EXPERIMENT ON STUDY OF TWO STROKE AND FOUR STROKE DIESEL ENGINES

Prepared
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AIM OF THE EXPERIMENT: -

To study about twostroke and four stroke diesel engines.

Sl.no	Name of the apparatus	specification	Quantity
01	Model of diesel engine	2-stroke01	01
02	Model of di0esel engine	4-stroke	02

THEORY: -

2-STROKE DIESEL ENGINE: -

A two stroke cycle diesel engine also has one working stroke after revolution of the crank shaft. All the four stages of a two stroke cycle diesel engine are described below:

1.SUCTION STAGE:-

- In this stage, the piston while going down towards BDC uncovers the transfer port and the exhaust port.
- The fresh air flows into the engine cylinder from the crank case.

2.COMPRESSION STAGE: -

- In this stage, the piston while moving up, first covers the transfer port and then exhausts post.
- After that the air is compressed as the piston moves upward.
- In this stage, the inlet port opens and the fresh air enters in to the crank case.

3.EXPANSION STAGE: -

- Shortly before the piston reaches the TDC (during compression stroke), the fuel oil is injected in the form of very fine spray into the engine cylinder through the nozzle known as fuel injection valve.
- At this moment, temperature of the compressed air is sufficiently high to ignite the fuel. It suddenly increases the pressure and temperature of the products of combustion.
- Due to increase in pressure, the piston is pushed with a great force. The hot burnt gases expand due to high speed of the piston.
- During the expansion, some of the heat energy produced is transformed into mechanical work.

4. EXHAUST STAGE: -

- In this stage, the exhaust port is opened and the piston moves downwards.

- The product of combustion from the engine cylinder is exhausted through the exhaust port into the atmosphere.
- This completes the cycle, and the engine cylinder is ready to suck the air again.

4-STROKE DIESEL ENGINE: -

It is also known compression ignition engine. Because the ignition takes place due to the heat produced in the engine cylinder at the end of compression stroke.The four stokes of the diesel engine are described below:

1.SUCTION STROKE: -

- In this stroke, the inlet valve opens and the pure air is sucked into the cylinder as the piston moves downwards from TDC.
- It continues till the piston reaches in the BDC.

2.COMPRESSION STROKE: -

- In this stroke, both the valves are closed and the air is compressed as the piston moves upwards from BDC to TDC.
- As result of compression, pressure and temperature of the air increases considerably.
- This completes the revolution of the crank shaft.

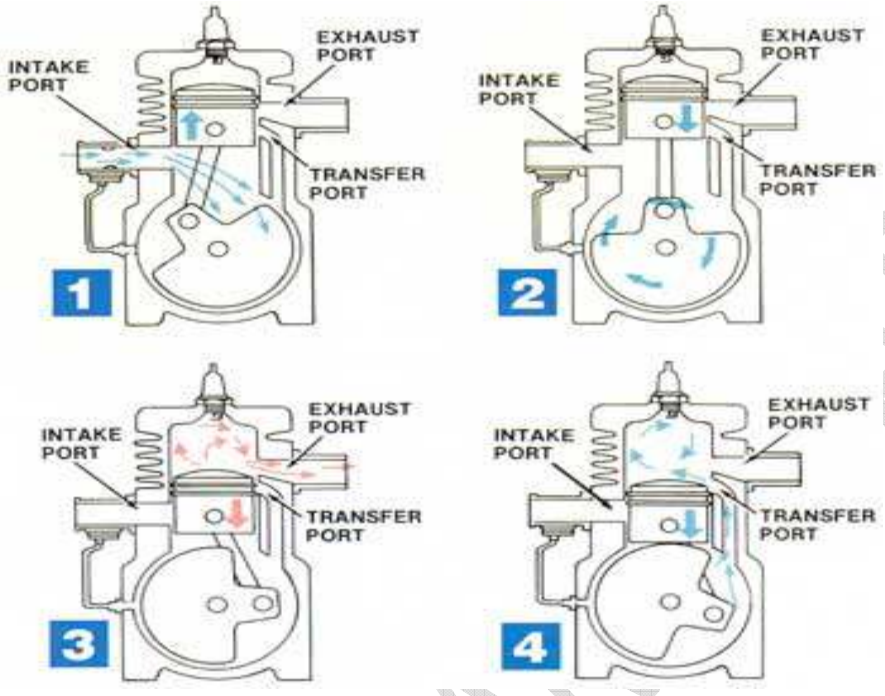
3.EXPANSION STROKE: -

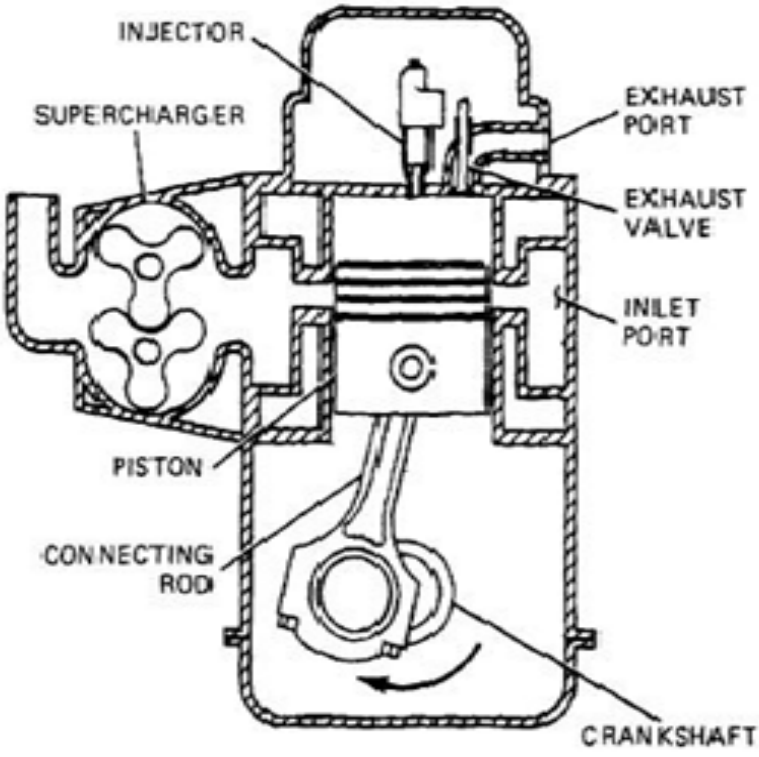
- Shortly before the piston reaches the TDC, fuel is injected in the form of very fine spray in to the engine cylinder through the nozzle known as fuel injector or fuel injection valve.
- At this moment, temperature of the compressed air is sufficiently high to ignite the fuel.It suddenly increases the pressure and temperature of product of combustion.
- Due to increased pressure, the piston is pushed down with a great force.The hot burnt gases expand due to high speed of the piston.
- During the expansion,some of heat energy is transformed into mechanical work.

4.EXHAUST STROKE:-

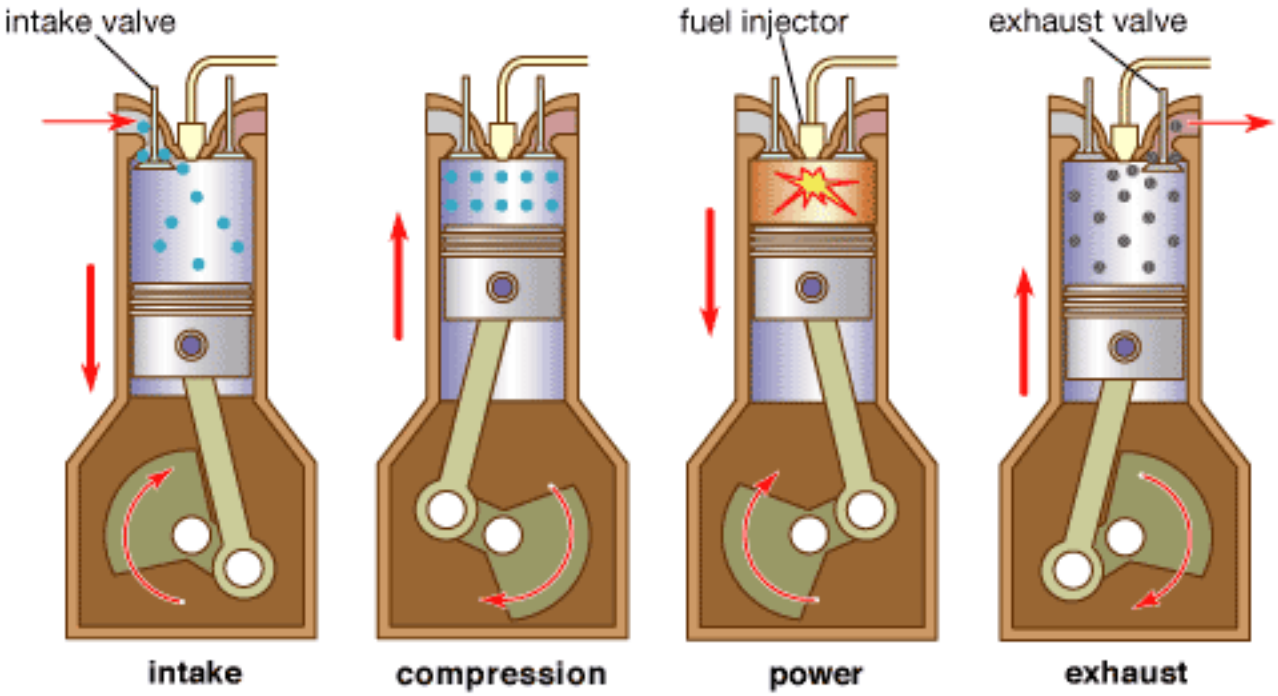
- In this stroke the exhaust valve is open as the piston moves from BDC to TDC.
- This movement of the piston pushes out the product of combustion from the engine cylinder through the exhaust valve into the atmosphere.
- This completes the cycle and the engine cylinder is ready to suck the fresh air again.

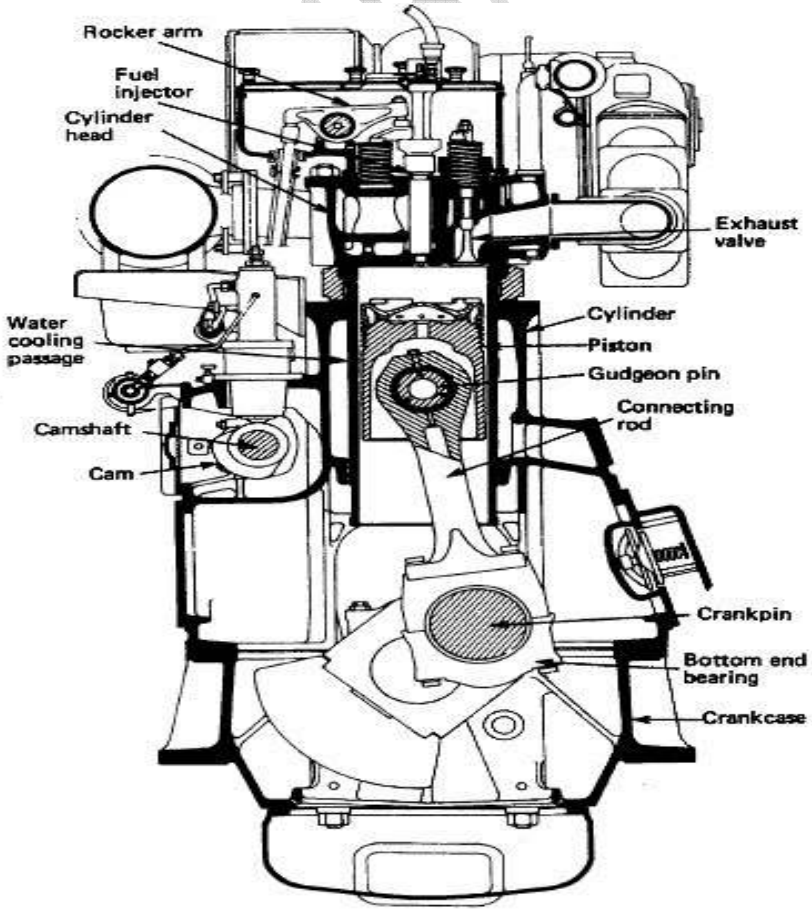
WORKINGS PRINCIPLES OF TWO STROKE DIESEL ENGINES





WORKING PRINCIPLES OF FOUR STROKE DIESEL ENGINE





CONCLUSIONS: -

From the above experiment we have successfully studied about the 2-stroke and 4-stroke diesel engines, their working principles and operations.