G 550
Fire Protection System

Shot 2

L Fire bottle discharge

2

inwards

Shot 2

2

R
The fire protection system is about:

1. Detection: presence of fire and/or smoke
2. Notification: alert the crew via CAS message
3. Fire fighting:

   - Engine APU fire bottles:
- **Smoke Evacuation:**

  ![Diagram of smoke evacuation system]

- **Portable Fire Bottles:**

  - 3 (Halon)
  - 1 (Water)

  ![Diagram of fire extinguishers]
Engine Fire Detection System

- Dual loop Fire Detection System

- Each engine has two (2) fire loops - A and B

<table>
<thead>
<tr>
<th>L ENG</th>
<th>R ENG</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOOP A</td>
<td>LOOP A</td>
</tr>
<tr>
<td>LOOP B</td>
<td>LOOP B</td>
</tr>
</tbody>
</table>

- A loop is a temperature-sensitive wire

- It can be routed - looped - throughout the engine nacelle

- Each loop sends raw data to the Fire Detection Control Unit (FDCU)

- The FDCU determines whether a loop is faulty, failed, or sensing an actual fire

- A faulty/failed loop can be deselected. The system can then operate as a single loop system

- Requires LESS DC to operate
The Fire Detection Control Unit (FDCU) is the brains of the system.

Loops A/B:  
1. Fault, 
2. Failed, or 
3. Fire

Determines loop condition/status:

Then notifies crew via CAS message(s):

- Engine Fire Loop Alert
- Engine Fire
Engine Fire Extinguishing System

- Available any time the buses are powered

- The system has two (2) identical single-shot fire extinguishing bottles

  L bottle = Shot 2
  R bottle = Shot 1

- The bottles are located in the tail compartment

- Each bottle contains extinguishing agent under high pressure

- In the event of overpressure, the extinguishing agent is vented into the tail compartment

- The bottles can be discharged into the engine nacelle by the crew via the fire handles

- Upon discharge a Fire Bottle Discharge CAS is displayed
- Each engine has its own **Fire Handle** powered by its respective **ESS DC bus**

- Pulling a **Fire Handle**:
  1. Shuts off fuel (at the tank)
  2. Shuts off hydraulic fluid
  3. Trip the IDG

- Fire Handles, when rotated, can discharge one or both bottles/shots
- Rotating the **FIRE HANDLE** outwards discharges
  shot 1

- Rotating the **FIRE HANDLE** inwards discharges
  shot 2

- L bottle
- R bottle

L ENG  |  APU  |  R ENG
L ENG  |  APU  |  R ENG
L Engine Fire

Shot 1

R Fire bottle Discharge

Shot 1

APU

1

outwards

L

2

1

2

inwards

R

R Engine Fire
ENGINE FIRE TEST

① IT TESTS THE FIRE DETECTION SYSTEM FOR EACH ENGINE

② If a loop does not illuminate it is because there is:
   - an open loop, or
   - no continuity, or
   - a defective fire detection circuit

③ "Good TEST, good ENGINE." ✓
   "Bad TEST, bad ENGINE." x

④ When pressed the following lights illuminate:
   (Similarly for left engine)
   Two (2) overhead lights
   Two (2) CAS messages
   Two (2) master warning lights
   FIRE HANDLE
   FUEL CONTROL SWITCH
   Run off
Engine Fire Fault Test

1. It tests the fire detection fault system, not the loops.

2. When the switchlight is pressed in and held the following lights illuminate:

   Five (5) overhead lights
   
   One (1) CAS message
   
   Two (2) master caution lights

3. A faulty loop can be deselected.
APU Fire Extinguishing System

- APU is enclosed in a fireproof Titanium case
- APU Fire Extinguishing System is powered by the LESS bus (down to main batteries)

![Diagram of APU Fire Extinguishing System]

Press to discharge
In the event of an engine fire the right bottle/shot is used first. This saves the other bottle for the APU.

APU TEST=

- Two (2) overhead lights
- Two (2) CAS messages
- Two (2) master warning lights
- Two (2) master caution lights
- Exterior aural warning "Fire Bell" (ground) only

After the APU FIRE TEST ensure the following CAS message is not displayed:

L Fire Bottle Discharge
In the event of an APU FIRE, the ECU will auto shutdown the APU. The QRH will direct the crew to:

1. SELECT APU switchlight to OFF

2. PRESS the APU switchlight to fire the bottle and discharge extinguishing agent into the APU.

* L FIRE BOTTLE NO LONGER AVAILABLE TO ENGINES

L FIRE BOTTLE DISCHARGE

Shot 2

APU
Smoke is evacuated from the aircraft by deflating the seal around the baggage compartment exterior door. Differential pressure forces the smoke to exit the aircraft. The seal can then be re-inflated to restore normal pressurization of the baggage compartment.
Smoke in the cabin can also be vented overboard by partially opening the internal baggage door.

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**Emergency Smoke Evacuation VLV**

- **VENT/SMOKE**
- **BAG COMPT VENT VLV SENSE/TEST PORT**
- **WARNING: DO NOT BLOCK PORT**

**Baggage Compartment**

- **Secondary Pressure Bulkhead**
- **Conditioned Air**
- **Check Valve**
- **Smoke Evacuation Valve**
- **Internal Baggage Door Open**
- **External Baggage Door**
- **Smoke Vent Overboard**

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**Reset Valve**

- **Primary Pressure Bulkhead**
SMOKE EVACUATION

With the Emergency Smoke Evacuation Valve closed, the Vent Valve can be reset and the Baggage Compartment repressurized.
Questions, comments or errors?
ivan.luciani@gmail.com

Thank you!