

SECTION 3

3.1 FIRE PROTECTION SYSTEM

AERO ENGINE SCHOOL

8.1 FIRE PROTECTION SYSTEM

To ensure adequate protection against fire risk, each engine compartment is divided into zones by bulkheads integral with the engine which seal on to the aircraft structure. The compartments thus formed being lined with titanium sheet. The forward zone, designated Zone 1, is not covered by the extinguishing system spray pipes. The rear zone is sub-divided by an intermediate bulkhead immediately forward of the combustion chambers, the two positions being known as Zones 2A and 2B respectively. Refrased blankets are fitted to each side of the centre engine rib in Zone 2B, these heat insulators protect the rib from the high temperature which is produced at this point.

Automatic warning of fire is given by a thermo-electric resetting fire detector system consisting of two control units mounted port and starboard in the nose-wheel bay. A set of detectors containing thermocouples in engine Zones 2A and 2B, and combined

warning indicator operating switches one in each engine on the pilots cockpit ceiling.

The indicator operating switches are painted red and are identified by the letter F in their centres. An automatic warning is given and normally the extinguishant is released by manual operation or if the deceleration exceeds the given value of 'G' (set on the inertia switches) the extinguishers are discharged automatically.

System Installation

Two Graviner fire extinguishers (12 lb capacity) using methyl-bromide as the extinguishant are installed on each side of the bomb bay. From the forward extinguisher, light-alloy piping leads to the inboard engine compartment and from the rear extinguisher to the outboard engine compartment. These pipes feed fore and aft spray pipes which pass along

pass along the inboard lower and outboard upper sides of engine Zones 2A and 2B. The extinguishant is sprayed into these zones through small holes positioned in two rows along the length of the spray-pipes.

Method of Operation

This system of fire detection works on the thermoelectric principle of voltage generator when heat is applied to the junction of two dissimilar metals which form the thermocouple. Each of the detectors heads consists of the two thermo-couples in series and of opposite polarity, one of which is shrouded from flame and rapid temperature changes, whilst the other, being exposed is rapidly affected by temperature change when the combined temperature of the exposed thermo-couples exceeds that of the shrouded couples by 185 deg C., sufficient electrical output is generated (7.5 millivolts) to illuminate the corresponding cockpit warning indicator. It is

then necessary to depress the warning indicator switch to fire the electrically operated fuses which discharge the extinguishers.

When a cockpit indicator is depressed, an explosive charge in the extinguisher is ignited electrically to rupture the container diaphragm and create an outlet through which liquid methyl-bromide can flow into the pipe line system.

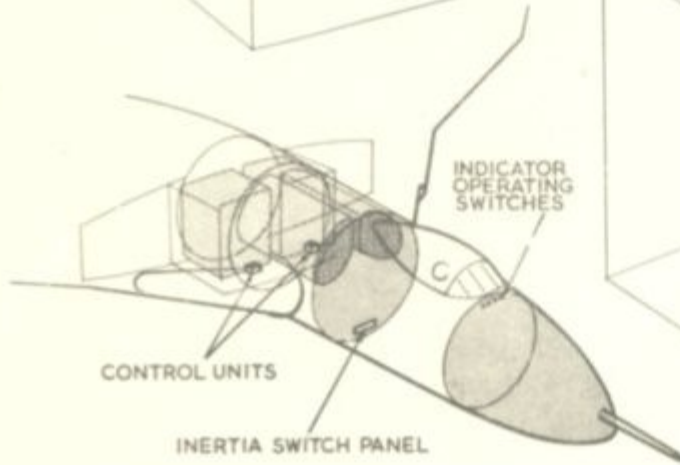
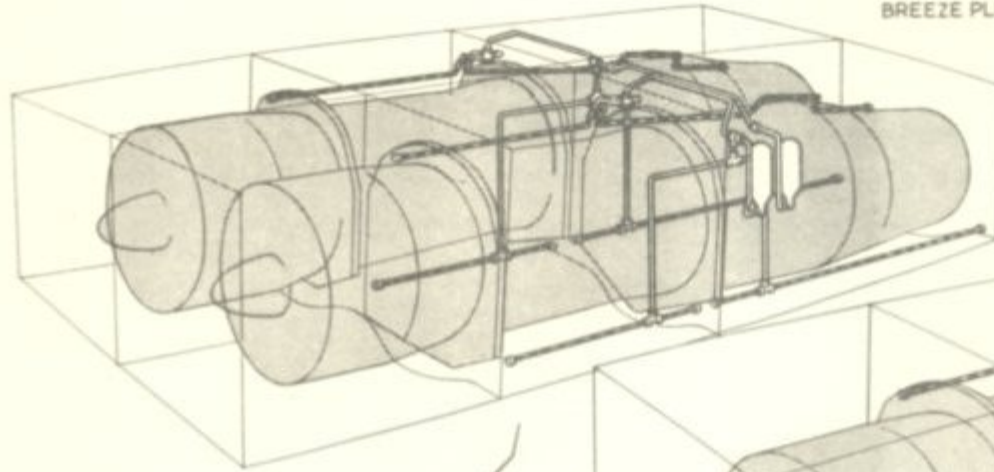
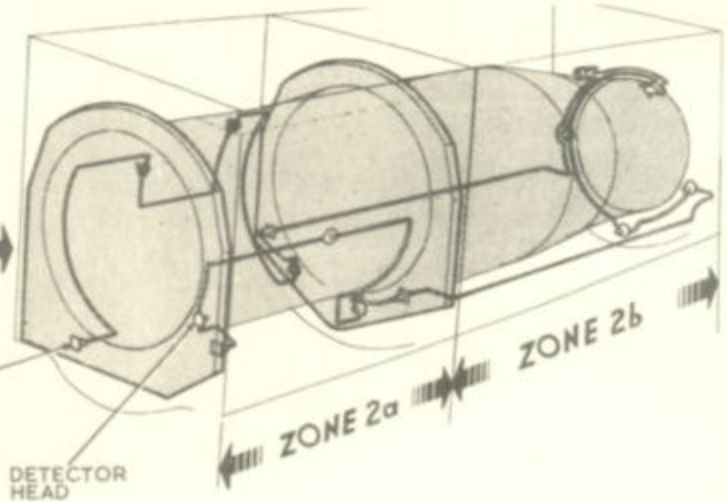
KEY

- SUPPLY PIPE
- - - SPRAY PIPE

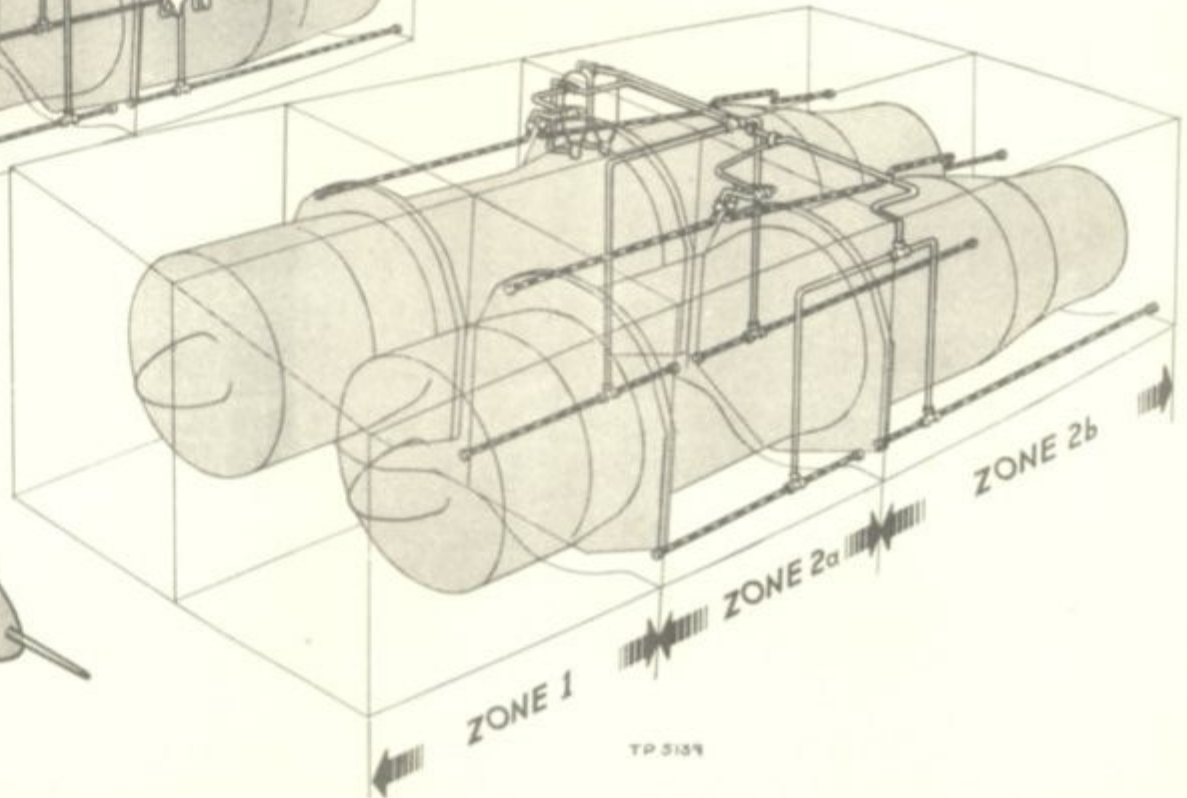
PIPE IDENTIFICATION



LOCATION OF FIRE DETECTORS (ENGINE BAYS IDENTICAL)



LOCATION OF CONTROL UNITS AND INERTIA SWITCHES



TP 5139

Fire protection system - engines

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