Introduction to Aerospace Propulsion

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Lecture No - 39
A glimpse into the future of Aerospace Propulsion
A Diesel engine powered propeller for aircraft

Diesel engines are CI engines and are too heavy for aircraft. But, modern light & strong materials are used for developing new aircraft–worthy diesel engines.
Small Gas turbine powered propeller engines – Turbo-props
Prop-Fans or Unducted Fans

Size – In between a Big Fan and a Propeller

Bypass Ratio – 20 to 30
Counter Rotating Prop-Fans

Prop-Fans are designed using both the propeller theory and the compressor blade design methods.
All civil aircraft engines will need to conform to

Energy Audit

Environment Audit
Ramjet Wrapped around a Turbojet

Mainly Turbojet

Low Mach number

Mainly Ramjet

High Mach number

Wraparound Turboramjets
RAM – SCRAMJET schematic
Missile configuration
PSLV Launch – used for Chandrayan-I

The PSLV has four stages using solid and liquid propulsion systems alternately.

The first stage is one of the largest solid-fuel rocket boosters in the world.
GSLV-D3 -to be used for Chandrayan-II

1) The GSLV uses four liquid strap-on boosters, which are loaded with hypergolic propellants (UDMH & N₂O₄)
2) 1st Stage is of solid fuels
3) 2nd Stage with liquid UDMH as fuel and nitrogen tetroxide (N₂O₄) as oxidizer
4) The 3rd stage is propelled by a cryogenic rocket engine (LoX+LH)
This closes the course on

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