

Chapter 5 FIRE PROTECTION SYSTEM

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WARNING

Methyl bromide vapour is highly poisonous if inhaled, although the effects may not become apparent for some time. If methyl bromide liquid or vapour is allowed to remain in contact with the skin, severe and painful blisters may develop. Contaminated skin must, therefore, be washed thoroughly at the first opportunity.

DESCRIPTION AND OPERATION

Introduction

1. The fire protection system is brought into operation by either of two methods as follows:—

- (1) Manually by push-button control from the cabin.
- (2) Automatically, by inertia switches which complete the circuit to operate the discharge head of the extinguisher bottle in the event of a crash landing.

The manual control in the cabin incorporates a fire warning lamp which is actuated by the flame detector switches in the engine bay. For details of the electrical circuit of the system, reference should be made to Sect. 5 of this Volume. A description of fire protection generally will be found in A.P. 957C, Vol. 1.

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Extinguisher bottle

2. One methyl bromide fire extinguisher bottle is provided. It is mounted in a cradle on the aft 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 either of the two inertia switches (*para. 3*).

Inertia switches

3. The two inertia switches, which operate in the event of a crash landing, are mounted one on the forward face of frame 12 and the other on the underside of the accumulator mounting, forward of frame 19.

Flame detector switches

4. Twelve unit resetting 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 have been pre-set, thus completing the circuit to illuminate the fire warning lamp incorporated in the pilot's push-button control (*para. 6*). They do NOT operate the fire extinguishing system. The location of the switches is shown in fig. 1.

Note . . .

In certain circumstances during an engine ground run, when the engine may become temporarily overheated, the fire warning lamp may flicker on and off although there is no fire. In such circumstances, emergency action is not necessary unless the lamp remains steadily illuminated.

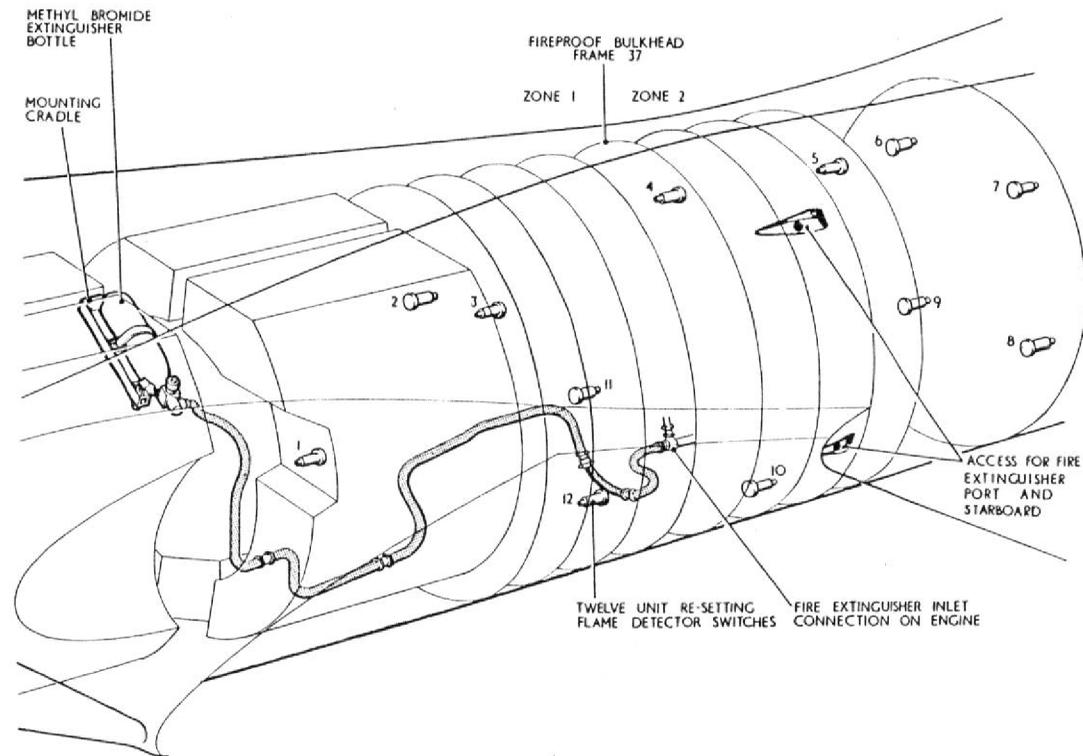


Fig. 1. Fire protection system

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 in each zone, the forward ring encircling the engine compressor outlet casing and the rear ring encircling the turbine nozzle box. Both rings are in connection with each other and with the extinguisher bottle by piping (*as shown in fig. 1*). The spray rings are drilled to enable them to spray both fore and aft.

Fire extinguisher manual control

6. The manual control consists of a push-button switch in the cabin. The action of pressing the push-button energizes the detonating fuze in the discharge head of the extinguisher bottle which, being piped to the engine system, feeds extinguisher fluid to the spray rings. The manual control switch incorporates the ENGINE FIRE warning lamp which is actuated by the flame detector switches (*para. 4*). The lamp is checked for serviceability by pulling out the button of the push-button switch.

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SERVICING**General**

7. Before attempting to service any part of the fire extinguisher system, the aircraft *must be made electrically safe*, and, since the battery master switch does NOT isolate the fire extinguishing circuit, the following procedure MUST be adopted before servicing or removing any component:—

- (1) Place the battery master switch in the cabin to the OFF position and disconnect the electrical socket from the plug in the operating head of the extinguisher bottle.
- (2) Ensure that the ground service trolley battery is disconnected from the aircraft.
- (3) Disconnect the Cannon plugs from their terminals on the aircraft batteries and place them in a position where they will not short against any part of the aircraft structure.

Note . . .

Bared ends of electrical leads removed must be taped immediately after disconnection to eliminate the possibility of fire due to shorts. This is essential as there is always a possibility of the batteries being reconnected before all leads are replaced. Ensure that the electrical socket is not live before reconnection to the operating head of the extinguisher bottle.

Extinguisher bottle

8. The weight of the extinguisher bottle fully charged is stamped on the head. Should the bottle weigh less than that indicated on the head, it should be replaced by a fully-charged bottle. Checks for determining the serviceability of the discharge head and other electrical tests are given in Sect. 5 of this Volume.

Inertia switches

9. Apart from the resetting of the inertia switches as described in Sect. 5 of this Volume no servicing of the inertia switches is possible.

Flame detector switches

10. Apart from the routine checks for continuity and insulation which are described in A.P.4343 series, and a functional check which is described in Sect. 5 of this Volume, no servicing of the flame detector switches is possible.

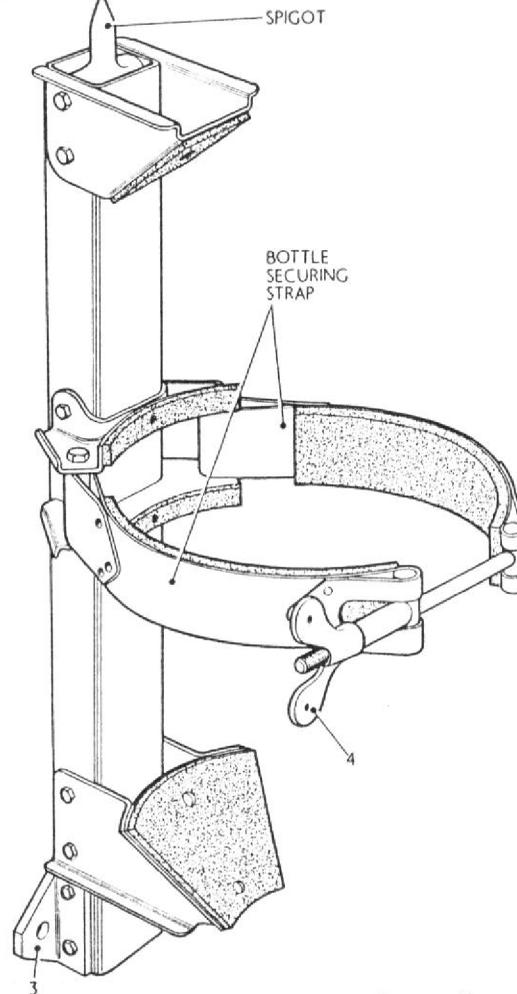


Fig. 2. Extinguisher bottle cradle

Spray rings and pipe-lines

11. Examine the pipe-lines and spray rings for security of attachment and ensure that no chafing of pipes has occurred. Ensure that the holes in the spray rings are clear and unobstructed.

REMOVAL AND ASSEMBLY**General**

12. Before attempting to remove any of the components of the fire protection system, ensure that the aircraft is made electrically safe in accordance with the instructions given in para. 7.

Extinguisher bottle

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

- (1) *Render the aircraft electrically safe (para. 7).*
- (2) Gain access to the engine starter bay, remove the Breeze plug from the operating head of the bottle and disconnect the supply pipe from the union on the bottle.
- (3) Remove the two nuts securing the bottom of the cradle and tilt the cradle to draw it off the studs 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 and remove the cradle complete with bottle.
- (4) 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 strap and remove the bottle.

Flame detector switches

14. The removal of the flame detector switches is effected as follows:—

- (1) *Render the aircraft electrically safe (para. 7).*
- (2) Gain access to the switch concerned and remove the electrical connections at the switch.
- (3) Remove the securing nuts and bolts and remove the switch.

Inertia switches

15. To remove the inertia switches proceed as follows:—

- (1) *Render the aircraft electrically safe (para. 7).*
- (2) Gain access to the switch concerned.
- (3) Disconnect the electrical connections at the switch, insulate the bare ends of the leads and stow.
- (4) Remove the nuts and bolts securing the switch to the structure and remove the switch.

Assembly

16. The assembly of the components of the fire protection service is, in general, a reversal of the removal procedure. When the assembly is completed, ensure that all nuts are securely locked, and that the wing nut securing the metal strap holding the extinguisher bottle in its cradle is locked to the strap with 22 s.w.g. stainless steel locking wire. For details of the electrical tests and the re-setting of the inertia switches prior to reconnection, refer to Sect. 5 of this Handbook.

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