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10.1 DESCRIPTION

The fire protection system is provided in order to ensure :

- Detection for :
 - each engine fire
 - right nacelle overheat (on ground only)
 - each cargo compartment and toilets smoke
 - avionics compartment smoke
- Extinguishing for :
 - each engine
 - cockpit, cabin and each cargo compartment
 - toilets waste bin

ENGINE FIRE DETECTION SYSTEM

Each engine is equipped with a fire detection system which consists of :

- Two identical detection loops (A and B) mounted in parallel.
- A fire detection control unit.

The detection principle is based on the variation of resistance and capacitance of the detection cable (fire signal). If there is only a change in resistance, associated loop will be declared failed by the fire detection control unit (fault signal).

Red ENG. FIRE illuminates on CAP in case of :

- Fire signal detected by both loops A and B or,
- Fire signal detected by one of the 2 loops if the other one is selected OFF.

R RIGHT NACELLE OVERHEAT DETECTION SYSTEM (on ground only)

Right nacelle is equipped with an overheat detector. When right nacelle temperature exceeds 170°C, NAC2 OVHT red alarm is triggered on CAP, and the CCAS is activated.

CARGO AND TOILETS SMOKE DETECTION SYSTEM

Forward cargo and after cargo are each equipped with one optical smoke detector.

R Ambient transmittance is monitored by reflection measurement.

Toilets are equipped with one photoelectric smoke detector.

In case of smoke detection, "SMOKE" signal is sent to CCAS through the MFC.

AVIONICS SMOKE DETECTION (See schematic 1.03.30 p. 3)

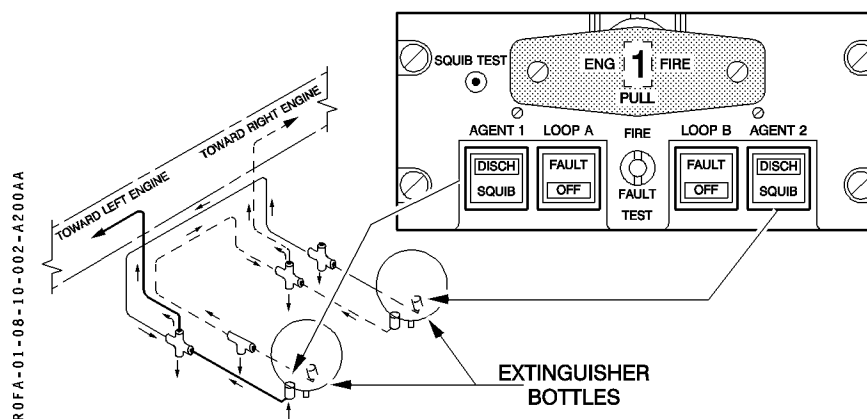
The avionics extract air duct is provided with a smoke detection device, linked to the CCAS. Smoke detection between the avionics compartment and the extract fan activates a "ELEC SMK" red alert on CAP.

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ENGINE FIRE EXTINGUISHING SYSTEM

It includes two extinguishers bottles which may be used for engine n°1 or engine n° 2. They are located on each side of the fuselage. Dual squibs are installed in the discharge heads on each bottle. For fire extinguishing, the squibs are ignited by depressing the corresponding illuminated AGENT pb on the ENG FIRE panel.

The extinguishing agent (freon or halon) is pressurized by nitrogen.



COCKPIT, CABIN AND CARGO COMPARTMENTS FIRE EXTINGUISHING SYSTEM

Portable extinguishers are provided to be operated manually (refer to schematic 1.07.10 p. 2 for location).

TOILETS WASTE BIN FIRE EXTINGUISHING SYSTEM

The system operates automatically when fire is detected (when the temperature is greater than 78°C (172°F)).

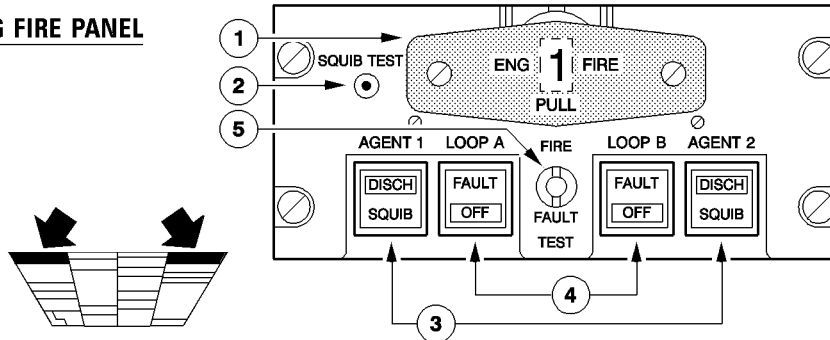
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10.2 CONTROLS

ENG FIRE PANEL

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Two identical ENG FIRE panels with fire handles are provided for control of fire detection and extinguishing. One panel controls ENG 1, the other controls ENG 2.

① ENG FIRE handle

An ENG FIRE warning light is integrated into the handle. The light illuminates red and the CCAS is activated as long as the respective engine fire warning is activated (independently of handle position). Light goes off when the temperature detected by the loops drops below warning threshold.

The handle has two positions :

- Normal position (mechanically locked)
- PULLED

Pulling the handle electrically causes for the respective engine :

- PROPELLER Feathering
- FUEL ENG LP VALVE closure
- AIR BLEED VALVE and HP VALVE closure
- DE ICE DE ICE VALVE and ISOLATION VALVE closure
- ELEC ACW and DC GEN deactivation
- ALERT SQUIB lights illumination

② SQUIB TEST pb

Controls the test of the squibs in the discharge heads and their electrical circuits. When pressed in with the respective ENG FIRE handle in normal position, the two SQUIB lights illuminate if squibs and circuits are operative.

③ AGENT pbs

Control the ignition of squibs and resultant discharge of fire extinguisher bottles

- SQUIB : The lights illuminate white when the ENG FIRE handle is pulled to facilitate identification of the AGENT pbs which may be activated. When one is pressed in, the associated bottle is discharged.
- DISCH : The light illuminates amber when the related fire extinguisher bottle is depressurized after discharge.

Note : The discharge light will also illuminate on the non affected engine fire panel to facilitate identification of the depressurized bottle.

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④ LOOP pb

Allows activation of aural and visual alerts when a fire signal (FIRE) or a fault signal (LOOP) is generated by the fire detection control unit for the related loop.

pb pressed in : Aural and visual alerts are activated when a fire or a fault signal is generated by the fire detection control unit for the related loop.

OFF : (pb released) Aural and visual alerts are inhibited for the related loop. The OFF light illuminates white. LOOP amber light illuminates on CAP.

FAULT : The light illuminates amber and the CCAS is activated when the associated pb is selected ON and a fault signal is generated by the fire detection control unit. LOOP amber light illuminates on CAP.

⑤ TEST sw Spring Loaded in neutral position

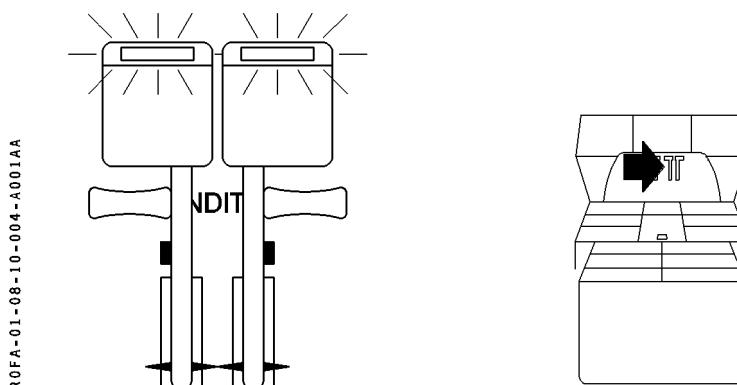
Spring loaded in neutral position allows a test of the detection of fire and fault signals when both LOOP pbs are selected ON :

FAULT - FAULT lights of both LOOP A and LOOP B pb illuminate
- CCAS is activated, LOOP amber light illuminates on CAP.

FIRE - ENG FIRE red light illuminates in associated fire handle
- FUEL SO light illuminates in associated CL if CL isn't in fuel shut off position
- CCAS is activated, ENG FIRE red light illuminates on CAP.

R

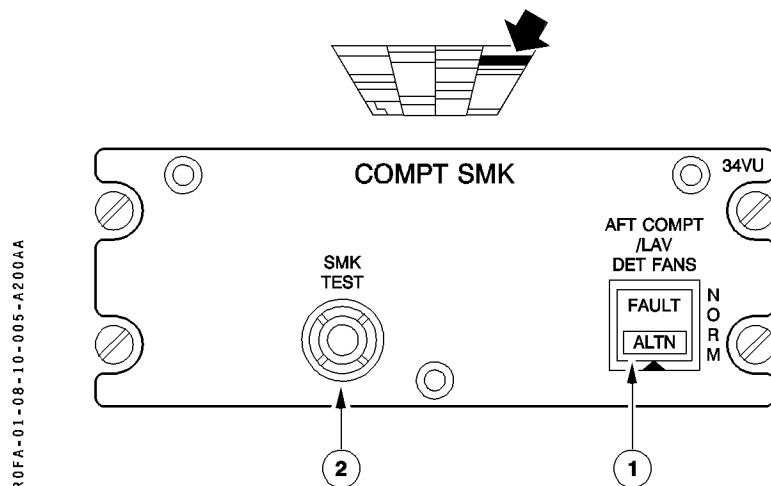
CL FUEL LT



Illuminates red in case of fire signal from associated engine. Extinguishes after CL is set at fuel shut off position or if fire detection signal terminates.

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CARGO COMPARTMENTS AND TOILET SMOKE DETECTION



① AFT COMPT/LAV FANS Pb

NORM : (Pb pressed in) one fan runs.

FAULT : The fan is out of order

FAULT illuminates amber and CCAS is activated.

ALTN : (Pb released) the alternate fan runs, ALTN light illuminates white.

② SMK TEST Pb

Tests the smoke detectors working.

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10.3 ELECTRICAL SUPPLY/SYSTEM MONITORING

ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY (C/B)
ENG 1	
Loop A	DC EMER BUS (on lateral panel LOOP A)
Loop B	DC EMER BUS (on lateral panel LOOP B)
Fire handle	DC EMER BUS (on lateral panel FIRE HANDLE)
CL light	DC EMER BUS (on lateral panel CLA)
ENG 2	
Loop A	DC EMER BUS (on lateral panel LOOP A)
Loop B	DC EMER BUS (on lateral panel LOOP B)
Fire handle	DC EMER BUS (on lateral panel FIRE HANDLE)
CL light	DC EMER BUS (on lateral panel CLA)
Left extinguisher bottle squibs	DC EMER BUS (on lateral panel SQUIBS) HOT MAIN BAT BUS (on lateral panel SQUIBS)
Right extinguisher bottle squibs	DC EMER BUS (on lateral panel SQUIBS) HOT MAIN BAT BUS (on lateral panel SQUIBS)
Forward cargo smoke detector	DC ESS BUS (on lateral panel FWD SMOKE DETECTOR)
Aft cargo smoke detector	DC ESS BUS (on lateral panel AFT SMOKE DETECTOR)

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ELECTRICAL SUPPLY

EQUIPMENT	DC BUS SUPPLY (C/B)	AC BUS SUPPLY (C/B)
Avionics smoke detector	DC ESS BUS (on lateral panel ELEC SMK DET)	– Nil –
Toilets smoke detector	DC ESS BUS (on lateral panel)	– Nil –
Aft cargo and toilets ventilation fans PWR	– Nil –	AC STBY BUS (on lateral panel FANS PWR)
Aft cargo and toilets ventilation fans CTL.	DC ESS BUS (on lateral panel AFT FANS IND)	– Nil –
Forward cargo ventilation fans CTL	DC ESS BUS (on lateral panel)	– Nil –
Forward cargo ventilation fans PWR	– Nil –	AC STBY BUS (on lateral panel)

SYSTEM MONITORING

The following conditions are monitored by visual and aural alerts :

- ENG fire signal
 - See ENG FIRE procedure in chapter 2.04.02.
- Smoke detected in the avionics ventilation circuit
 - See ELECTRICAL SMOKE procedure in chapter 2.04.03.
- Smoke detected in the FORWARD cargo compartment
 - See FWD CARGO SMOKE procedure in chapter 2.04.03.
- Smoke detected in the aft cargo compartment or in the lavatory
 - See AFT COMPT SMOKE procedure in chapter 2.04.03.
- Nacelle temperature exceeds 170°C (338°F) when aircraft is on ground.
 - See NAC OVHT procedure in chapter 2.05.02.
- Fire Loop fault signal
 - See FIRE LOOP FAULT procedure in chapter 2.05.12.