



# UNIT IV

# DIESEL ENGINE

**Basic Civil and Mechanical Engineering**

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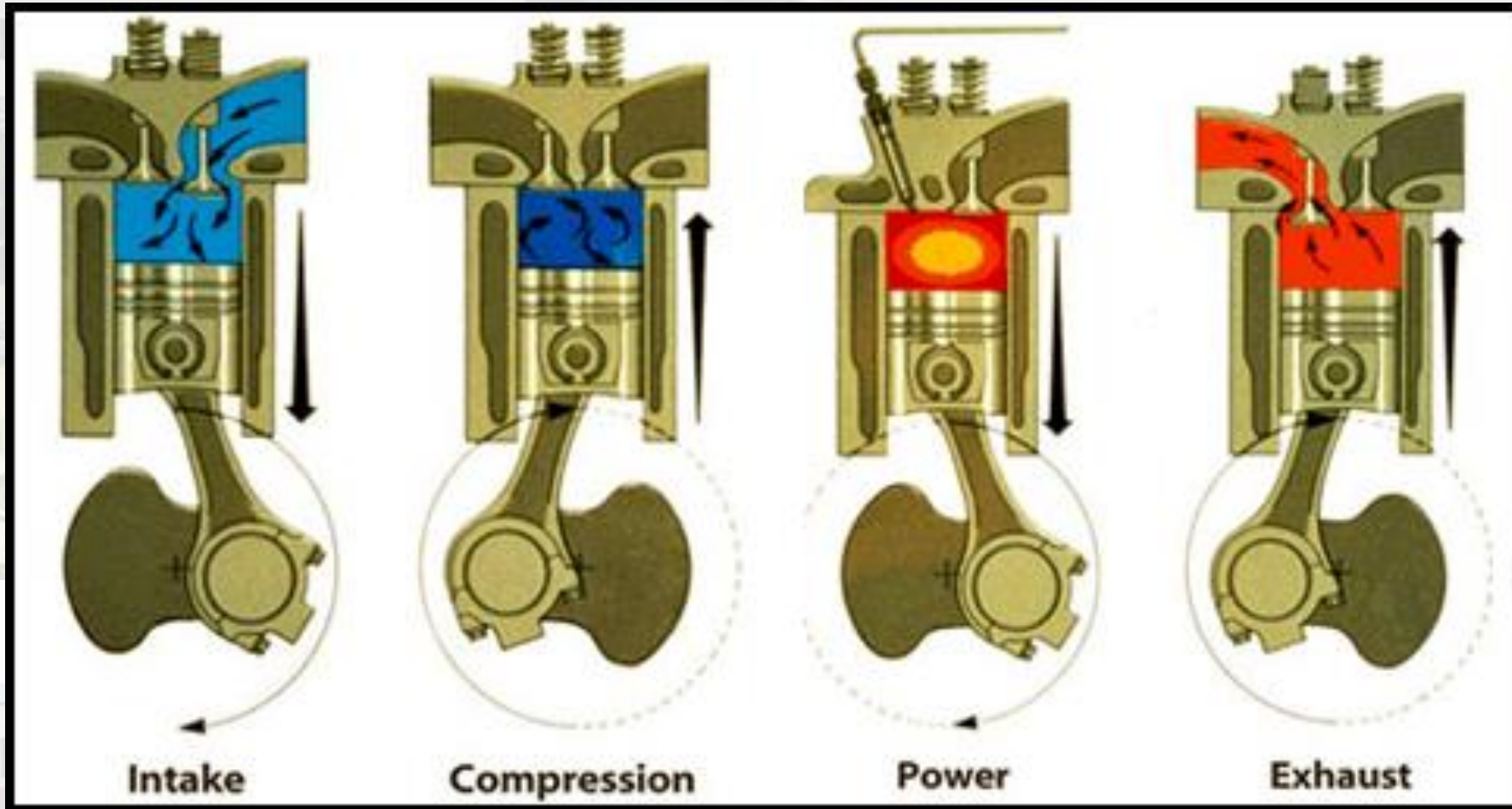
# FOUR STROKE CYCLE DIESEL ENGINES

## Construction :

- A piston reciprocates inside the cylinder
- The piston is connected to the crankshaft by means of a connecting rod and crank.
- The inlet and exhaust valves are mounted on the cylinder head.
- A fuel injector is provided on the cylinder head
- The fuel used is diesel.



# FOUR STROKE CYCLE DIESEL ENGINES







# FOUR STROKE DIESEL ENGINE - WORKING

## (a) Suction Stroke (First Stroke of the piston)

- Piston moves from TDC to BDC
- Inlet valve is opened and the exhaust valve is closed.
- The pressure inside the cylinder is reduced below the atmospheric pressure.
- Fresh air from the atmosphere is sucked into the engine cylinder through air cleaner and inlet valve.



# FOUR STROKE DIESEL ENGINE - WORKING



## Compression stroke (Second stroke of the piston)

- Piston moves from BDC to TDC
- Both inlet and exhaust valves are closed.
- The air is drawn during suction stroke is compressed to a high pressure and temperature



# FOUR STROKE DIESEL ENGINE - WORKING



## Working or power or expansion stroke (Third stroke of the piston)

- The burning gases (products of combustion) expand rapidly.
- The burning gases push the piston move downward from TDC to BDC
- This movement of piston is converted into rotary motion of the crank shaft through connecting rod.
- Both inlet and exhaust valves are closed.





# FOUR STROKE DIESEL ENGINE - WORKING

## Exhaust Stroke (Fourth stroke of the piston)

- Piston moves from BDC to TDC
- Exhaust valve is opened the inlet valve is closed.
- The burnt gases are forced out to the atmosphere through the exhaust valve. (some of the burnt gases stay in the clearance volume of the cylinder)
- The exhaust valve closes shortly after TDC
- The inlet valve opens slightly before TDC and the cylinder is ready to receive fresh air to start a new cycle.



# SCAVENGING



- Scavenging :
- It is the process of forcing out the burnt exhaust gases from the cylinder for admitting the fresh charge into the cylinder.
- This action takes place in the two stroke cylinder.





# SCAVENGING PROCESS



- The charge (air fuel mixture or air) enters the engine cylinder from the crank case at a pressure higher than the exhaust gases.
- This fresh charge forces the exhaust gases to the atmosphere through the exhaust port.
- During the period both the transfer and exhaust ports are kept open for a short period.
- Hence there is a possibility of the fresh charge escaping out with the burnt gases.
- This is over come by designing the piston to have a deflected shape.
- This shape of piston deflects the fresh charge upward in the engine cylinder.
- It also helps out in forcing out the exhaust gases to atmosphere.
- This process is known as **Scavenging**.



**THANK YOU**