**OTTO VS DIESEL CYCLE**

**P-V diagrams for Otto and Diesel Cycles**

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P

P

V

V

**Otto cycle Diesel cycle**

Otto cycle summarizes the major steps that take place in the internal combustion engine present in gasoline fueled vehicles. Combustion takes place at constant volume in gasoline engines.

However, combustion takes place at constant pressure in diesel engines.

**Gasoline engine operates based on the following steps:**

1. Intake stroke – fuel is mixed with air
2. Compression stroke – piston goes up, mixture of fuel and air is compressed
3. Ignition stroke – fuel/air is ignited through the use of a spark plug
4. Exhaust stroke – piston goes up, pushes exhaust through the exhaust valve

**Diesel engine operates based on the following steps:**

* 1. Intake stroke – intake valve opens, air in, piston goes down
  2. Compression stroke – piston goes up, air compressed (heated in excess of 540°C)
  3. Combustion stroke – fuel is injected (right time), ignition, piston goes down
  4. Exhaust – piston goes up, pushes exhaust through the exhaust valve

Below graph expresses the cycle efficiencies for different cycles. Graph is adapted from Jefferson W. Tester and Michael Modell, “Thermodynamics and Its Applications”, 1996, Prentice Hall.



References:

Jefferson W. Tester and Michael Modell, “Thermodynamics and Its Applications”, 1996, Prentice Hall.

D. Winterbone and A. Turan , "Advanced Thermodynamics for Engineers", 1996, Butterworth-Heinemann.