

## Chapter 5

## FIRE PROTECTION SYSTEM

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## WARNING

Methyl bromide gives off an odourless non-irritant vapour which is highly poisonous. The effects may not be apparent at once and may be fatal if large amounts are inhaled before signs develop.

## DESCRIPTION AND OPERATION

## Introduction (fig. 2)

1. The fire protection system is operated in two ways as follows:—

(1) Manually by push button control from the cabin.

(2) Automatically, by inertia switches, which operates the spray units in the event of a crash landing.

The manual push-button control in the cockpit incorporates a warning lamp which is actuated by the flame detector switches in the engine bay. A full description of the electrical circuit is given in Sect. 5, Chap. 1, Group C.2, and general information on aircraft fire protection is given in A.P.957C, Vol. 1.

## Extinguisher bottle

2. The Mk. 5A methyl bromide fire extinguisher bottle (Stores Ref. 27N/69) is mounted in a cradle (fig. 1) on the rear face of the main spar member on the starboard side of the aircraft. The bottle, which is secured in its cradle by a metal strap, has a single discharge head, the outlet being piped to the inlet connection of the engine spray units. The discharge head is fired electrically, either by means of the push-button control in the cabin or automatically on operation of an inertia switch.

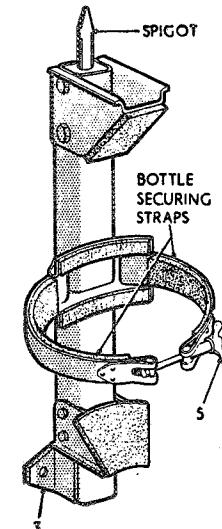


Fig. 1. Extinguisher bottle cradle

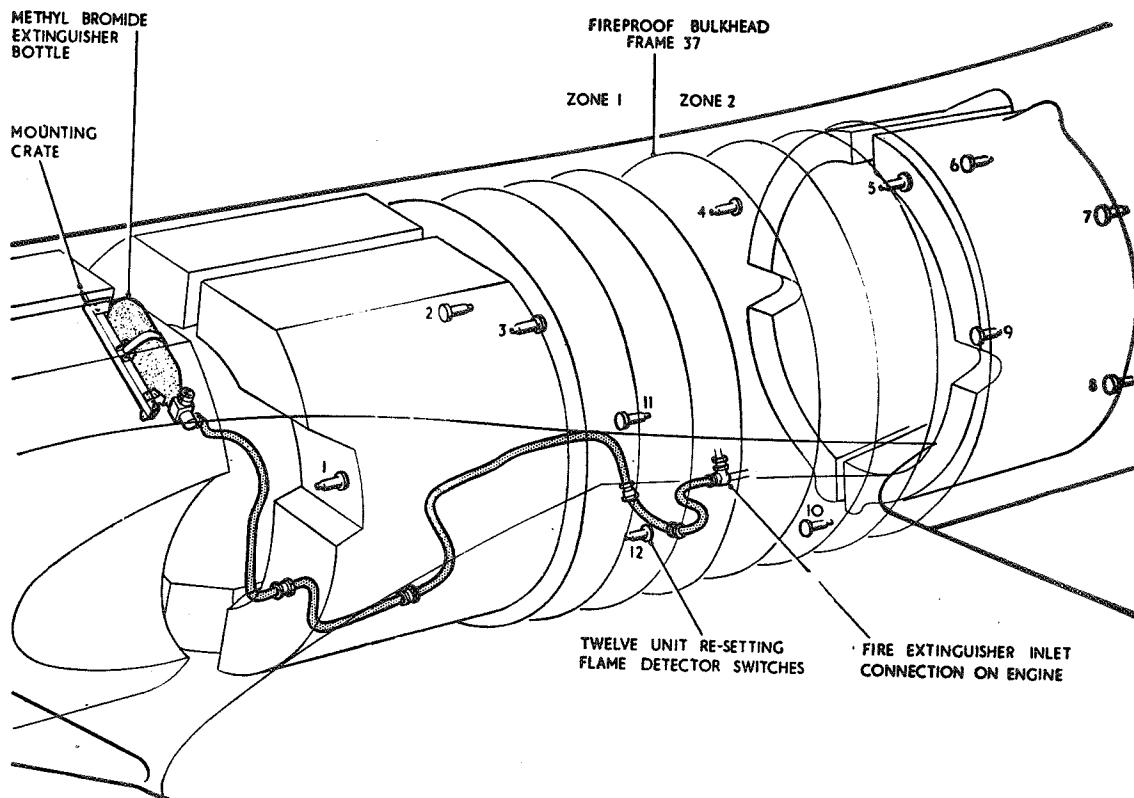


Fig. 2. Fire protection system

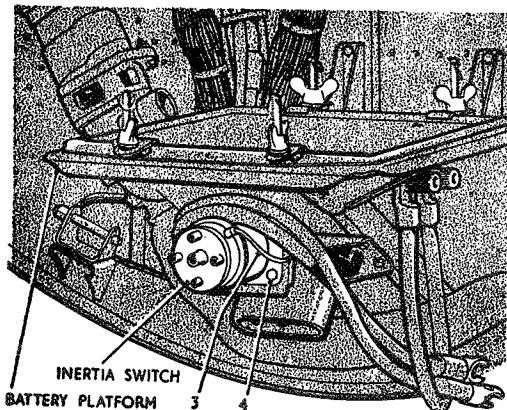


Fig. 3. Typical inertia switch

◆ **Inertia switches (fig. 3)**

3 The inertia switches, which operate in the event of a crash landing, are mounted one underneath the battery platform in the radio bay, and the other on frame 12 below the cabin floor.

**Unit re-setting flame detector switches (fig. 4)**

4. Twelve unit re-setting flame detector switches are arranged at vital points in the engine bay, and in the region of the jet pipe joint. These switches operate when subjected to temperatures in excess of that for which they are preset. The switches operate the warning lamp contained in the pilot's push-button control (para. 6), but they do not operate the extinguishing system.

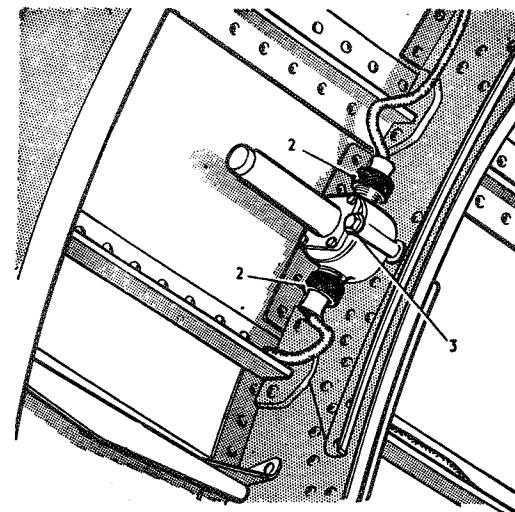


Fig. 4. Typical flame detector switch assembly

**Note . . .**

*In certain circumstances during an engine ground run, when the engine bay may become temporarily overheated, the warning lamp may flicker on and off although there is no fire. In such circumstances, emergency action is not necessary unless the warning lamp remains steadily illuminated. The positions of the flame switches are shown in fig. 2.*

**Spray units**

5. For fire protection purposes, the engine bay is divided into two zones by a fireproof bulkhead (frame 37) which screens the fuel system components from the engine combustion chambers. A spray ring is fitted in each zone, the forward ring encircling the compressor outlet casing and the rear ring encircling the turbine nozzle box. The two rings are interconnected by a pipe on the port side of the engine. They are drilled to enable them to spray both fore and aft.

**Fire extinguisher manual control (fig. 5)**

6. The manual control consists of a push-button switch mounted on the starboard arch panel in the cockpit. The action of pressing the push-button energizes the fuse in the discharge head of the extinguisher bottle which, being piped to the engine system, feeds extinguisher fluid to the spray rings. The

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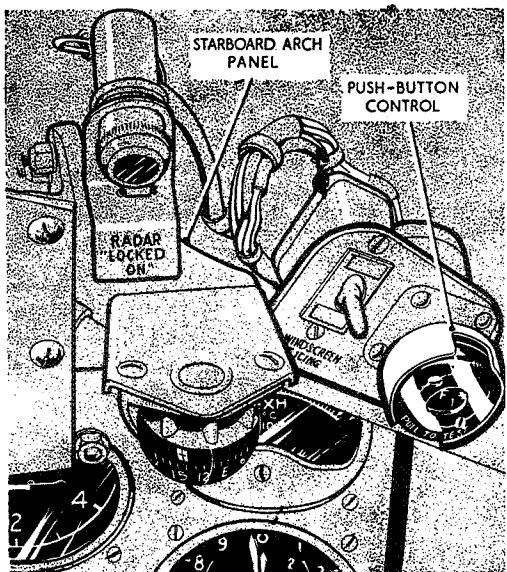


Fig. 5. Fire extinguisher manual control

manual control switch incorporates an ENGINE FIRE warning lamp, which is actuated by the flame switches (para. 4). The lamp can be checked for serviceability by pulling out the button of the push-button switch.

#### SERVICING

##### Note . . .

*The fuse actuating the discharge head of the fire extinguisher bottle is very sensitive, and as the battery isolating switch in the cockpit does not isolate the fire extinguisher circuit, the system must be rendered electrically safe, prior to servicing, by removal of the appropriate fuse (Sect. 5, Chap. 1). If the bottle has been discharged, do NOT inhale the gas.*

##### General

7. No servicing of the flame switches is possible, apart from the routine checks for continuity and insulation, which are described in A.P.4343 series, and a functioning check, which is described in Sect. 5, Chap. 1, Group C.2 of this volume. The servicing of the

electrical circuit generally is also described in this Group.

#### Extinguisher bottle

8. Apart from weighing and examining the extinguisher bottle to determine whether it has been discharged, no servicing is possible. The weight of the bottle when it is fully charged is 18 lb. 6 oz. + 4 oz. Should the bottle weigh less than this figure, it must be replaced by a fully charged bottle. Checks for determining the serviceability of the fuse in the discharge head and other electrical checks of the system are described in Sect. 5, Chap. 1, Group C.2 of this volume.

#### Inertia switches

9. Apart from the re-setting of the inertia switches, which is described in Sect. 5, Chap. 1, Group C.2 of this volume, no servicing of the inertia switches is possible.

#### REMOVAL AND ASSEMBLY

##### General

10. Before attempting to remove any of the components of the fire protection system, the aircraft should be made electrically safe. The procedure for doing so is to put the battery isolating switch in the cockpit to the OFF position, ensure that the trolley battery is disconnected and either remove the battery leads and stow them on the dummy terminals on the battery platform, or remove the fuse protecting the service to complete the isolation (Sect. 5, Chap. 1, Group A.1). Once access has been obtained, the removal of the majority of the components of the system is obvious.

#### Extinguisher bottle (fig. 1)

11. To remove the fire extinguisher bottle, proceed as follows:—

- (1) Render the aircraft electrically safe (Sect. 5, Chap. 1, Group A.1).
- (2) Gain access to the engine starter bay (Sect. 2, Chap. 4, fig. 2), remove the breeze plug from the operating head of the bottle and disconnect the spray pipe from the union on the head.
- (3) Remove two nuts securing the bottom of the cradle holding the bottle and tilt

the cradle to draw it off the stud in the aircraft structure. Pull the cradle downwards until the spigot at the top of the cradle is free from its attachment bracket on the structure.

- (4) Remove the cradle complete with bottle.
- (5) Release the locking wire securing the wing nut on the strap securing the bottle to the cradle and unscrew the wing nut. Open out the two halves of the hinged strap and remove the bottle.

#### Flame detector switches (fig. 4)

12. The removal of the flame switches presents no unusual difficulties once access has been obtained. Removal is effected as follows:—

- (1) Render the aircraft electrically safe (Sect. 5, Chap. 1, Group A.1).
- (2) Gain access to the flame detector switch concerned and remove the electrical connections at the switch.
- (3) Remove the securing nuts and bolts and remove the switch.

#### Inertia switches (fig. 3)

13. The inertia switches are mounted one underneath the battery platform in the radio bay, and one on frame 12 below the cabin floor. To remove the inertia switches, proceed as follows:—

- (1) Render the aircraft electrically safe (Sect. 5, Chap. 1, Group A.1).
- (2) Gain access to the appropriate switch.
- (3) Disconnect the electrical connections at the switch, insulate the bare ends of the leads and stow.
- (4) Remove the bolts securing the switch to the structure and remove the switch.

The procedure for re-setting the switches after installation is given in Sect. 5, Chap. 1, Group C.2 of this volume.

##### Note . . .

*Assembly of the extinguisher bottle, inertia switches and flame detector switches is, in general, a reversal of the removal procedure. For electrical tests prior to re-connection, reference should be made to Sect. 5, Chap. 1 of this volume.*



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