Chapter 5

FIRE PROTECTION SYSTEM

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Fire extinguisher details

DESCRIPTION

indicator type fuzes is mounted on the inboard rib of each main-wheel bay. There is one fuze to each of the Griffon, Viper, water/methanol tank and heater fire extinguishers. Two fuzes are fitted on each panel for the fuel tanks on the respective side of the aircraft, one fuze for No.1 tank and one for No.2, 3,4 and 5 tanks. Hand-operated, bromochlorodi-

fluoromethane (B.C.F.) extinguishers are provided at suitable positions in the fuselage for the use of crew members. Installation of the fire extinguishers and the associated piping is shown in fig.1. The electrical circuits and fire detector switches are illustrated and described in Sect.6, Chap.3J of this Volume.

Introduction

1. This chapter contains a description of the fire extinguishing systems and provides servicing details. Protection for the power plants, fuel tanks and heaters is provided by systems of spray pipes fed from automatically or manuallyoperated methyl-bromide extinguishers. A bottles-fired indicator panel, incorporating

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GRIFFON POWER UNIT SYSTEM

2. Two methyl-bromide extinguishers are fitted in each engine nacelle, a 12 lb. extinguisher for the engine spray installation and a 6 lb. extinguisher for the air intake installation. A pipe from each is led to a union on the firewall (Sect.4, Chap.1, Fig.7 of this book). A description of the piping forward of the firewall is given in A.P.4275A, Vol.1.

Automatic operation

3. Two inertia switches are mounted in the nose. These operate the system in the event of a crash landing where the impact causes sufficient deceleration. Both extinguishers are then discharged into their respective systems. For details of the electrical system associated with these switches refer to Book 2, Sect.6, Chap.3J. Automatic operation is also initiated if, when an engine is on fire, the propeller is feathered. The engine air intake extinguisher system is operated immediately, and after a short interval the engine system is operated.

Manual operation

4. Instantaneous operation of each complete power plant installation can be initiated by pressing the relevant pushbutton of four, mounted on the pilot's emergency panel. These buttons are provided with red guard covers inscribed ENGINE FIRE EXTINGUISHER.

Fire warning system

5. An amber warning lamp is incorporated in each propeller feathering pushbutton. Twelve flame detector switches, positioned four on the firewall and eight at suitable points round the engine, are connected to the warning system. Warning of a fire in each power plant is given by the continuous illumination of the associated warning lamp.

FUEL TANK SYSTEM

6. Fire protection for the fuel tanks in the main plane is provided by a methylbromide system. Sixteen fire extinguishers (Ref.No.27N/100) are used, eight for the port main plane and eight for the starboard. The extinguishers supply spray pipes secured to the main plane structure in the space between the tank bay plating and the main plane structure.

Port system

7. The air space around the tank bay plating of the No.1 fuel tank is covered by two extinguishers. The extinguishers, mounted on the arch ribs on the inboard side of the landing gear bay, each supply one spray pipe, one along the rear of the tank bay with the other along the front.

8. The air space around the tank bay plating of the No.2 and 3 fuel tanks is covered by two extinguishers. One extinguisher, mounted on the rear face of the rear spar immediately to the rear of the landing gear bay, supplies a spray pipe along the rear of the tank bays. A spray pipe, along the front of the tank bays, is supplied by an extinguisher mounted on the rear inboard upright tube of the outboard Griffon engine sub-frame.

9. The No.4 fuel tank bay is covered by two extinguishers mounted outboard on the outboard Griffon engine sub-frame. One extinguisher, mounted on the rear face of the rear upright tube, supplies the rear spray pipe, whilst the other, mounted on the diagonal sub-frame tube, feeds the forward spray pipe.

10. The No.5 fuel tank bay is covered by two extinguishers mounted on a structure on the inboard side of the outboard Griffon engine sub-frame to the rear of the water/ methanol tank. The extinguishers feed a single spray pipe which passes round the tank bay.





Fig. 3. NºI and 2 heater bay systems **RESTRICTED**

Starboard system

11. The location of the starboard system fire extinguishers is similar to the port system except that the extinguisher supplying the No.4 fuel tank bay rear spray pipe is mounted outboard on the Viper engine suspension frame.

Automatic operation

12. In the event of a crash landing the system is operated automatically by the two inertia switches located in the nose of the aircraft.

Manual operation

13. Two push buttons are provided on the pilots' emergency panel, one for each half of the fuel system. The system for the port or starboard half operates immediately the appropriate push-button is depressed.

WATER/METHANOL TANK SYSTEM

14. Fire protection for each water/ methanol fluid tank is provided by a methyl-bromide fire extinguisher (Ref. No.27N/100). The fire extinguisher, mounted on the rear outboard upright tube of each outboard engine sub-frame, supplies a spray pipe positioned round the water/methanol fluid tank.

Operation

15. The water/methanol fluid tank fire extinguishers are operated by the fuel tank extinguisher controls described in para.12 and 13.

VIPER ENGINE SYSTEM

16. Each Viper engine is fitted with integral fire detectors and spray system. The spray system of each engine is supplied by a single fire extinguisher. (Ref.No.27N/100), mounted outboard of the No.5 fuel tank extinguishers on each outboard Griffon engine sub-frame.

Operation

17. Instantaneous operation of each system is initiated by operating the relevant fire indicator/extinguisher operating push-button on the pilots' emergency panel.

CABIN HEATER SYSTEMS

General

18. The four heater compartments, No.1 and 2 on each side of the escape hatch chute, No.3 aft of former 30 and No.4 heater located in the starboard side of the scanner bay, are each provided with a spray system fed from an extinguisher (Ref.No.27N/100). Flame cords, operating flame switches, are provided in each compartment. When an extinguisher is operated, its fluid sprays the compartment and is also injected into the burner of the heater.

Automatic operation

19. Each of the four extinguishers is discharged into its respective spray system when the inertia switches in the nose of the aircraft are operated, or when the flame switches are actioned. Flamestats, installed in the ducting, downstream of each heater, operate the heater fuel system solenoid valves to shut off the fuel supply to the associated heater in the event of an excessive temperature rise in the ducting.

Manual operation

20. Four guarded push-switches, inscribed F, are mounted below the heater control switches on the flight engineer's main panel. Each switch makes provision for manually triggering-off the operation of the individual heater bay extinguisher. A fire warning indicator, incorporated in each switch, is illuminated in the event of fire in the associated heater bay. A further fire warning indicator, on the pilots' emergency panel is operated in the A.P.4267E, Vol.1, Book 1, Sect.4, Chap.5 A.L.14, Nov.65

event of a fire in any of the four heater bays.

BOMB COMPARTMENT FIRE WARNING

Bomb compartment fire warning is 21. provided by an indicator located on the pilots' emergency panel. The indicator is connected, electrically, with two flame detector switches mounted in the bomb compartment on the port and starboard sides of former 3. Each flame detector switch is connected with a pyrotechnic flame cord clipped to, and led along, each side of the bomb compartment roof, terminating at former 18. The system provides a visual indication of fire only and does not connect with or actuate any of the fire extinguishing systems previously described.

HAND-OPE RATED FIRE EXTINGUISHERS

22. Five, Type 34H hand-operated fire extinguishers (Ref.No.27N/299), using bromochlorodifluoromethane as an extinguishant, are provided in the fuselage. The extinguishers are for use against all types of fire in aircraft and may be used in crew compartments. The extinguishers are coloured signal red and mounted in the following positions:-

- One in the gunner's compartment just forward of the compartment bulkhead at floor level on the port side.
- (2) One on the inverter crate on the starboard side of the nose section.
- (3) One on the rear face of signaller's forward bulkhead.
- (4) One on the forward face of the galley.
- (5) One in the emergency equipment stowage on the entrance door.



Fig. 4. 'Nº3 and 4 heater bay systems

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SERVICING

AUTOMATIC EXTINGUISHERS

23. When the window of an indicator fuze is stained red, the associated automatic extinguisher must be suspected of having been discharged. Confirmation that the extinguisher has been discharged is given by an indicator pin protruding 0.125 in. from the cap of the junction box on the extinguisher head.

24. No in-situ servicing is possible but the extinguishers should be weighed periodically to check the weight of the contents and ensure that no loss has occurred. The fully charged weights will be found in A.P.957C, Vol.1, and are also stamped on the head of the container. If the weight is outside the tolerance quoted the extinguisher must be replaced with a serviceable item.

SPRAY HOLES

25. Spray pipes are to be kept clean by connecting a compressed air supply to

the feed pipes and blowing through. At the same time a check should be made that there are no leaks at the supply and feed pipe connections.

PIPE CONNECTIONS

26. At all times when any pipe joint is disconnected and remade, a soft copper S Type crush washer (Graviner Part No. D.2204) must be fitted. The gland nut is then torque loaded to 80/100 lb. in., the action of which crushes the copper washer to form a completely gas tight joint.

FLAME DETECTOR SWITCHES

27. Details of electrical checks will be found in Sect.6, Chap.3J of this Volume.

INERTIA SWITCHES

28. At the periods stipulated in A.P. 101B-1703-5B the switches are to be

examined for the presence of moisture or damage and replaced, if necessary, by a serviceable item. A transparent case facilitates examination. To set an inertia switch proceed as follows:-

- Remove the nuts securing the terminal block cover and remove the cover. This will reveal the setting plunger.
- (2) Press the setting plunger until the contacts bow springs back into the unoperated position.
- (3) Fit the terminal block cover.

HAND-OPERATED EXTINGUISHERS

29. At the periods stipulated in A.P. 101B-1703-5B the extinguishers must be weighed to ascertain whether any loss of charge has occurred. An indicator pin is provided in the extinguisher head to show when total or partial discharge has occurred.

General

30. No special instructions for the removal of extinguishers are considered necessary. Access to those in the inboard nacelles are accessible after removal of the nacelle fairings and the extinguisher mounted in the port and starboard trailing edges between ribs 1 and 1A are reached through access panels in the underskin of the trailing edges. The forward heater extinguishers are accessible through the nose-wheel bay, and the two aft heaters through the floor panel aft of the entrance door, and the top of the scanner well.

REMOVAL AND ASSEMBLY

31. Spray pipes of the fuel tank systems may be removed or installed after removal of the associated fuel tanks, (Sect.4, Chap.2 of this book). Removal of components from clips and other mountings follows normal procedure.

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TABLE 1

Location	Qty.	Туре	Ref.No.	Er We Ib.	npty ight oz.	ү 16.	Full leight oz.	Charge Pressure p.s.i.
GRIFFON ENGINE SYSTEM	1	Graviner Mk.13A (Methyl-bromide)	27N/99	6	3·5 ±3	18	4•5 <u>+</u> 3	250
Each engine nacelle	1	Graviner Mk.12A (Methyl-bromide)	27N/100	3	3·25 <u>+</u> 3	10	1 ± 4	200
FUEL AND WATER/METHANOL TANK SYSTEM								
Inboard and outboard nacelles	16	Graviner Mk.12A (Methyl-bromide)	27N/100	3	3·25 <u>+</u> 3	10	1 ± 4	200
HEATER SYSTEM								
One in each heater compartment	4	Graviner Mk.12A (Methyl-bromide)	27N/100	3	3·25 ± 3	10	1 <u>+</u> 4	200
HAND-OPERATED EXTINGUISHERS INTERNAL								
Gunner's compartment Inverter crate (nose section) Signaller's station Galley Entrance door (emergency panel)	1 1 1 1	Graviner type 34H (B.C.F.)	27N/100	2	14	5 <u>+</u> 4	7 <u>+</u> 4	45
VIPER ENGINE SYSTEM								
Each engine	1	Graviner Mk.12A (Methyl-bromide)	27N/100	3	3·25 <u>+</u> 3	10	1 ±4	200

Fire extinguisher details

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