



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



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

DEPARTMENT OF AUTOMOBILE ENGINEERING

23AUT202 – AUTOMOTIVE ENGINES AND EMISSION CONTROL

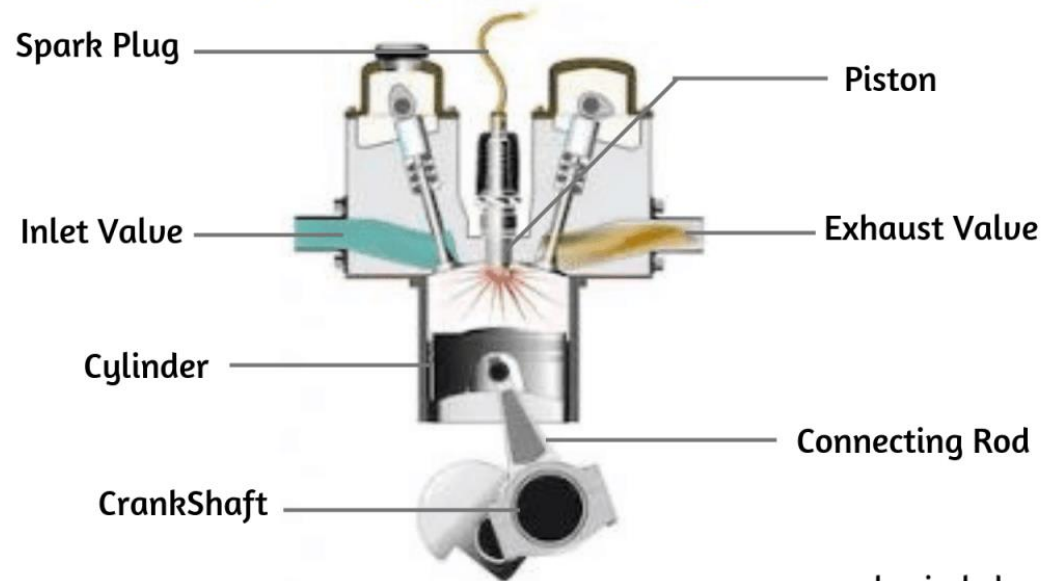
II YEAR / III SEMESTER

Topic – Construction and Working of SI Engine

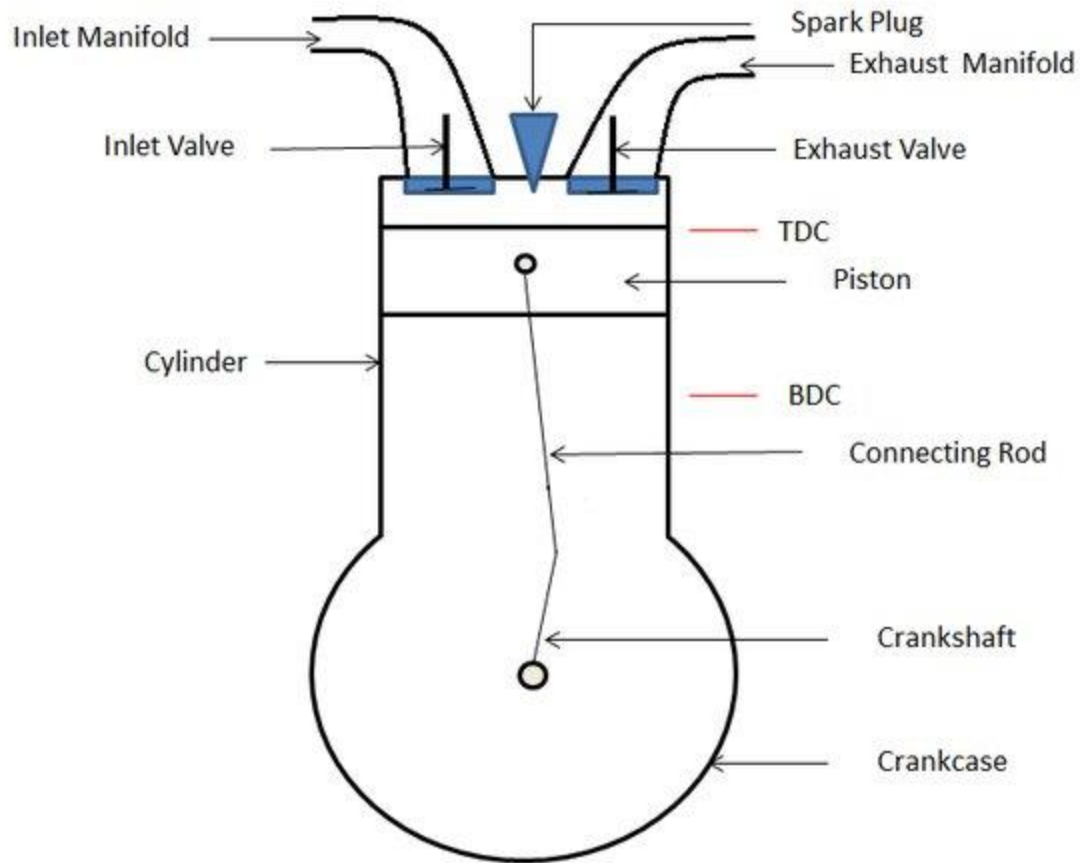


- A Spark Ignition (SI) engine, commonly known as a gasoline engine, is an internal combustion engine that uses a spark plug to ignite an air-fuel mixture.

Spark Ignition Engine



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Construction of Spark Ignition Engine



- **Cylinder:** The cylinder is the core part of the engine where combustion takes place. It is a cylindrical chamber that houses the piston and allows it to move up and down.
- **Piston:** A cylindrical component that moves up and down inside the cylinder. The piston is connected to the crankshaft via a connecting rod.
- **Crankshaft:** The crankshaft converts the reciprocating motion of the piston into rotational motion. It is located at the bottom of the engine and drives the vehicle's wheels.
- **Connecting Rod:** It connects the piston to the crankshaft and transmits the force generated by combustion to the crankshaft.



- **Cylinder Head:** This is the top part of the engine cylinder that covers the combustion chamber. It houses the intake and exhaust valves, the spark plug, and sometimes the camshaft.
- **Spark Plug:** The spark plug is located in the cylinder head and is responsible for igniting the air-fuel mixture by producing a spark.
- **Valves:** There are two types of valves in an SI engine:
 - **Intake Valve:** Allows the air-fuel mixture to enter the combustion chamber.
 - **Exhaust Valve:** Allows the burnt gases to exit the combustion chamber after combustion.



- **Camshaft:** The camshaft controls the opening and closing of the intake and exhaust valves. It is driven by the crankshaft via a timing belt or chain.
- **Fuel Injector/Carburetor:** In modern engines, a fuel injector sprays the fuel into the combustion chamber. Older engines use a carburetor to mix air and fuel before sending it to the combustion chamber.



Intake Stroke:

- The intake valve opens, and the piston moves downwards, creating a vacuum.
- Air-fuel mixture enters the cylinder from the carburetor or fuel injector.

Compression Stroke:

- The intake valve closes, and the piston moves upwards, compressing the air-fuel mixture.
- Compression increases the temperature and pressure of the mixture, making it more volatile.



Power (Combustion) Stroke:

- At the end of the compression stroke, the spark plug generates a spark, igniting the compressed air-fuel mixture.
- The combustion of the mixture generates a high-pressure force that pushes the piston downwards, generating power that turns the crankshaft.

Exhaust Stroke:

- The exhaust valve opens, and the piston moves upwards again, expelling the burnt gases from the cylinder through the exhaust valve.
- The exhaust gases exit the engine through the exhaust system.



Key Points



- **Spark Ignition:** Unlike diesel engines, which use compression to ignite the fuel, SI engines rely on a spark plug to initiate combustion.
- **Fuel Type:** SI engines typically use gasoline (petrol) as fuel.
- **Efficiency:** SI engines are generally less efficient than diesel engines but are preferred for their smoother operation and lower emissions.



Thank You !