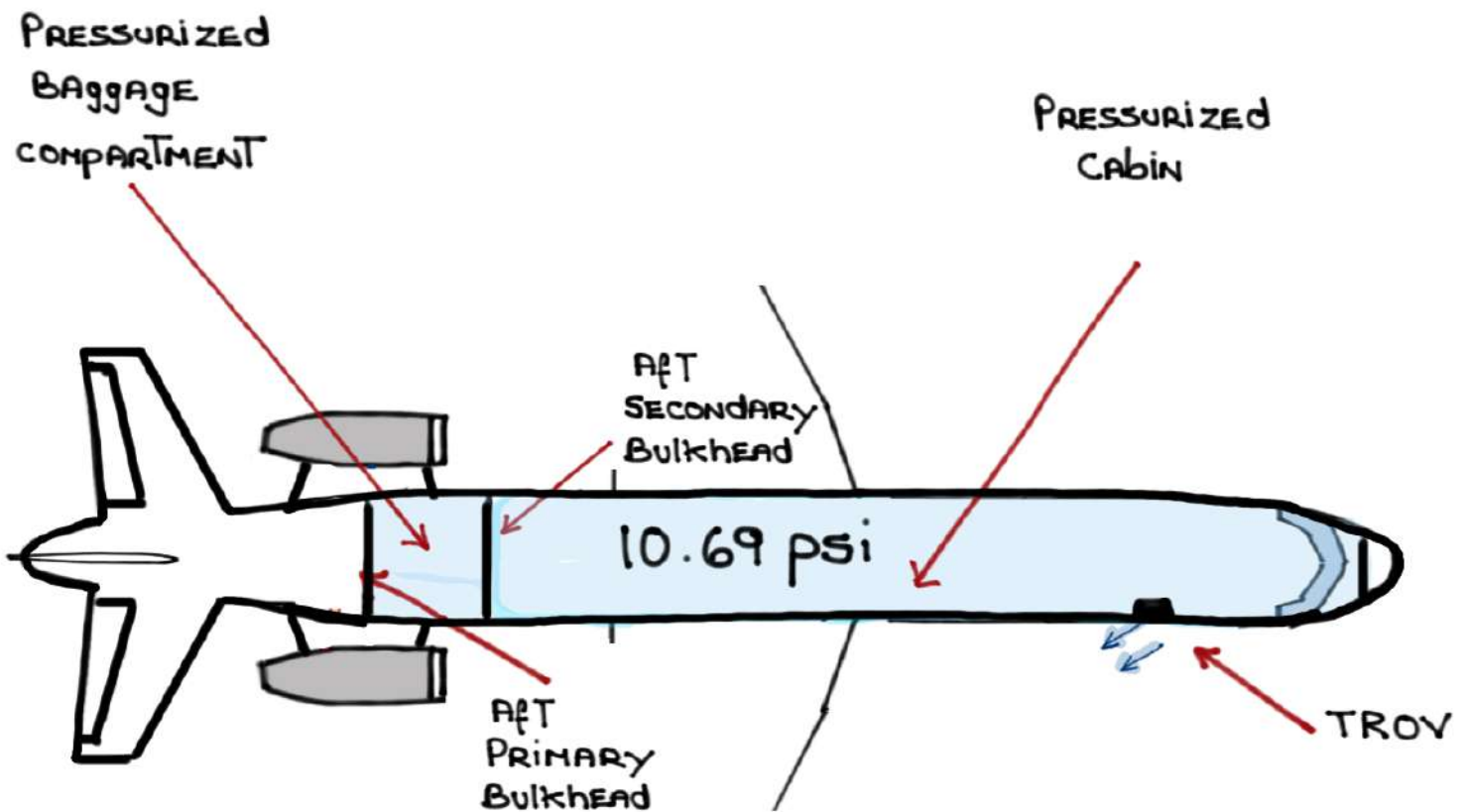
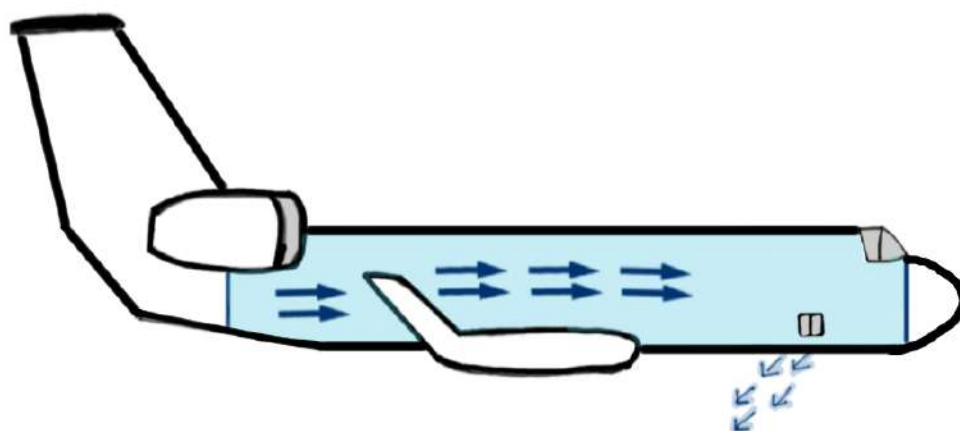


G500 PRESSURIZATION System

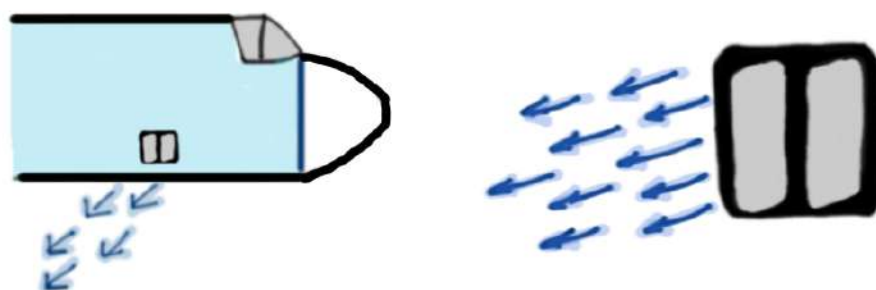


For study purposes only

The Pressurization System controls cabin pressure by modulating the Thrust Recovery Outflow Valve (TROV) in order to achieve and maintain an optimum cabin pressure of **10.69** Psi and a cabin altitude of **4,850'** at FL510

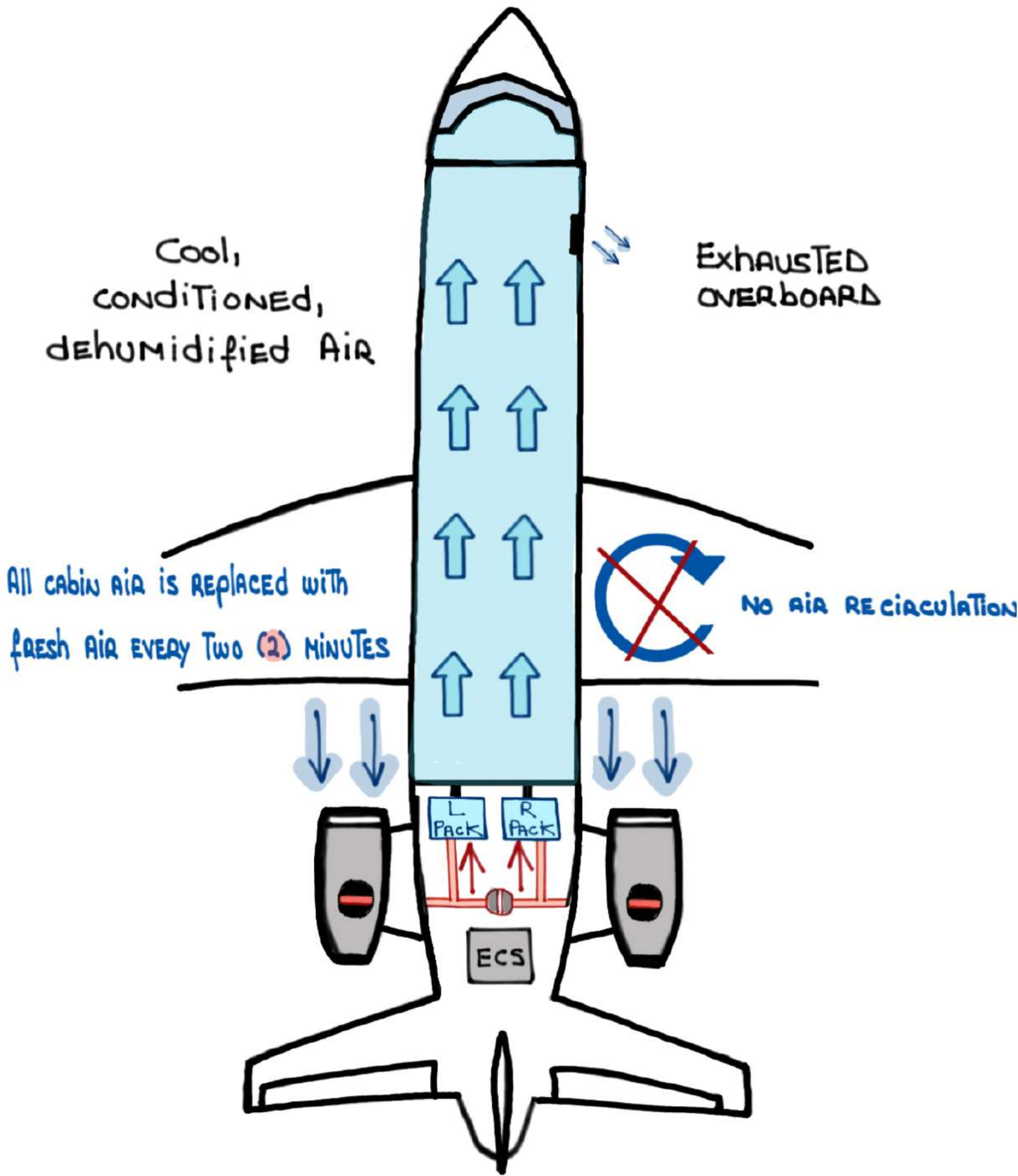


CABIN AIR EXITING VESSEL VIA:



THRUST RECOVERY
OUTFLOW VALVE
(TROV)

IN ORDER TO ACHIEVE
OPTIMUM CABIN PRESSURE



THREE (3) OPERATIONAL MODES

Mode: AUTO 1 (2)
SYSTEM Mode



Mode: SEMI 1 (2)
SYSTEM Mode



TWO (2) PRESSURIZATION MODES

PRESSURE PROFILE



PRESSURE PROFILE



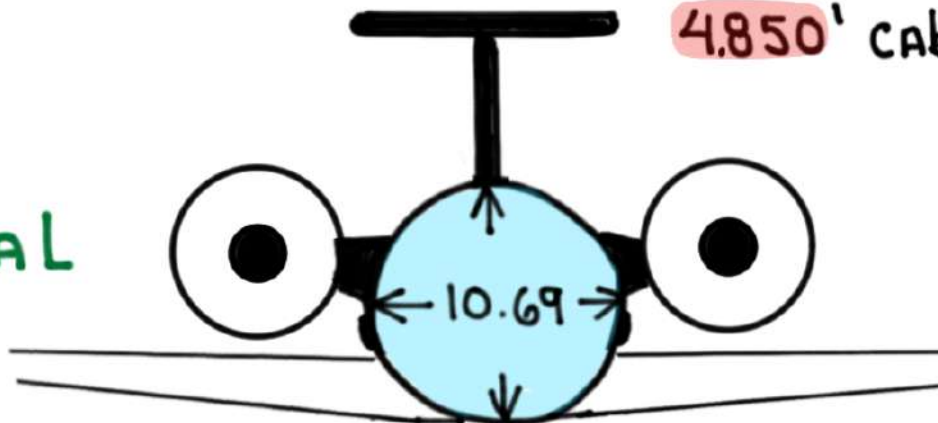
PSI Limits

FL 510

10.69 PSI

4,850' CABIN ALTITUDE

NORMAL

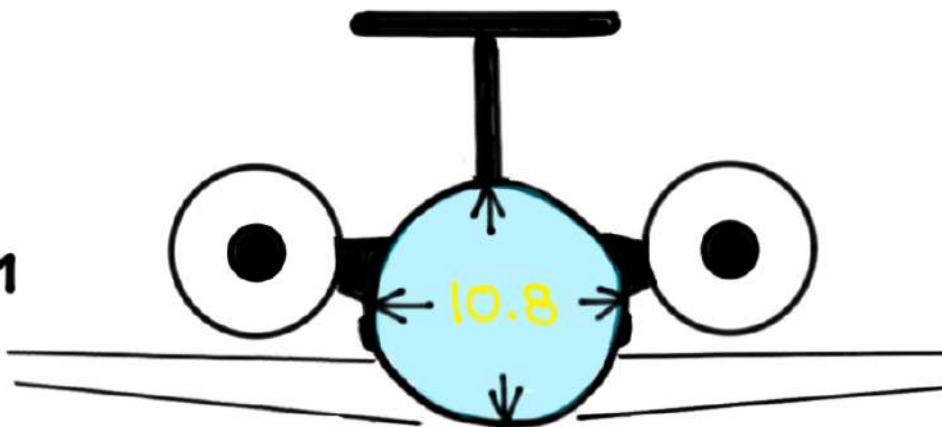




Cabin Differential High



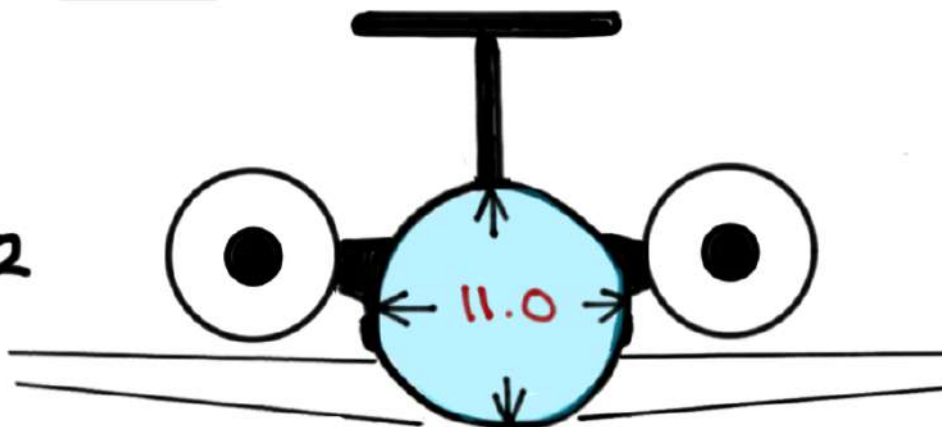
MAX 1



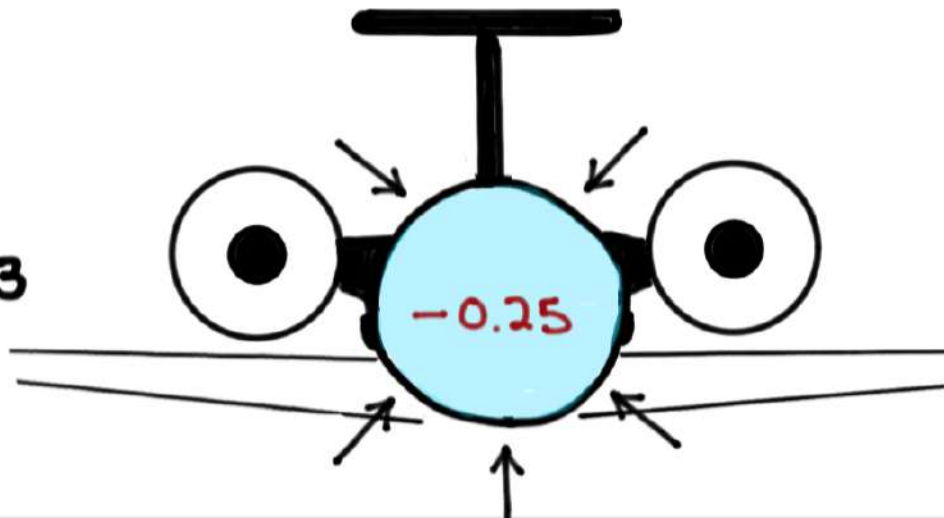
Cabin Differential High



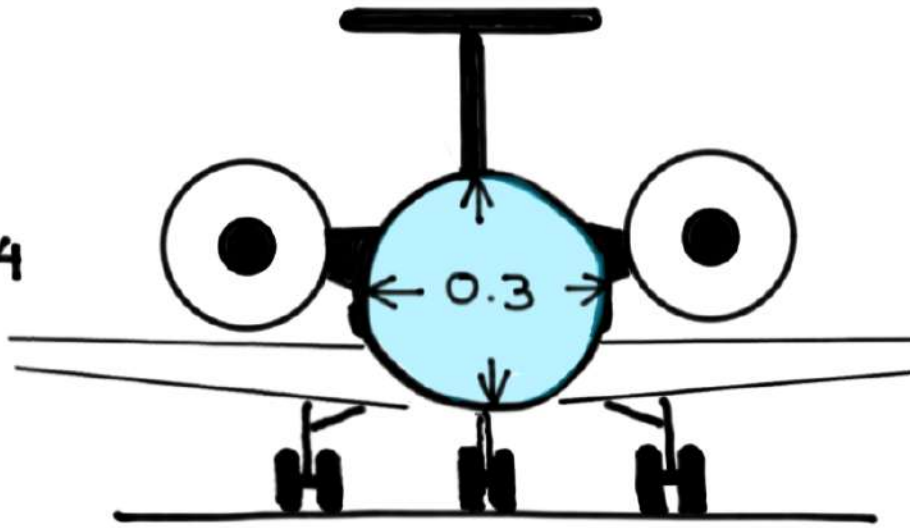
MAX 2

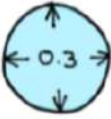


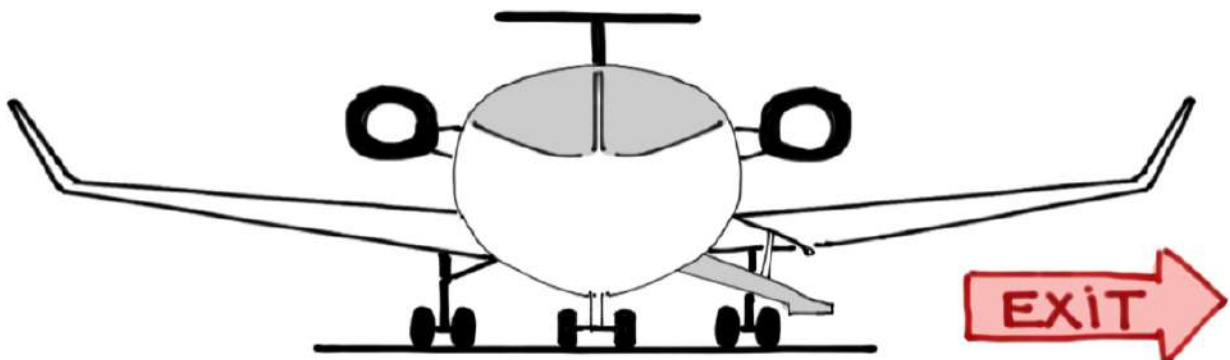
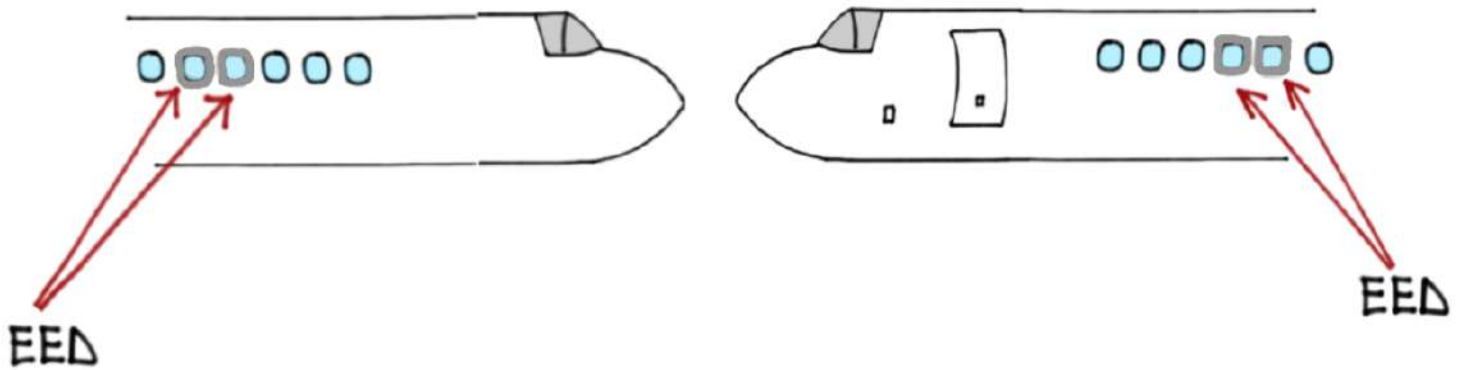
MAX 3



MAX 4

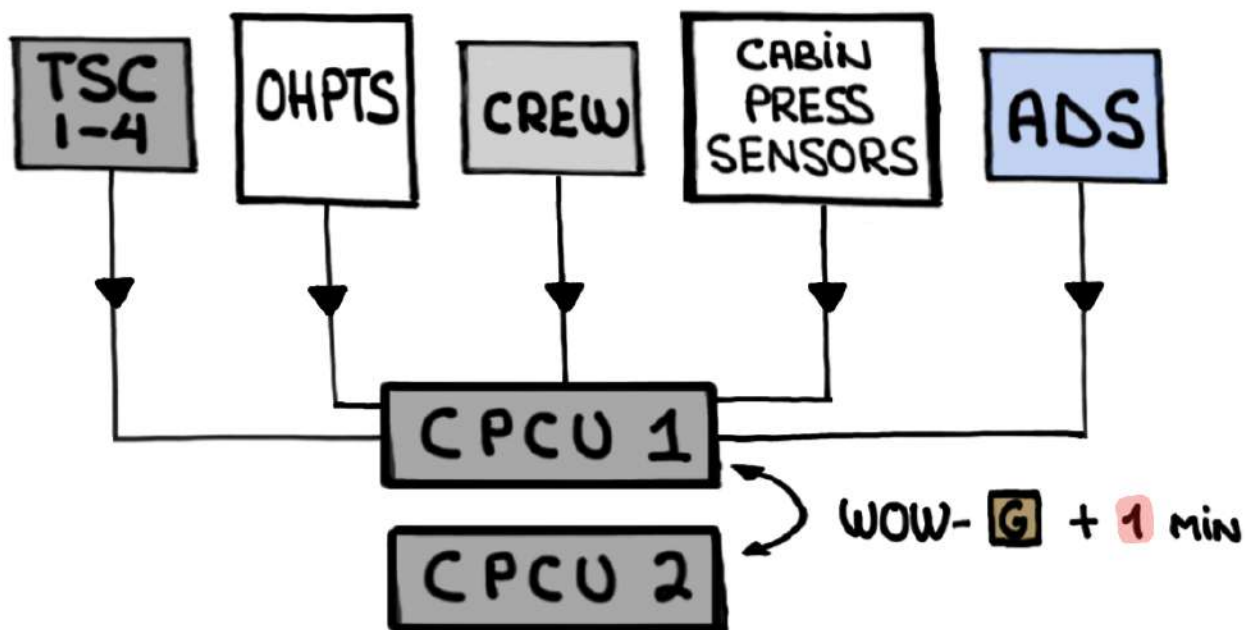


MAX  psi during TAXI, TAKEOFF AND LANDING
SO AS TO ALLOW THE OPENING OF THE **EMERGENCY**
EXIT DOORS (EED) AND MAIN ENTRANCE DOOR (MED)



CABIN PRESSURE CONTROL UNITS (CPCU)

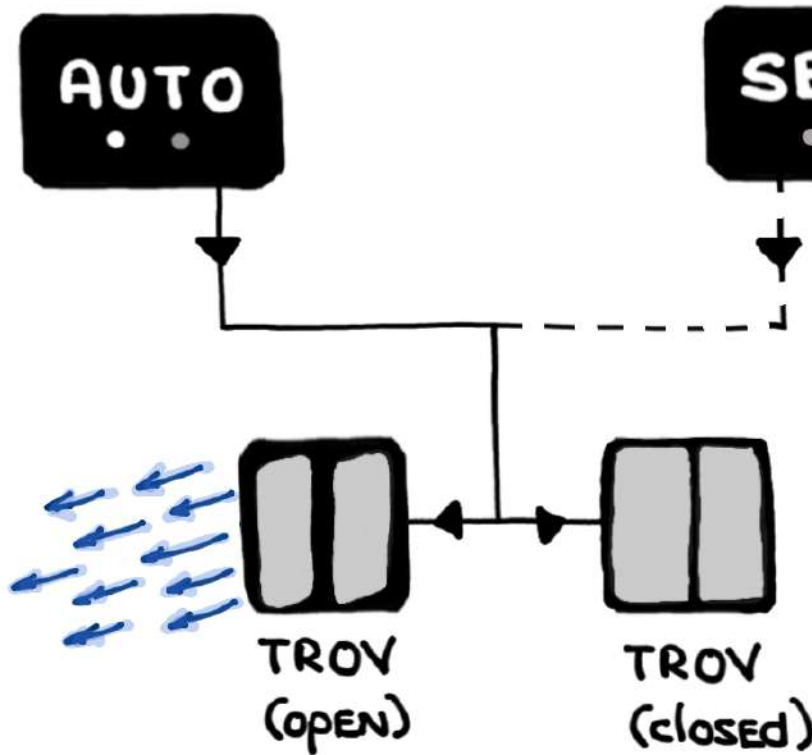
- BRAINS of the PRESSURIZATION SYSTEM
- THE CPCUs ARE MICROPROCESSORS THAT MAKE ALL LOGICAL DECISIONS ASSOCIATED WITH PRESSURIZATION
- ONE (1) CPCU IN CONTROL AT THE TIME WITH REMAINING CPCU ON STANDBY
- ACTIVE AND STANDBY ROLES SWITCH AFTER LANDING
WOW - **G** plus ONE (1) MINUTE
- THE CPCUs RECEIVE INPUT:



- **CPCU 1** **CPCU 2** ARE LOCATED BENEATH THE COCKPIT FLOOR
- CONTROL THRUST RECOVERY OUTFLOW VALVE when in

Mode: **AUTO 1 (2)**
SYSTEM Mode

Mode: **SEMI 1 (2)**
SYSTEM Mode



- REGULATE CABIN RATE OF CLIMB AND DESCENT by MODULATING THE TROV

- **CPCU 1** **CPCU 2** PROVIDE THE FOLLOWING INFORMATION AND DISPLAY IT ON OHPTCs:

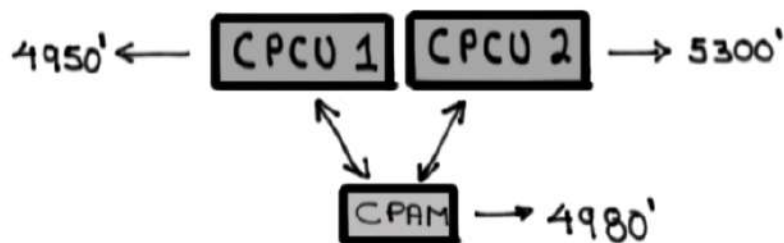
CABIN ALTITUDE, CABIN DIFFERENTIAL PRESSURE AND CABIN RATE OF CHANGE

CABIN PRESSURE ACQUISITION MODULE (CPAM)

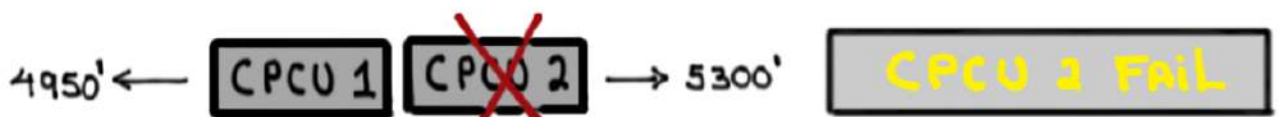
- SELF CONTAINED UNIT LOCATED BENEATH THE COCKPIT FLOOR
- STANDALONE SOURCE OF CABIN PRESSURE INFORMATION
- **CPCU 1** **CPCU 2** COMPARE CABIN PRESSURE DATA WITH EACH OTHER



- ARBITRATOR: USED IF **CPCU 1** AND **CPCU 2** DISAGREE
- IF THEY DIFFER BY $\geq 310'$ THEY THEN COMPARE EACH OTHER AGAINST THE **CPAM**



- $\geq 310'$ THAN THE **CPAM** CAUSES THAT CPCU TO FAIL



THRUST RECOVERY OUTFLOW VALVE (TROY)

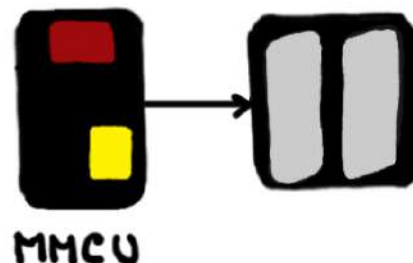


- The TROY is flushed MOUNTED ON LOWER SIDE OF RIGHT FORWARD FUSELAGE
- Butterfly plates open/close TO MANAGE ESCAPE OF CABIN AIR
- DRIVEN by 1 of 3 28 VDC MOTORS AT A TIME

Mode: AUTO 1 (2)
SYSTEM Mode

Mode: SEMI 1 (2)
SYSTEM Mode

- A MANUAL MOTOR CONTROL UNIT (MMCUC) allows for MANUAL CONTROL OF THE TROY



PRESSURE RELIEF VALVE (PRV)



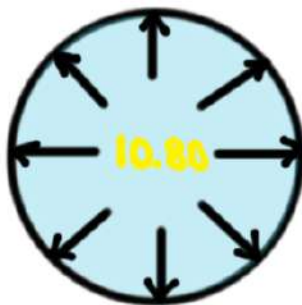
- THE PRV IS LOCATED JUST ABOVE THE TROV
- THE PURPOSE OF THE PRV IS TO PROTECT THE AIRCRAFT FROM DAMAGE DUE TO EXCESSIVE POSITIVE OR NEGATIVE PRESSURE

① POSITIVE DIFFERENTIAL PRESSURE RELIEF:

TWO (2) METERING SECTIONS

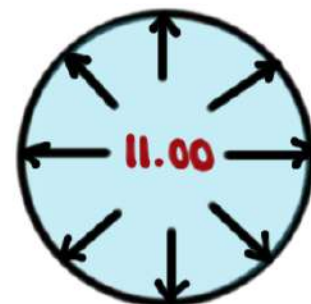
1ST CHAMBER OPENS AT:

Cabin Differential High



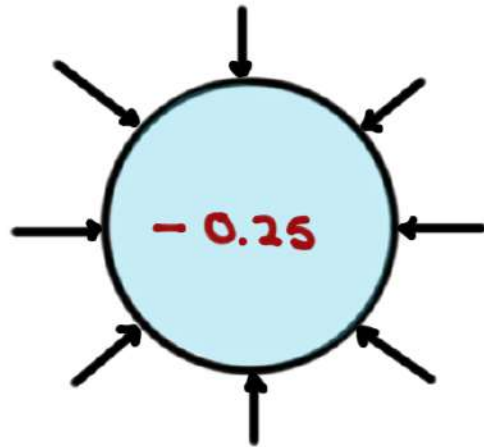
2ND CHAMBER OPENS AT:

Cabin Differential High



PSI

② Negative Differential Pressure Relief:

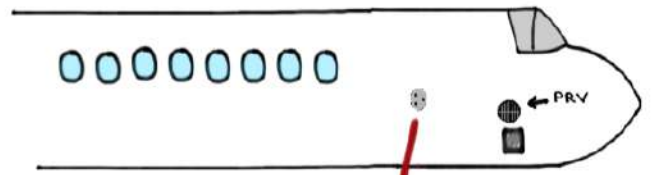


NO CAS MESSAGE

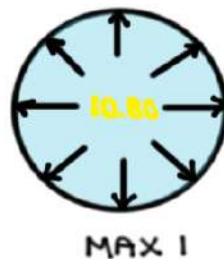
③ Ground Pressurization Limiting:

PRV opens sixty (60) SECONDS AFTER TOUCHDOWN

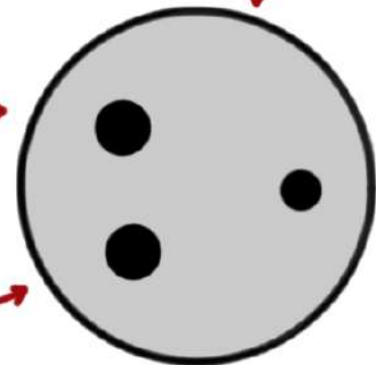
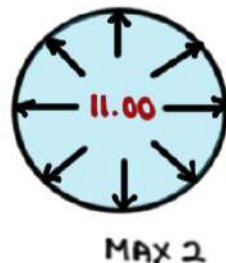
- INDEPENDENTLY SENSES CABIN PRESSURE USING AIRCRAFT STATIC PORTS LOCATED ON THE RIGHT SIDE OF THE FUSELAGE



FEEDS PRV
10.8 PSID
Relief



FEEDS PRV
11.0 PSID
Relief



AUTO MODE

Mode: AUTO 1
SYSTEM Mode



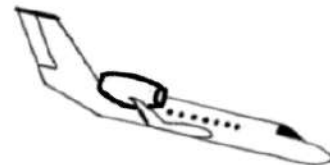
Mode: AUTO 2
SYSTEM Mode



- NORMAL MODE of OPERATION (fully AUTOMATIC)
- **CPCU 1** **CPCU 2** CONTROL PRESSURIZATION BASED ON PRESSURIZATION SCHEDULE
- **CPCU 1** **CPCU 2** RECEIVE INPUT FROM FMS DATA
- PRESSURE PROFILE MODES ARE AUTOMATIC



PRESSURE Profile

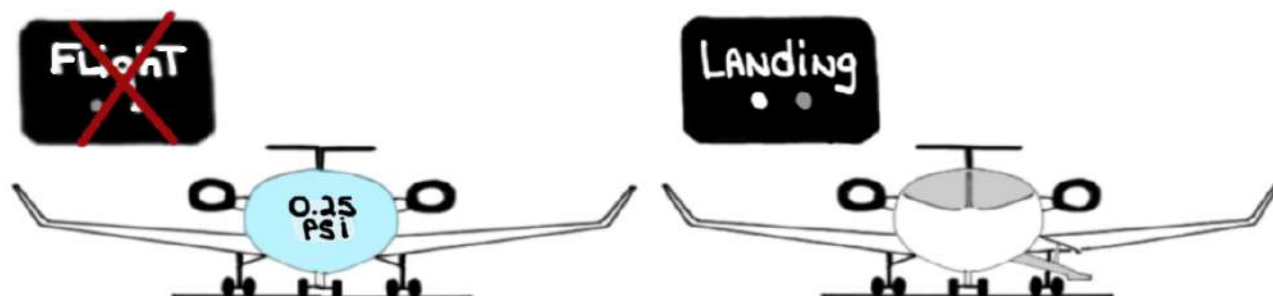


PRESSURE Profile



- PRE-PRESSURIZATION TO 0.25 PSI (APPROX. LFE - 500') INITIATED IF DOOR CLOSED AND ANY OF THE FOLLOWING OCCUR:
 - 1) TAXI SPEED > 9 KNOTS, OR
 - 2) THROTTLES ADVANCED $\geq 15^\circ$ THRUST LEVER ANGLE (TLA), OR
 - 3) MANUALLY SELECTED BY THE CREW

CAUTION IF RETURNING TO THE RAMP Deselect **Flight** IN ORDER TO DEPRESSURIZE THE CABIN PRIOR TO OPENING THE MAIN DOOR

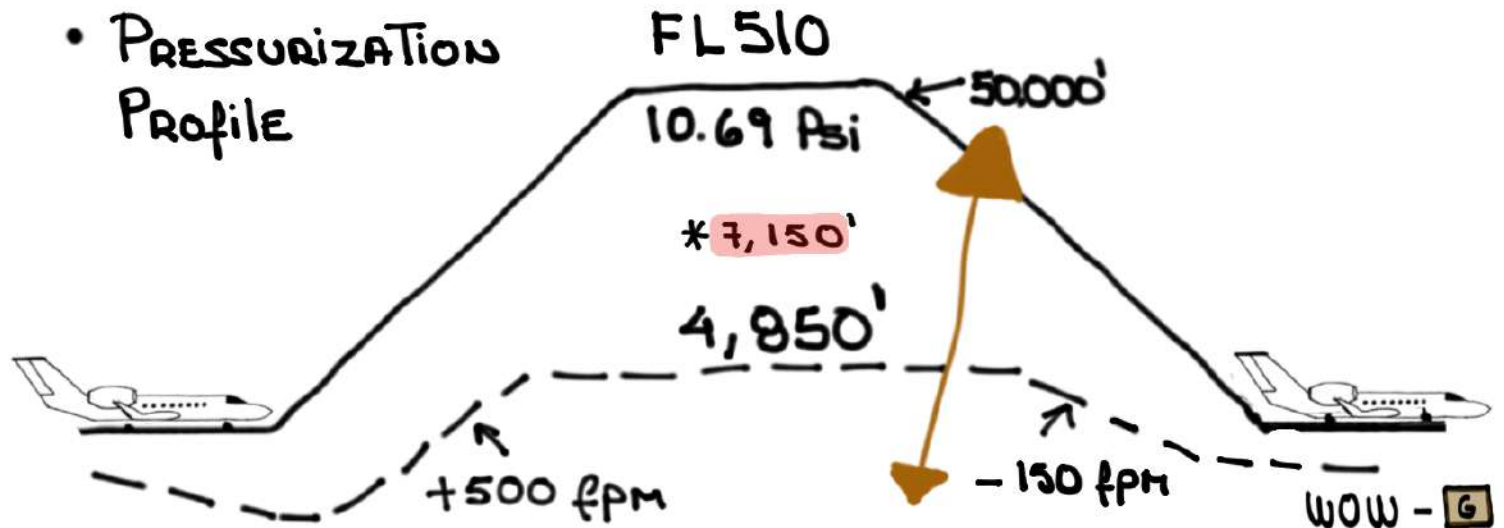


- CABIN RATE OF CLIMB AFTER TAKEOFF: 500 fpm
- DURING DESCENT AS THE AIRCRAFT CROSSES 1,000' BELOW CRUISE ALTITUDE PRESSURE PROFILE CHANGES FROM:

Flight To **Landing**

- If the aircraft levels off for 3-6 minutes \geq FL 250
The Pressure Profile changes from:

LANDING To FLIGHT



Taxi out
> 9 knots

FLIGHT

LFE - 500'
@ 300 fpm
 ΔP 0.25 Psi

1,000' below
CRUISE ALTITUDE

LANDING

LFE - 250'
@ 150 fpm

* 7,150' w/LFE > 10,000'

WOW - G:

- ① Cabin climbs @ 500 fpm for ONE (1) MINUTE to DEPRESSURIZE
- ② PRV opens sixty (60) SECONDS AFTER TOUCHDOWN

SEMI MODE

Mode: SEMI 1
SYSTEM Mode



Mode: SEMI 2
SYSTEM Mode



- ALTERNATE NORMAL MODE OF OPERATION (SEMI AUTOMATIC)
- SEMI MODE USED WHEN:

- FMS DATA NOT AVAILABLE OR IS INVALID
- DIRECTED BY THE CHECKLIST
- CREW DISCRETION $\left\{ \begin{array}{l} \text{QFE OPERATIONS} \\ \text{CREW WANTS MORE CONTROL} \\ \text{OVER THE SYSTEM} \end{array} \right.$

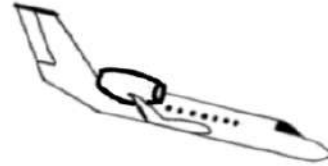
- CREW ENTERS DATA VIA TSC 1-4

MENU → SYSTEMS → CPCU TAB

- PRESSURE PROFILE MODES ARE AUTOMATIC



PRESSURE PROFILE



PRESSURE PROFILE



- LANDING FIELD ELEVATION (LFE) LIMITED TO < 10,000' *
IN SEMI MODE

Mode: SEMI 1 (2)

SYSTEM Mode



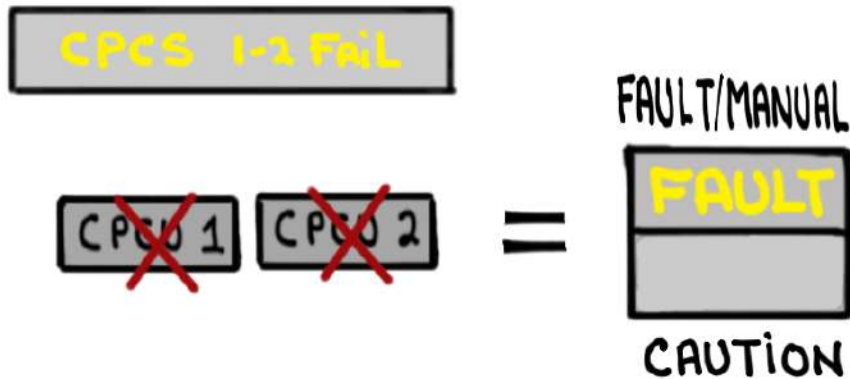
PRESSURE PROFILE



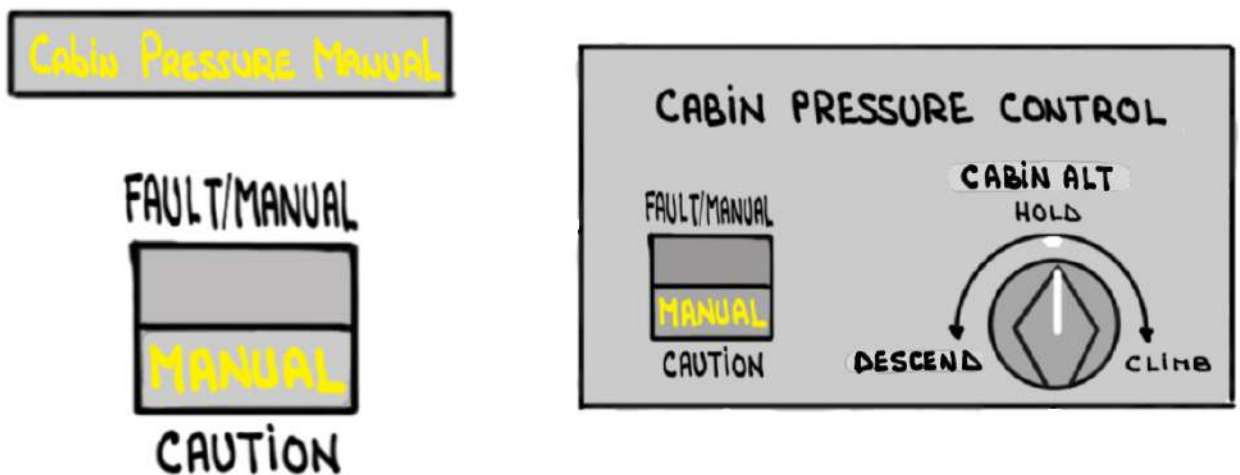
* EXCEPT IN AN EMERGENCY

MANUAL MODE

If ~~CPCU 1~~ ~~CPCU 2~~ ARE INOPERATIVE THE CREW CAN STILL CONTROL THE PRESSURIZATION SYSTEM



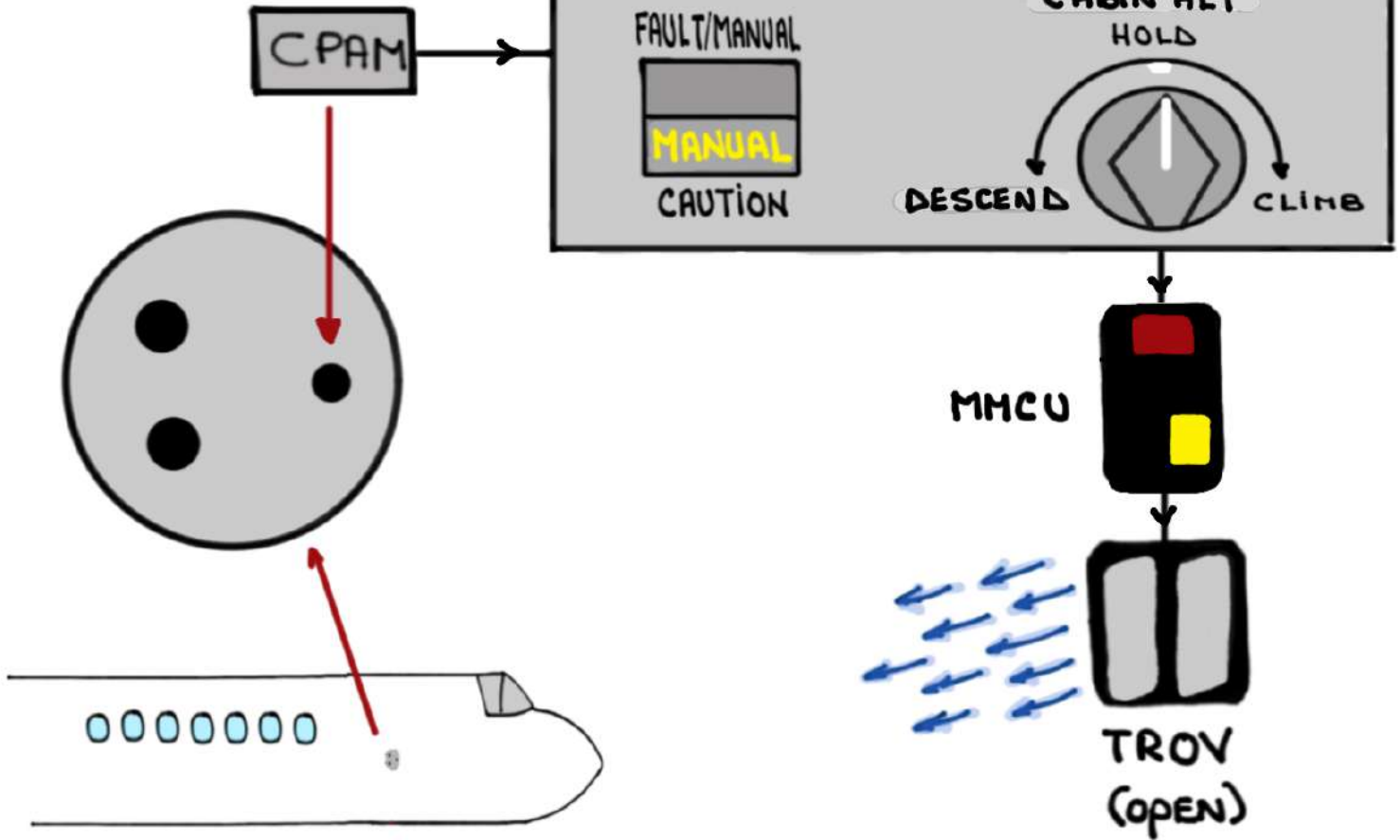
- The CREW SELECTS MANUAL MODE IN ORDER TO MANUALLY CONTROL THE TROV AND CLIMB, MAINTAIN, AND DESCEND THE CABIN



- The **CPAM** provides data

Cabin Pressure Manual

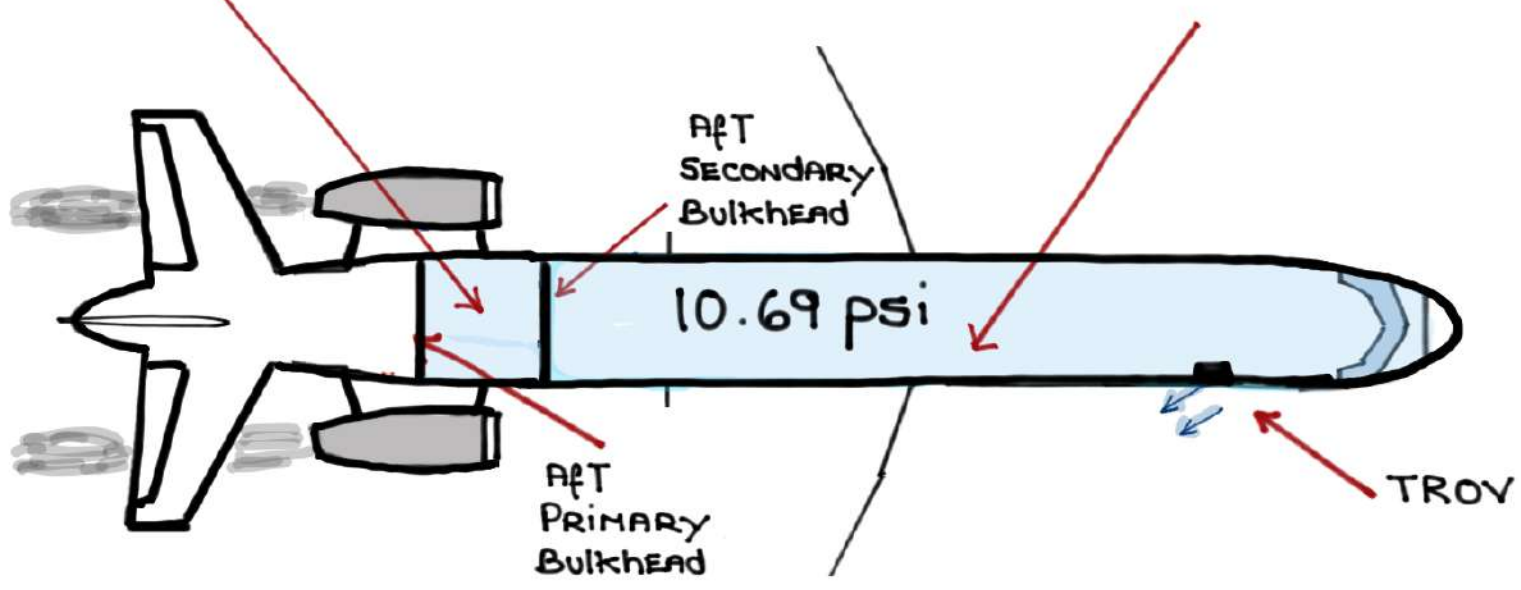
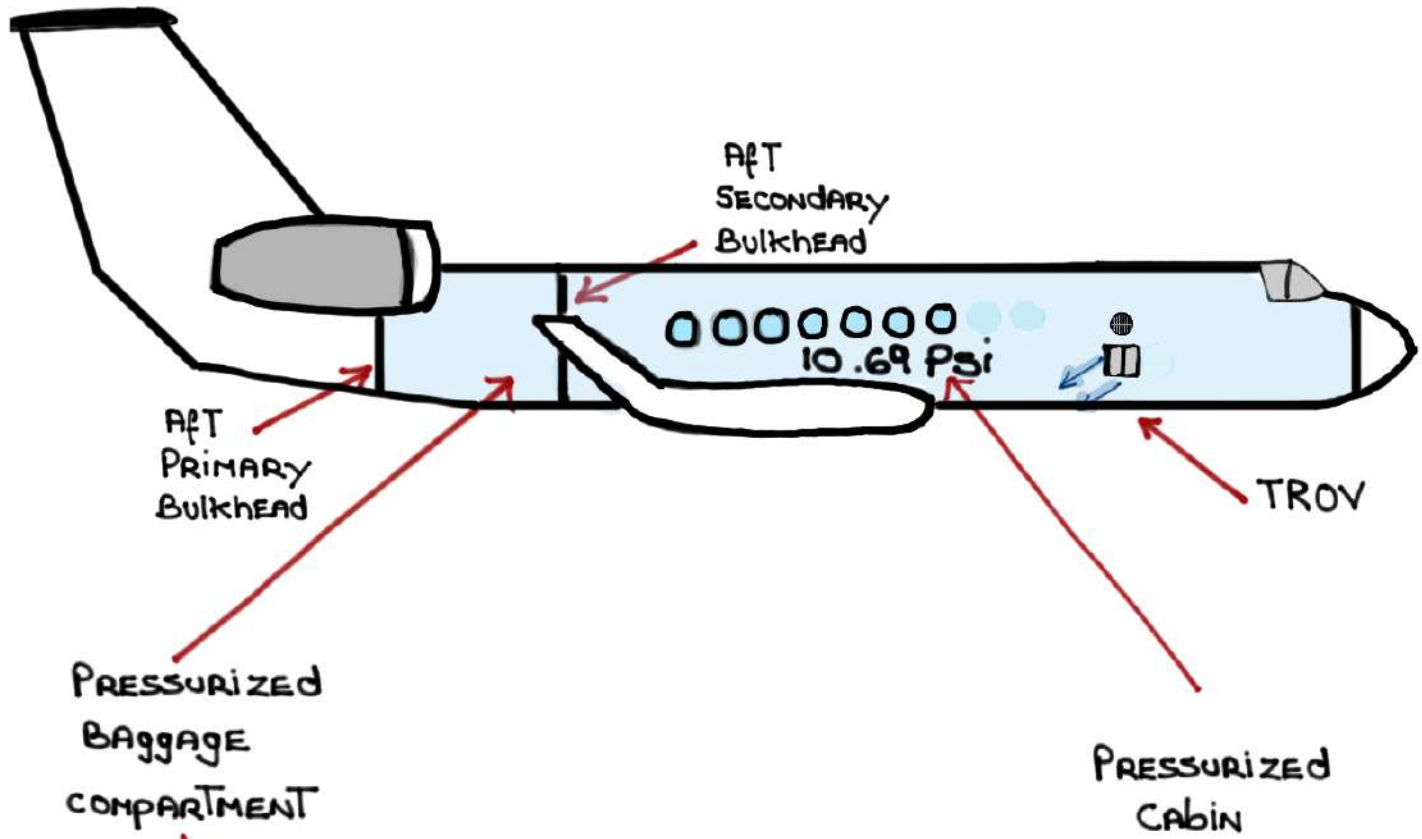
CABIN ALTITUDE
CABIN RATE
CABIN DIFFERENTIAL



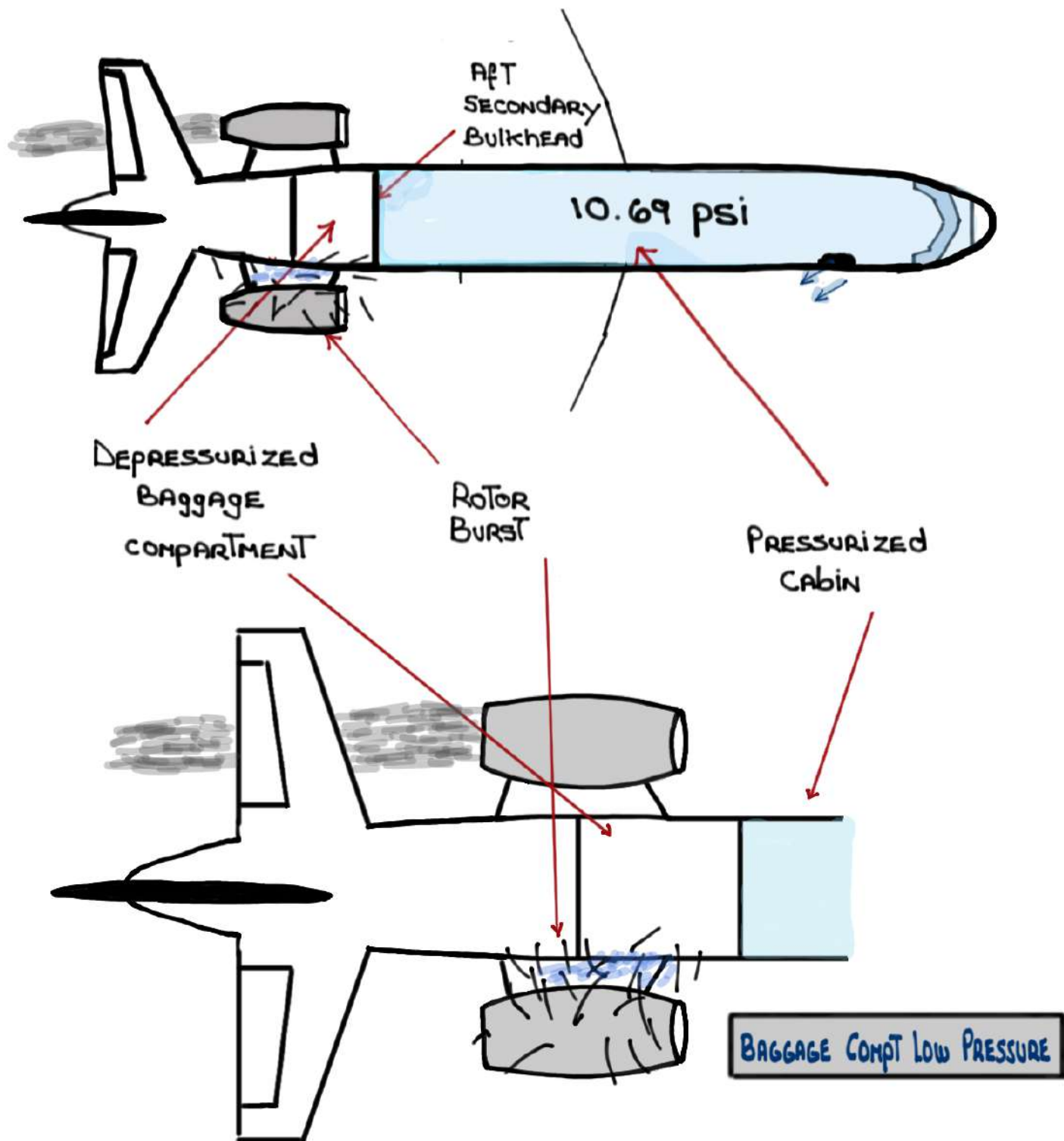
- CHANGES IN ENGINE THRUST AFFECT CABIN AIRFLOW. THIS CAUSES VARIATIONS IN CABIN PRESSURE AND RATES OF CHANGE

- MANUALLY CONTROLLING CABIN PRESSURE REQUIRES CONSTANT MONITORING AND CREW COORDINATION



ROTOR BURST/PRESSURIZATION



The physical location of the TROV, and the availability of the secondary pressure bulkhead, ensures that cabin pressurization is not affected



CABIN PRESSURE LOW TRIP POINTS

<u>Mode</u>	<u>LANDING FIELD ELEVATION</u>	<u>Cabin ALTITUDE</u>
FAULT/MANUAL  CAUTION	N/A	 8,000'

Mode: AUTO 1 (2)
System Mode



> 14,000'

≥ 15,500'

9,500' - 14,000'

≥ 14,500'

Mode: SEMI 1 (2)
System Mode



7,500' - 9,500'

≥ 10,000'

SEA LEVEL - 7,500'

≥ 8,000'

EMERGENCY DESCENT MODE (EDM)

Autopilot ON

AIRCRAFT ALTITUDE \geq FL400

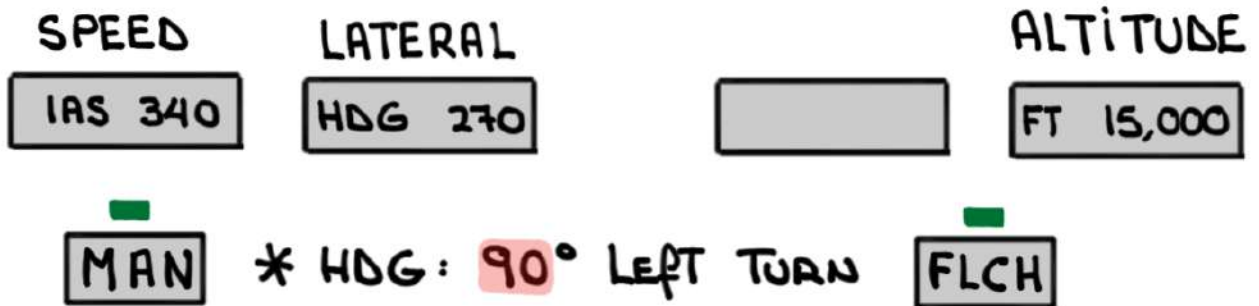
Cabin Pressure Low CAS MESSAGE

- ① AutoThrottles engage if desengaged
 - Throttles Retard to idle
 - FMA Power display on PFD → **FLCH**
- ② GP Lateral Mode - deselected
 - FMA Lateral display on PFD → **EDM**
 - Command **90°** Left Turn
- ③ GP Vertical Mode - FLCH
 - FMA Vertical display on PFD → **IAS** with ASEL
- ④ GP Speed mode - MAN
 - VMO (**340** knots) displays on Speed window
- ⑤ Altitude - **15,000'** in Preselect window
- ⑥ Speed Brakes extend automatically as speed increases above **0.91M/315** KCAS (handle doesn't move)

- FLIGHT MODE ANNUNCIATOR (FMA)



- GUIDANCE PANEL (GP)



- LEVEL OFF

- FMA VERTICAL display on PFD → ASEL → ALT
- FMA Speed display on PFD → 340 → 250
- SPEED BRAKES RETRACT AT 270 KNOTS



- CANCELING EDM:

- AP DISCONNECT BUTTON ON SIDESTICK, OR
- Deselect on GP

Oxygen Requirements / Operations

Above 41,000' ONE pilot MUST BE ON oxygen - FAR 91

CREW AND PASSENGER MASKS NOT APPROVED FOR USE
ABOVE 40,000' CABIN ALTITUDE

Above 35,000' ONE pilot MUST BE ON oxygen if THE
OTHER pilot LEAVES THE cockpit - FAR 91

PASSENGER MASKS will NOT provide sufficient oxygen
ABOVE 34,000' CABIN ALTITUDE

Above FL250 CREW MASKS MUST BE IN THE quick
donning position which allows donning within
five (5) SECONDS

AUTOMATIC deployment of PASSENGER oxygen MASKS
AT 14,750' ± 250' (15,750' ± 250' with ALT SELECT)

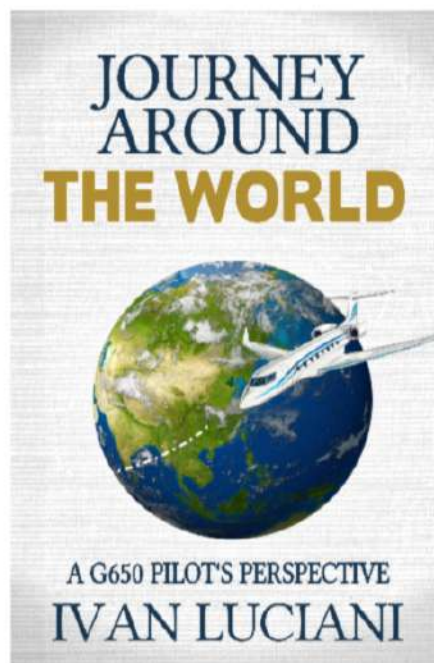
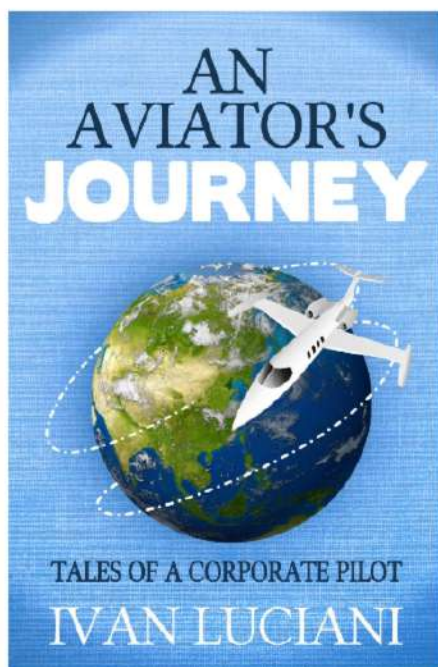


REFER TO AFM 01-35-10 TO DETERMINE REQUIRED oxygen
QUANTITY FOR DEPARTURE

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.luciani@gmail.com



Thank you!