Mod 228 – all stores
Post-Mod 228 – Stores on outboard pylons only
9 HYDRAULIC FAILURE WARNING LAMP
10 HOOD JETTISON CONTROL
Pull to jettison hood
11 FLAPS EMERGENCY CONTROL
To operate, grasp control between fingers, depress centre button with thumb and pull
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Post-Mod 228 – all stores
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14 STANDBY COMPASS
15 TURN AND SLIP INDICATOR NORMAL/ EMERGENCY SUPPLY SWITCH
16 FIRE WARNING LAMP AND EXTINGUISHER PUSH-SWITCH
Illuminates when temperature in engine bay and/or accessories bay exceeds 300± 30°C.
Push to operate fire extinguishers
17 FUEL LOW PRESSURE WARNING LAMP
18 EMERGENCY LIGHTING SWITCH
19 FUEL TRANSFER FAILURE INDICATOR – PORT
20 EMERGENCY OXYGEN RELEASE
Pull to operate
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Finger holes between the hood and windscreen are provided to facilitate the removal of the hood. If, however, the pilot is able to move the lever, integral with the hood control box, to the FREE position, this will release the clutch of the hood winding motor and deflate the hood seal, thus allowing the hood to be pushed open by hand.

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Engine

Emergency balancing of fuel contents

12. 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 fuel low pressure, are provided in the cabin.

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14. In the event of 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 made to relight the engine.*

Fire extinguisher and warning lamp

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The engine must not be restarted after operating the fire extinguishing system owing to the possible risk of the fire re-commencing after the fire fighting resources are exhausted.

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16. The incidence of the tail plane is varied by means of a two-speed electric actuator, the normal high speed movement being controlled by a switch on the control column and the emergency low-speed movement by means of a guarded switch on the cabin port shelf. In the event of a breakdown of the normal control circuit, the emergency low-speed circuit can be brought into use by fully raising the guard and operating the shelf switch.

Survival equipment

17. A Type R personal survival pack is provided for use with the ejection seat and contains a dinghy and other survival equipment.

Emergency oxygen

18. An emergency oxygen set is mounted on the starboard beam of the pilot's ejection seat and is brought into action by a static line when ejection action is taken or may be operated, should an emergency arise, by pulling the manual control handle, which is located on the right-hand side of the seat pan.

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19. Immediately before jettisoning external stores the fuzing selector switch must be set to DEFUZE. Subsequent action is as follows:-

Pre-Mod 229. All external stores may be released in a safe condition by depressing the jettison switch on the port glare shield.

Post-Mod 229. All external stores may be released in a safe condition by depressing the CLEAR A/C switch on the port instrument panel or stores on the outboard pylons only may be released by depressing the jettison switch on the port glare shield.

Emergency lighting

20. Should the normal cabin lighting fail, an emergency system can be brought into operation by a switch located on the starboard side of frame 9 above the cabin shelf. The emergency lighting system is supplied with current from a small battery mounted in the radio bay.

First aid kit

21. A first aid kit is contained in the pilot's personal survival pack.