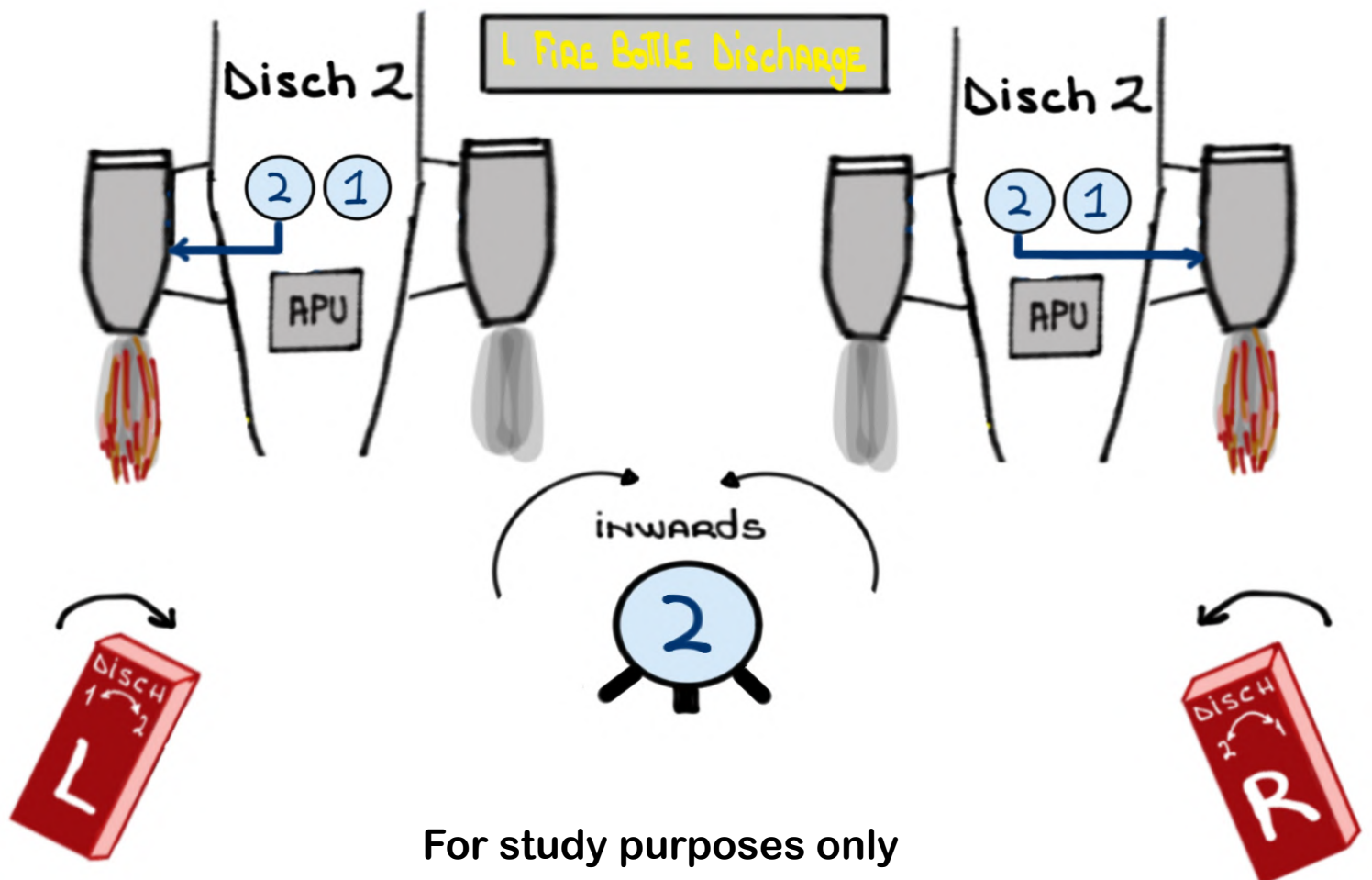


G450 FIRE PROTECTION SYSTEM



THE FIRE PROTECTION SYSTEM IS ABOUT:

① DETECTION:

• FIRE DETECTION SYSTEM:

- ENGINE NACELLE - TEMPERATURE SENSITIVE WIRES
- APU COMPARTMENT - HELIUM-FILLED TUBES

• SMOKE DETECTION SYSTEM:

SMOKE DETECTORS (OPTICAL SENSORS)

- BAGGAGE COMPARTMENT
- FORWARD AND AFT LAVATORIES

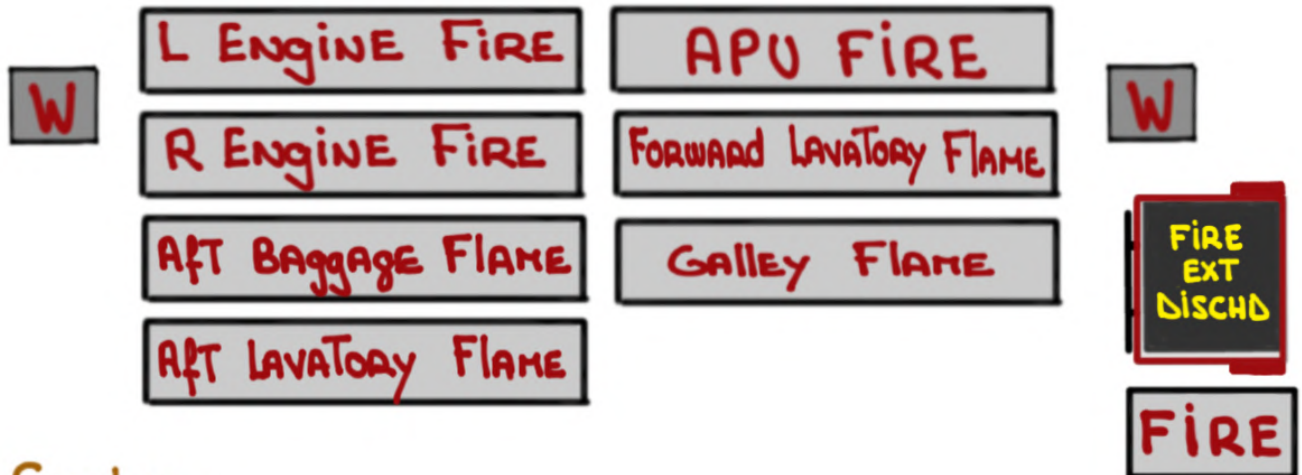
• OVERHEAT DETECTION SYSTEM:

- TEN (10) AREAS MONITORED BY THERMAL SWITCHES
- AREAS MONITORED AND TRIP POINTS:
 - * BLEED AIR RELATED AREAS (250°F)
 - * ELECTRONIC EQUIPMENT AREAS (150°F)

② NOTIFICATION:

CREW NOTIFICATION

- FIRE:



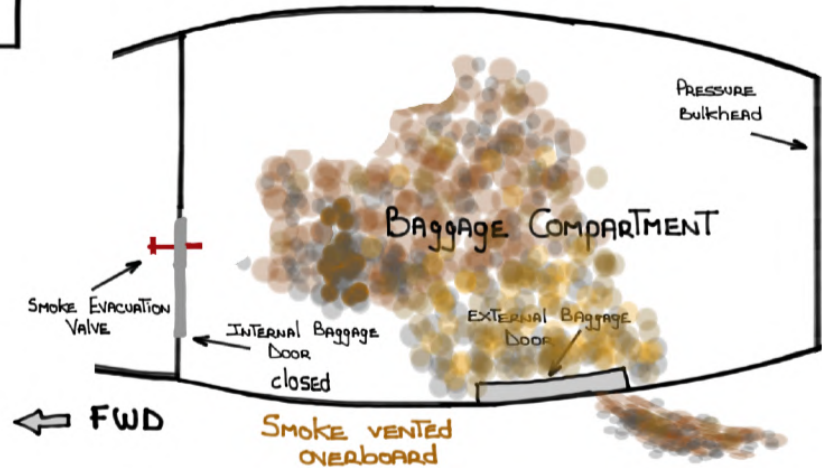
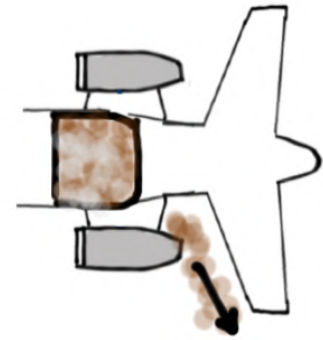
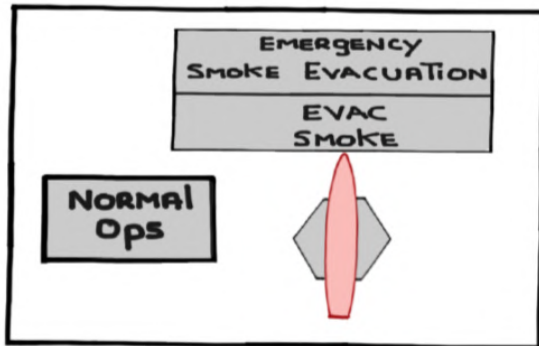
- SMOKE:




- OVERHEAT CONDITION:




④ SMOKE EVACUATION:

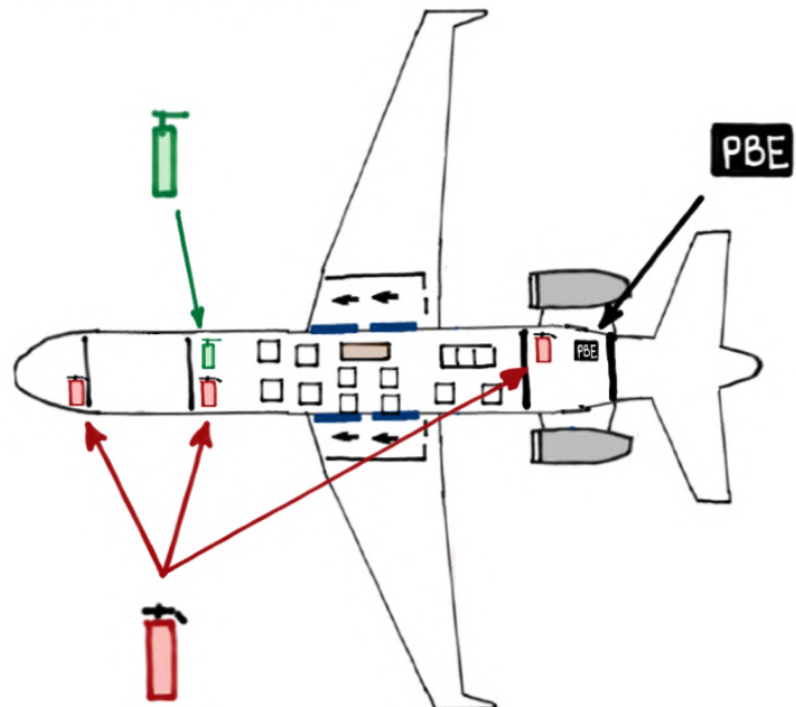


- PORTABLE FIRE BOTTLES:

 X 3 (HALON)

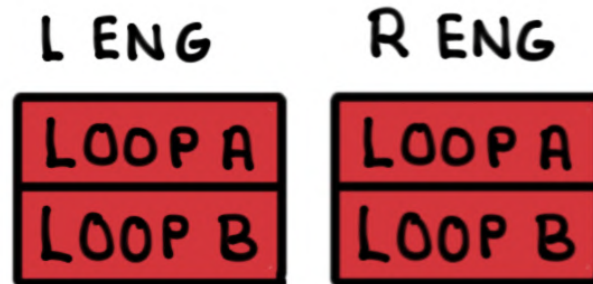
 X 1 (WATER)

PBE X 1



ENGINE FIRE DETECTION SYSTEM

- DUAL loop fire detection system
- Each engine has two (2) fire loops - A and B

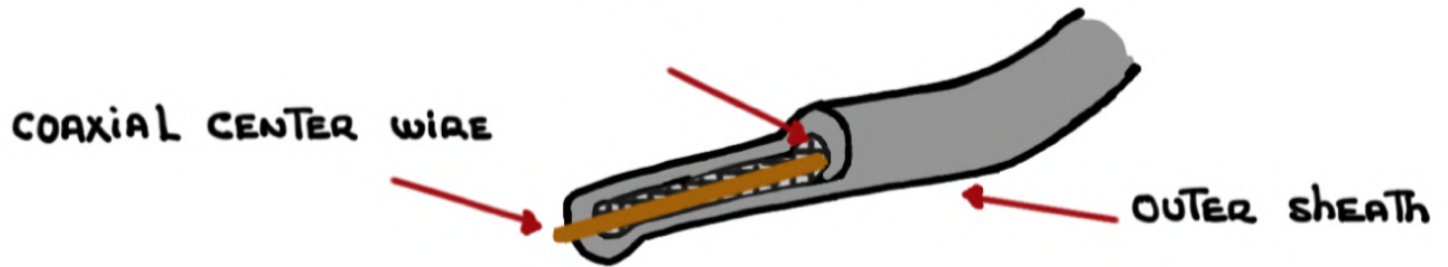


- A loop is a temperature - sensitive wire
- IT CAN BE ROUTED - looped - throughout the engine nacelle
- Each loop sends raw data to the FIRE DETECTION CONTROL UNIT (FDCU)
- The FIRE DETECTION CONTROL UNIT (FDCU) determines whether a loop is faulty, failed or sensing an actual **FIRE**
- A faulty/failed loop can be deselected. The system can then operate as a single loop system

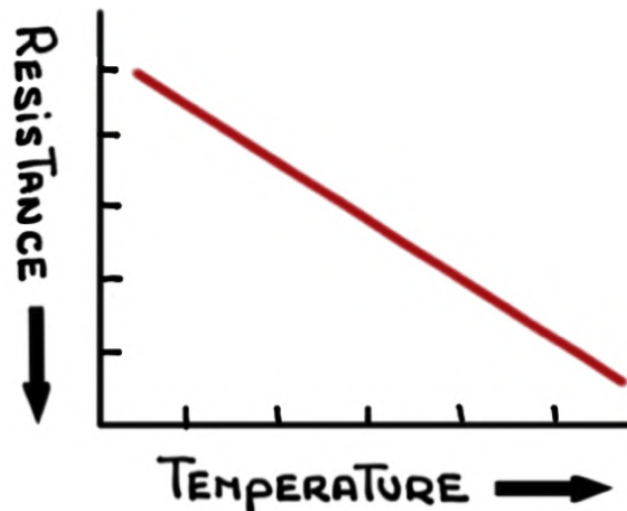
- Requires L
ESS
DC R
ESS
DC to operate

- COMPRISED OF A SERIES OF DETECTOR SEGMENTS/ELEMENTS
- TEMPERATURE SENSITIVE WIRES ARE ROUTED THROUGHOUT THE ENGINE NACELLE

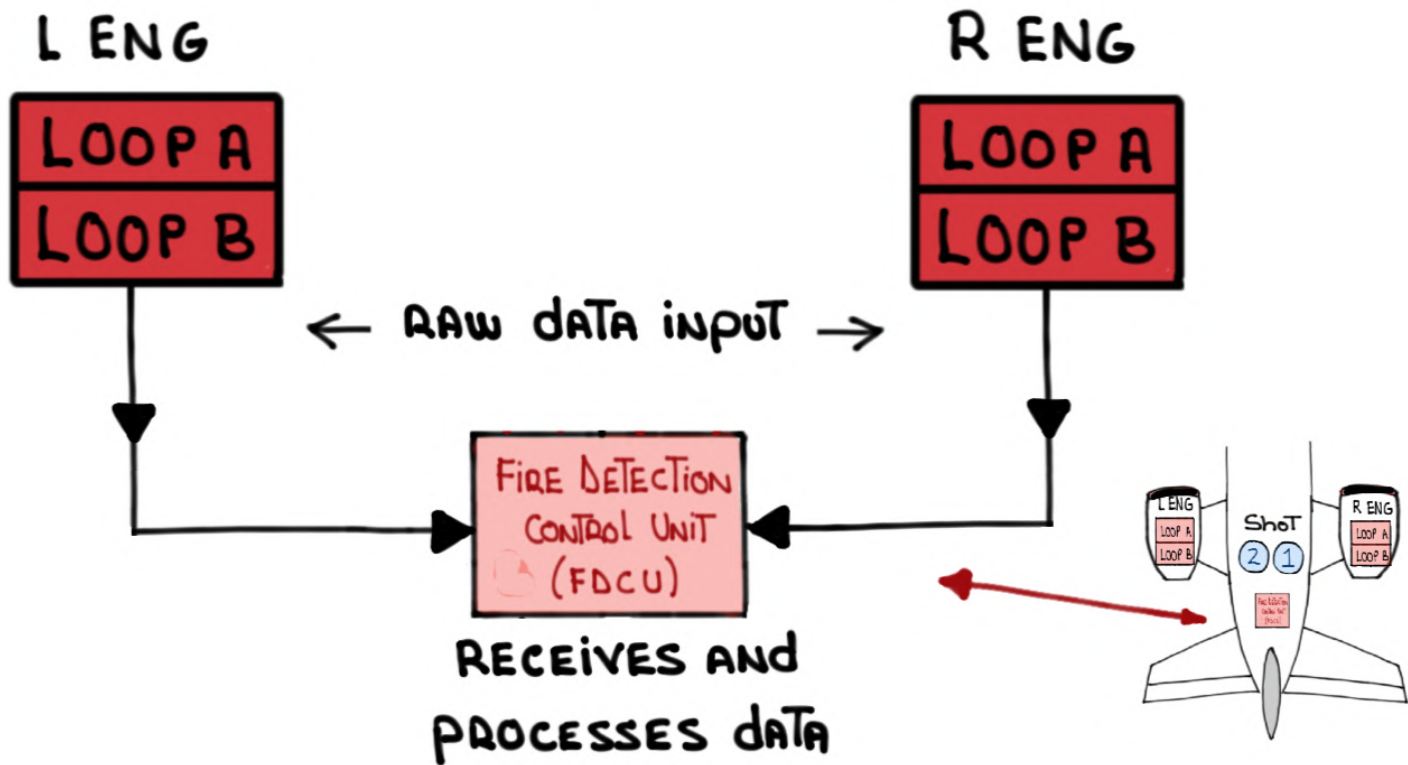
SEMI CONDUCTING GLASS/OXIDE MATERIAL



- THE STAINLESS STEEL SHEATH COVERS THE TEMPERATURE SENSITIVE SEMI CONDUCTING GLASS AND COAXIAL CENTER WIRE
- AS TEMPERATURE INCREASES THE RESISTANCE AROUND THE CENTER WIRE DECREASES



- The **FIRE DETECTION CONTROL UNIT (FDCU)** is the BRAIN of the system



Loops A/B: ← DETERMINES loop CONDITION/STATUS → Loops A/B:

① FAULT, OR
 ② FAILED, OR
 ③ **FIRE**



↓

THEN NOTIFIES CREW VIA CAS MESSAGE

① FAULT, OR
 ② FAILED, OR
 ③ **FIRE**




C FIRE DETECTION LOOP FAULT **C** **W** ENGINE FIRE LOOP ALERT **W**
R ENGINE FIRE

ENGINE FIRE EXTINGUISHING SYSTEM

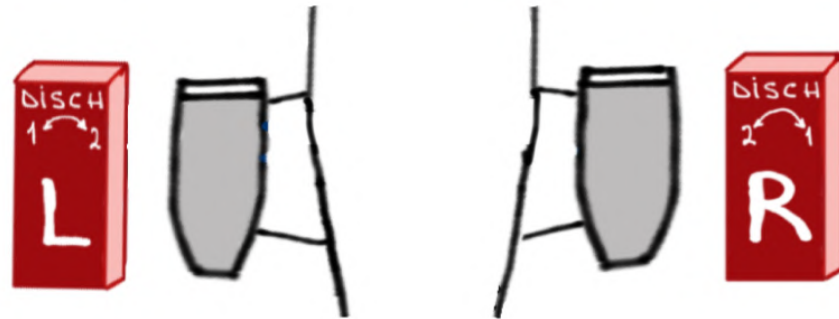
- Available any time the   buses are powered
- The system has two (2) identical single-shot fire extinguishing bottles

L bottle = Disch (2)

R bottle = Disch (1)

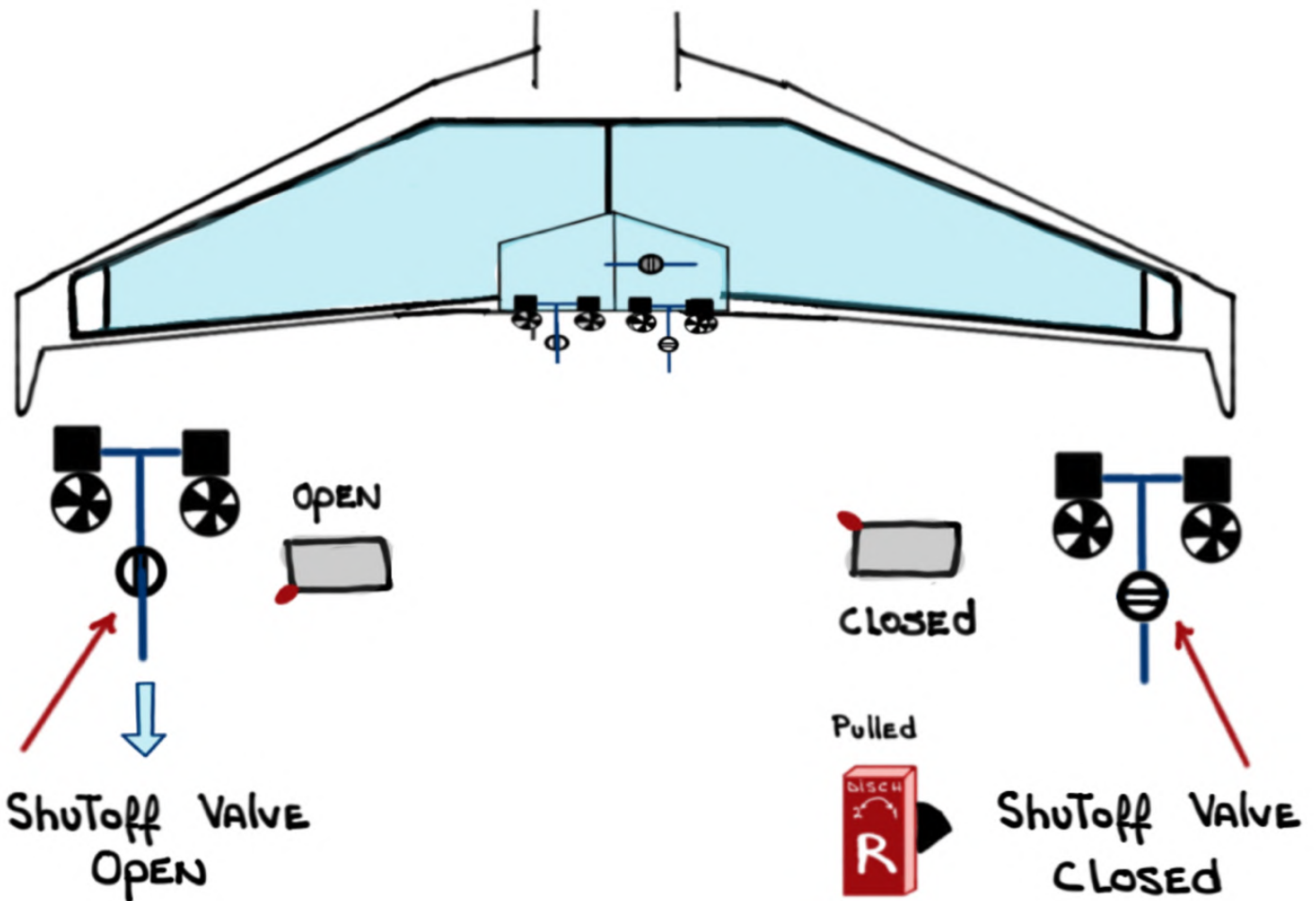
- The bottles are located in the tail compartment
- Each bottle contains  extinguishing agent under high pressure (non-toxic and non-corrosive)
- In the event of overpressure the extinguishing agent is vented into the tail compartment
- The bottles can be discharged into the engine nacelle by the crew via the **FIRE HANDLES**
- Upon a discharge a   CAS message is displayed

- Each ENGINE has its own **FIRE HANDLE**

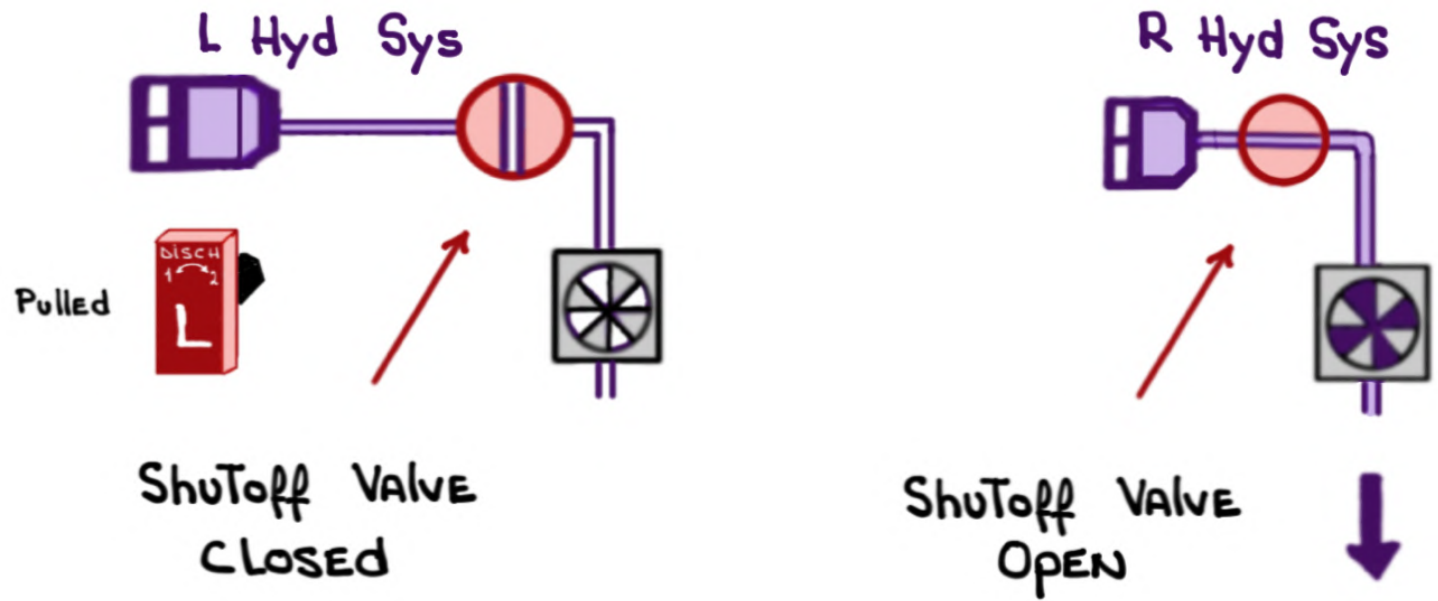


- Pulling a **FIRE HANDLE**

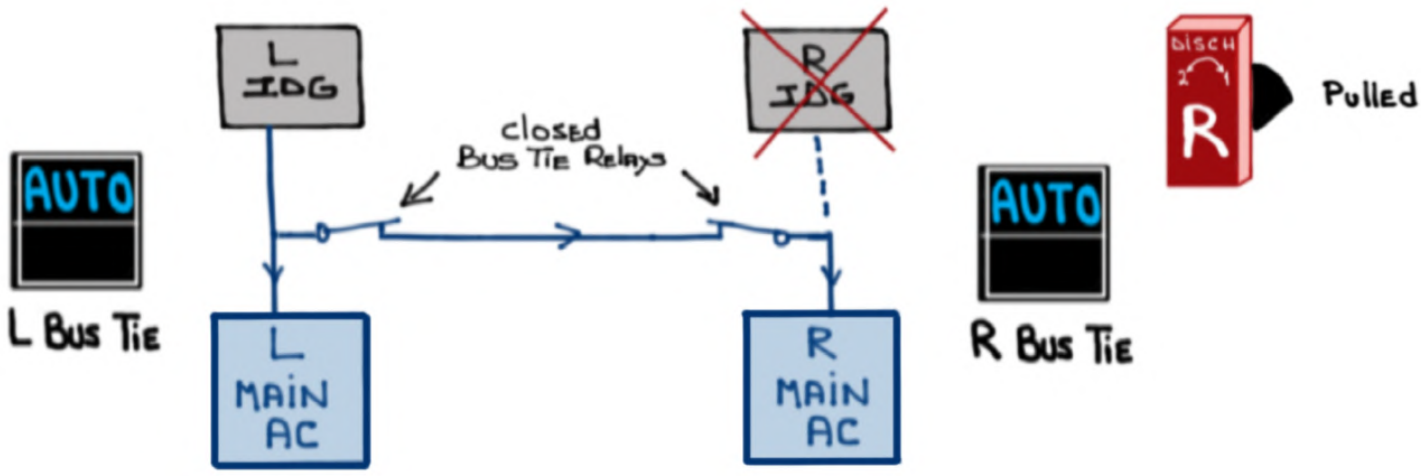
① Shuts off FUEL AT THE TANK



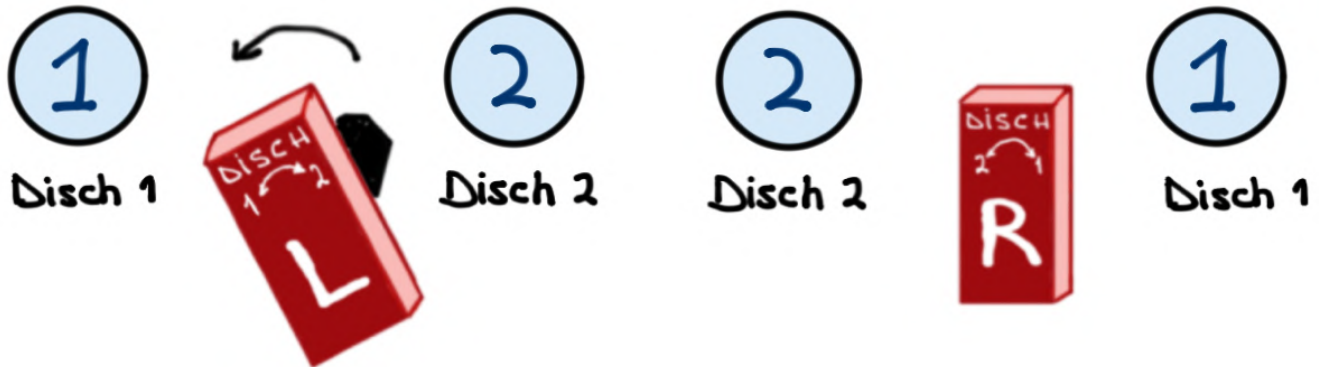
② Shuts off Hydraulic fluid DOWNSTREAM FROM RESERVOIR



③ Trips The IDG



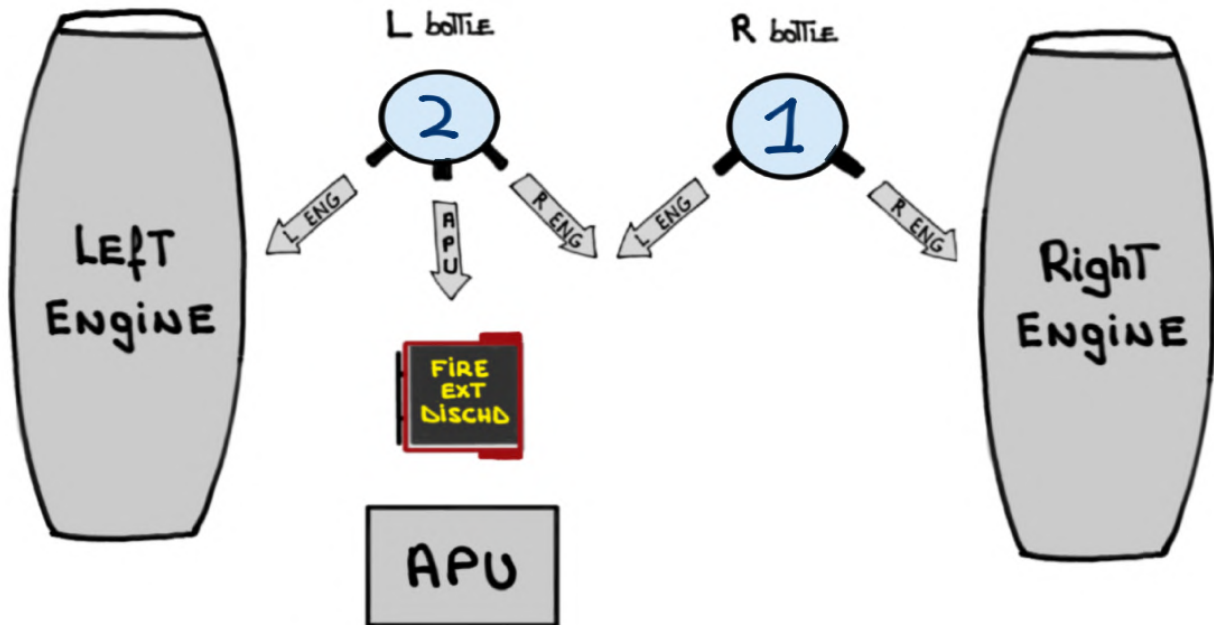
- **FIRE HANDLES**, when ROTATED, CAN DISCHARGE ONE OR BOTH BOTTLES/SHOTS



R FIRE BOTTLE DISCHRG

- L BOTTLE — EITHER ENGINE
 APU

R BOTTLE — EITHER ENGINE

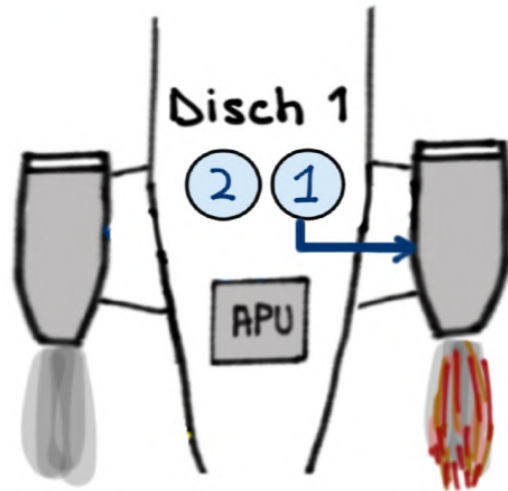
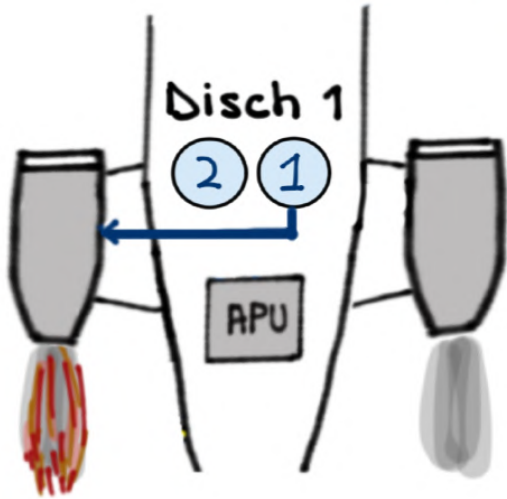


- ROTATING THE **FIRE HANDLE** OUTWARDS discharges
shot ①

L ENGINE FIRE

R ENGINE FIRE

R FIRE BOTTLE DISCHARGE



OUTWARDS

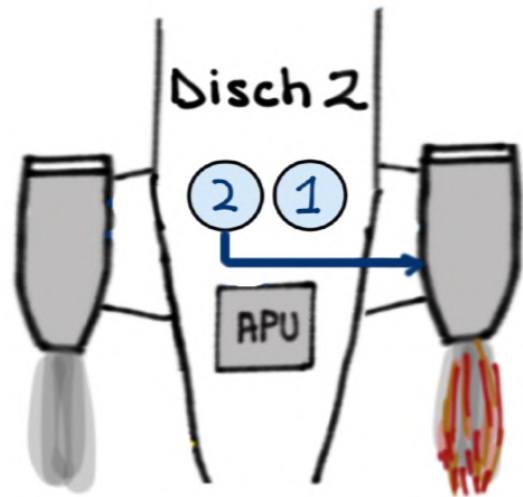
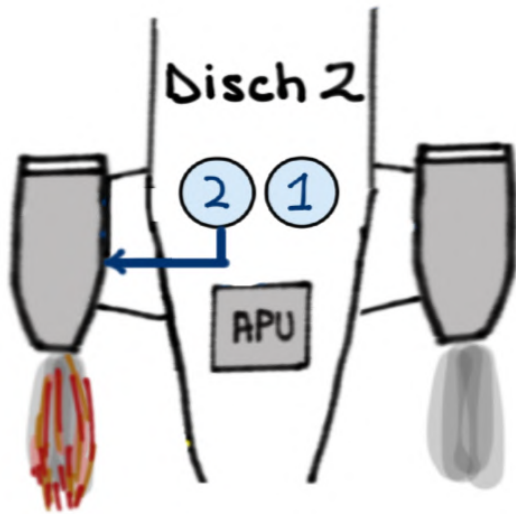


- ROTATING THE **FIRE HANDLE** INWARDS discharges
shot (2)

L ENGINE FIRE

R ENGINE FIRE

L FIRE BOTTLE DISCHARGE



ENGINE FIRE TEST

① 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" **NO FIRE**

" Bad TEST, bad ENGINE" **FIRE**

④ When PRESSED IN The following lights illuminate:

Two (2) OVERHEAD lights

R ENG



Two (2) CAS MESSAGES



Two (2) MASTER WARNING lights



FIRE HANDLE



FUEL CONTROL switch



(similarly for LEFT ENGINE)

ENGINE FIRE FAULT TEST

① IT TESTS THE FIRE DETECTION FAULT SYSTEM, NOT THE loops

② WHEN THE ^{FAULT TEST} **TEST** SWITCHLIGHT IS PRESSED IN AND HELD THE FOLLOWING LIGHTS ILLUMINATE:

FIVE (5) OVERHEAD LIGHTS

Loop A	Loop B	FAULT TEST	Loop A	Loop B
FAULT	FAULT	TEST	FAULT	FAULT

ONE (1) CAS MESSAGE

FIRE DETECTION LOOP FAULT

TWO (2) MASTER CAUTION LIGHTS

C	C
----------	----------

③ A FAULTY loop

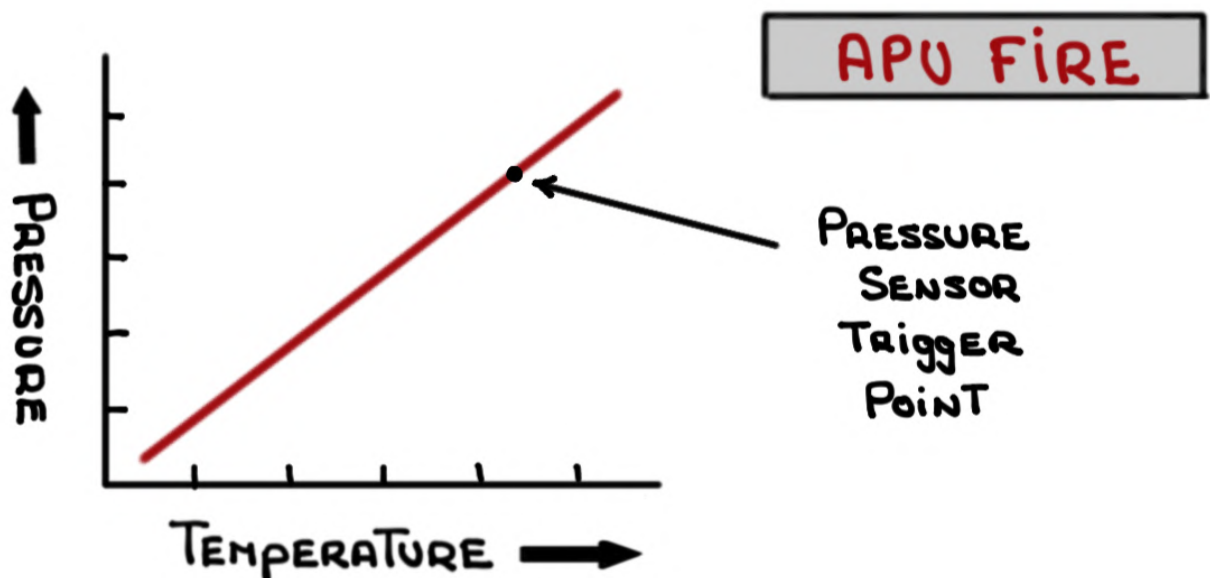
R ENG
LOOP B

 CAN BE Deselected

Loop A
OFF

APU FIRE DETECTION SYSTEM

- The APU is ENCLOSED in a TITANIUM CASE CAPABLE of SUSTAINING A FIRE FOR FIFTEEN (15) MINUTES. BEYOND THIS PERIOD DAMAGE TO OTHER SYSTEMS WILL OCCUR
- The APU OVERHEAT/FIRE DETECTION SYSTEM CONSISTS OF A HERMETICALLY SEALED HELIUM-FILLED TUBE SECURED TO THE TOP OF THE APU ENCLOSURE
- AS THE TEMPERATURE INSIDE THE ENCLOSURE INCREASES THE GAS IN THE TUBE EXPANDS AND THE PRESSURE INCREASES



APU FIRE EXTINGUISHING SYSTEM

- The APU FIRE EXTINGUISHING SYSTEM is POWERED by THE bus (down to MAIN BATTERIES)

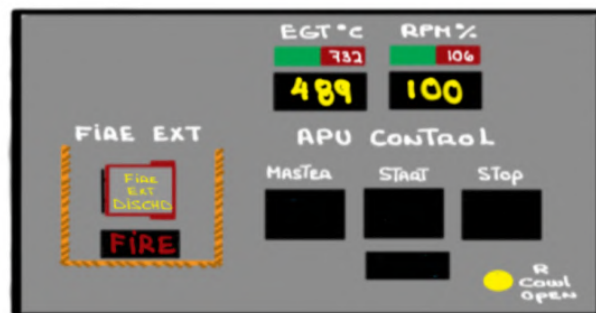
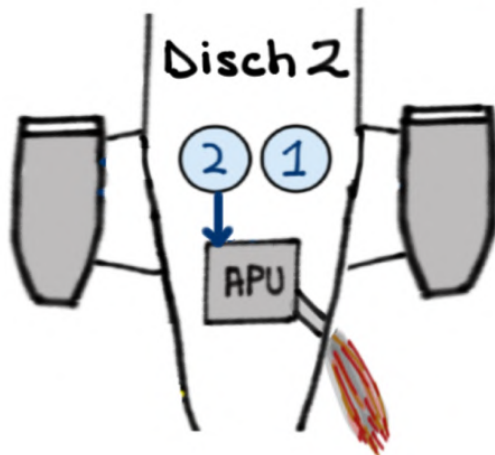


- In THE EVENT of a **FIRE** THE ELECTRONIC CONTROL UNIT (ECU) AUTOMATICALLY shuts down THE APU

- FIRE EXTINGUISHING discharge switch (GUARDED) is located ON THE APU CONTROL PANEL



APU FIRE



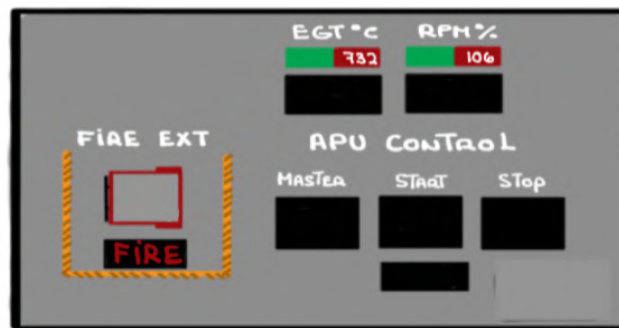
- DISCHARGES LEFT FIRE BOTTLE HALON INTO APU COMPARTMENT. ONLY ONE SHOT IS AVAILABLE

- DISCHARGE GENERATES **L FIRE BOTTLE DISCHARGE** CAS MESSAGE

APU FIRE TEST

- PROPER TEST - Eight (8) indications

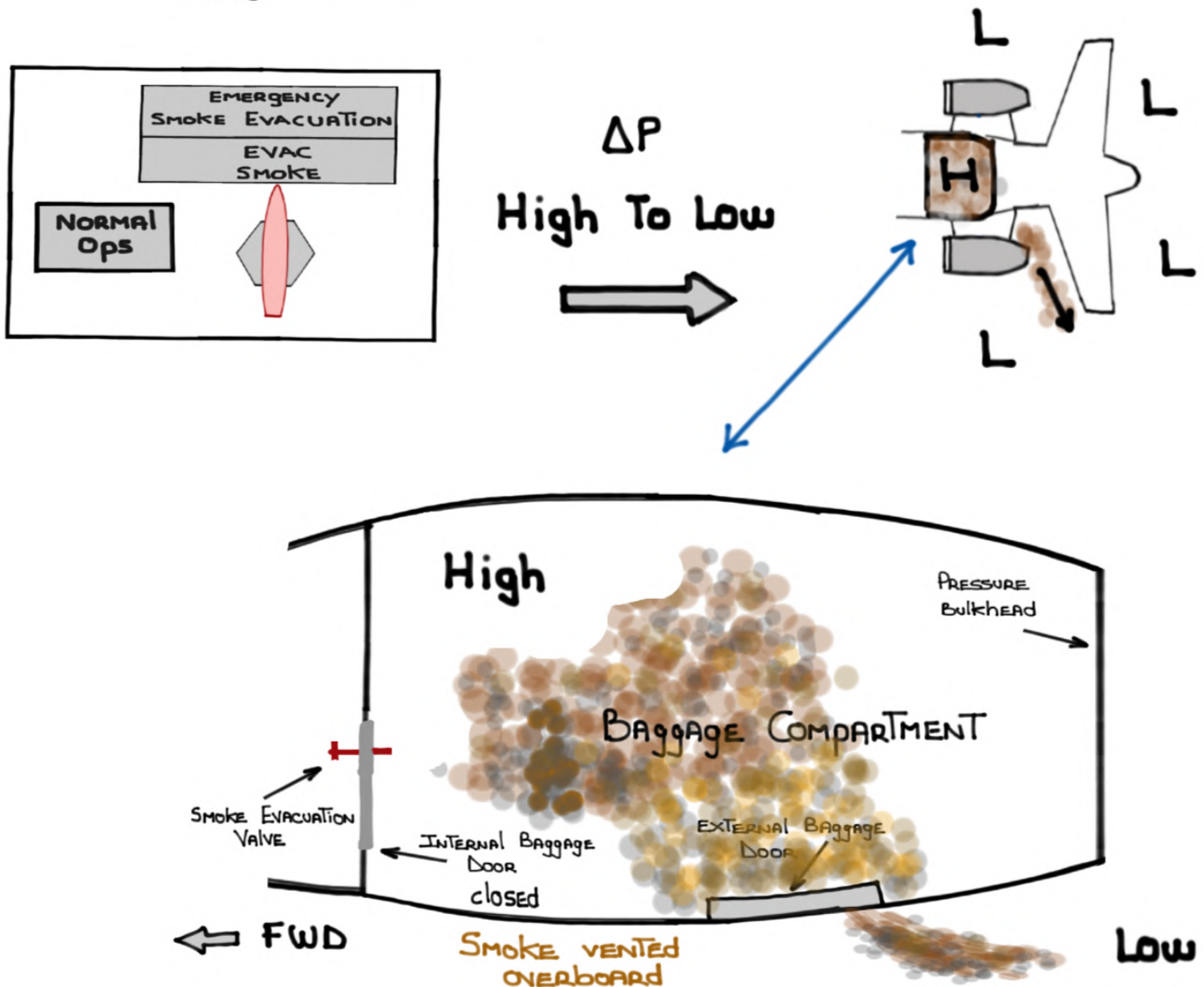
APU



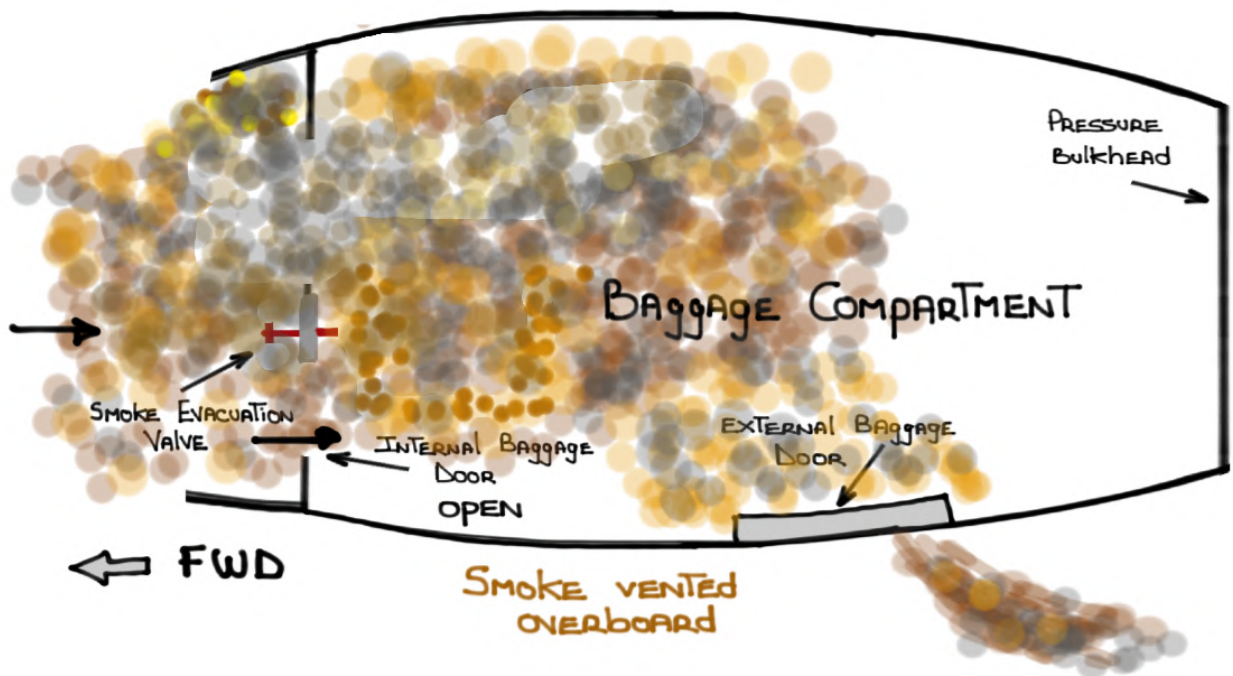
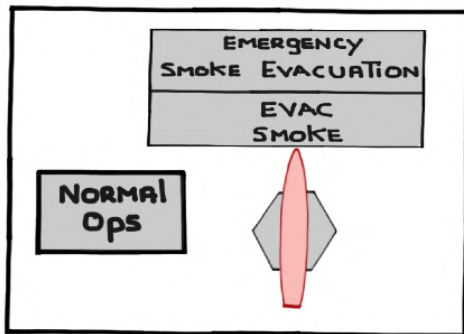
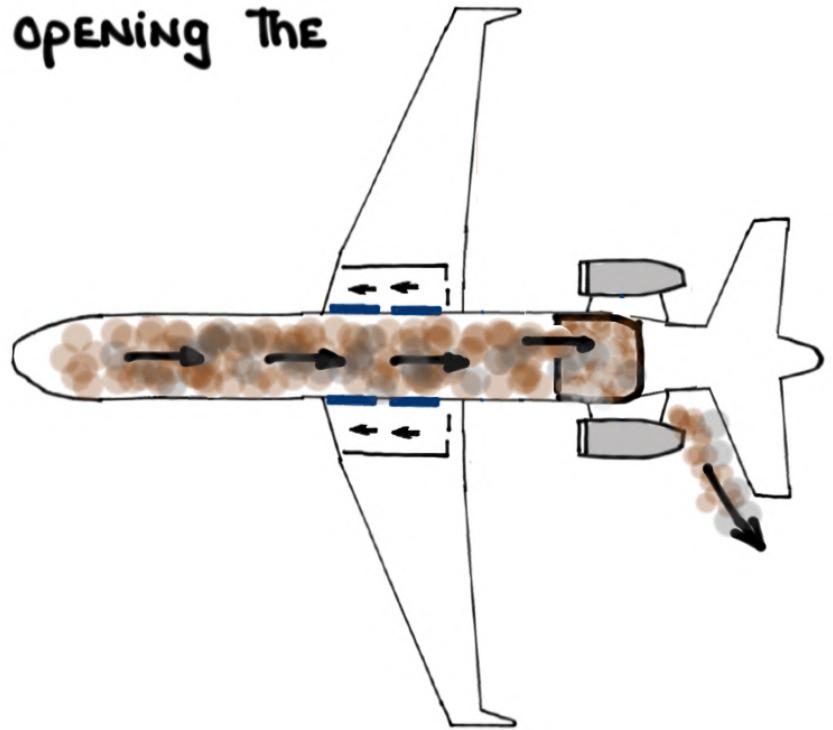
If on the ground a Fire Bell (located in the nose wheel well) will sound

SMOKE EVACUATION

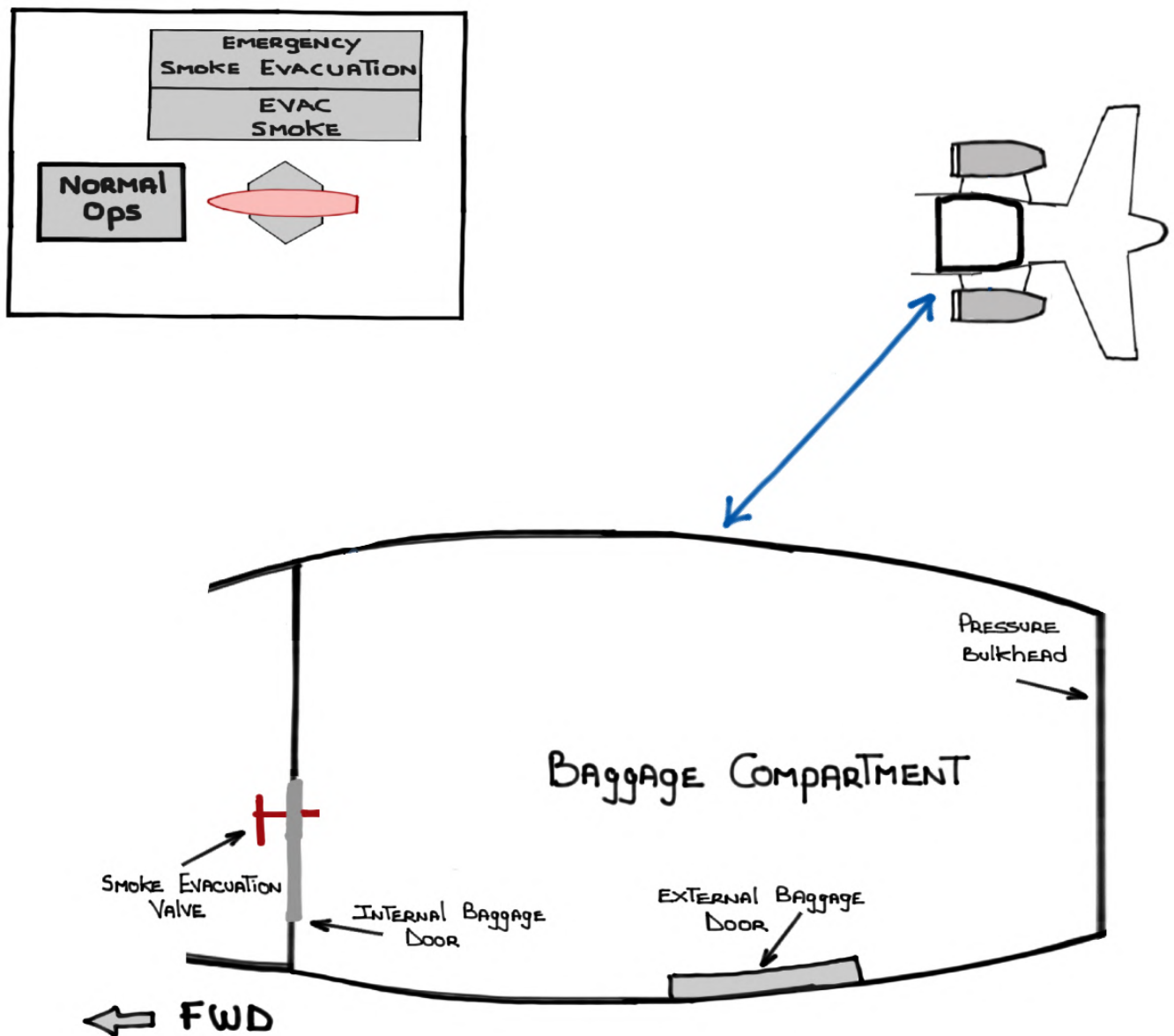
SMOKE IS VENTED OVERBOARD BY DEFLATING THE EXTERIOR BAGGAGE DOOR SEAL. DIFFERENTIAL PRESSURE FORCES THE SMOKE TO EXIT THE AIRCRAFT. THE SEAL CAN THEN BE REINFLATED TO RESTORE NORMAL PRESSURIZATION INSIDE THE BAGGAGE COMPARTMENT



SMOKE IN THE CABIN CAN ALSO BE VENTED OVERBOARD BY PARTIALLY OPENING THE INTERNAL BAGGAGE DOOR



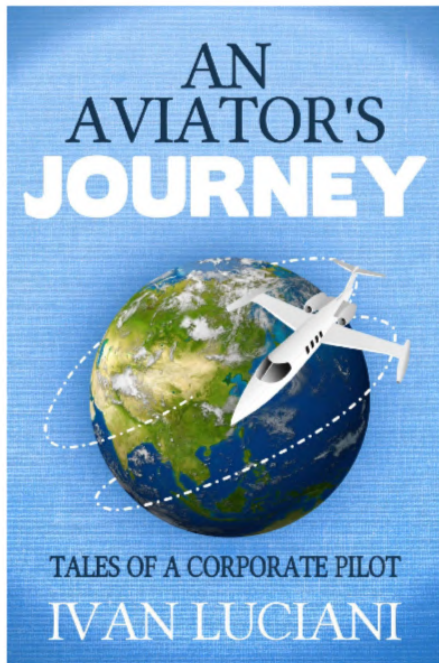
With The EMERGENCY SMOKE EVACUATION handle selected to **NORMAL Ops** The bleed air system re-inflates the EXTERNAL baggage door seal and the baggage COMPARTMENT is REPRESSURIZED



REMINDER: these system notes are intended for study purposes only. Always refer to official Gulfstream manuals and other approved references when operating your aircraft.

NOTE: these system notes are updated from time to time and what is posted on Code450.com will always be the most recent version.

Questions, comments or errors...please do send me an email:
ivan@code7700.com



Thank you!