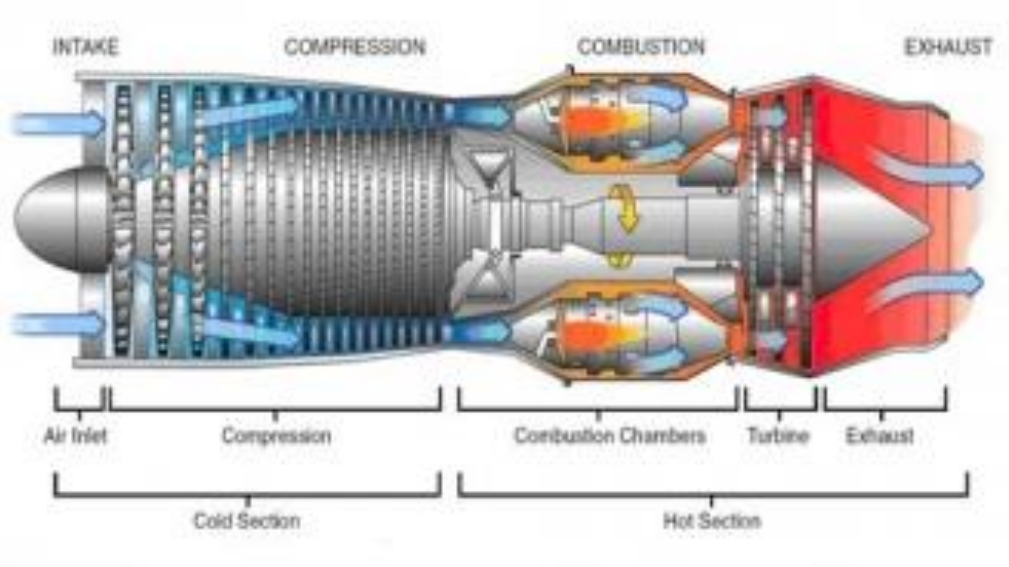
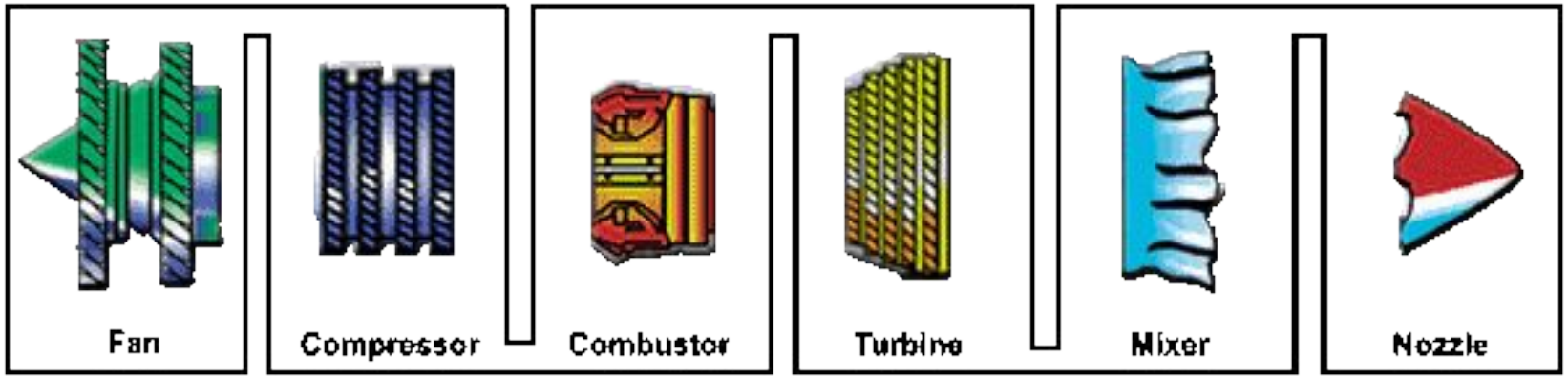
How do aircraft jet engines work?

- The first jet engine was built by Egyptian scientists during 100 B.C
- This device was known as **Aeolipile**.
- It is also called as **the Hero's Engine**

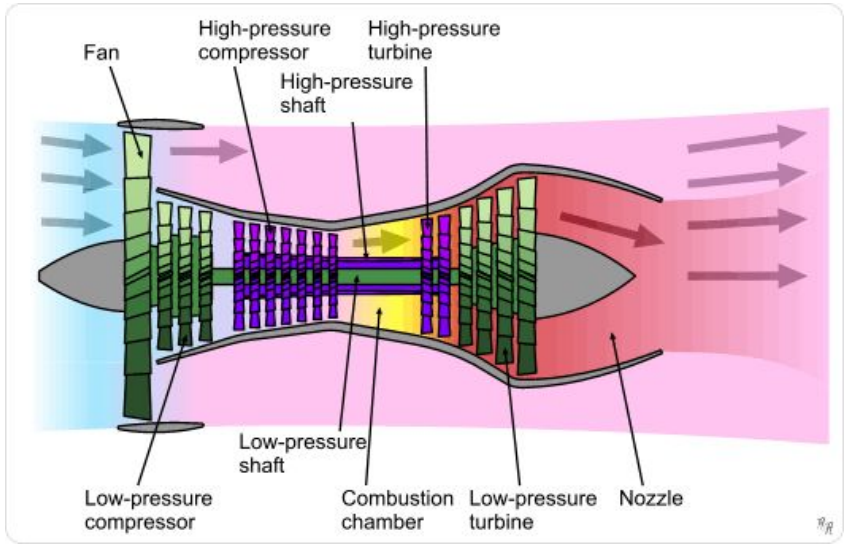
- Jet engine is nothing but a Gas turbine.
- It works under the principle of Newton's third law
- It states that "For every acting force there is an equal and opposite force"
- Gas turbine operates like toy balloon



Parts Of Jet Engine

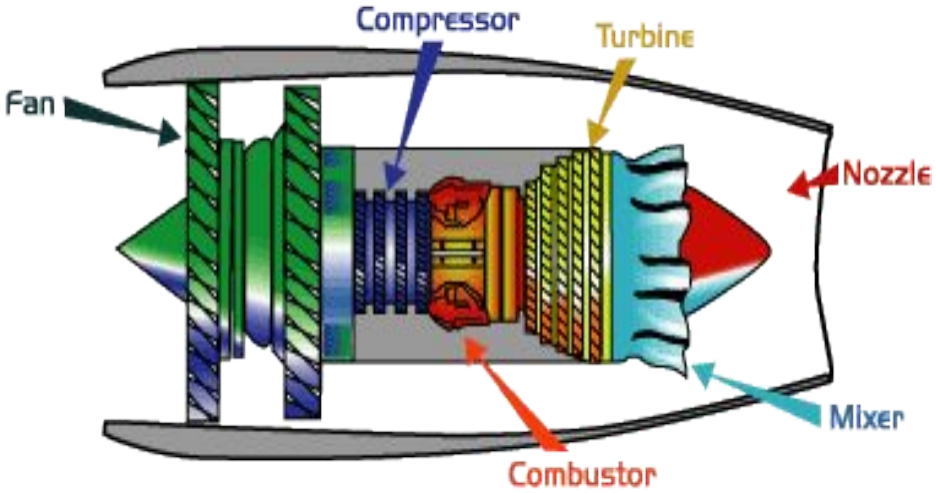


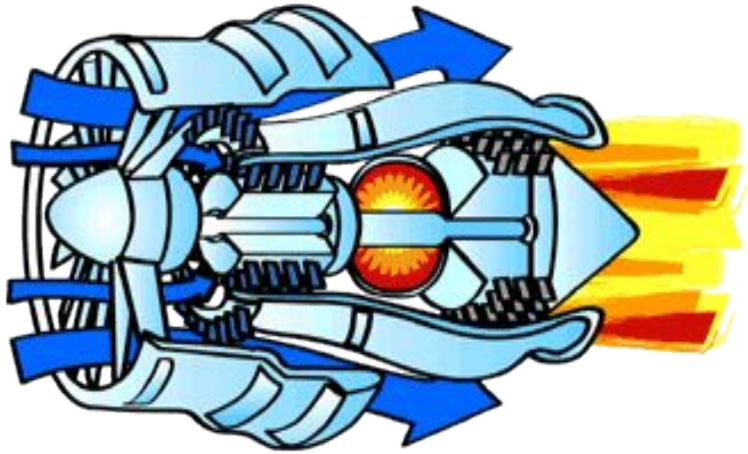
- FAN
- COMPRESSOR
- COMBUSTOR
- TURBINE
- MIXER
- NOZZLE



How A Jet Engine Works ?

- Jet engines move the airplane forward with a great force that is produced by a tremendous thrust and causes the plane to fly very fast.





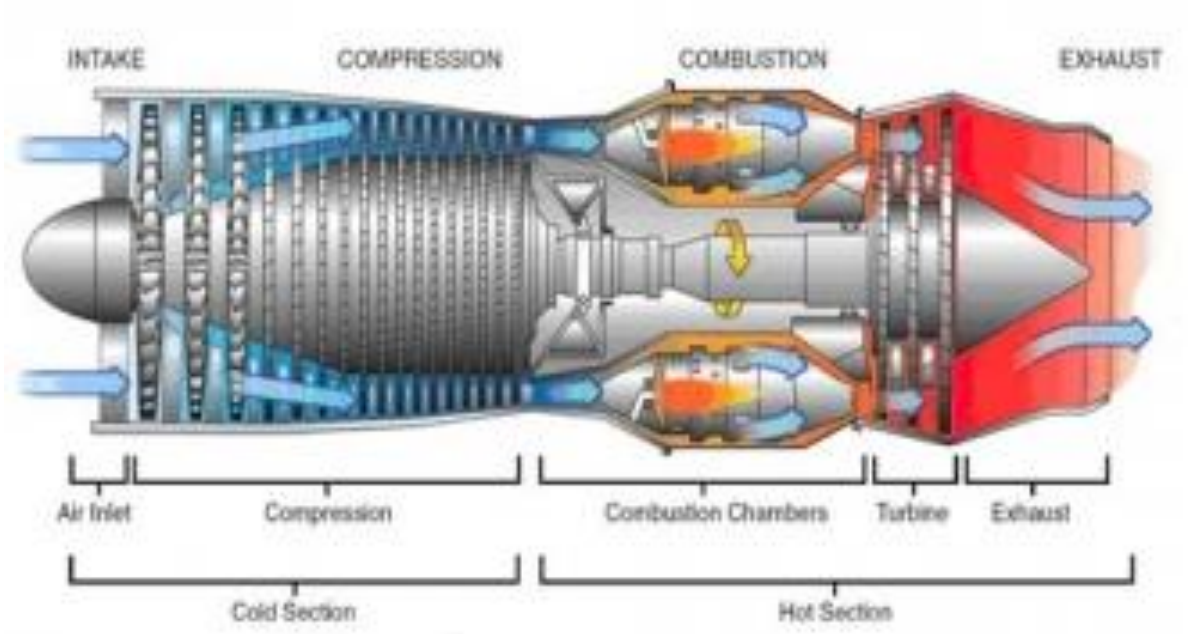
How A Jet Engine Works ?

Air Intake

- Sucked in by the compressor

Compressor

- Series of vanes and stators
- The vanes rotate, while the stator remains stationary
- Compressor speed and temperature increases gradually



How A Jet Engine Works ?

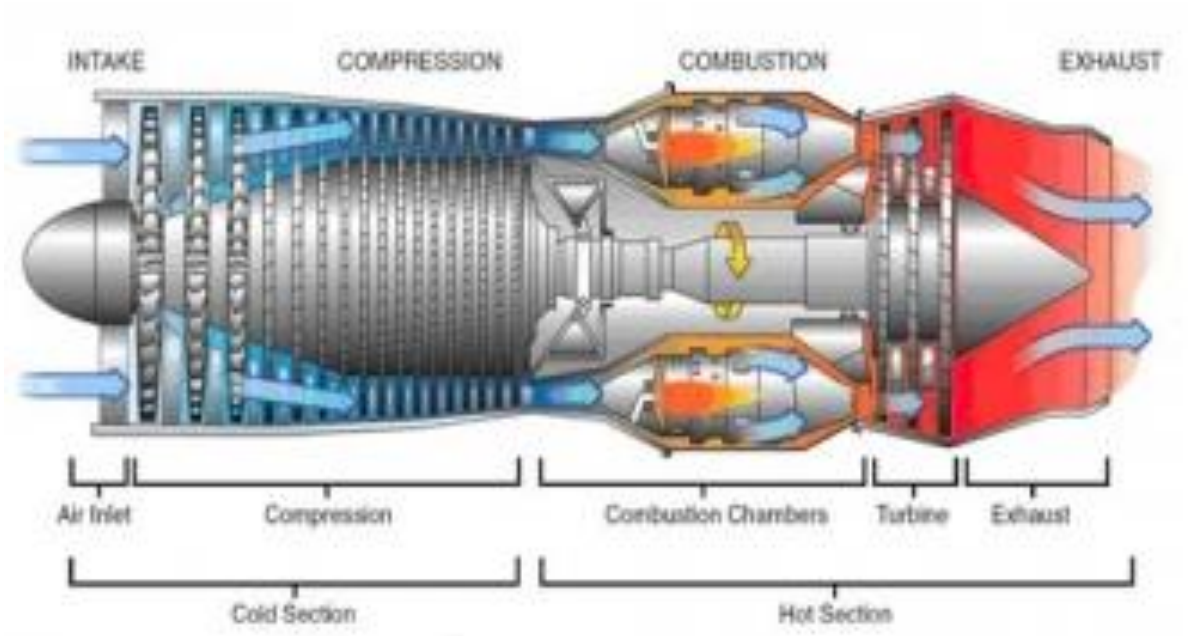
Fuel Burner

- Fuel is mixed with the air, and electric sparks light the air, causing it to combust

Combustion Chamber

- The air is burnt

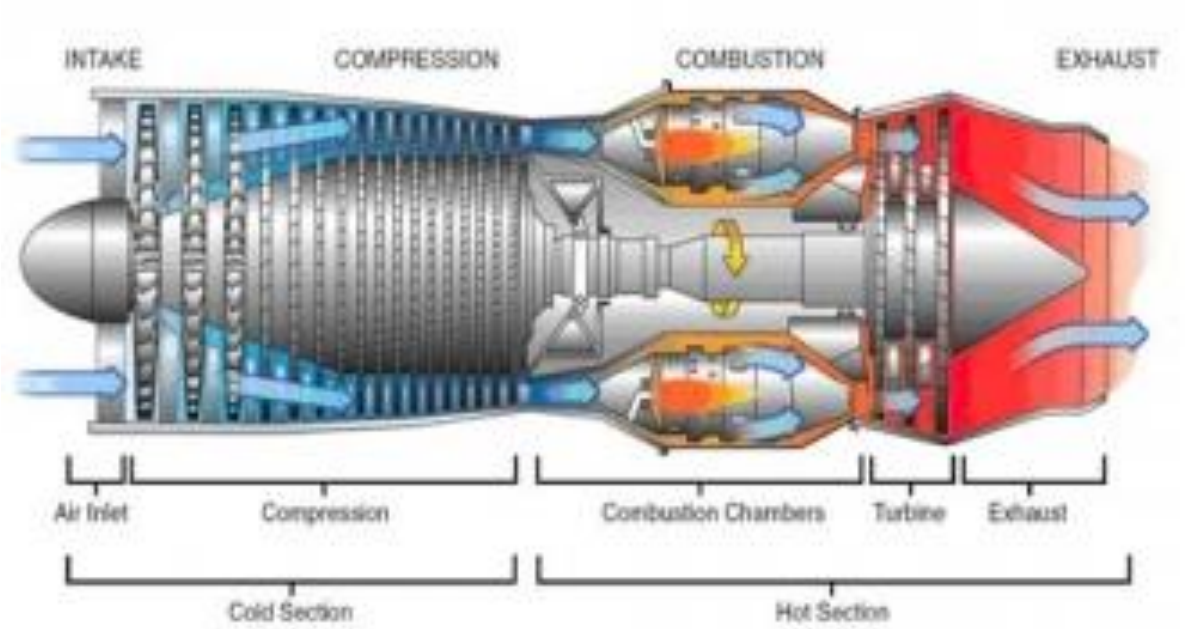
- Increase in the temperature of the air, thus increases the pressure inside the engine



How A Jet Engine Works ?

Turbine

- Works like a windmill
- The blades gain energy from the hot gases moving past them
- This movement is used to power the compressor



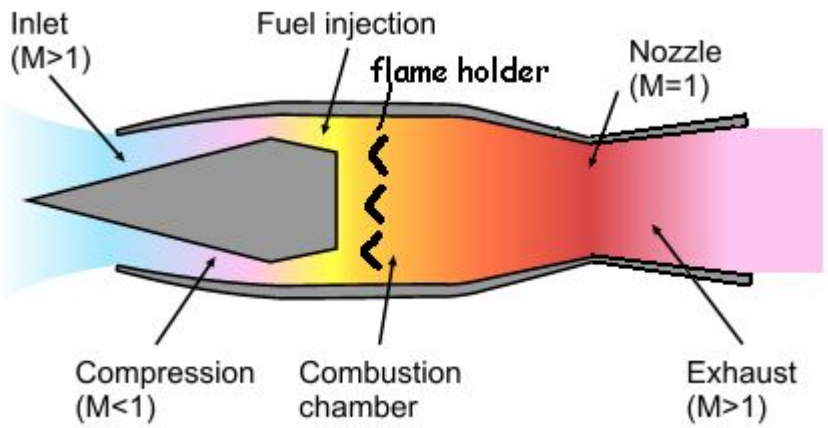
Jet Pipe and Propelling Nozzle

- The hot air rushes out of the nozzle
- High pressure
- Hot air rushes out at very high speed

Types Of Jet Engines

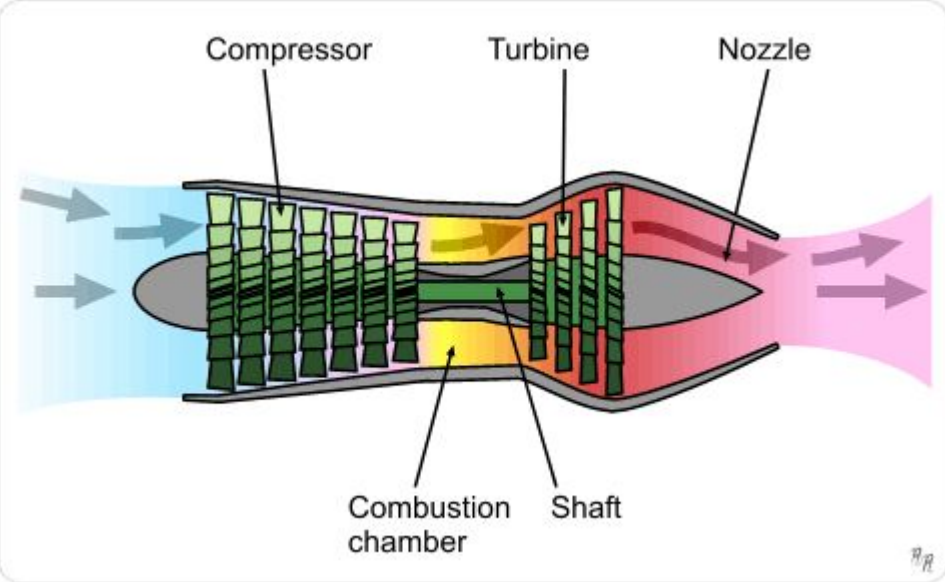
- Ramjet
- Turbojet
- Turbofan
- Turboprop
- Turbo shaft

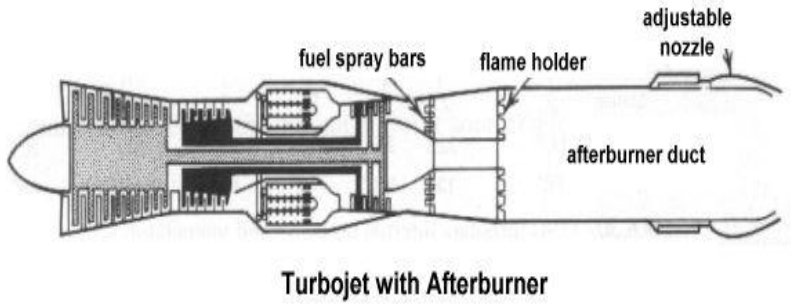
Ramjet



- It has no moving parts
- Its compression ratio depends on forward speed
- It has no static thrust
- Guided-missile systems, Space vehicles use this type of jet

Turbojet

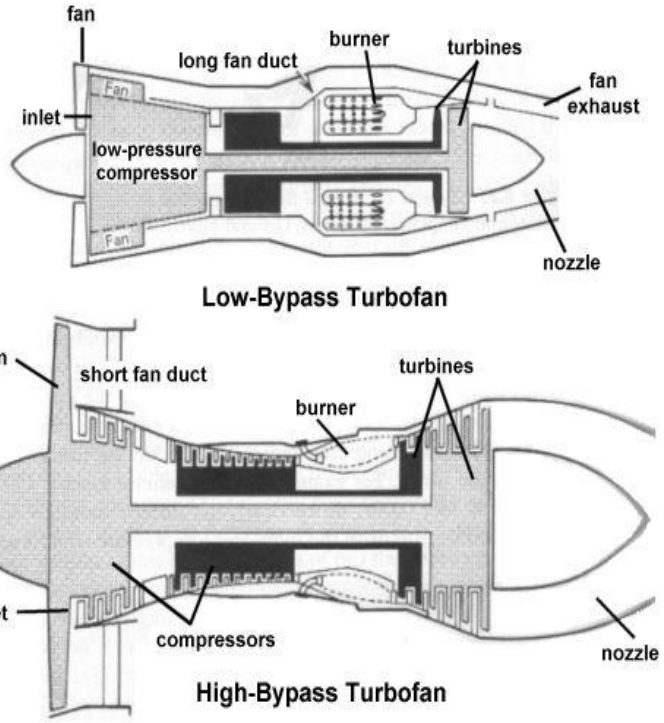




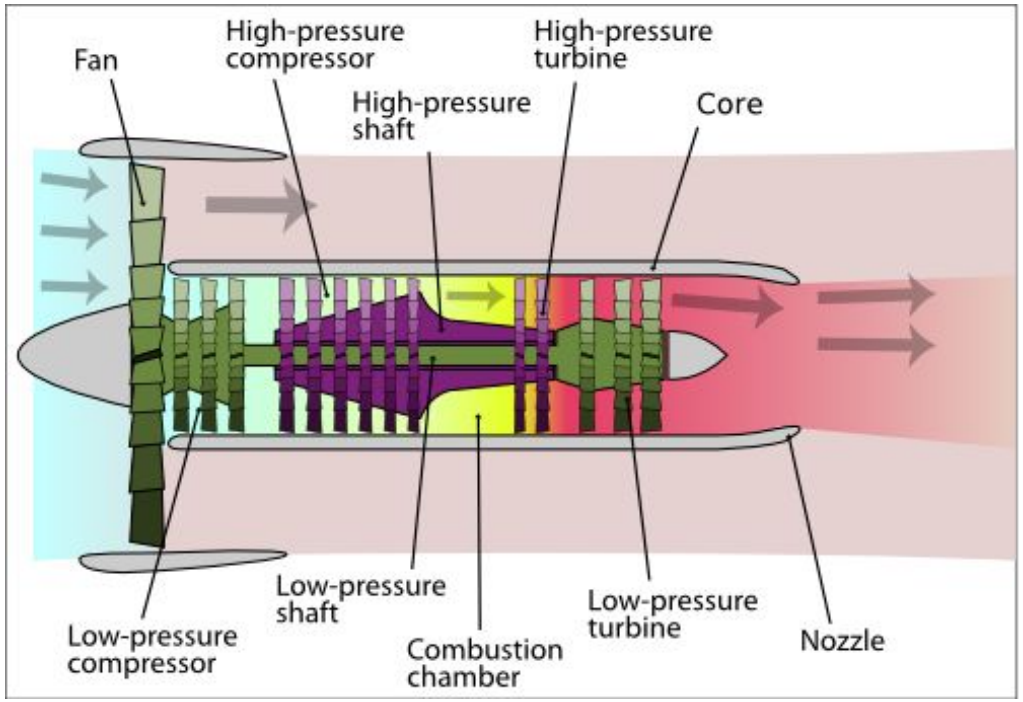
Turbojet with Afterburner

- The turbojet engine is a reaction engine
- Substantial increases in thrust can be obtained by employing an afterburner

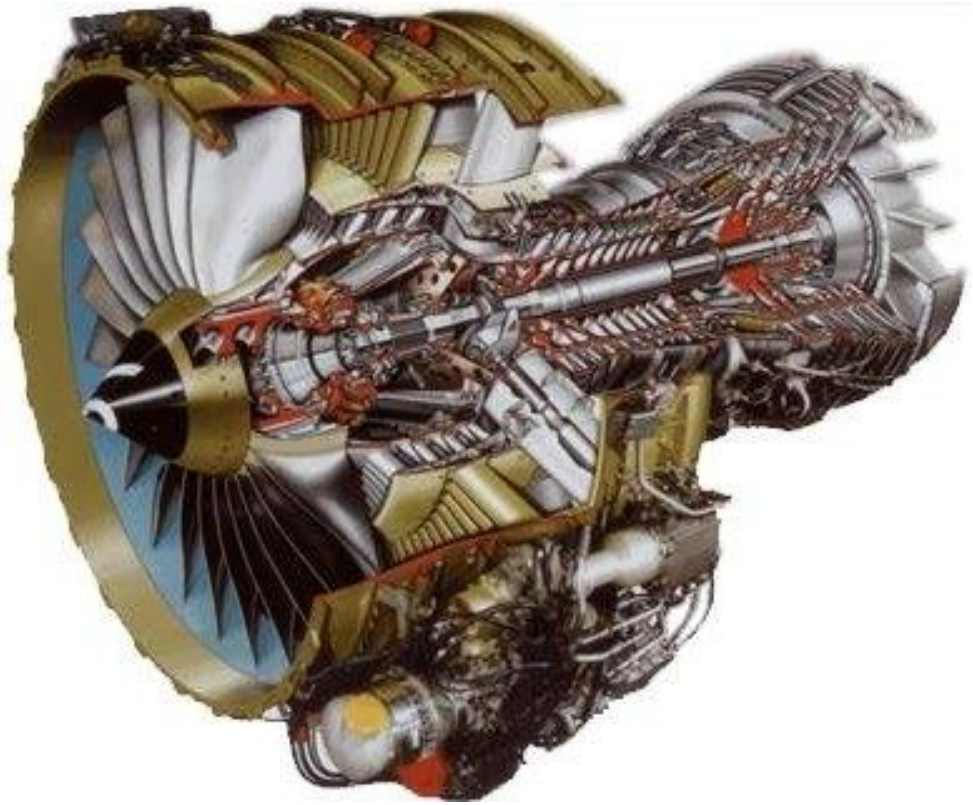
Turbofan



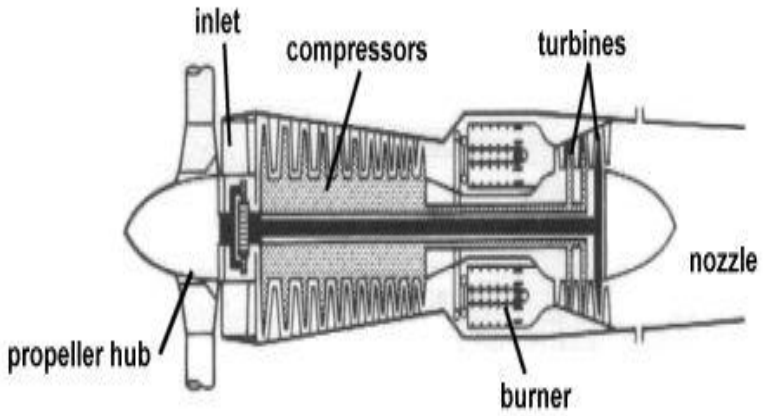
- The objective of this sort of bypass system is to increase thrust without increasing fuel consumption.
- It achieves this by increasing the total air-mass flow and reducing the velocity within the same total energy supply.
- 75% of thrust is produced by the fan.



A Turbofan Aircraft Engine:



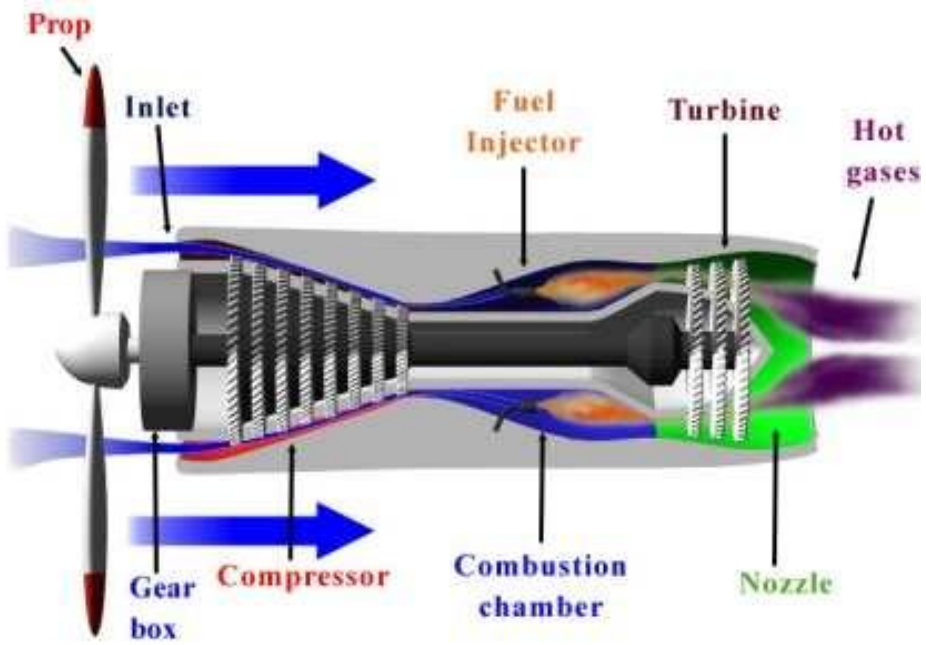
Turboprop



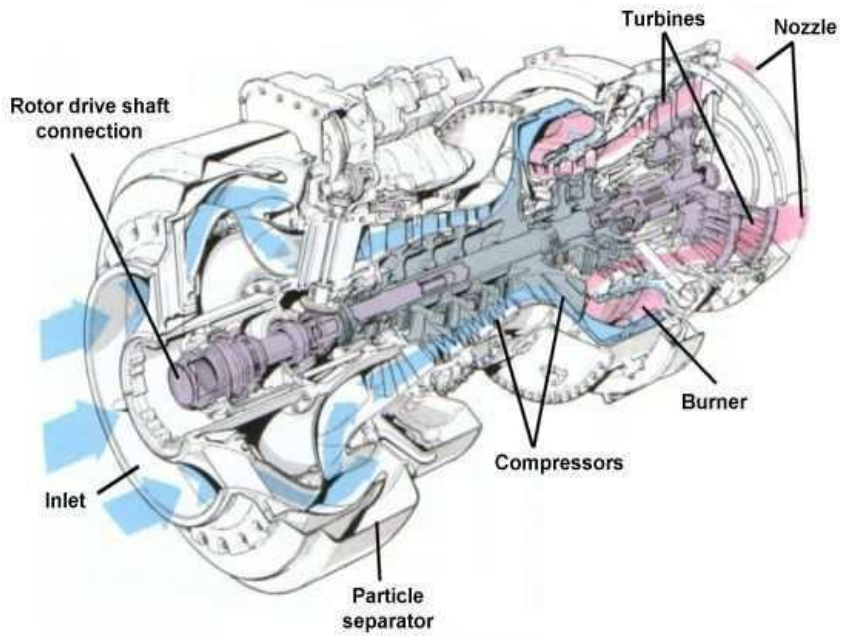
Turboprop

- A turboprop engine is a jet engine attached to a propeller.

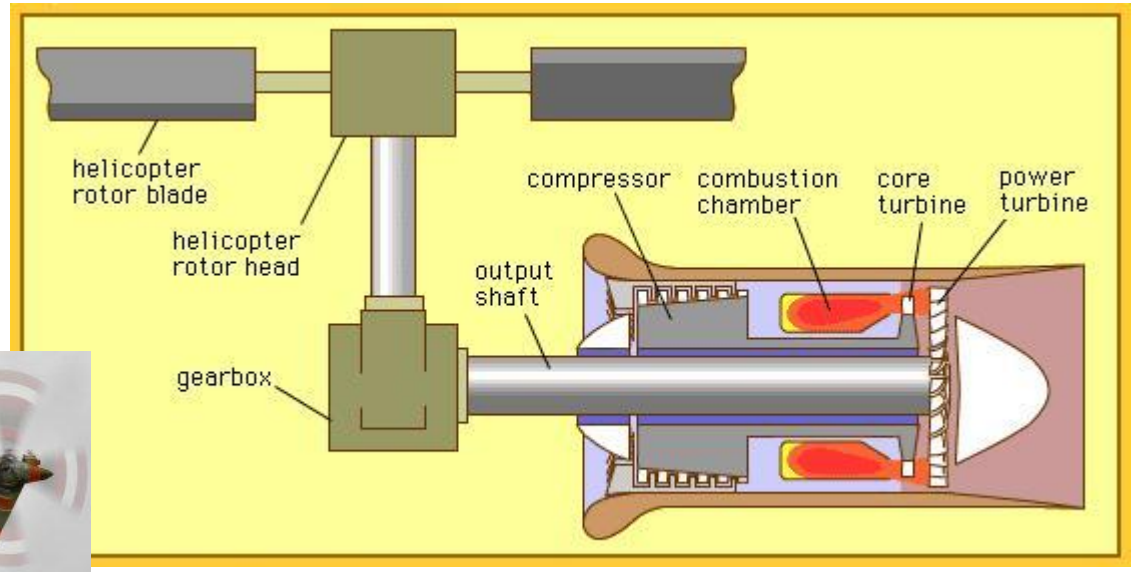
- Modern turboprop engines are equipped with propellers that have a smaller diameter but a larger number of blades for efficient operation at much higher flight speeds



Turboshaft



- It does not drive a propeller
- It provides power for a helicopter rotor
- It permits the rotor speed to be kept constant even when the speed of the generator is varied



That’s all. Any questions?