

# **SNS COLLEGE OF TECHNOLOGY**

**(An Autonomous Institution)**

**COIMBATORE-35.**

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

## **DEPARTMENT OF AUTOMOBILE ENGINEERING**

### **23GET102 – BASIC CIVIL MECHANICAL ENGINEERING**

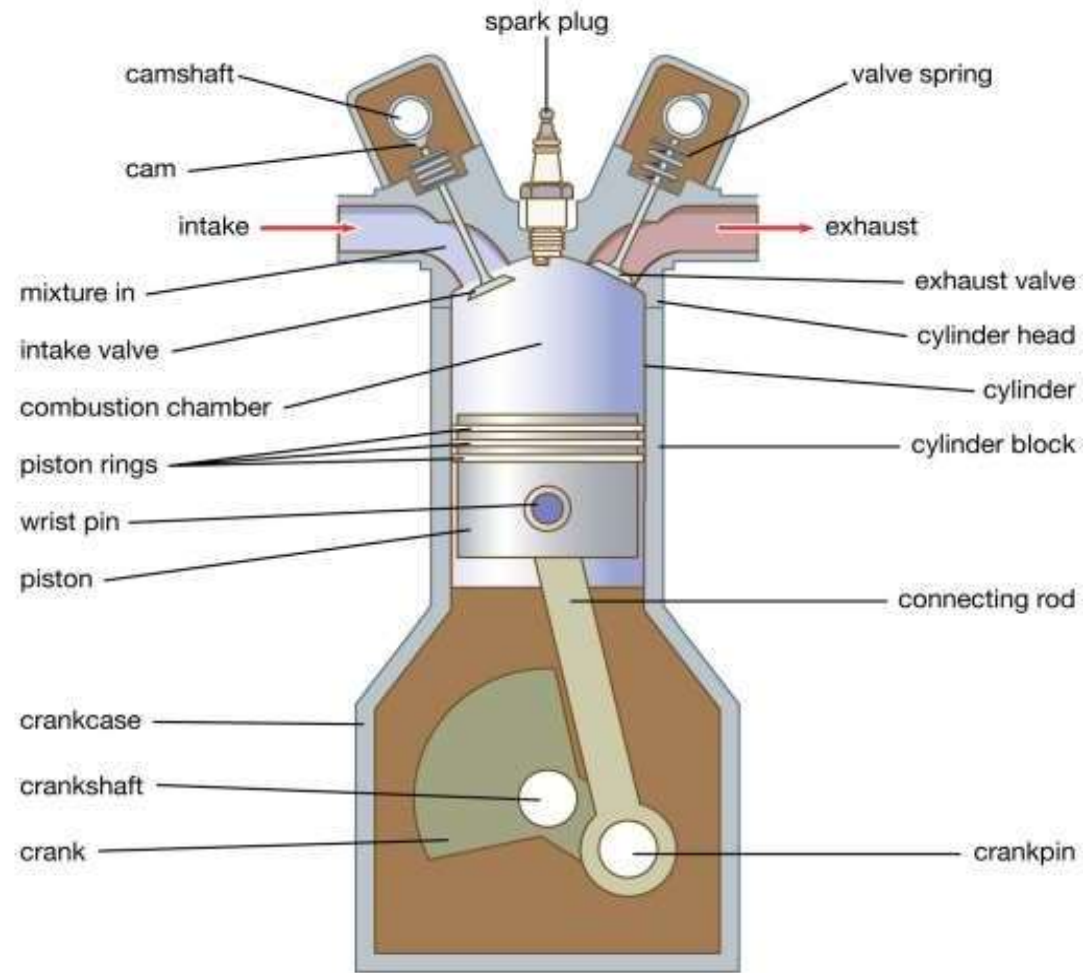
**I YEAR / I SEMESTER**

#### **UNIT 4 – IC ENGINES AND POWER PLANT ENGINEERING**

**Topic : Working Principle of Diesel Engine**



# Let's Recall !!

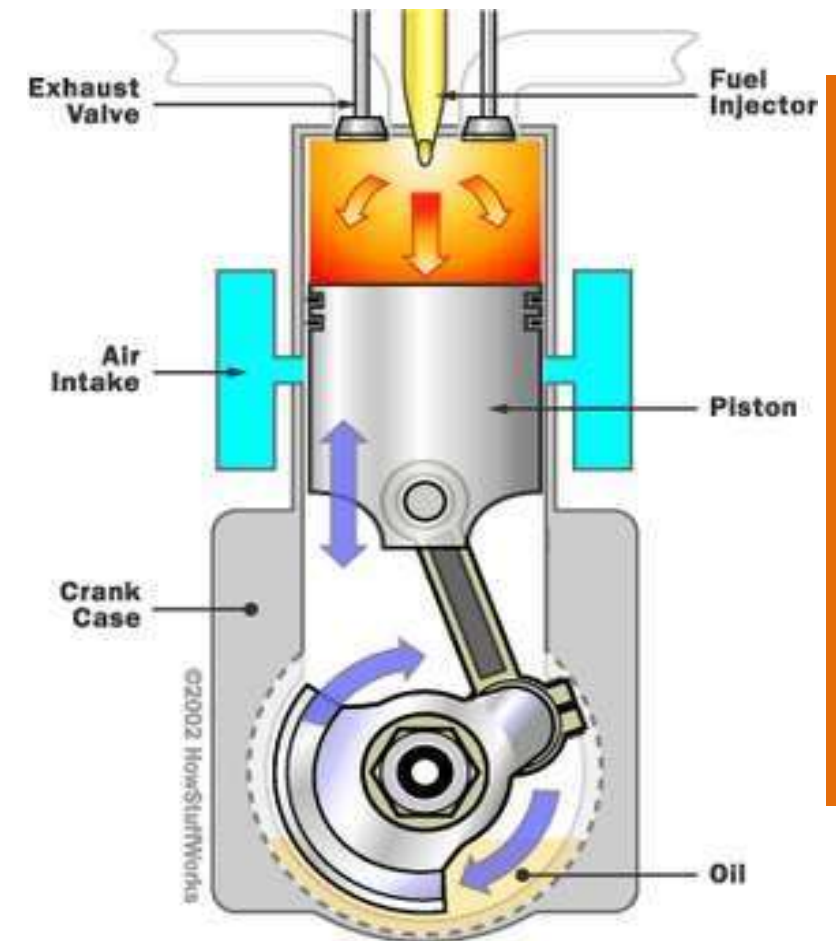


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# Working Principle of Diesel Engine

- Essential working principles of Diesel engines.
- Key functions and components of the engine
- Processes involved in transforming fuel into mechanical energy.

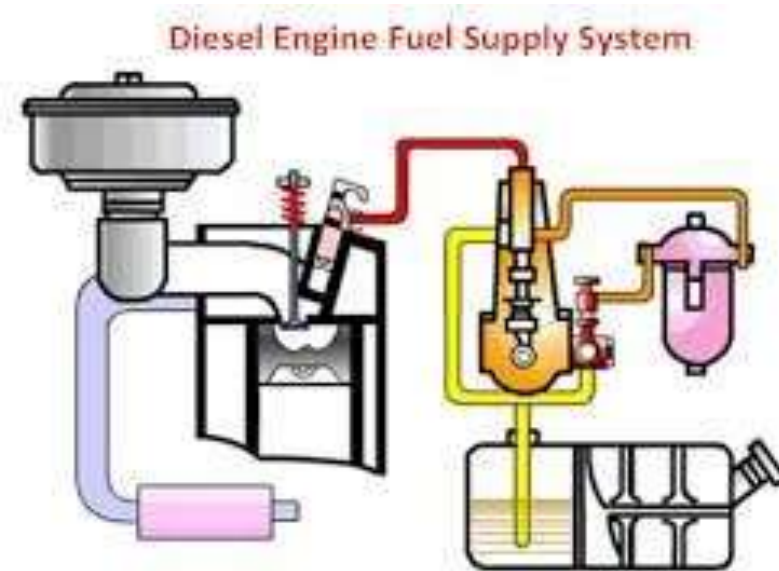
*DT-Empathy*



# Definition

*DT-Define*

- Diesel engine
- Operates on internal combustion of diesel within the engine cylinders
- Converting chemical energy into mechanical energy to power vehicles.



# Applications

*DT-Ideate*

## Transportation

Diesel engines power commercial vehicles such as trucks, buses, and trains due to their efficiency and ability to haul heavy loads.

## Industrial Use

Diesel engines are extensively used in industrial applications, such as generators, construction equipment, and agricultural machinery.

## Marine Applications

Many ships rely on large diesel engines for propulsion, consistent power output, and reliability over long distances.

## Power Generation

Diesel generators are commonly used as backup power sources in various sectors, providing reliable electricity in case of outages.

# Types

1

## Two-Stroke Diesel Engines

These engines complete a power cycle in two strokes of the piston, offering high power for their size and are often used in marine applications.

2

## Four-Stroke Diesel Engines

These engines complete the cycle in four strokes, providing smoother operation and less noise, commonly used in vehicles and generators.

3

## Turbocharged Diesel Engines

These engines use a turbocharger to force more air into the combustion chamber, increasing efficiency and power output.

4

## Direct Injection Diesel Engines

This type injects fuel directly into the combustion chamber, leading to better efficiency and lower emissions.

*DT-Ideate*

# Main Components

*DT-Ideate*



Cylinder

The cylinder houses the piston and is where the combustion process occurs. It must withstand high pressures and temperatures.



Piston

The piston converts the pressure from combustion into mechanical energy, moving up and down in the cylinder.



Fuel Injector

The fuel injector sprays the diesel fuel directly into the cylinder at high pressure, ensuring a fine mist for efficient combustion.



Crankshaft

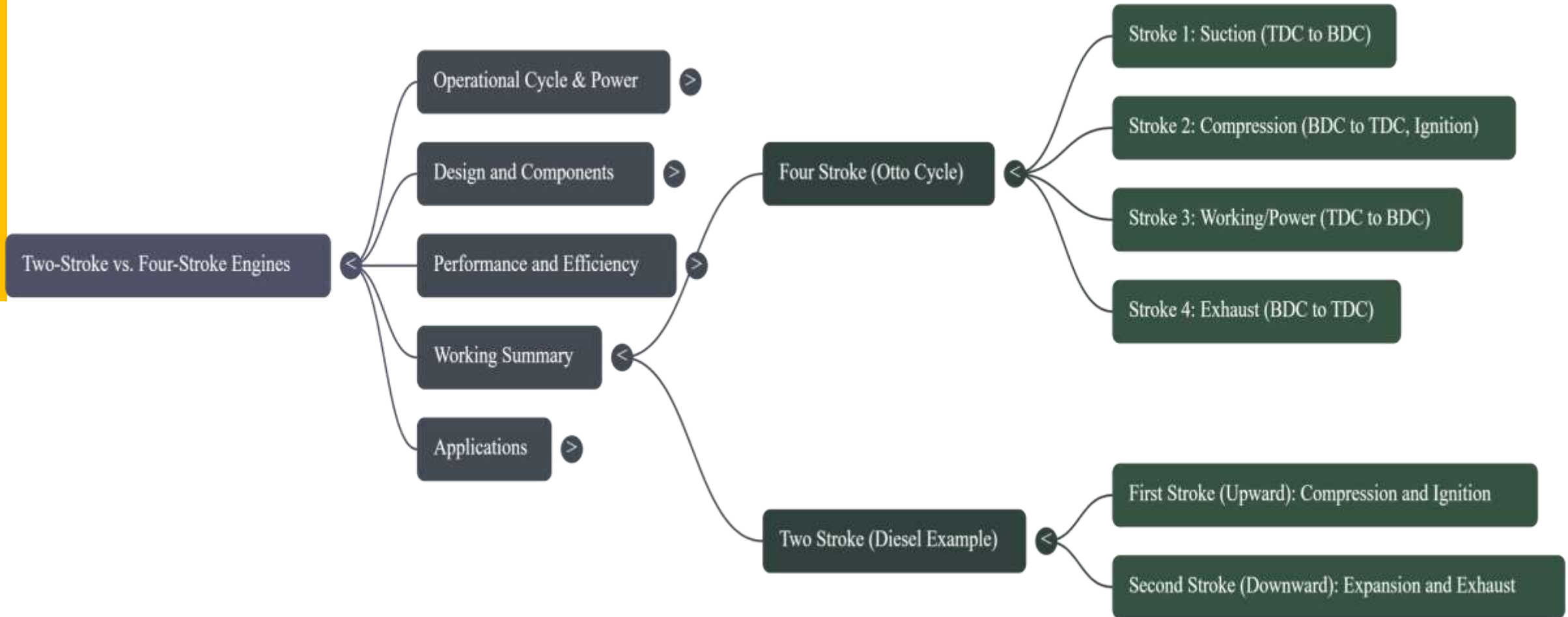
This component transforms the linear motion of the piston into rotational motion, driving the engine's output.



Valves

The engine has intake and exhaust valves that open and close to regulate the entry of air and the exit of exhaust gases.

# Mind map



# Assessment- Quiz

Question: Air and Fuel are Mixed in

Options:

- A. Carburetor
- B. Cylinder
- C. Engine
- D. Crank

Option: A

Question: Separates from Diesel Engine

Options:

- A. Port
- B. Piston
- C. Spark Plug
- D. Fuel Injector

Option: C

## References

- <https://www.youtube.com/watch?v=DZt5xU44IfQ>
- <https://www.youtube.com/watch?v=8ruuieWiXT4>
- <https://www.youtube.com/watch?v=rlK7JIAz9WY>