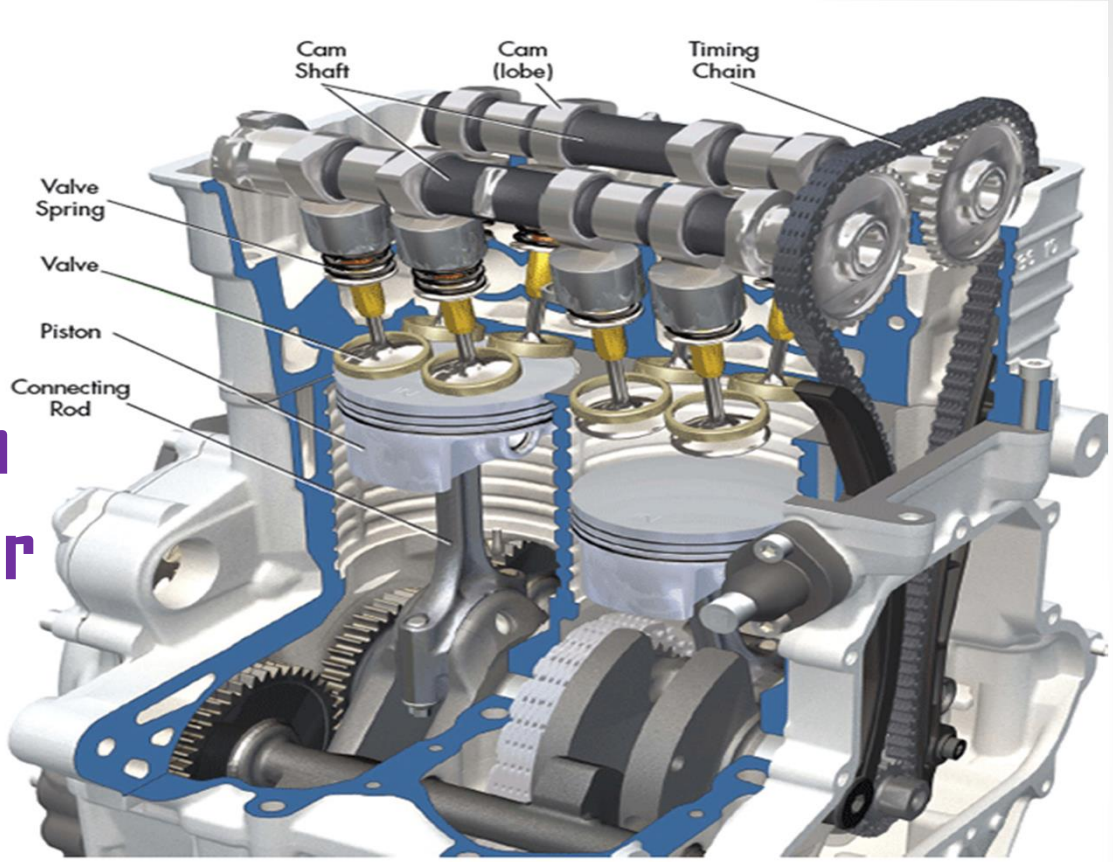
I C Engine, Steam & Nuclear Power



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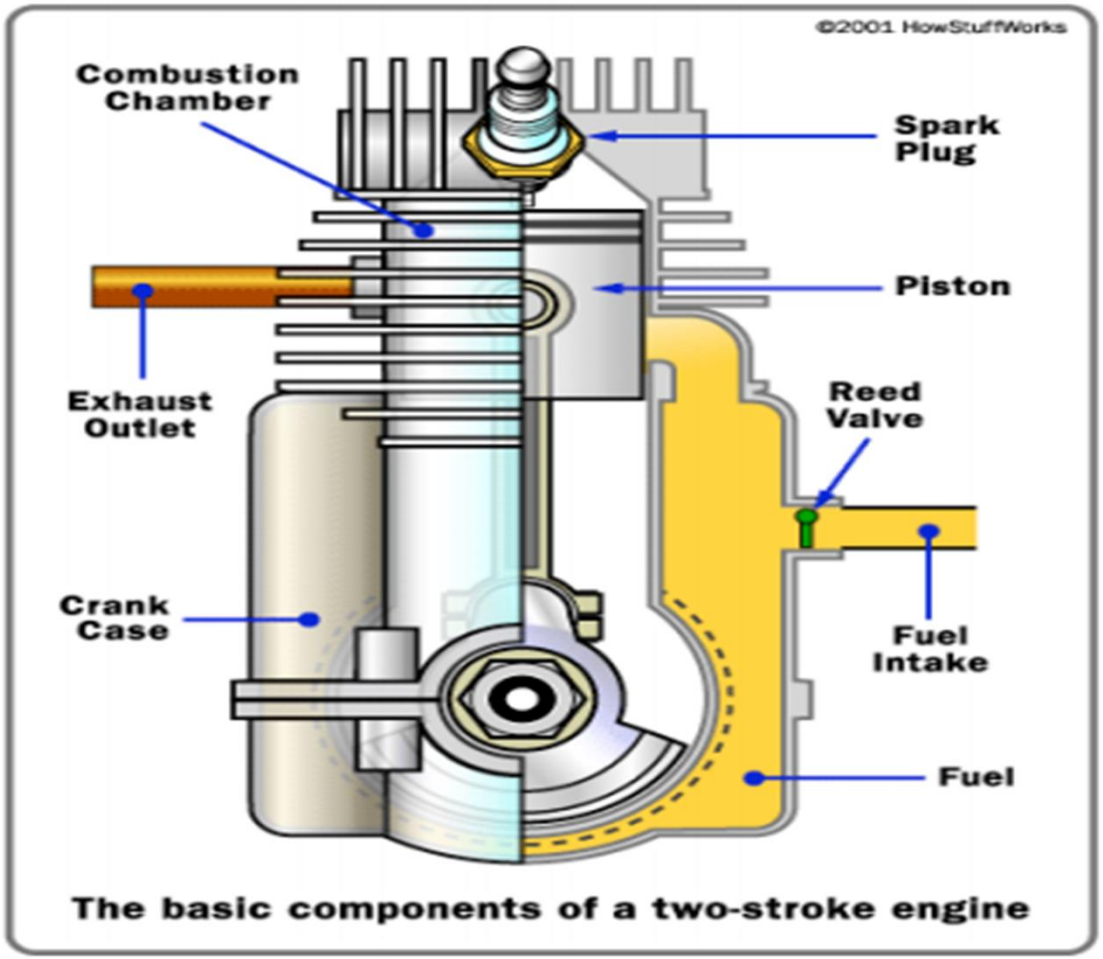
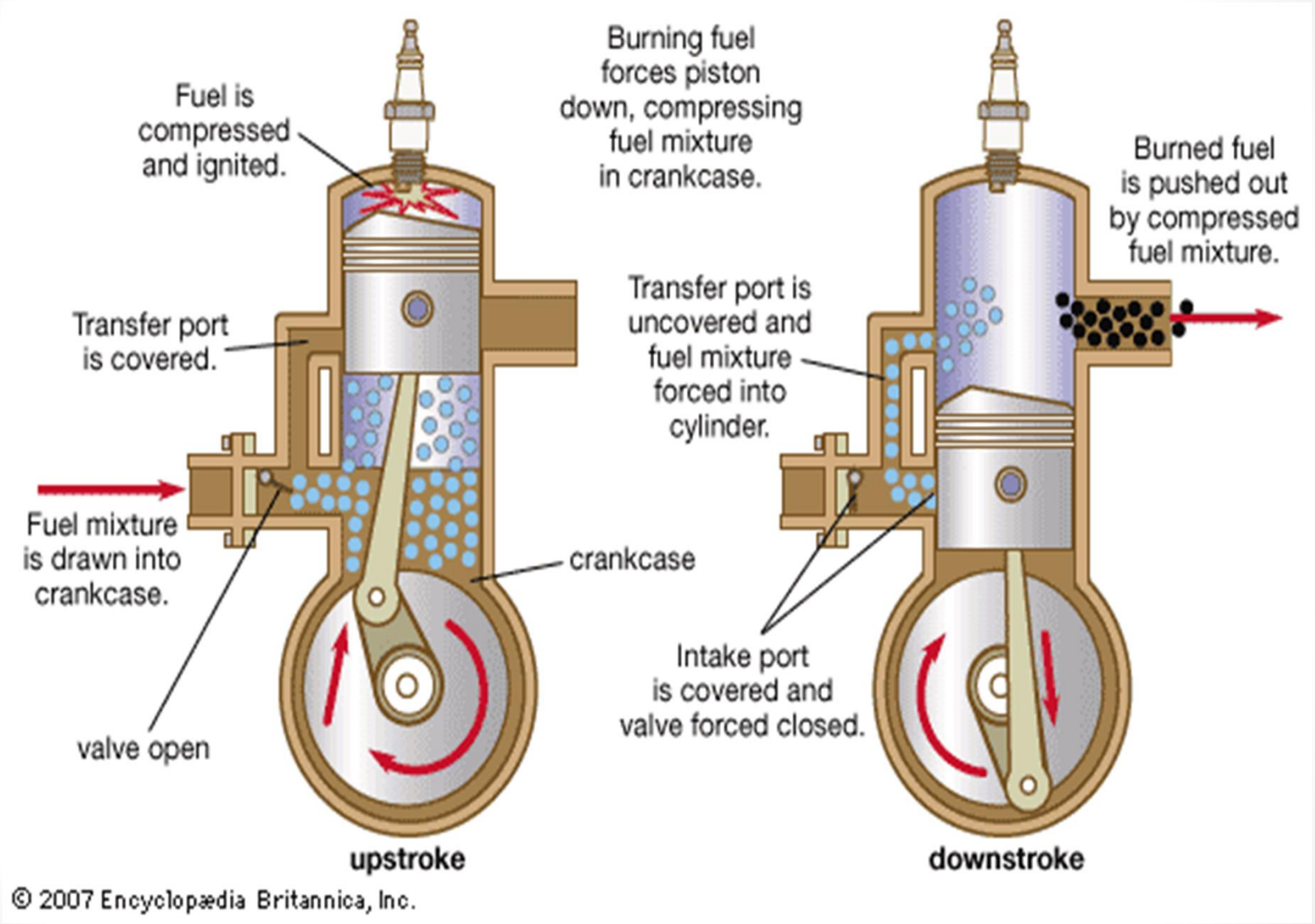
2 Stroke Engine




Fuel is compressed and ignited.
Transfer port is covered.
Fuel mixture is drawn into crankcase.
valve open
crankcase
upstroke
Burning fuel forces piston down, compressing fuel mixture in crankcase.
Transfer port is uncovered and fuel mixture forced into cylinder.
Intake port is covered and valve forced closed.
Burned fuel is pushed out by compressed fuel mixture.
downstroke
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Basic Concept of 2-S engine

- **Intake-** Fuel mixture is drawn into ***crankcase*** during **upstroke**
- **Compression-** mixture is compressed in the **crankcase** during down stroke and again during upstroke before combustion
- **Combustion**-fuel is recompressed and ignited in cylinder during upstroke
- **Exhaust**- burned mixture is forced out by **fresh mixture** being forced in during down stroke

Piston fires once every revolution. No traditional valves like a four-stroke. Piston serves as a "valve" by covering the ports.

- Two-stroke engines do not have valves, which simplifies their construction and lowers their weight.
- Two-stroke engines fire once every revolution, while four-stroke engines fire once every other revolution. This gives two-stroke engines a significant power boost.

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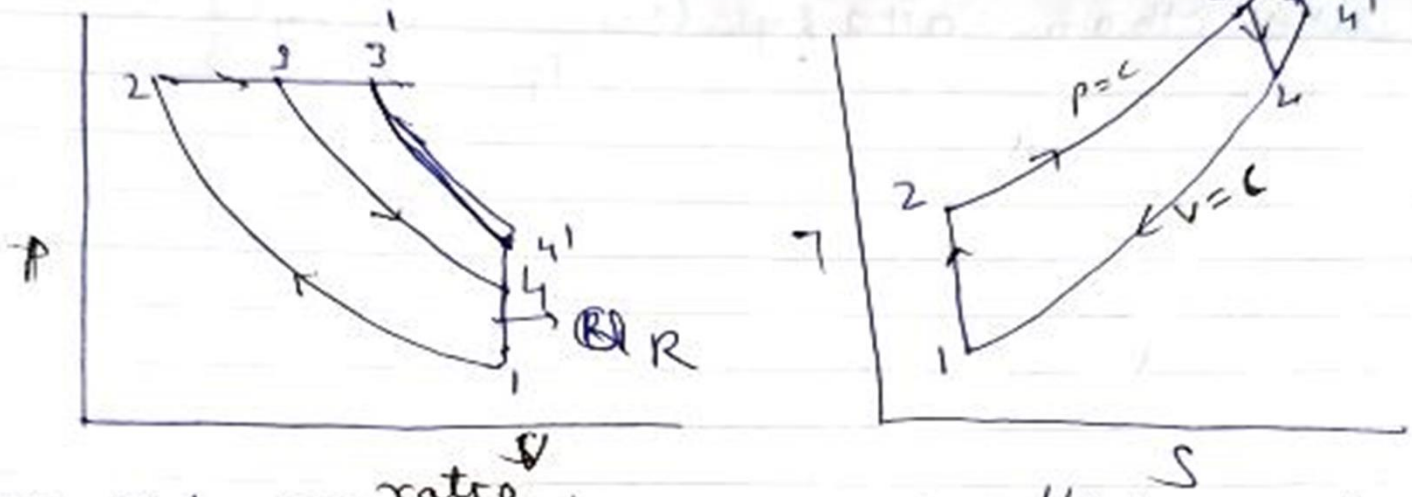
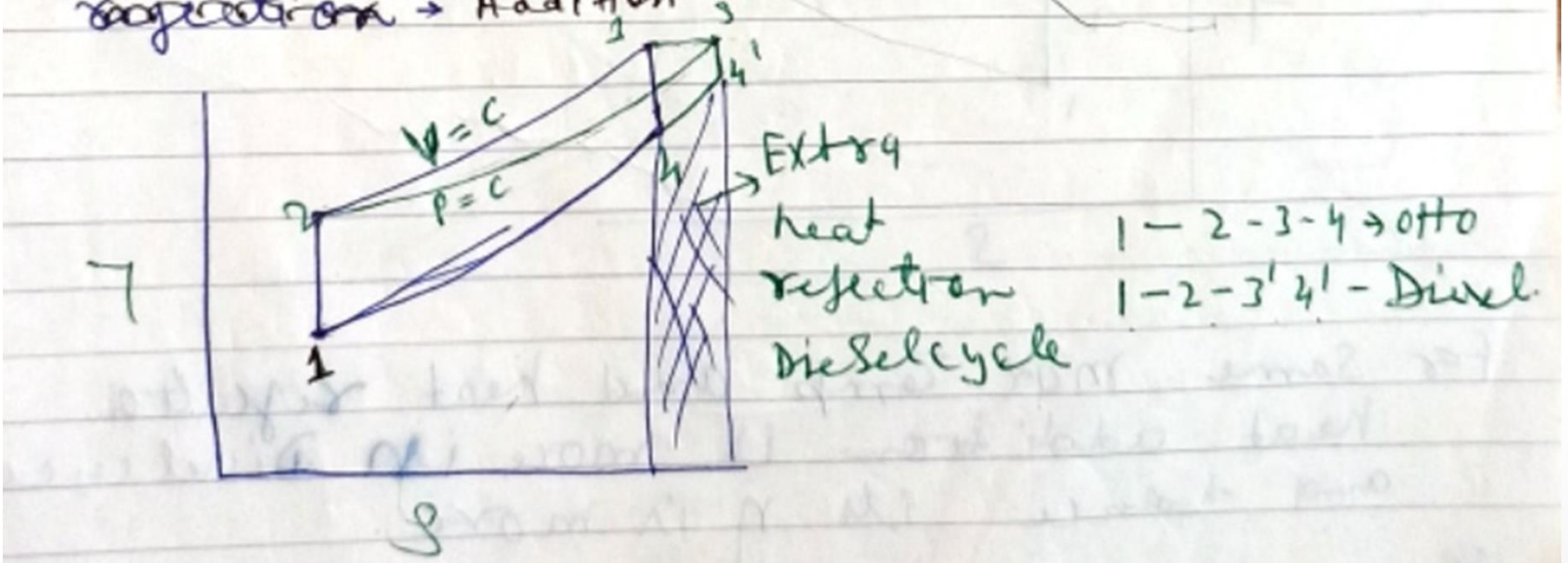
Effect of variation of cut off ratio on the η of Diesel cycle-



as Cut off ~~ratio~~ ratio increases : Efficiency ↓
& CO2 with increase in cut off ratio the heat rejection is increase at faster rate as comparison to heat addition.
Because of Slope constant volume line is greater than the slope of constant pressure line.

Comparison of otto cycle and Diesel cycle.

Case → 1 Same ε compression ratio and heat ~~rejection~~ → Addition.



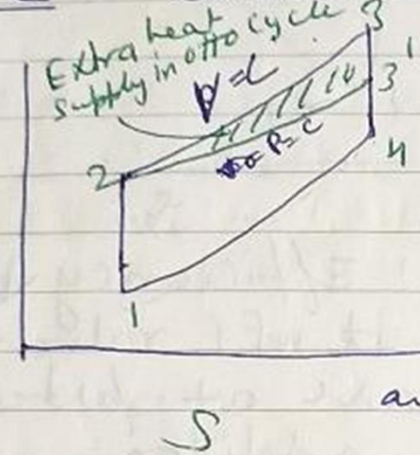
1 – 2 – 3 – 4 → otto

1 – 2 – 3' 4' – Diesel.

For same compression ratio and heat addition heat rejection more in Diesel cycle. and hence its η is less than otto cycle

$$\eta = 1 - \frac{Q_R}{Q_S}$$

Case-2 Same Compression and heat rejection



1-2-3-4 otto

1-2'-3'-4' Diesel

For same compression ratio and heat rejection heat supply is more in otto cycle and hence its η is more.