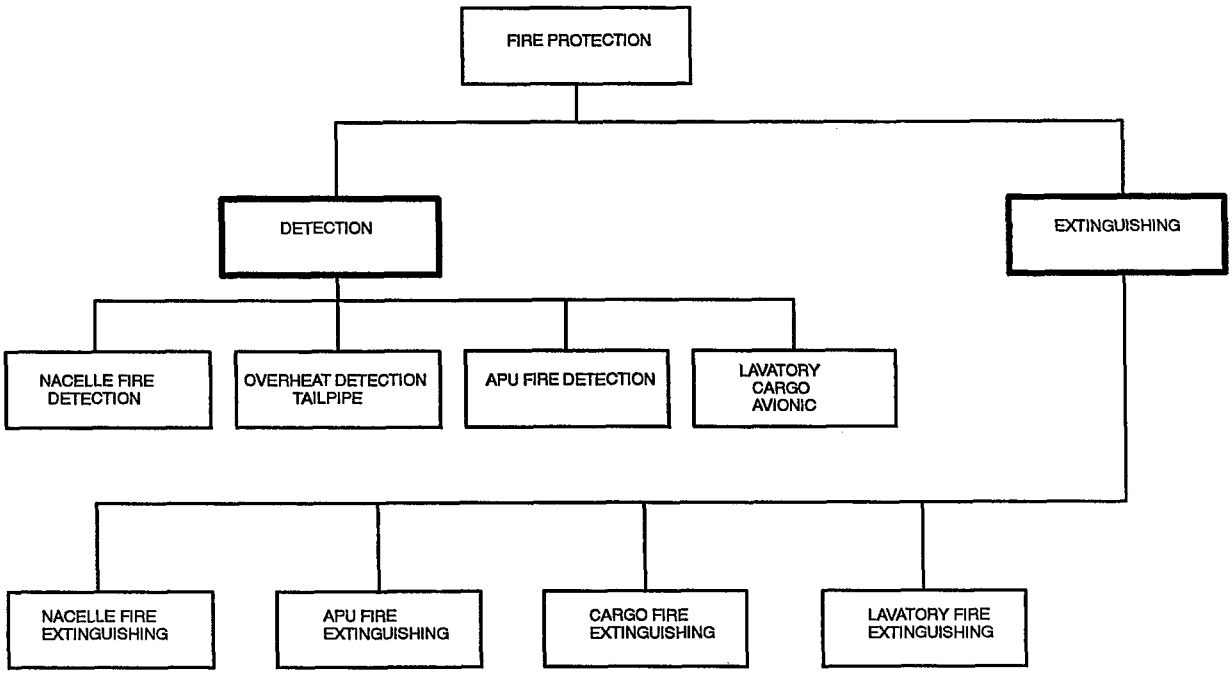


1. GENERAL.

The fire protection system provides fire detection plus an extinguisher system as shown.

2. MAIN COMPONENTS AND SUBSYSTEMS.

2.1. Engine and APU fire protection.

Sensor wire loops provide detection of fire or overtemp for the systems. Each system can be tested from a separate test panel in the cockpit.

There is one control unit for each system. If a preset value indication is reached, the unit will activate the warning system. Too quick resistance change in the loop will not result in a warning, but a detector failure indication, indicating that the loop has been short circuited and is unreliable.

There is one extinguisher bottle installed in each engine nacelle equipment compartment. Each bottle can be discharged into the fire zone and the hydraulic bay of the nacelle, where it is installed, or it can be routed to the opposite side for fire extinguishing of the opposite engine.

One bottle is installed in the tailsection for the APU. Extinguishing agent is Halon 1301.

The system is a "one shot" system and is manually operated from the cockpit overhead panel (DISCH p/b).

An outside panel on the left hand side wingfairing hatch is equipped with APU trip and extinguishing switches for ground operation only.

A low pressure switch on the cockpit overhead panel (DISCH p/b) shows the extinguishant container status.

2.2. Tailpipe overtemperature.

The overtemperature detectors installed around the engine tailpipe are wired so that an overtemp signal from a single detector is enough to initiate an overtemp warning.

2.3. Smoke detection.

There are three independent smoke detection systems installed, namely in the AVIONIC and CARGO compartment plus in the LAVATORY. The smoke detectors, one in each compartment, use a light beam and a photo sensor to detect smoke. The respective warning is triggered when the smoke density reaches a preset value.

The AVIONIC and LAVATORY compartments have one detector each. The CARGO compartment has two detectors.

2.4. Cargo compartment fire extinguishing system.

The cargo compartment is provided with a fire extinguishing system consisting of Halon 1301 extinguisher.

The two extinguisher bottles are located behind the rear bulkhead of the cargo compartment.

The extinguishers are of the dual wall type ("bottle within a bottle"). When a bottle is discharged, the outer volume rapidly floods the compartment with agent in order to extinguish the fire. The inner volume slowly leaks a regulated flow of the agent through a restrictor thereby maintaining a high concentration level.

If smoke is detected in the cargo compartment, the fire extinguisher can be activated by a pushbutton (CARGO FIRE EXTG) on the cargo fire extinguisher panel.

2.5. Optional cargo fire extinguisher system.

An optional fire extinguishing bottle, equal to the main bottles, is provided to maintain fire suppression for at least 90 minutes.

The activation of the bottle is performed by an additional pushbutton on the cargo fire extinguisher panel.

When pushing CARGO FIRE EXTG 1 & 2 p/b, the first fire extinguishing bottle will be activated. The second bottle will be activated automatically after 20 minutes.

If there is no need to activate the second bottle it is possible to reset the system. This is done by pushing the CARGO FIRE EXTG 1 & 2 within those 15 minutes.

The third container is activated by pushing the CARGO FIRE EXTG 3 on the overhead panel. The third extinguisher shall be activated manually 40 minutes after the CARGO FIRE EXTG 1 & 2 p/b has been pushed. The third cargo container can not be activated before the second container has been activated.

2.6. Lavatory fire extinguisher.

One lavatory fire extinguisher is installed in conjunction with the waste bin. The extinguisher is activated automatically when an increased temperature is sensed in the waste bin.

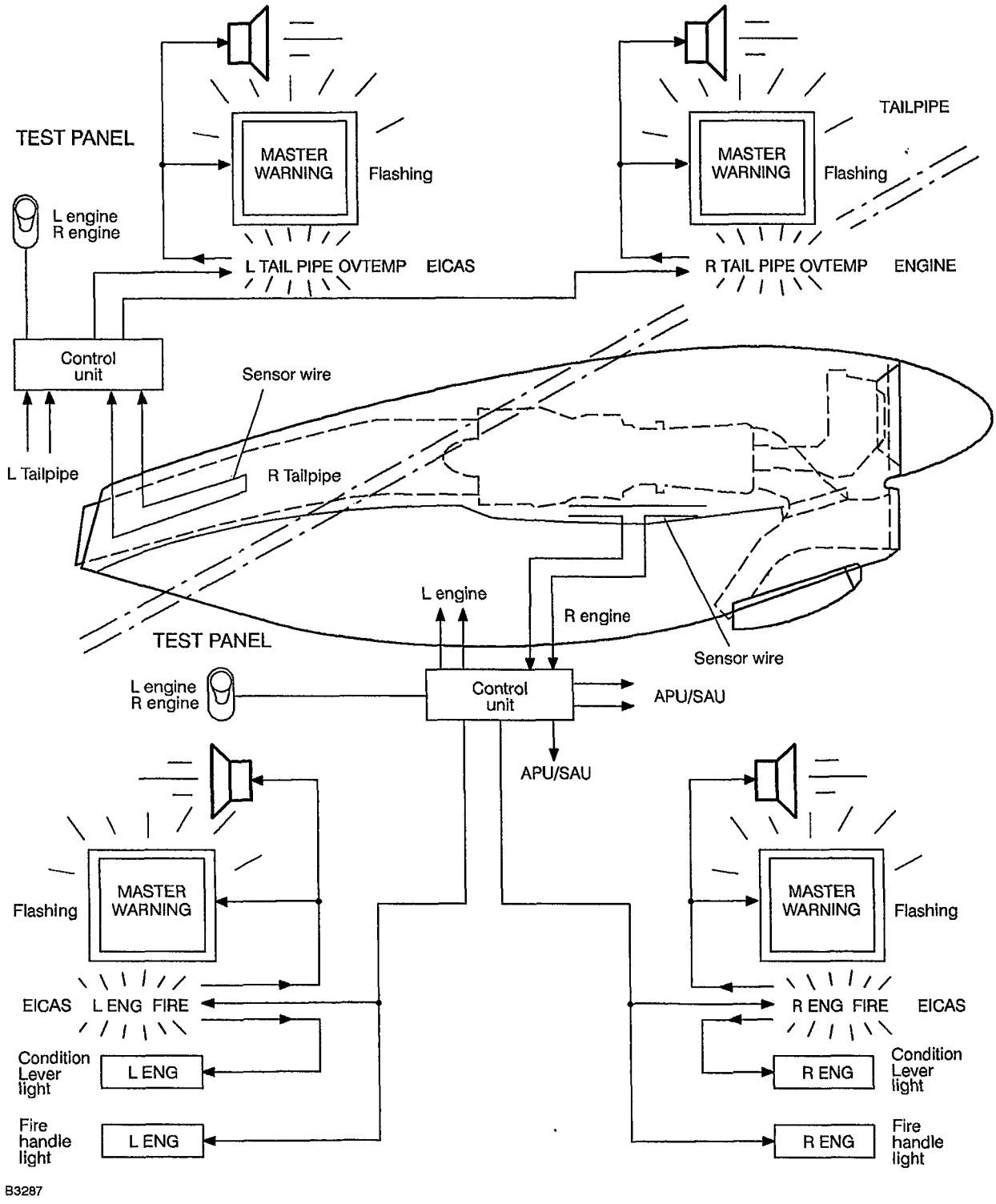
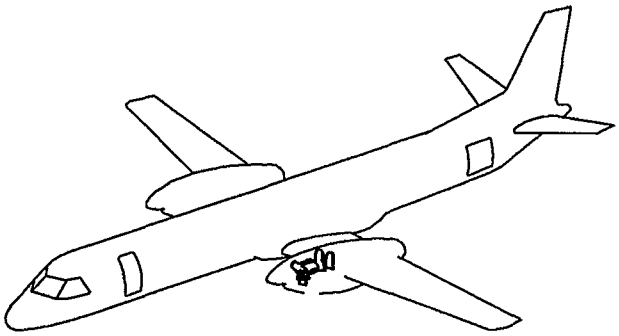
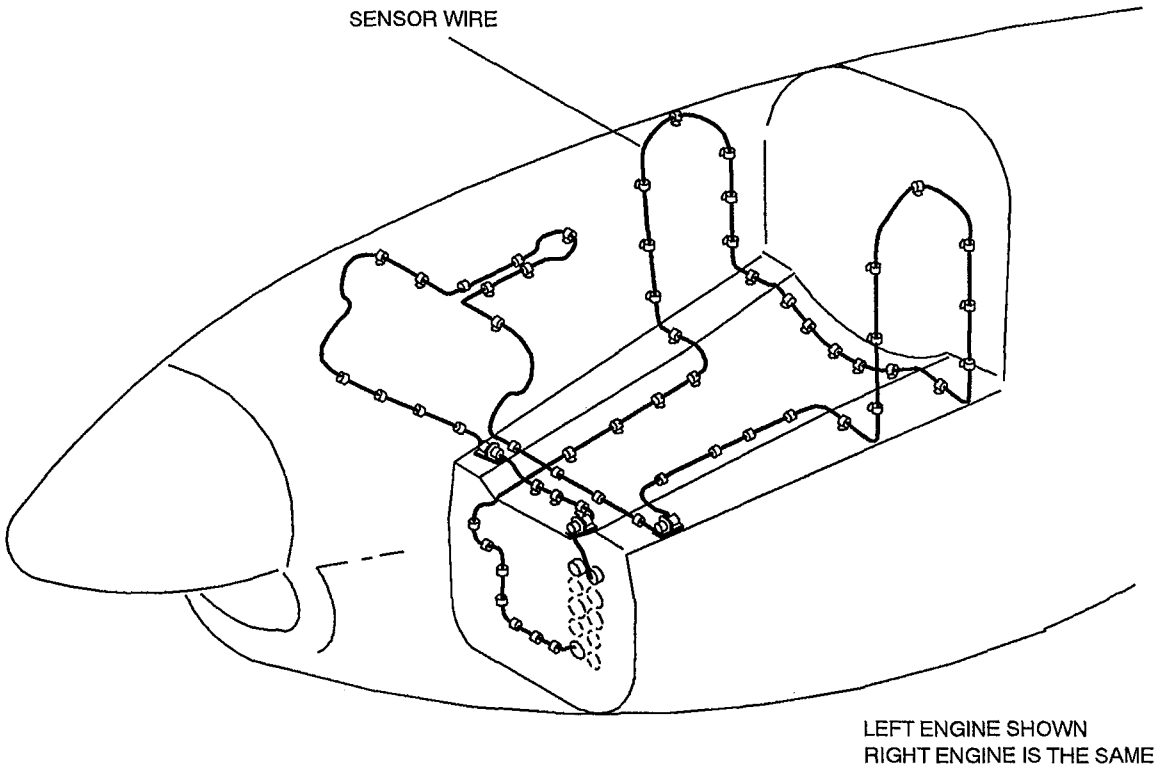


FIG.1. Engine and tailpipe detection schematic.

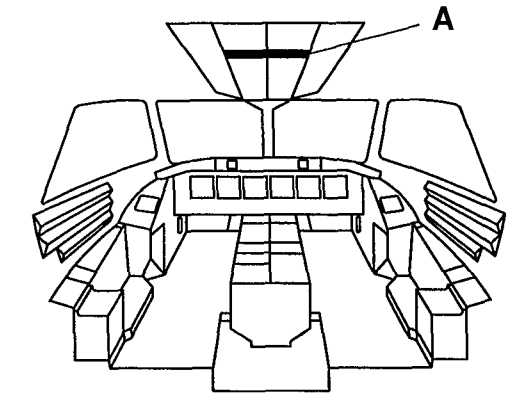




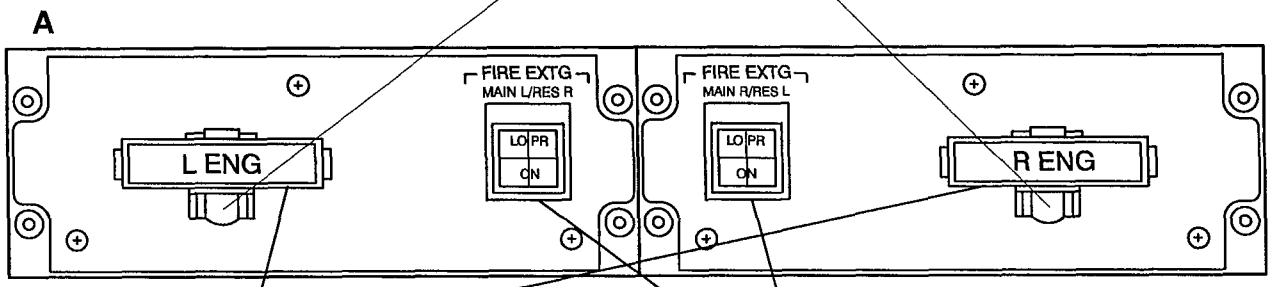
B4533

FIG.2. Engine fire detection sensor.

3. CONTROLS AND INDICATORS.



Push to release mechanical lock before pulling fire handle.



L and R ENG fire handle

Pulling a FIRE HANDLE will result in the following:

- Close the HP fuel SOV in the FPMU
- Close the Fuel Tank SOV
- Disconnect the generator
- Close BLD VLV
- Close the hydraulic section fire SOV
- Arm the Fire Extg. bottle.

FIRE EXTG, extinguisher p/b

MAIN L/RES R = Main shot for L engine and reserve shot for R engine.

MAIN R/RES L = Main shot for R engine and reserve shot for L engine.

NORMAL (blank)
- No operation of system

ON (white)
- Main Fire Extg. bottle activated.

LO PR (white)
- Low pressure in the Main Fire Extg. bottle.

B3278

FIG.3. Fire handles and fire extinguishers.

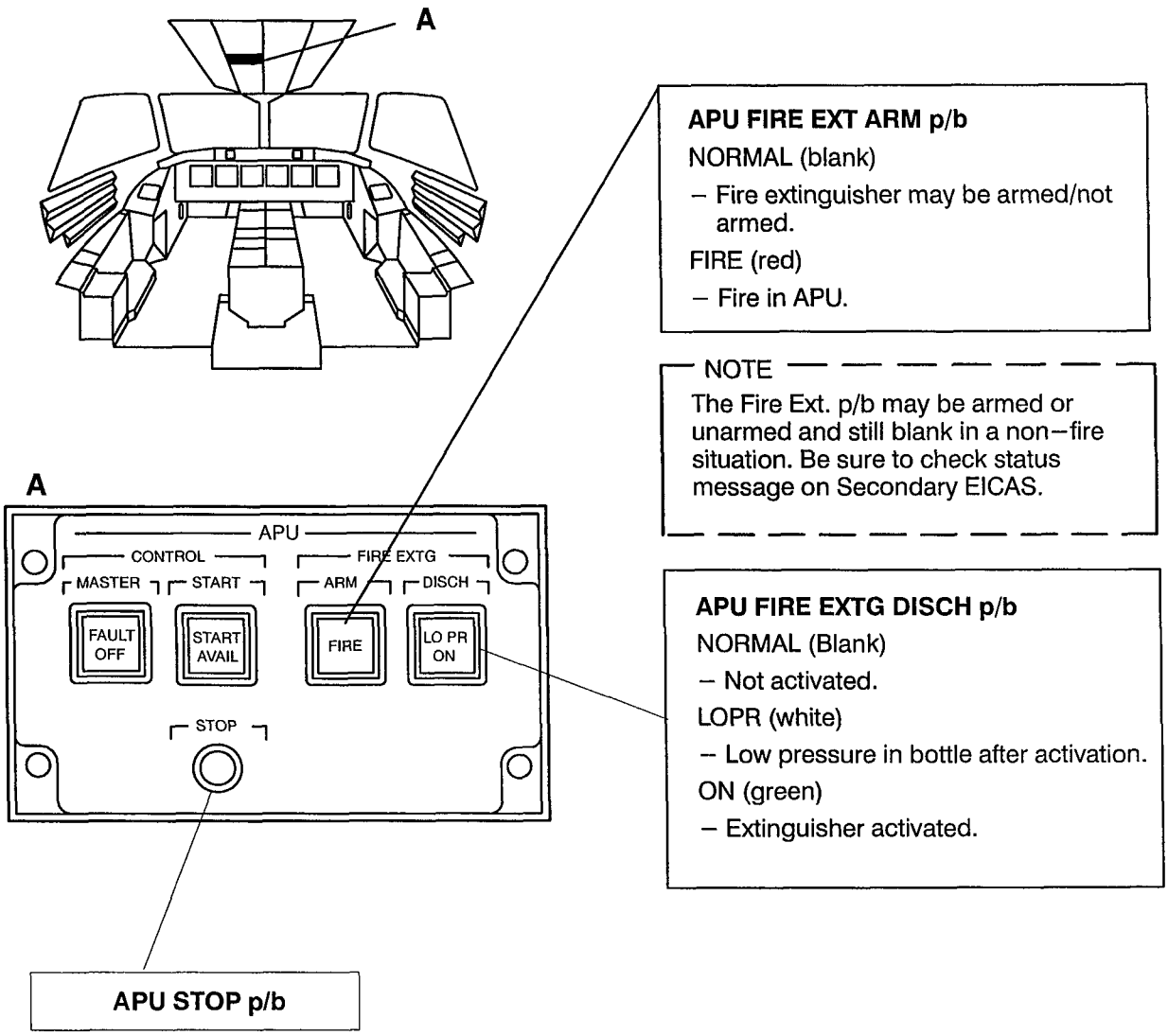


FIG.4. APU fire controls.

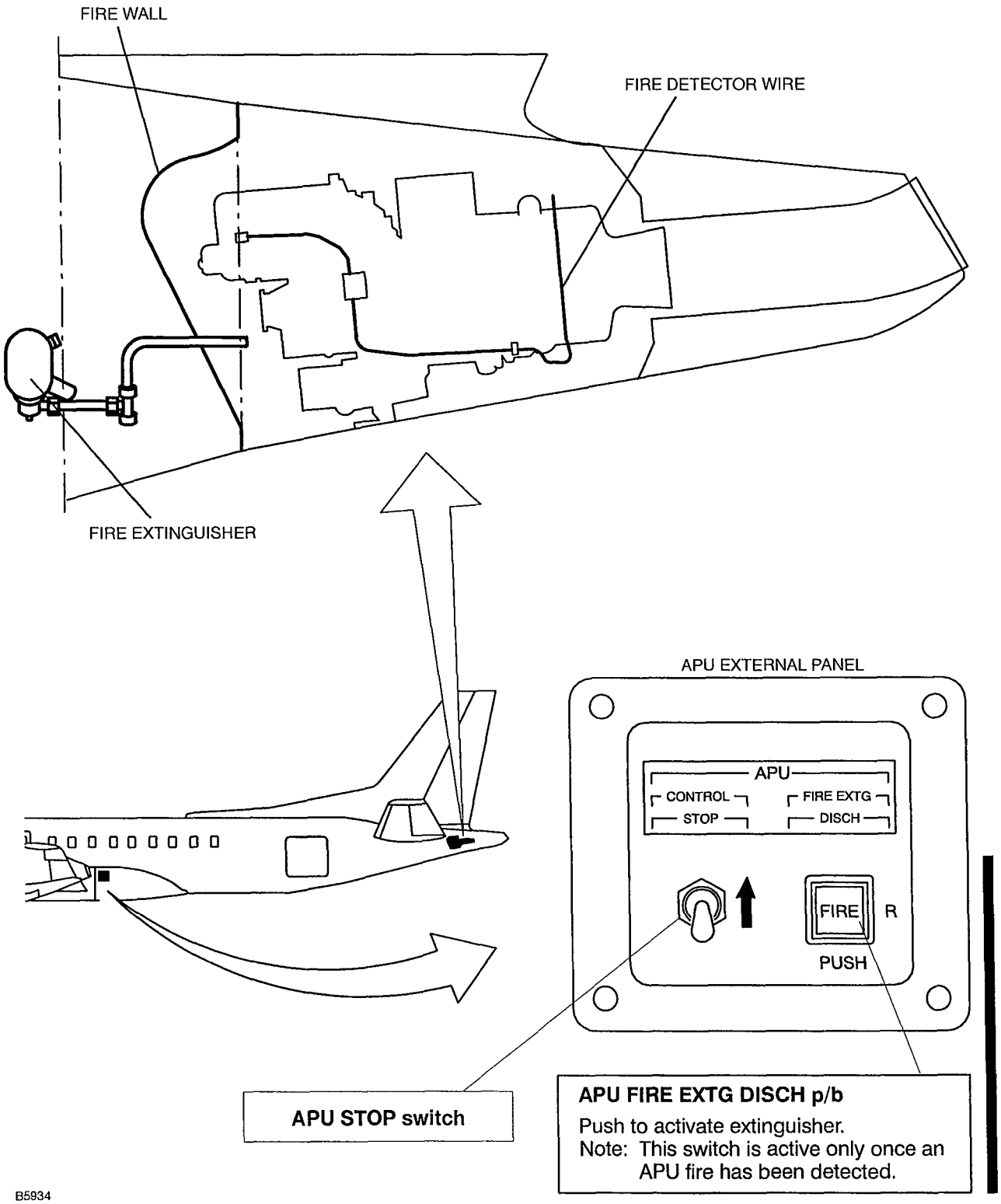
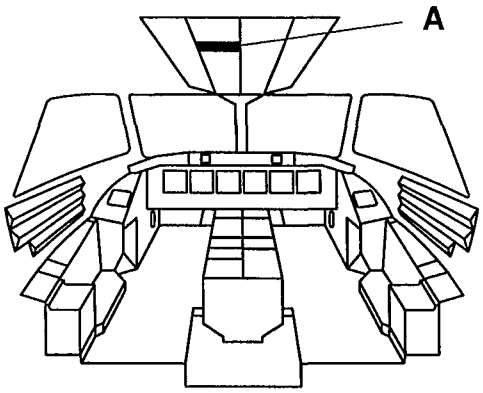
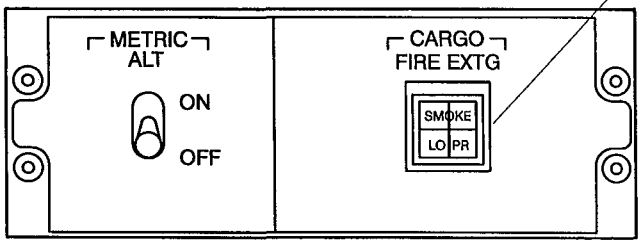


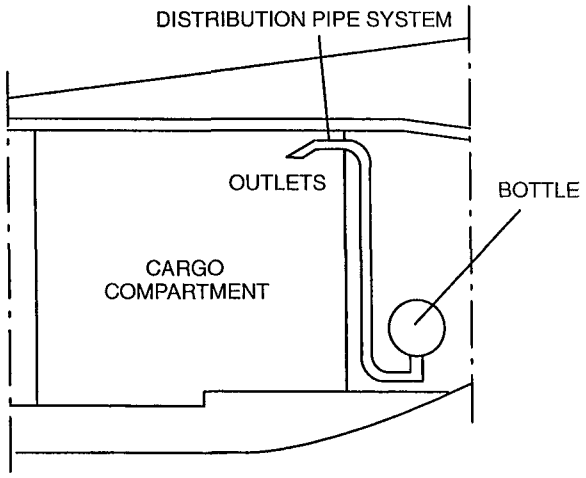
FIG.5. APU external controls, fire detection and extinguishing.



CARGO FIRE EXT p/b
Normal (blank)
– System not activated.

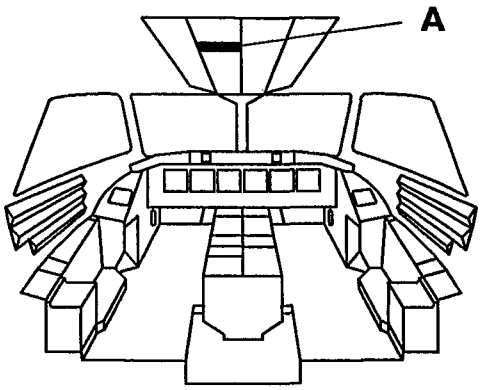
SMOKE (red)
LO PR
– Low pressure in the Fire Ext. bottle.





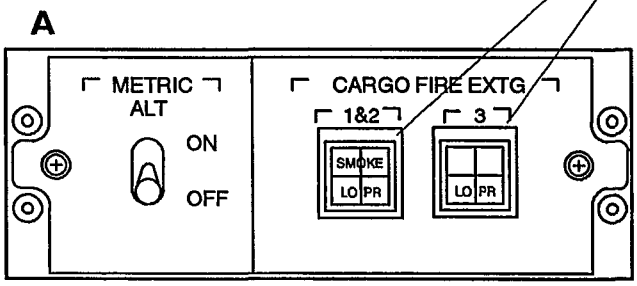
B7989

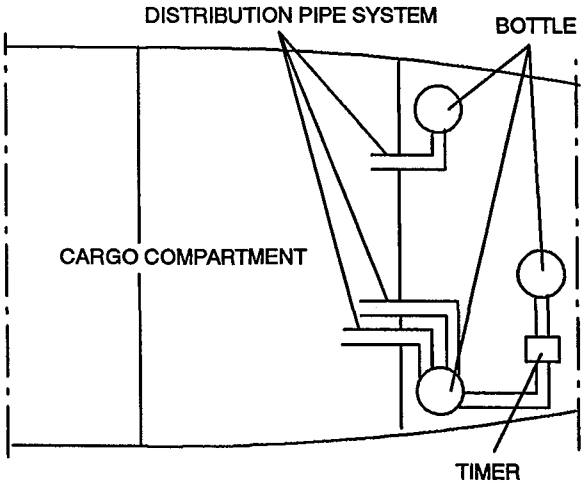
FIG.6. Cargo fire controls.



CARGO FIRE EXT p/b
Normal (blank)
– System not activated.

SMOKE (red)
LO PR
– Low pressure in the Fire Ext. bottle.





NOTE

Bottle No.2 will be automatically activated * minutes after pressing p/b 1 & 2. If there is no need for bottle No. 2, the system can be reset by pushing p/b 1 & 2 within 15 minutes. Bottle No. 3 to be activated manually after ** minutes.

*15 minutes with Mod No 5320 installed.
20 minutes with Mod No 5320 and 5575 installed.

**40 minutes with Mod No 5320 installed.
55 minutes with Mod No 5320 and 5575 installed.

B8055

FIG.7. Cargo fire controls (optional).

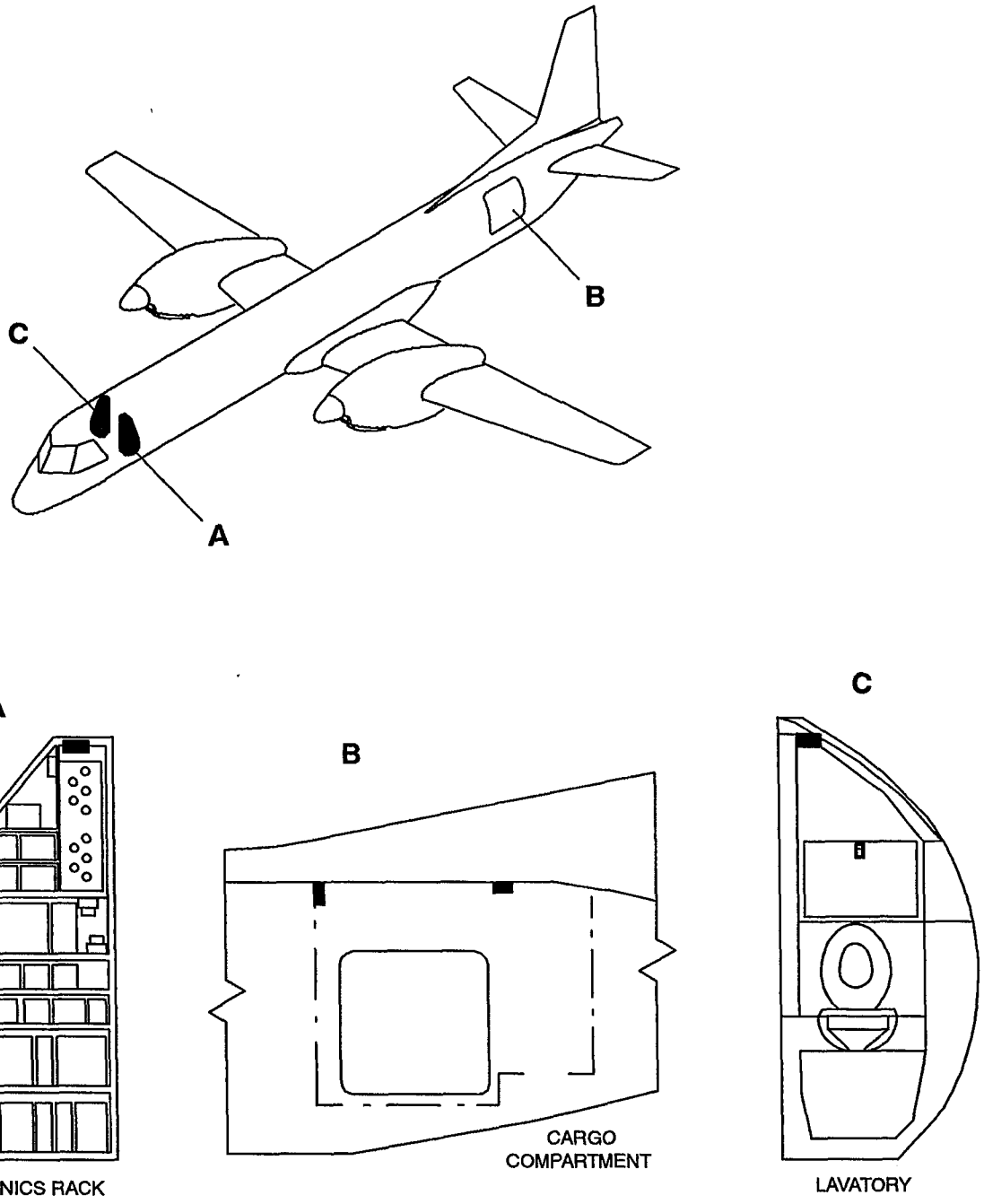


FIG.8. Smoke detectors.

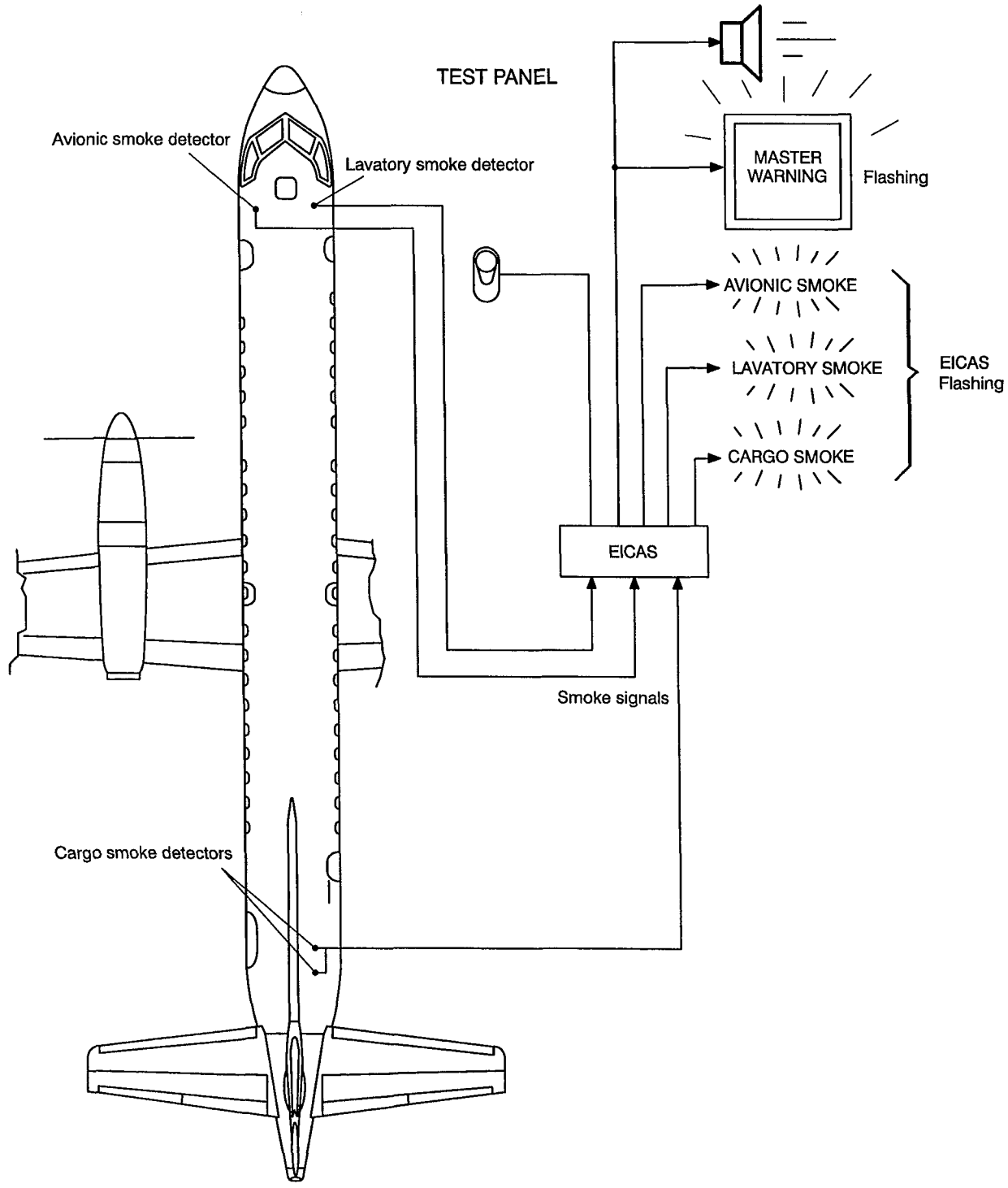
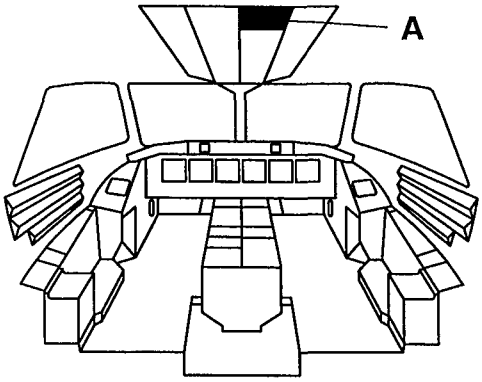


FIG.9. Smoke detection.



APU FIRE test switch

When the switch is activated the APU FIRE detection/short circuit system is checked with a simulated warning condition.

The APU test warnings are:

- Master Warning/Caution lights
- Fire bell
- Triple chime
- APU Fire p/b light on OH panel.

On EICAS:

- APU FIRE
- APU DET FAULT

ENG FIRE test switch

When held in L/R position the integrity of the following systems are tested:

- L/R fire detection/short circuit system
- L/R tailpipe overtemp detection and short circuit system.

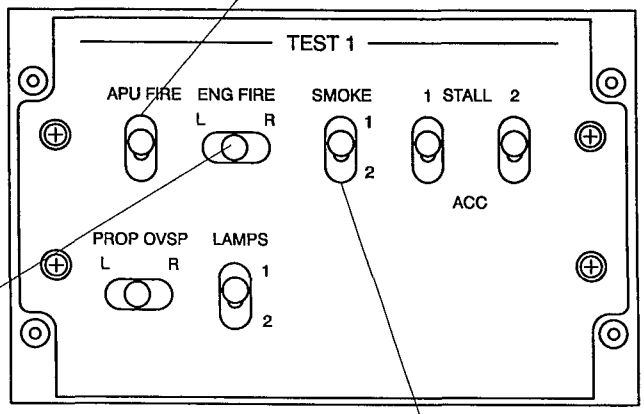
Switch held in left/right position will give the following indications:

- Master Warning and Caution lights
- Fire bell
- Triple chime
- L/R ENG fire handle light
- L/R COND condition lever lights.

On EICAS:

- L/R ENG FIRE
- L/R TAILPIPE OVTEMP
- L/R ENG FIRE DET FAULT
- L/R TAILPIPE DET FAULT.

A TEST PANEL



SMOKE test switch

When activated, smoke conditions in the AVIONIC compartment, LAVATORY and CARGO compartment are simulated.

The smoke test warnings are:

- Master Warning light
- Repetitive chime.

On EICAS:

- AVIONIC SMOKE
- LAVATORY SMOKE
- CARGO SMOKE.

B3303

FIG.10. Test switches.

4. ELECTRICAL POWER SUPPLY.

Fire Extinguishing.

L/R Eng Fire Extinguisher shot 1	R HOT BAT BUS	M–6	FIRE EXTG L & R ENG MAIN
L/R Eng Fire Extinguisher shot 2	L HOT BAT BUS	F–6	FIRE EXTG L & R ENG RESERVE
L/R Fire handle shut off A (FADECS)	L HOT BAT BUS	F–7	FIRE EXT L&R ENG SH OFF A
L/R Fire handle shut off B (FADECS)	R HOT BAT BUS	M–7	FIRE EXT L&R ENG SH OFF B
APU Fire Extinguishing	L HOT BAT BUS	F–8	FIRE EXTG APU BOTTLE
L/R Eng Emerg Shutdown FADECS A	L HOT BAT BUS	J–13	ENG SH OFF CHAN A
L/R Eng Emerg Shutdown FADECS B	R HOT BAT BUS	R–10	ENG SH OFF CHAN B
Cargo Fire Extinguishing	HOT BAT BUS	F–5	FIRE EXTG CARGO

Detection.

Avionic Smoke	L BAT BUS	E–7	DETECTION AVION SMOKE
Lavatory/Cargo Smoke	R BAT BUS	L–8	DETECTION LAV CRG SMOKE