# Group 3 FIRE EXTINGUISHER SYSTEM

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**WARNING . . .**

**Voltages in excess of 100 volts either a.c. or d.c. can be dangerous under certain circumstances. Personnel should therefore ensure that the electrical system is electrically safe before any servicing is attempted. Where it is essential that tests or adjustments be made with the electrical power switched on, the greatest care must be exercised.**

### Introduction

**1.** The General Information Group contained in this Book immediately after Section 5 marker card, describes the layout, and gives the interpretation, of the schematic diagrams. Information on all the general modifications applicable to all aircraft can be found in there.

### Engine and jet pipe system (*fig.* 1)

**2.** There is an identical system to each of the four engine and jet pipe unit fire control systems. Pre-Mod. 1771 there are sixteen resetting type fire detectors to each engine unit, five in the compressor bay, seven in the combustion bay and four in the jet pipe bay. Post Mod. 1771 there are seventeen detectors, sixteen as before and an additional one, for engine failure warning, fitted at the 15th stage compressor vent. These are connected in parallel and fed from fuse panel D, and give fire warning by lighting warning lamps built into the fire-extinguisher push-switches on the pilots' instrument top panel. An extra contact in each of the push-switches pre-Mod. 1919, operated by pulling the push-switch out, enables the lamp filament to be tested. The positions of the various types of fire detectors is as follows:—

*Ref. No.* 27*N*/108 (14 in all)

One at the bottom port side of each engine zone 1.

Two at the end of each jet pipe.

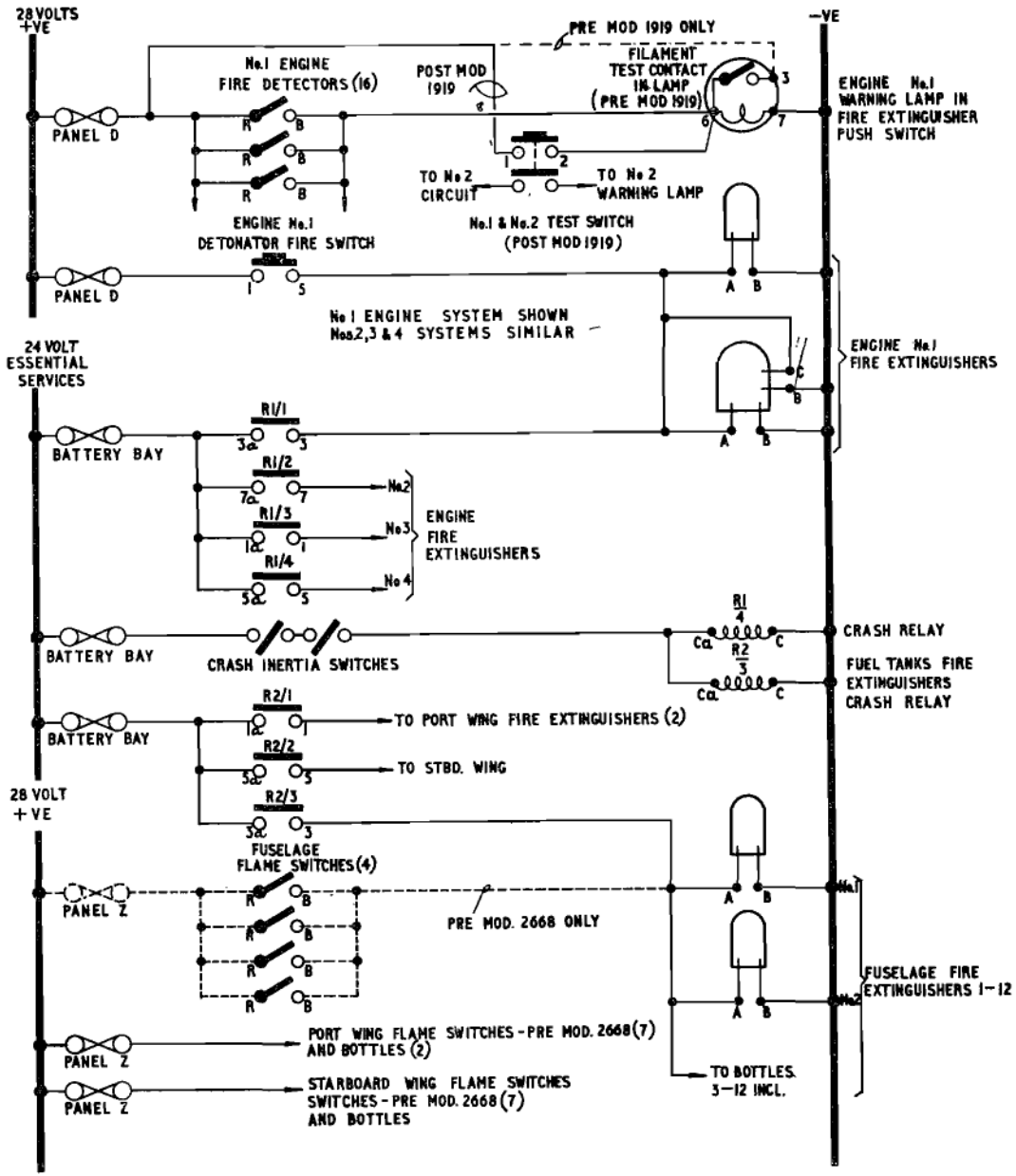


**Fig. 1. Fire extinguisher control (pre-Mod. 2945)**

One at the bottom starboard side of the forward face of the rear spar in zone 2 of the outboard engines.

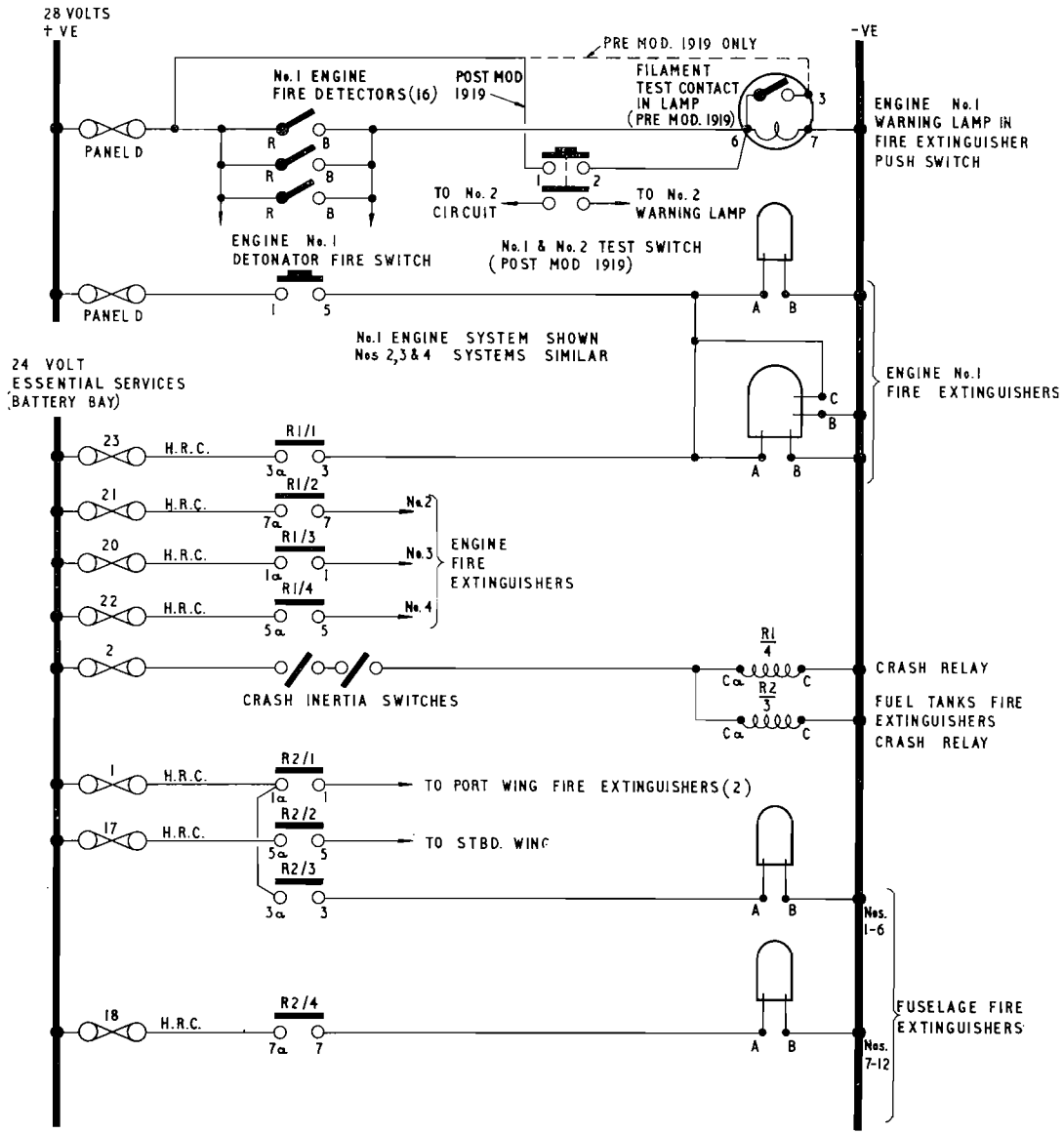


**Fig. 1A. Fire extinguisher control (post Mod. 2668 and 2945)**

*Ref. No.* 27*N*/91 (50 in all)

Four in each engine zone 1.

Four through the jet pipe shroud of each engine zone 2.

Five fixed to the forward and rear faces of the rear spar around the jet pipes shrouds in zone 3 of the inboard engines.

Four fixed to the forward and rear faces of the rear spar around the jet pipes shrouds (except bottom starboard side) in zone 3 of the outboard engines.

Fire detector, resetting 450 deg. C. (4 in all) 15th stage compressor vent of each engine in zone 1.

**3.** The fire extinguisher bottles are mounted, four in each wing at rib station 93, adjacent to the main undercarriage control panel. Of the four in each wing, there is one bottle for each engine and one for each jet pipe. To discharge the bottles, the relevant push-switch is depressed, so connecting a supply from panel D, to the bottles.

**4.** Aircraft fitted with Mod. 468 have double rate discharge bottles for the engine bay; these bottles have two cartridge firing units. Mod. 652 provides stowage plugs for the engine bay bottle connectors on those aircraft fitted with Mod. 468.

**5.** In the event of a crash landing, the inertia switches, on the pilots' floor forward beam, close to connect a 24-volt supply, from the essential services bus-bar, to the crash relay R1 (Type S4) also mounted on the pilots' floor beam. This relay closes (R1/1–4) to connect a further 24-volt essential service supply to all the engine fire extinguisher bottles; post Mod. 2945 this supply is split into four separately fused supplies, one for each engine system.

**Test push-switches (post Mod. 1919)** (*fig.* 1)

**6.** Modification 1919 disconnects the wiring from the test contacts (terminal 3) in the fire extinguisher combined warning lamp and push-switches and introduces two two-pole test switches on the instrument top panel. One of these switches is for Nos. 1 and 2 engines and the other for Nos. 3 and 4 engines. When either of these test switches is depressed, it connects the fire detector supply to the relative two warning lamps in the fire extinguisher push-switches.

**Fuel tank system** (*fig.* 1)

**7.** An independent fire control system is used for each of the fuselage, port and starboard wing fuel tanks. Each wing fuel system has two bottles and seven flame switches and the fuselage system has twelve bottles and four flame switches. The flame switches are plunger operated by flame cords having one end sealed and the other end connected to the flame switch. The flame switches in each system are connected in parallel and supplied from panel Z. Fire control is automatic; when the flame switches are operated by the flame cords, they connect their supply to the fire extinguisher bottles in their respective system.

**8.** In the event of a crash landing, the inertia switches, on the pilots' floor forward beam, close to connect a 24-volt supply from the essential services bus-bar to the fuel tank fire extinguisher relay R2 (Type S4) mounted on the pacitor relay panel. This relay closes (R2/1–3) to connect a 24-volt essential service supply to all the ◀ fuel tank fire extinguisher bottles; post Mod. 2945 this supply is split into three, separately fused supplies, and an additional contact R2/4 of the relay is used. ▶

**9.** Two types of flame cord leads are fitted, six with 15 ft. capillaries in the wings and twelve with 20 ft. capillaries in the fuselage and wings.

**Note . . .**

*Post Mod.* 2668, *the fire detection system has been rendered inoperative and in some cases the complete flame cord system has been removed. Under these conditions there is no automatic operation of the system other than in the event of a crash landing. The system will therefore operate only as described in para.* 8.

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## SERVICING

**Introduction**

**10.** A detailed description of all the general tests to be applied to all aircraft circuits can be obtained from the General Information group contained in this Book immediately after Section 5 marker card.

**Fire warning circuit**

**11.** To check the engine warning system:—

(1) Pre-Mod. 1919, pull the engine fire extinguisher switches in turn, the relative lamps should come on.

(2) Post Mod. 1919, press No. 1 and No. 2 TEST switch and check that engine No. 1 and No. 2 fire warning lamps come on. Repeat for No. 3 and No. 4 TEST switch.

(3) Short circuit the terminals for any one fire detector on No. 1 engine and jet pipe, check that No. 1 engine fire warning lamp comes on. Remove the shorting link.

(4) Repeat item 3 for Nos. 2, 3 and 4 engines.

**Fire extinguisher bottles**

**12.** Before carrying out circuit checks, disconnect all fire extinguisher bottles in order to prevent accidental discharges. Then proceed as follows:—

(1) Operate No. 1 engine fire extinguisher push-switch and check that a 28-volt test lamp lights up when connected across pins A and B (earth) of the 2-pin connector and across pins C and B (earth) of the 4-pin connector to the two bottles for this system.

(2) Repeat item 1 for Nos. 2, 3 and 4 engine systems.

(3) Short-circuit the terminals for any one of the four fuselage flame switches and check that a 28-volt test lamp lights up when connected across pins A and B (earth) of the 2-pin connectors for the twelve fire extinguisher bottles in the servicing bay above the nosewheel bay.

(4) Remove the shorting link.

(5) Short-circuit the terminals of any one of the seven flame switches for the starboard wing system and check that a 28-volt test lamp lights up when connected across pins A and B (earth) of both the starboard wing fire extinguisher bottles. Remove the shorting link.

(6) Repeat item 5 for the port wing system.

(7) Short-circuit the two crash inertia switches and check the operation of the crash relay, Type S4, and the fuel tank fire extinguisher crash relay, Type S4.

(8) Check that a 28-volt test lamp lights up when connected across pins A and B (earth) of all the 2-pin fire extinguisher bottle connectors (pins C and B (earth) of the 4-pin connectors). Remove the shorting links.

(9) After carrying out checks on the bottles, the bottles should be re-connected.

**Note . . .**

*Items* 3, 4, 5 *and* 6 *are only applicable to aircraft not embodying Mod.* 2668.

**Fire bottle checks**

**13.** Before connecting up the fire bottles, examine each bottle to ensure that the indicator pin is not projecting from the head of the bottle; this would indicate a discharged bottle. The cartridge firing circuits for each bottle should then be tested for continuity and resistance with a safety ohmeter. It is recommended that the firing unit be detached from the bottle for testing to guard against accidental firing. As an additional safeguard, the unit should be mounted on a suitable fixture with the end shielded but unrestricted. Each head unit must be tested independently and the resistance reading on the safety ohmeter must be between 7 and 11 ohms for each circuit. From the pins to earth the resistance must be at least 20 megohms.

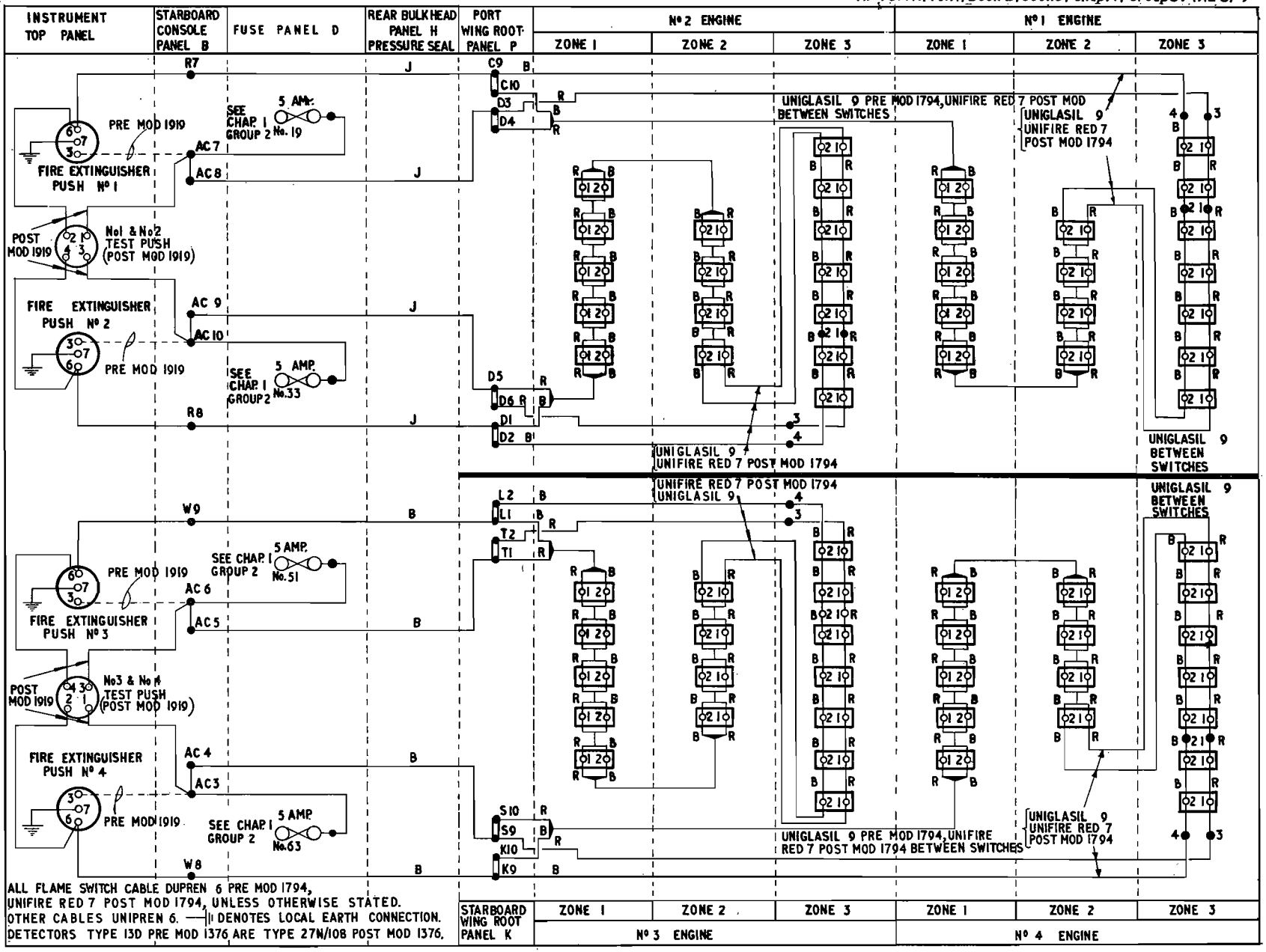


Fig. 2. Fire extinguisher warning lamps

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75836 SHT 119-C. 67436 SHT. 119-R

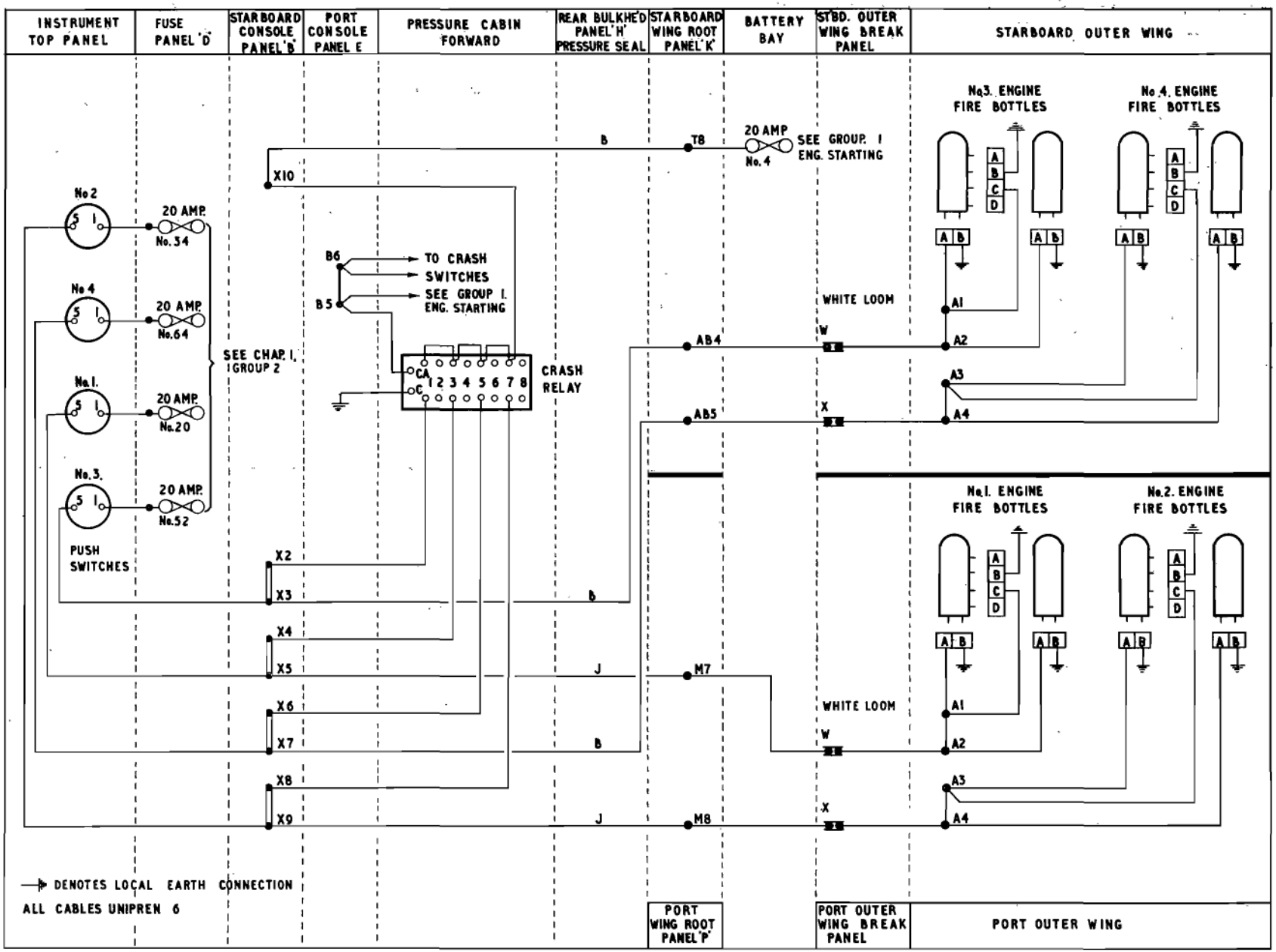


Fig. 3. Engine fire extinguishers (post Mod 1835)

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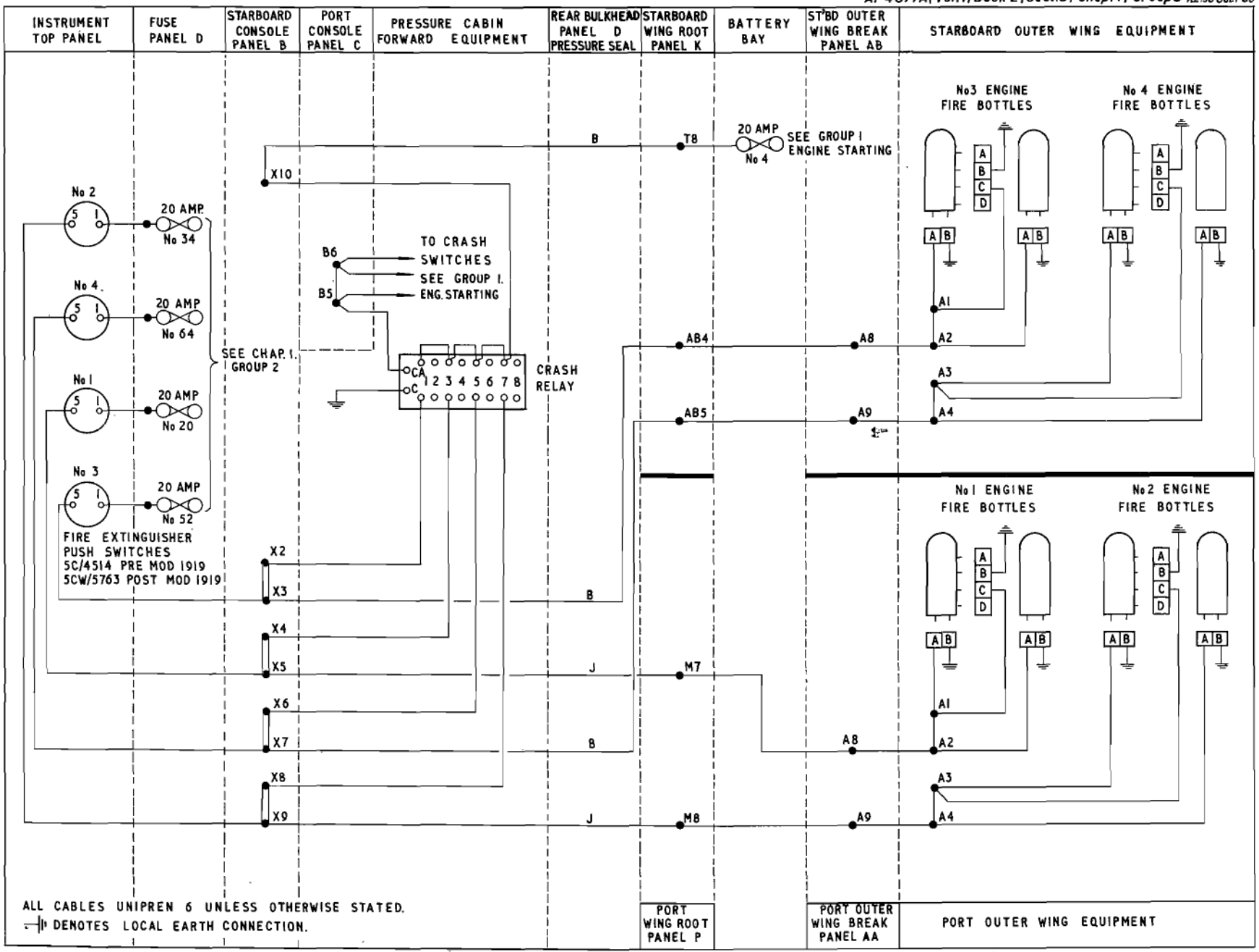


Fig. 4. Engine fire extinguishers (post Mod 1785)

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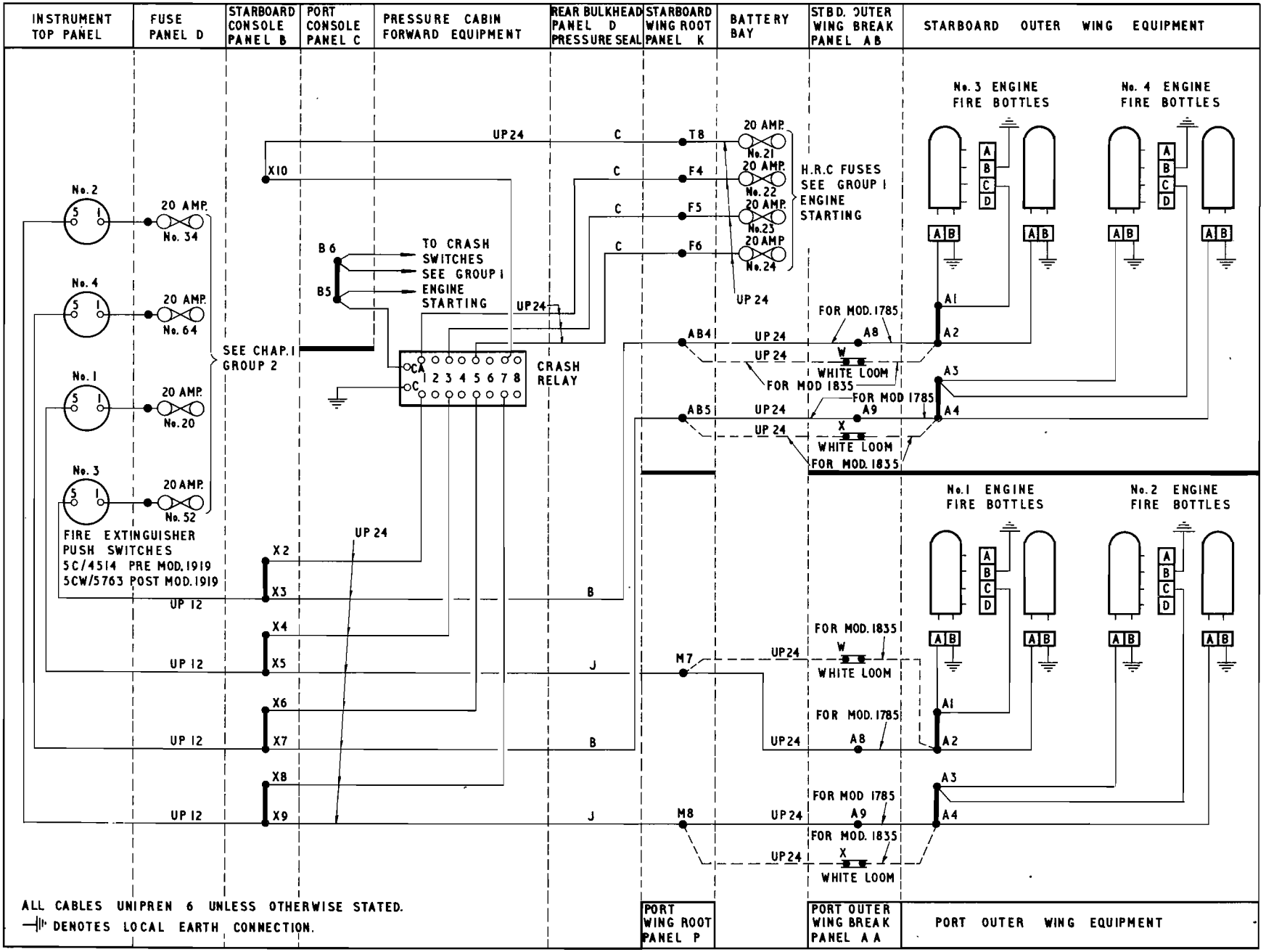


Fig. 5. Engine fire extinguishers (post Mod. 2945)

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67436 SHT. 406-F

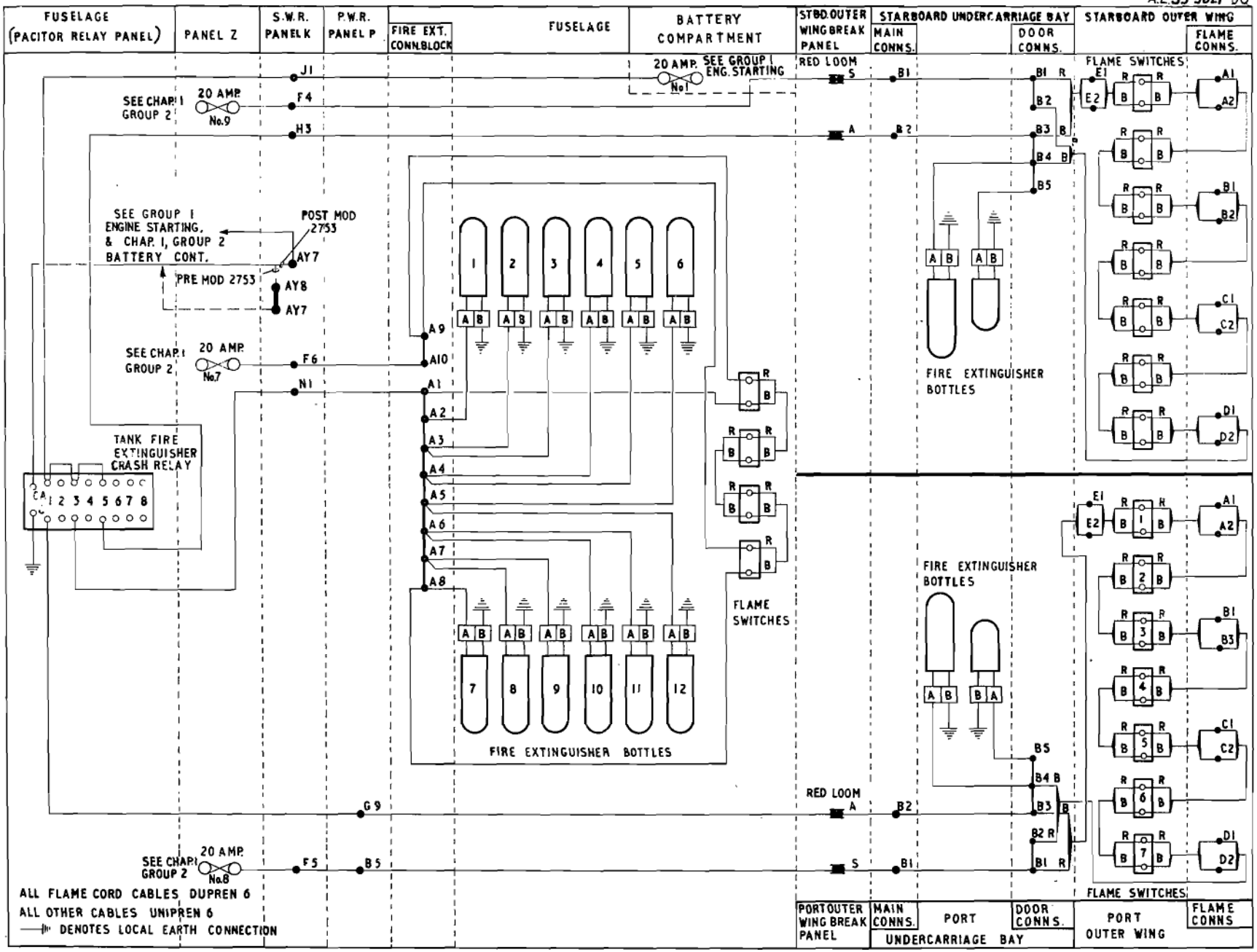


Fig. 6 Fuel tanks fire extinguishers (post Mod. 1835, pre Mod. 2668)

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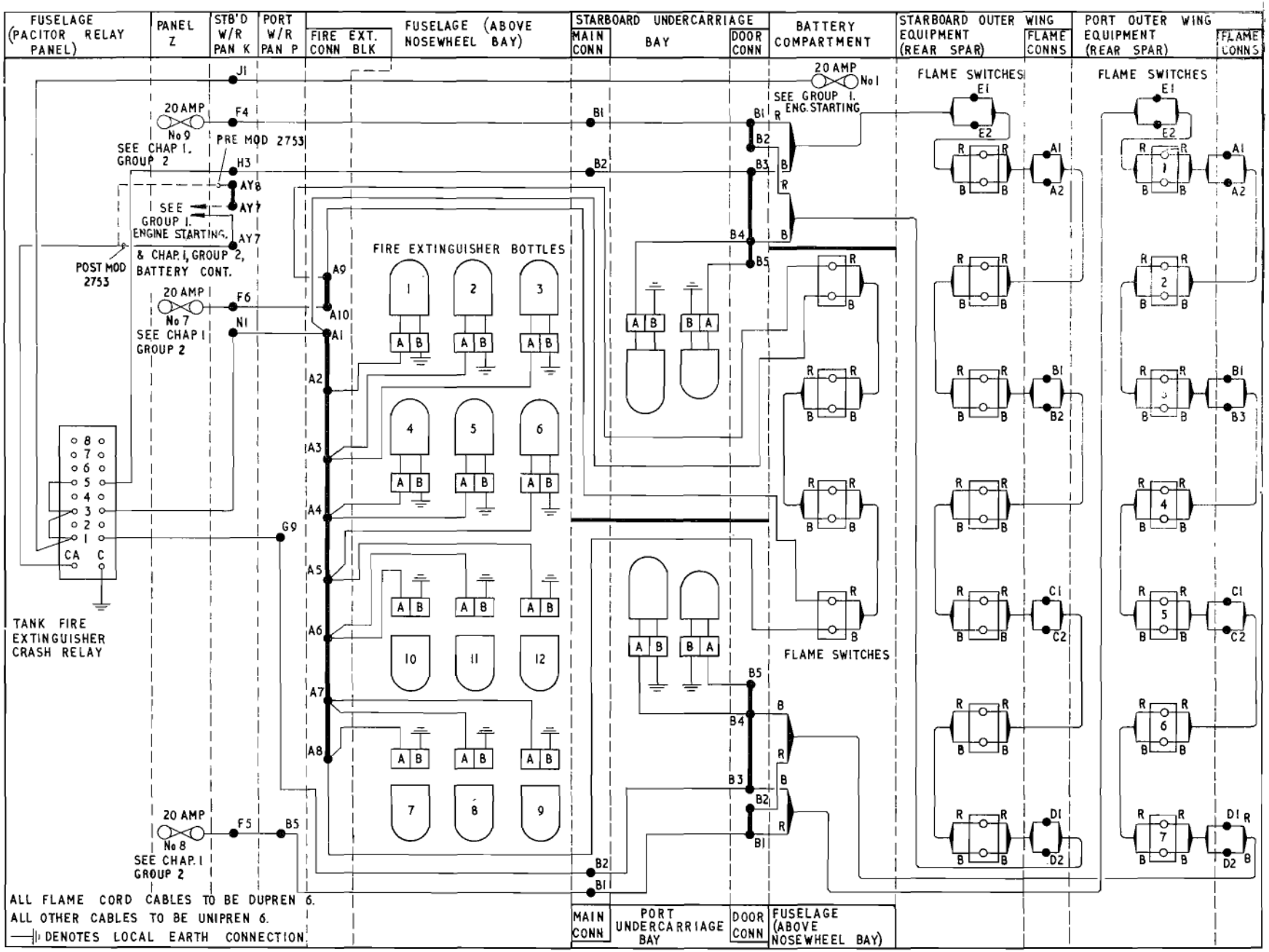


Fig. 7 Fuel tanks fire extinguishers (post Mod. 1785, pre Mod. 2668)

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75836 SHT 126-C

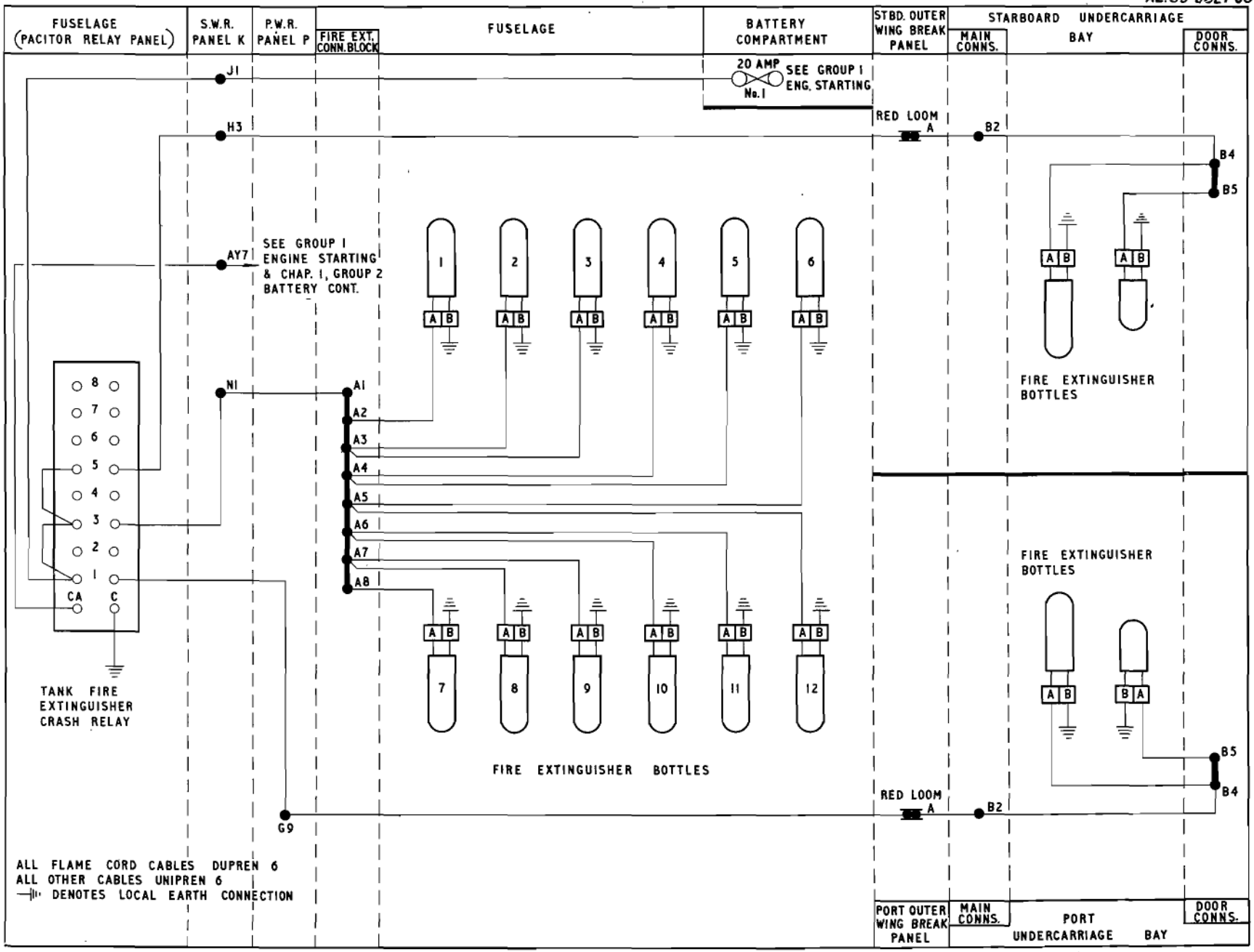


Fig. 8 Fuel tanks fire extinguishers (post Mods. 1835 and 2668)

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67436 SHT. 126-T

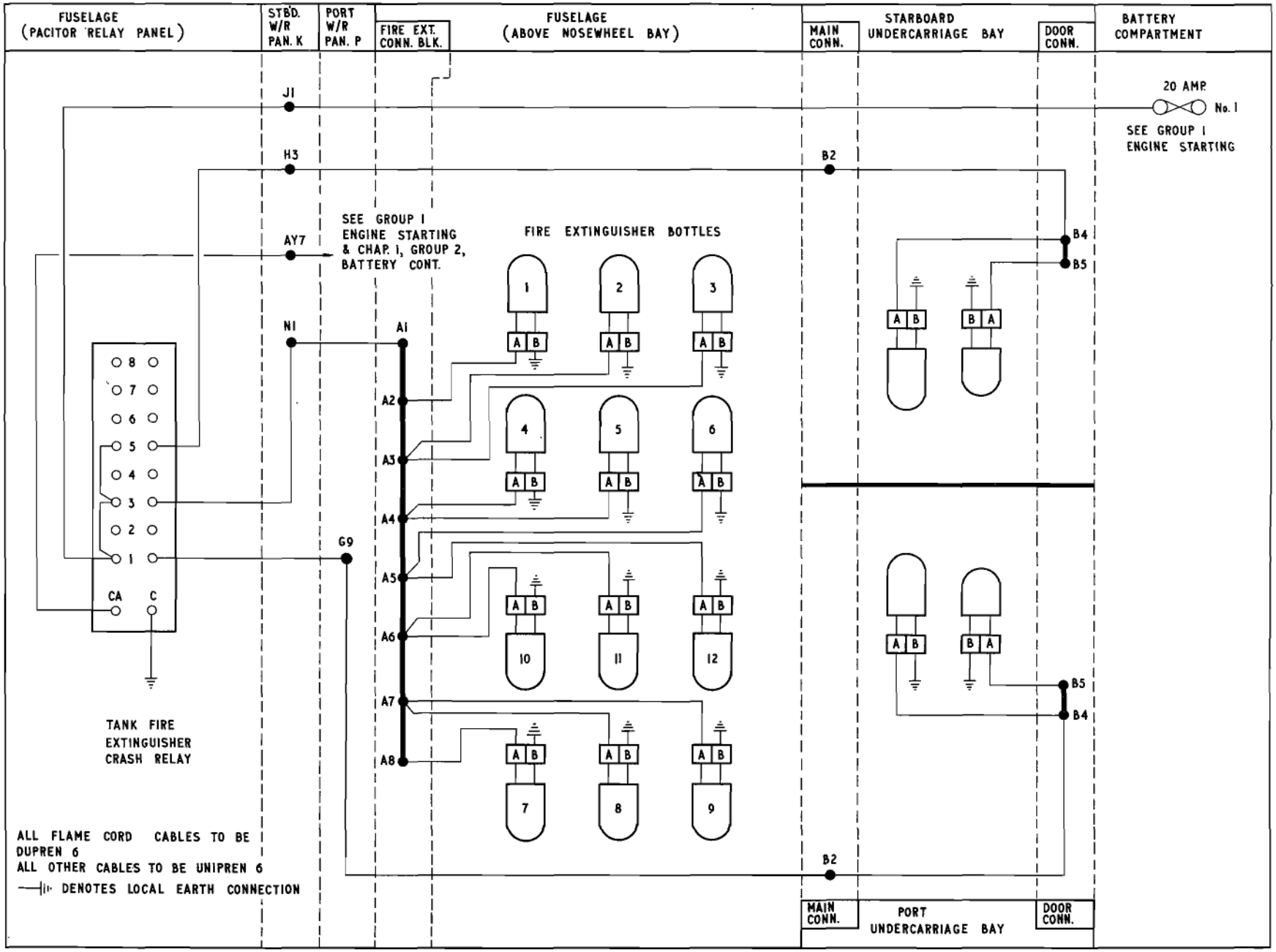


Fig. 9 Fuel tanks fire extinguishers (post Mods. 1785 and 2668)

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75836 SHT. 126-D

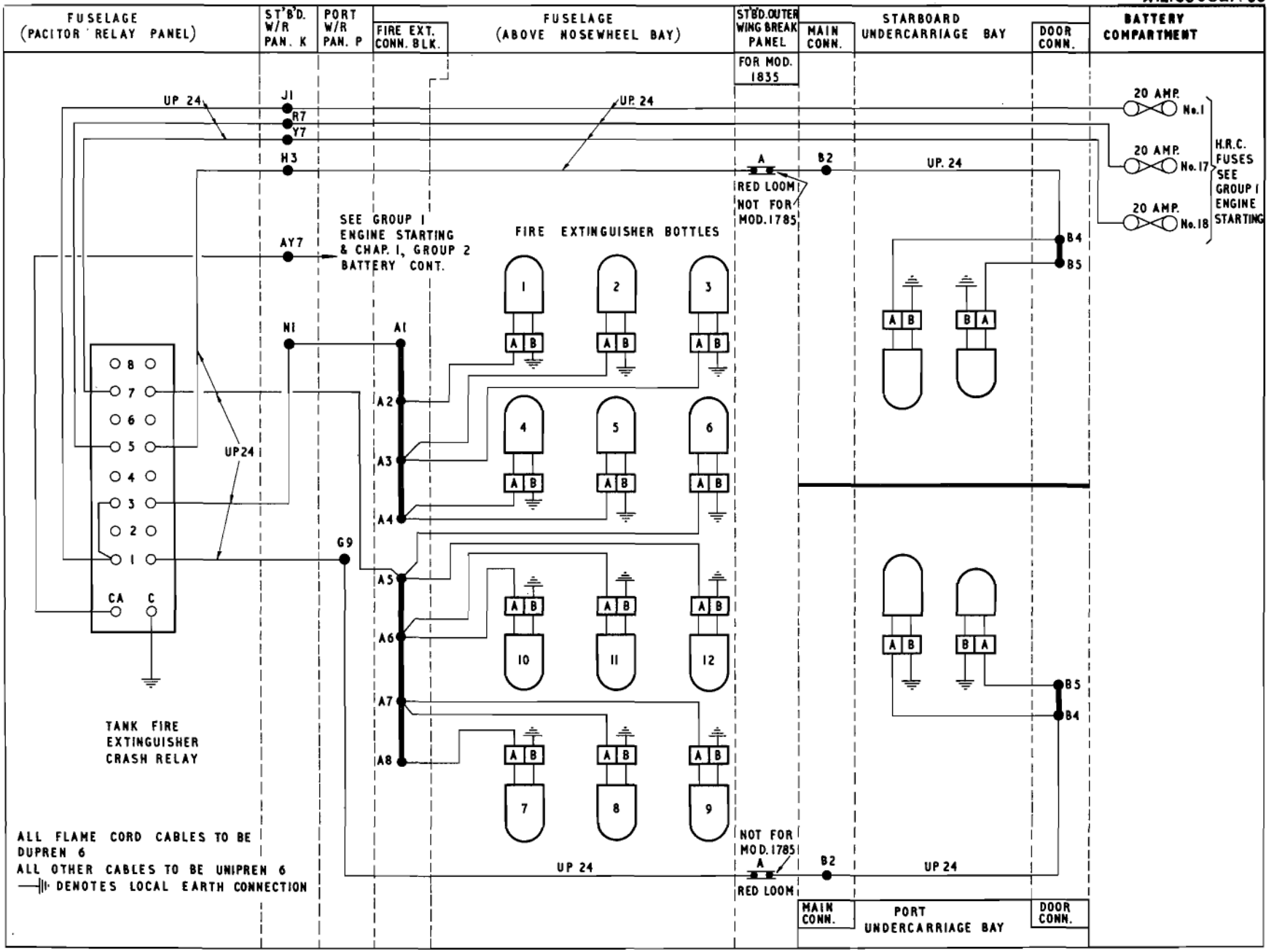


Fig 10. Fuel tanks fire extinguishers (post Mod. 2945)

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75836 SHT. 126-E
67436 SHT. 126-U

## LIST OF APPENDICES

# Appendix 1 FULSELAGE FIRE EXTINGUISHER INSTALLATION

## (post Mod. 1669 or 3019)

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**Introduction**

**1.** This appendix describes the fuselage fire extinguisher installation introduced on B. Mk. 1 aircraft by Mod. 1669 and on B/PR, Mk. 1, B/K/PR, Mk. 1 and B/K. Mk. 1 aircraft by Mod. 3019. The installation includes fuel tank fire control, a pre. Mod. description of which is given in Group 3. Schematic and routing diagrams are included in the appendix and the disposition of equipment is shown in Group 4 and in Sect. 4, Chap. 5.

**2.** The systems introduced by the two Mods. are similar, minor electrical and structural variations being necessary to suit basic differences in Valiant types. Consequent upon this similarity, Mod. 1669 only is considered in the installation description. Wiring and structural details for each aircraft type are shown in the routing and location diagrams.

**General**

**3.** The installation employs three continuous firewire detection systems to provide fire protection in normal flight for the bomb bay and forward servicing bays. Having detected a local outbreak of fire, a firewire system automatically operates its associated extinguisher bottles and warning lamp. Should the fire be successfully eliminated without damage to the firewire system, the warning indication will be cancelled. Subsequently, until relevant servicing is carried out the system will provide for fire warning only.

**4.** Fuselage and wing fuel tanks fire protection is provided in crash conditions only, when ALL extinguisher bottles are operated by inertia switches to blanket the fuselage and fuel tank areas with extinguishant.

**Firewire detection systems**

*General*

**5.** Each of the three firewire systems is essentially comprised of several lengths of sensing element, coupling units, bulkhead fittings and a relay box. The components are briefly described in the following paragraphs although reference should be made to A.P.957C, Vol. 1, Part 1, Sect. 3 (2nd edition), A.P.4343, Vol. 1, Sect. 22, and A.P.4343E, Vol. 1, Book 3, Sect. 14 for a detailed description and information on the complete installation.

*Sensing elements*

**6.** Sensing elements of varying lengths consist of a stainless steel tube in which is contained a central wire. The inside of the tube and the central wire are considered as electrodes and are separated by a resistive filling material. The filling material has an inverse temperature resistance characteristic in that its resistance decreases as its temperature rises. The element is so connected to the relay box that a current flowing between the electrodes controls operations of the relay. Under normal temperature conditions this current flow is restricted to 1mA by the resistive filling and is insufficient to operate the relay. With a rising temperature in the potential fire zone the resistance of the filling material falls until a current flow of 9-16mA energizes the relay, operation of which initiates fire bottle and warning lamp operation. A subsequent drop in temperature will increase the filling material resistance and decrease the current flow until a value of 2-6mA is reached, when the relay will be de-energized and the warning lamp open circuited.

**Note . . .**

*Reference may be made to the Air Publications detailed in para. 5, for the operating temperatures of the various element lengths.*

*Relay box*

**7.** The relay box comprises a transformer for stepping down input voltage to system level and a full wave rectifier which supplies the relay coil and the relay itself. An auxiliary relay and a 330 ohms resistor are incorporated to facilitate system testing. When alternating current at 115 volts, 400 c/s is applied to the primary coil of the transformer, a secondary output of 28 volts is rectified and applied via the sensing element (*para.* 6) to the relay coil. Under normal temperature conditions the resistance of the filling material in the sensing element is such that the current flow between the centre and outer electrodes and thus through the relay coil, is insufficient to energize the relay. With a sufficient rise in temperature at the element the current flow will increase and energizes the relay to initiate fire extinguisher bottle and warning lamp operation. Should the temperature subsequently fall, relay coil current will decrease, the relay will drop out and break the warning lamp circuit.

**8.** A 28 volts d.c. supply is connected by an external test switch across the auxiliary relay coil. Operation of the relay completes the system circuit through the centre electrode of the element instead of through the resistive filling to the outer electrode. The 330 ohm resistor is connected in series with the centre electrode to compensate for reduced resistance of the element circuit. Provided that there is continuity in the centre electrode, the main relay will be energized to operate the warning lamp. Under these test conditions the extinguisher bottles control circuit is open circuited by the test switch.

*Coupling units and bulkhead fittings*

**9.** Successive lengths of sensing element are joined by coupling units of which there are two types. One is provided with a flange so that attachment can be made to bulkheads within a fire zone. The other type is provided with hexagonal nuts for tightening the coupling, and fixing clips for securing to neighbouring stringers. Bulkhead fittings are used to secure the ends of the sensing elements. Each fitting provides an insulated connection from the centre electrode to a terminal stud on the remote side of the bulkhead. The outer electrode is earthed to the fitting and hence to the bulkhead itself.

**Fire extinguisher bottles**

**10.** Two types of methyl bromide automatic extinguisher bottles are used in the fuselage fire control installation, a type 40A with a single head and a Type 41A with a dual head. Type 40A bottles are also used, together with single head Type 39A bottles, for wing fuel tank fire control. Each bottle operates in conjunction with a 2-pin cartridge unit, Type A716, although the dual head bottles use in addition a 3-pin cartridge unit, Type A717. The cartridge units differs only in their connectors which are designed to prevent interchangeability of external wiring.

**11.** Cartridge units are sensed and fired automatically by the firewire detection and inertia switch (crash) systems to discharge extinguishant from the bottles, via pipelines and spray rings to the required fire zone. For a description of extinguisher

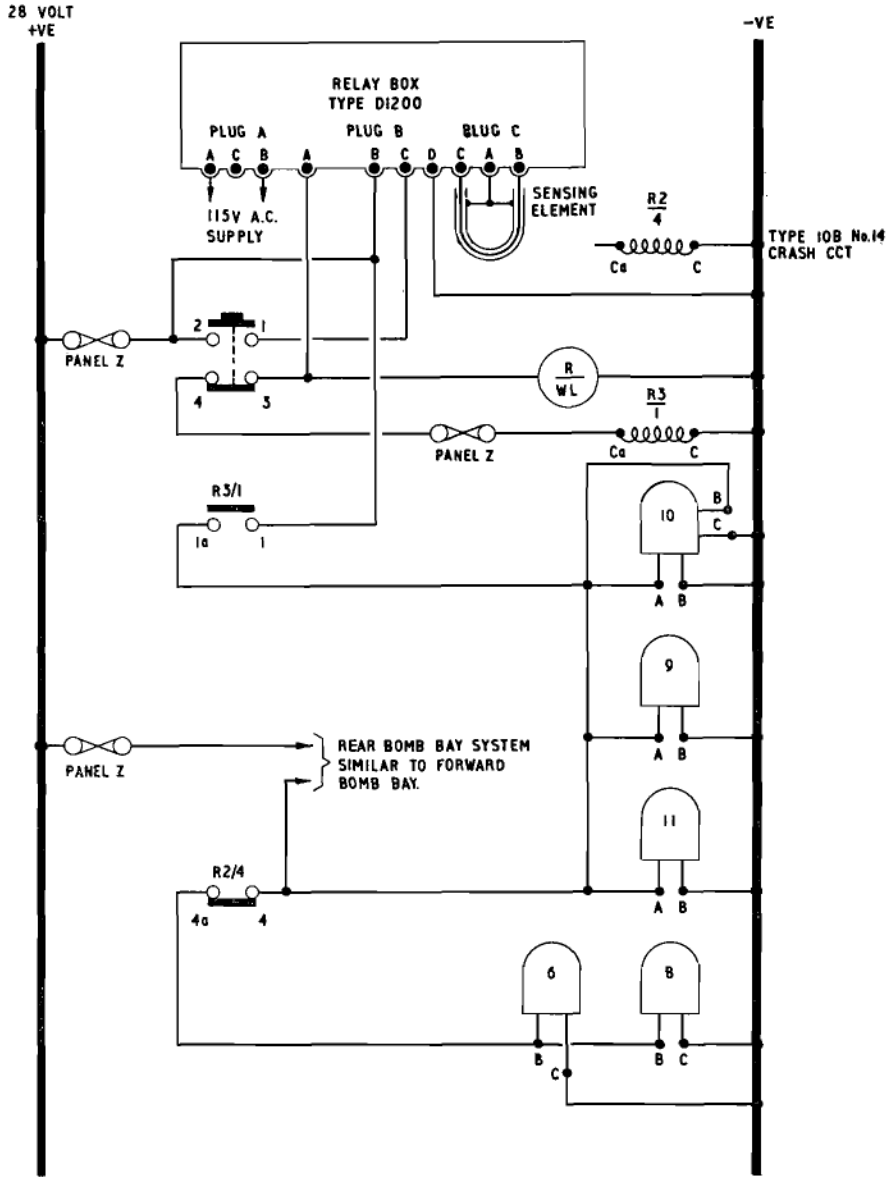


**Fig. 1. Forward and rear bomb bay extinguisher system (post Mod. 1669 or 3019)**

bottles, delivery pipelines and spray rings reference should be made to Sect. 4, Chap. 5, The cartridge units are fully described in A.P.1661F, Vol. 1, Sect. 5, Chap. 3.

**Power supplies**

**12.** The three firewire systems are fed with 115 volts, 400 c/s, a.c. from a common fuse box containing four type S fuses carried on a 6-way fuse block. The box is connected into the systems by a 3-way input and a 12-way output Mk. 4 plug. Three of the fuses provide individual system protection, the fourth is wired to the output plug and unused. The fuse box is supplied with a.c. from the instruments a.c. relay box on panel H, above which it is mounted (*Chap.* 1, *Group* 3, *App.* 1).

**13.** 28-volts d.c. supplies for the complete fuselage fire protection installation are taken from panel Z and the essential services busbar (*Chap.* 1, *Group* 2, *App.* 1).

**Forward bomb bay system** (*fig.* 1)

**14.** Six 10-ft. lengths of firewire sensing element are arranged, with coupling units, to form a continuous loop around the inside periphery of the bomb bay roof between Stn. 650 and Stn. 390. Each end of the loop terminates at Stn. 650 in a bulkhead fitting from whence it connects to a relay box, Type D1200, mounted on the aft bulkhead of the rear servicing bay (Stn. 734). A fire warning lamp fitted below the fuel panels and a relay, Type 10B-No. 17, mounted on the rear servicing bay aft bulkhead, operate in conjunction with the relay box. The system controls extinguisher bottles No. 9, 10 and 11 and, via the normally made contacts of a Type 10B-No. 14 relay (*para.* 21), extinguisher bottles No. 6 and 8. A test switch located adjacent to the warning lamp allows for testing the relay, warning lamp and sensing element centre electrode.

**15.** With 115 volts supplied to the relay box and a rise in temperature in the forward bomb bay zone, 28 volts from a fuse at

panel Z is connected via plug B (A-B) at the relay box to the warning lamp and, via the normally made contacts of the test switch and a secondary fuse, to the operating coil of relay R3. Relay R3 energizes to connect (R3/1) the d.c. supply to the cartridge units of No. 9, 10 and 11 extinguisher bottles and, via relay R2/4, to the 3-pin cartridge of bottles No. 6 and No. 8.

**Note . . .**

*Bomb bay fire protection under crash conditions is also provided by these extinguisher bottles, which in the event are operated by the crash system (para. 24). Bottles No. 6 and No. 8 are dual headed and allow extinguishant to be delivered to either the bomb bay (firewire system) of fuel tank areas (crash system) depending upon cartridge operation.*

**16.** Under normal temperature conditions, operation of the test switch open circuits relay R3 to prevent bottle operation and connects the Z panel supply across plug B C-D). The supply is subsequently connected by the relay box via plug B (A-B) to the warning lamp.

**Rear bomb bay system** (*fig.* 1)

**17.** Three firewire sensing elements, two 10-ft. long and one 5-ft. long, are arranged with coupling units to form a continuous loop around the inside periphery of the bomb bay roof. The loop extends from Stn. 673 to Stn. 793 where each end terminates in a bulkhead fitting.

**18.** A further two elements 20 inches long are coupled one either side of a looped detector and arranged across the forward end of the air deflector, with a bulkhead fitting at each end.

**19.** These two element assemblies are connected in series and their combined length connected to a relay box, Type D1200, mounted on the aft bulkhead of the rear servicing bay (Stn. 734). The relay box operates in conjunction with a relay, Type 10B-No. 17, mounted adjacent to the box and a fire warning lamp fitted below the

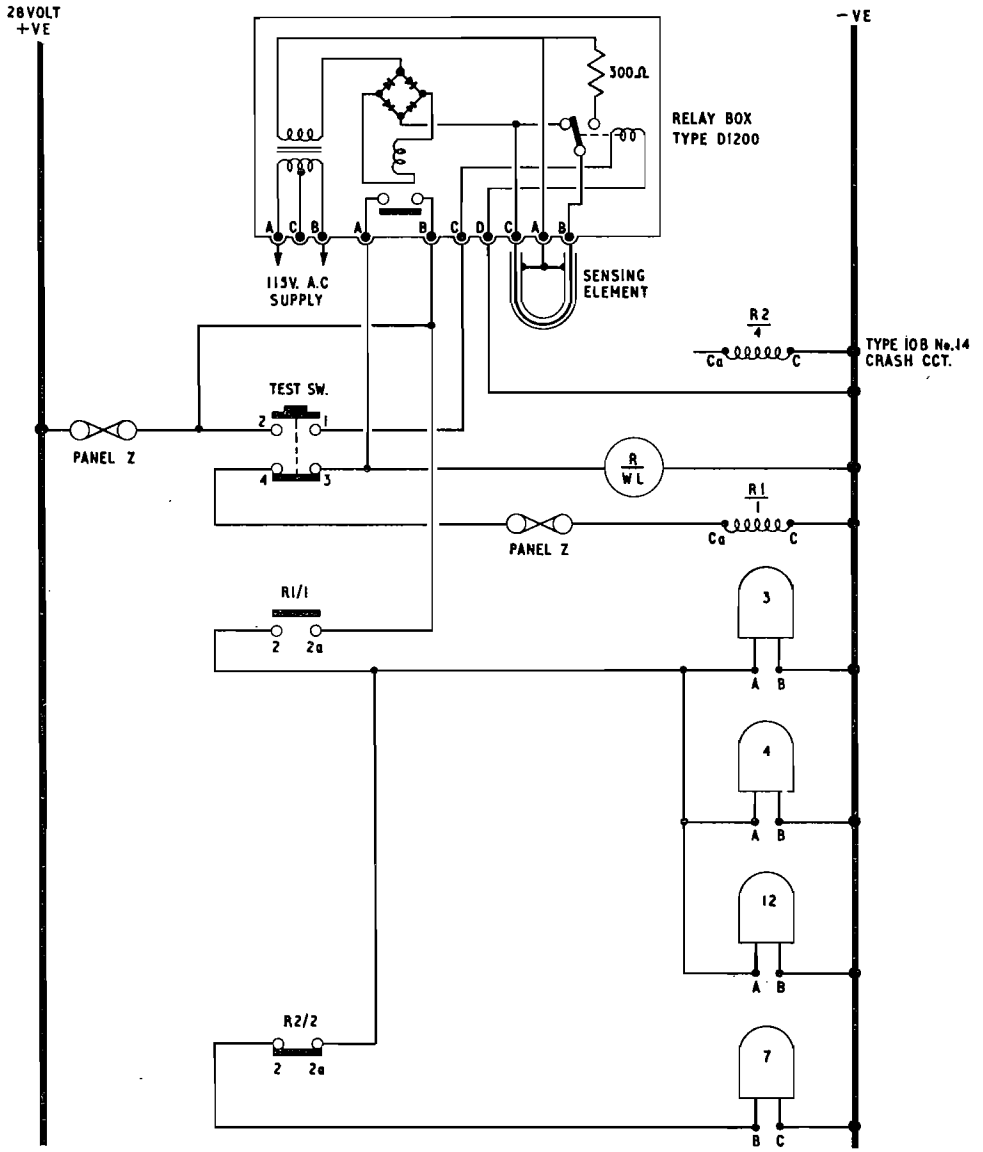


**Fig. 2. Forward servicing bay extinguisher system (post Mod. 1669 or 3019)**

fuel panels. The relay controls extinguisher bottles No. 9, 10 and 11 and, via the normally made contacts of a Type 10B, No. 14 relay (*para.* 24), bottles No. 6 and 8. A test switch located below the fuel panels facilitates relay, warning lamp and sensing element continuity testing.

**20.** Circuit operation is similar to that of the fwd. bomb bay system described in para. 15 and 16.

**Forward servicing bay system** (*fig.* 2)

**21.** Five 10-ft. lengths of firewire element, arranged with coupling units to form a continuous loop, are deployed in the forward servicing bay. The loop extends outwards at Stn. 360 from bulkhead fittings at stringers No. 5, to stringers No. 30 and thence forward to Stn. 310 where it crosses the compartment ceiling. The associated relay box, Type D1200, together with two relays, Type 10B-No. 17 (R1/2) and Type 10B-No. 14 (R2/4), used for extinguisher bottle control, are located on a panel in the roof at Stn. 360. A fire warning lamp and a system test switch are fitted below the fuel panels. The system uses extinguisher bottles No. 3, 4, 7 and 12.

**22.** With 115 volts a.c. supplied to the relay box and a rise in temperature in the forward servicing bay zone, 28-volts d.c. from a fuse at Z panel is connected via plug B (A-B) at the relay box to the warning lamp and, via the normally made contacts of the test switch and a secondary fuse, to the operating coil of relay R1. Relay R1 operates to connect (R1/1) the d.c. supply to the cartridge units of No. 3, 4 and 12 extinguisher bottles and, via R2/2, to the 3-pin cartridge unit of bottle No. 7.

**Note . . .**

*Fire protection under crash conditions is also provided by these extinguisher bottles, which in this event are operated by the crash system (para. 24). Bottle No. 7 is dual headed and allows extinguishant to be delivered to either the*

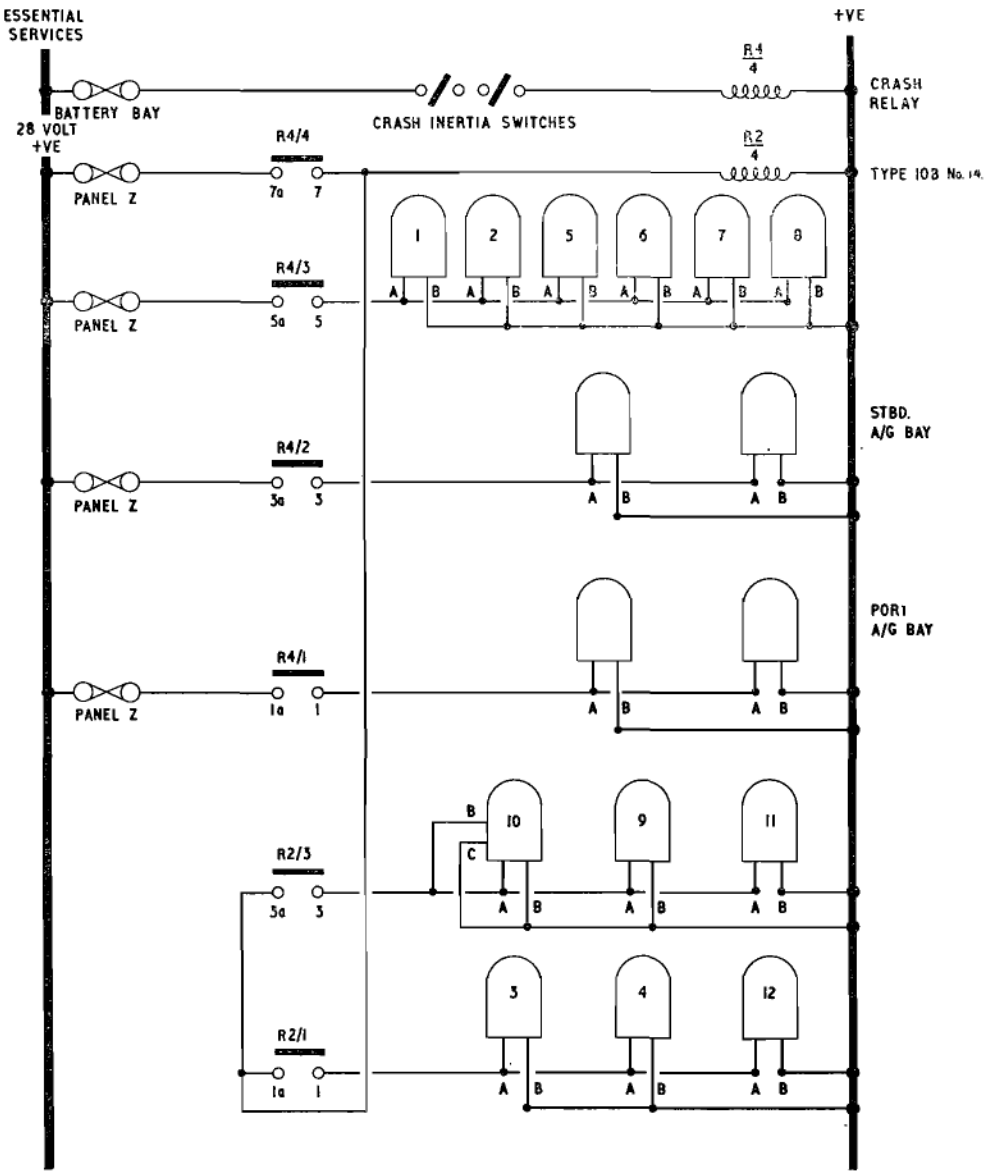


**Fig. 3. Fire extinguisher crash system (post Mod. 1669 or 3019)**

*servicing bay (firewire system) or fuel tank areas (crash system) depending upon cartridge operation.*

**23.** Under normal temperature conditions, operation of the test switch open circuits relay R1 to prevent bottle operation and connects the Z panel supply across plug B (C-D). The supply is subsequently connected by the relay box, via plug B (A-B) to the warning lamp.

**Crash system** (*fig.* 3)

**24.** Two inertia switches, Type 8C, mounted on the pilots' floor forward beam are used to control all extinguisher bottles for crash landing fire protection. The switches operate in conjunction with a relay, Type S4, fitted to the pacitor relay panel adjacent to panel K, and a relay, Type 10B-No. 14 (*para.* 21) mounted in the roof of the forward servicing bay. Extinguisher bottles No. 1, 2, 5, 6, 7 and 8 are used specifically for the fuselage fuel tanks and the four bottles in the U/C bays for the wing fuel tanks.

**Note . . .**

*Bottles No. 6, 7 and 8 are dual headed and depending upon cartridge operation deliver extinguishant to either the fuel tank areas (crash system) or the fuselage fire zones (firewire systems).*

**25.** In the event of a crash landing, both inertia switches (wired in series) trip to connect a 28-volts supply from the essential services bus-bar to the operating coil of relay R1. The relay contacts close to connect individually fused supplies from the essential services bus-bar as follows:—

(1) R4/1 and R1/2 to the cartridge units of the U/C bay extinguisher bottles.

(2) R4/3 to the cartridge units of bottles No. 1, 2 and 5 and to the 2-pin cartridge units of bottles No. 6, 7 and 8.

(3) R4/4 to the operating coil of relay R2.

Relay R2 operates to connect its coil supply via contacts as follows:—

(1) R2/1 to bottles No. 3, 4 and 12 (forward servicing bay system).

(2) R2/3 to bottles No. 9, 10 and 11 (bomb bay systems).

## SERVICING

**Introduction**

**26.** A detailed description of the general tests to be applied to all the aircraft electrical circuits can be obtained from the General Information group. Reference should be made to the relevant Air Publication for information on the servicing of equipment used in the installation.

**Firewire systems**

**27.** (1) Connect a 28 volts d.c. supply at the external power supply plug and select the 28-volt BATTERY MASTER switch to ON.

(2) Select the INSTRUMENT MASTER switch to ON.

(3) Using the appropriate test meters in accordance with current authorized procedure, check that the a.c. supply at the Type D1200 relay box is 115-volts ± 11·5-volts and 400 c/s ± 20 c/s.

(4) Check the circuit fuses at Z panel for serviceability.

(5) Depress each switch in turn at the remote test panel below the fuel panels and check that the associated fire warning lamp operates.

(6) Disconnect the fuselage extinguisher bottles (12 off in forward servicing bay).

(7) Break the plug B connection at each Type D1200 relay box.

(8) Using a suitable length of insulated cable, link out pins A and B at the plug B free sockets.

(9) Using a 28-volt test lamp, check for a supply on the socket at bottles No. 3, 4, 9, 10, 11 and 12 (bottle No. 10 is dual headed) and the 4 pin sockets at bottles No. 6, 7 and 8 (pins B and C).

(10) Remove the link and restore all disturbed electrical connections.

**Crash system**

**28.** (1) Ensure that no external 28 volts supply is connected and that the 28-volt BATTERY MASTER switch is selected to OFF.

(2) Ensure that the aircraft 28 volts accumulator is connected.

(3) Disconnect the free sockets at ALL extinguisher bottles.

**Note . . .**

*The engine fire extinguisher bottles must also be disconnected when simulating crash conditions.*

(4) Using a suitable length of insulated cable, link out the inertia switches.

(5) Using a 28-volt test lamp, check that there is NO supply on the 4-pin sockets (pin B-C) at bottles No. 6, 7 and 8.

(6) Check for a supply at all remaining extinguisher bottle free sockets.

(7) Remove the shorting link at the inertia switches and ensure that all extinguisher bottle sockets are 'dead'.

(8) Remove the link and restore all disturbed electrical connections.

**Extinguisher bottles**

**29.** (1) Disconnect ALL fire bottles.

(2) Using a suitable safety ohmeter check that the cartridge units fuse resistance is within the limits 5-6 ohms.

(3) Using a 250-volt megger, check that the insulation resistance from each pin of the units to earth is not less than 20 megohms.

(4) Physically check that the indicator pin is NOT projecting from the head of each bottle (This would indicate a discharged bottle).

(5) Re-connect all fire bottles.

**Note . . .**

*Whenever connecting extinguisher bottles, it should be ensured that their circuits are 'dead'.*

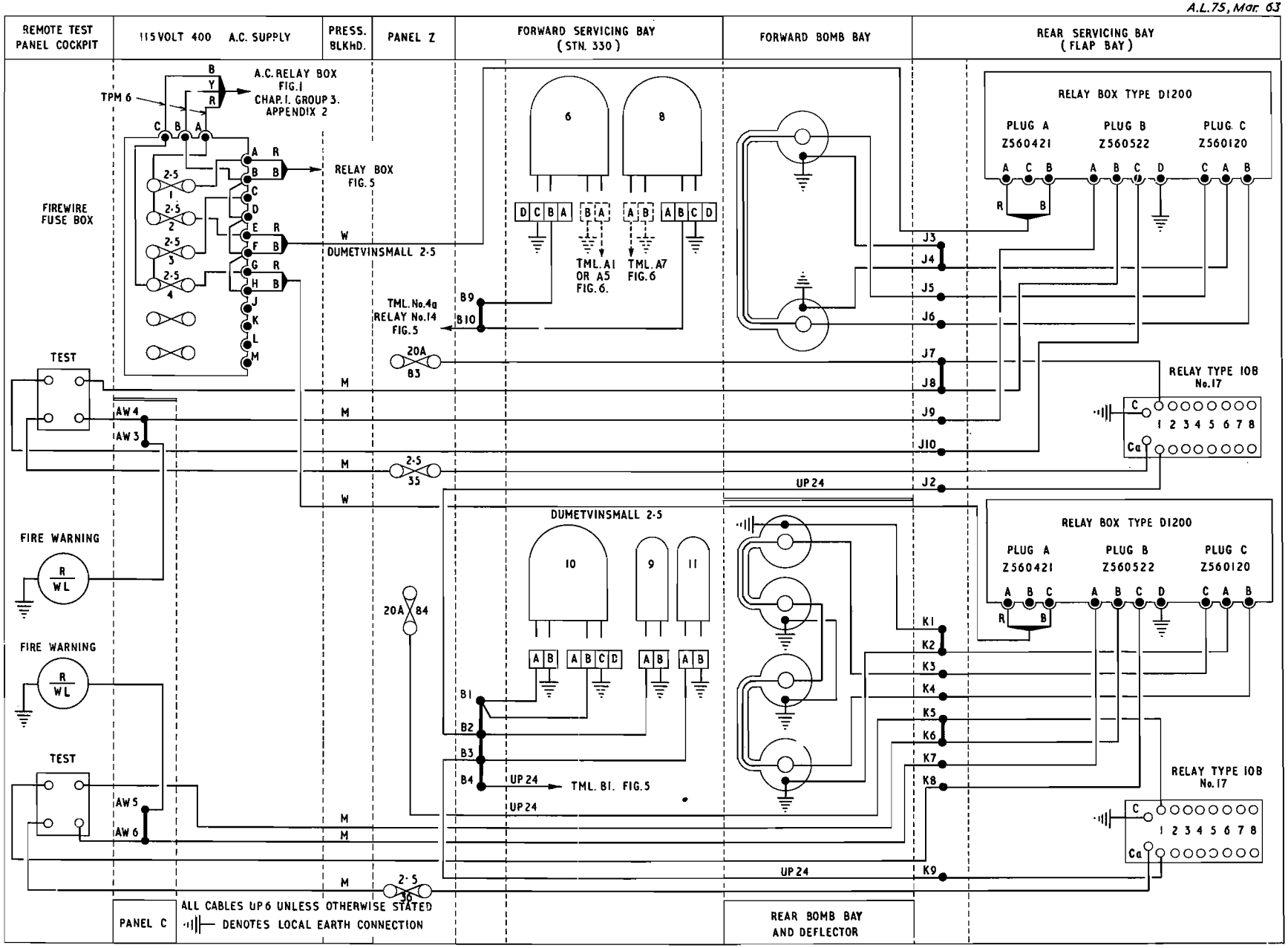


Fig.4. Forward and rear bomb bay fire extinguisher system (post Mod. 1669 or 3019)

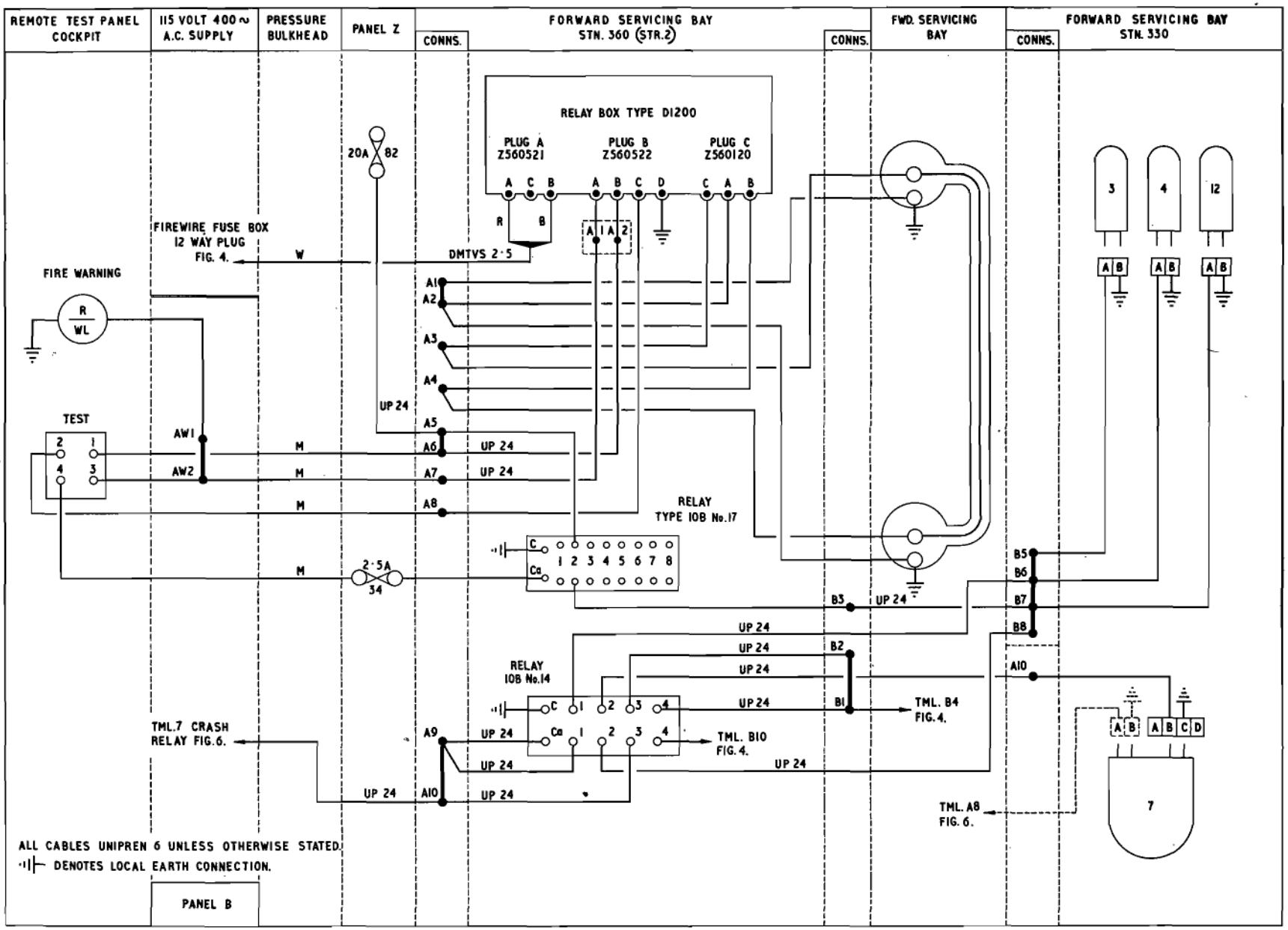


Fig.5. Forward servicing bay fire extinguisher system (post Mod. 1669 or 3019)

70636 SHT 769-E

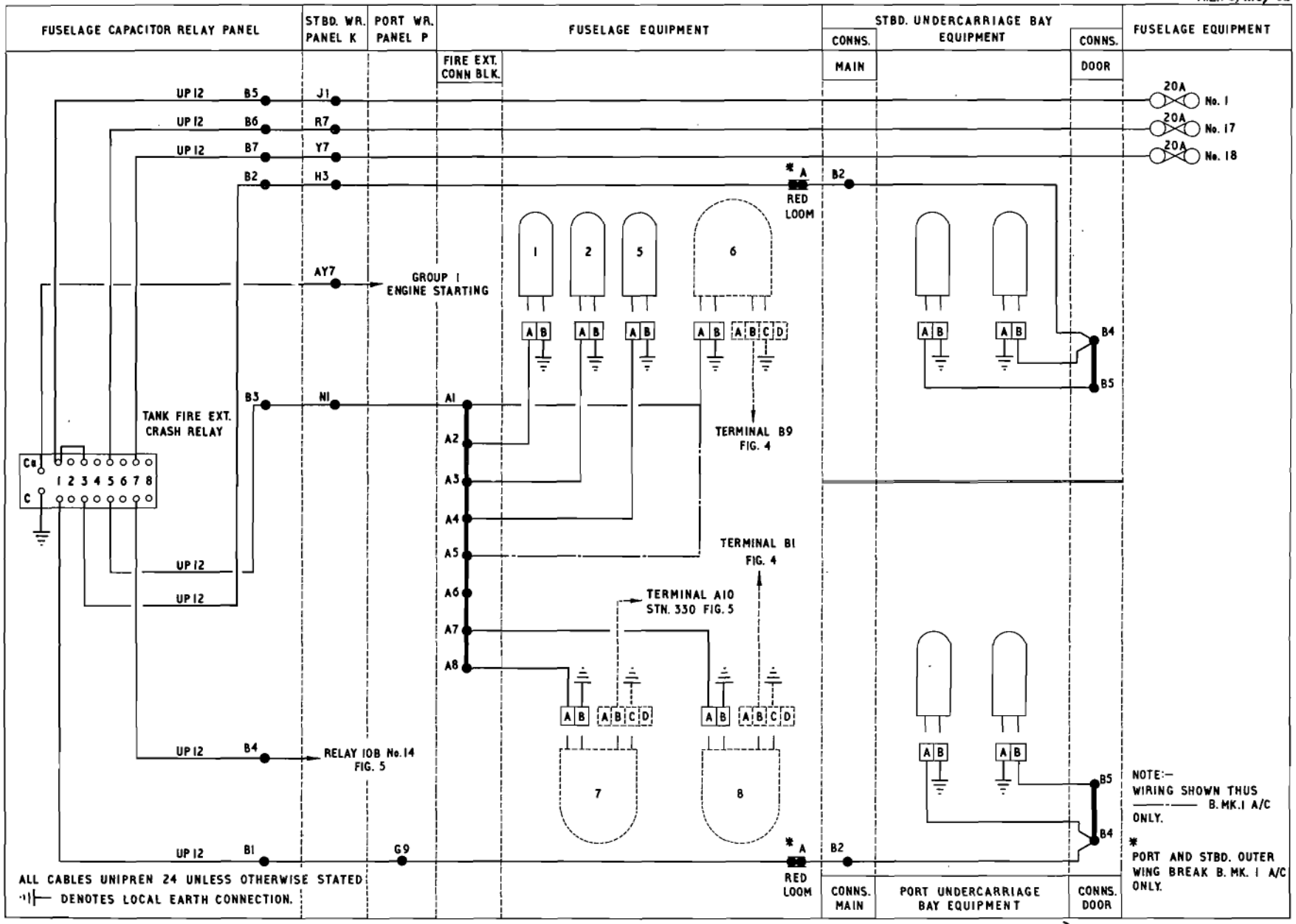


Fig. 6. Fuel tanks fire extinguishers (crash) system (post Mod. 1669 or 3019)

75836 SHT. 559-C
70636 SHT. 767-A

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# Appendix 2

## ENGINE AND JET PIPE SYSTEM (post Mod. 2457 and 3094)

**1.** Post Mod. 2457, the engine failure warning fire detectors (*Group* 3, *para.* 2) introduced by Mod. 1771 are deleted.

**2.** Post Mod. 3094, fire detectors, are used with the engine rear bearing overheat system as described in Group 1, App. 2.

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(30/10/62). 90025. Wt. 30465–3276. 625. 8/3/63. 375/6.

# Appendix 3

# GROUND SERVICING FIRE PROTECTION (Mod. 2810)

## LIST OF CONTENTS



## LIST OF ILLUSTRATIONS



### Introduction

**1.** Mod. 2810 introduces the aircraft wiring to provide fire protection during servicing of the aircraft. The installation consists of a bulkhead plug/socket and a protective cap, fitted above the external ground supply plugs. A socket mates with the plug/socket from which two 24 amp. unipren cables are connected between pins B and D to earth. From pin C a 24 amp. unipren cable is taken to terminal 3 of a relay type P, fitted adjacent to the bomb jettison contactor in the accumulator compartment. From pin A a 12 amp. unipren cable is taken to terminal Ca of the fuel tanks fire extinguisher relay, mounted on the Pacitor relay panel in the upper servicing bay. A unipren 24 amp. cable is connected between terminal 4 of the relay type P and the bus-bar side of fuse 3 mounted above the 24 volt battery control panel. The modification is illustrated on fig. 6, Group 4.

## DESCRIPTION AND OPERATION

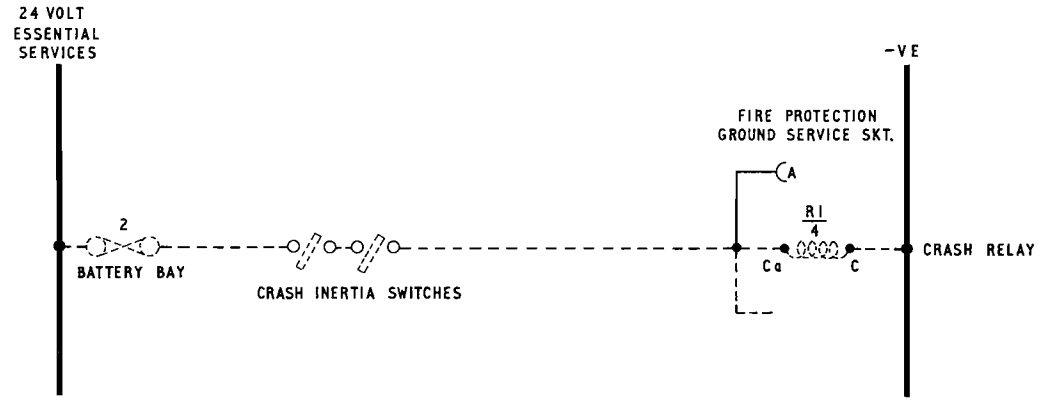
### General

**2.** The supply line from pin A of the fire protection ground servicing socket to terminal Ca of the fuel tanks fire extinguisher relay is shown on figs. 1 and 2 of this appendix. The remainder of the wiring is shown on fig. 1, Appendix 4, Group 1.

**3.** The fuel tanks fire extinguisher bottles can be discharged during ground servicing of the aircraft by connecting a 24 volt d.c. supply to pins A and C (positive), and B and D (negative) of the fire protection ground servicing socket. This will energise the coil of the fuel tanks fire extinguisher relay, and the coil of the relay type P. Both relays operate and close their contacts, the type P relay to feed a supply to the linked bank of 28 volt essential services fuses, and the fuel tanks fire extinguisher relay to supply the fuel tanks fire bottles from the 28 volts essential services fuses.

### Ground equipment

**4.** The ground equipment required to complete the installation is introduced by Bomber Command Mod. 48, and is not included in this A.P.

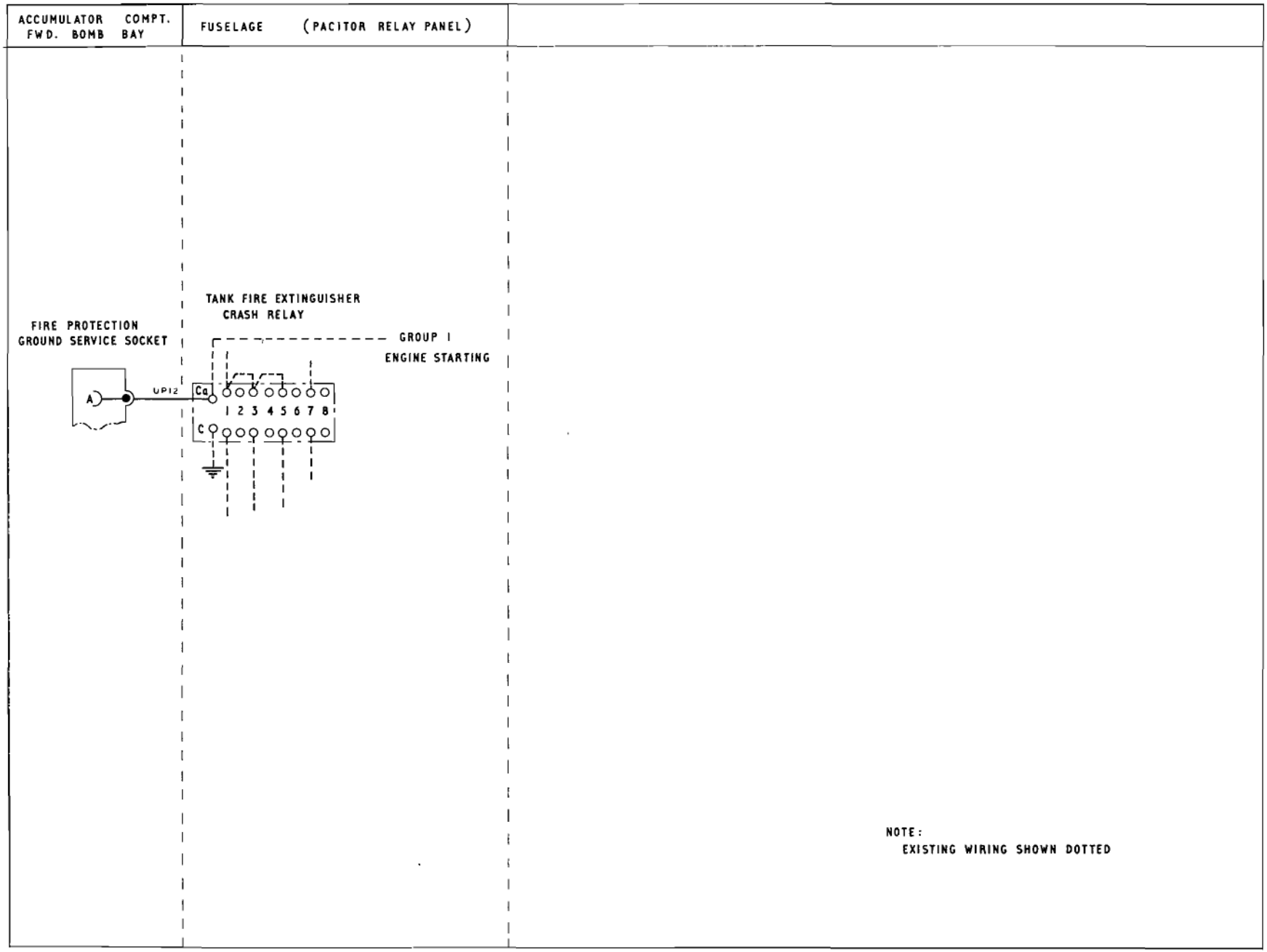



NOTE:-
EXISTING WIRING SHOWN DOTTED

Fig.1 Alterations to Fig.1 and 1A (Mod.2810)



372203 4581 652 5/64 VB 925/1




75836 SHT. 559 ISS. D
75836 SHT. 126 ISS. H
70636 SHT. 126 ISS. E
70636 SHT. 767 ISS. C
67436 SHT. 126 ISS. Y

Fig. 2 Alterations to Figs. 6,7,8,9 and 10 (Mod. 2810)

RESTRICTED