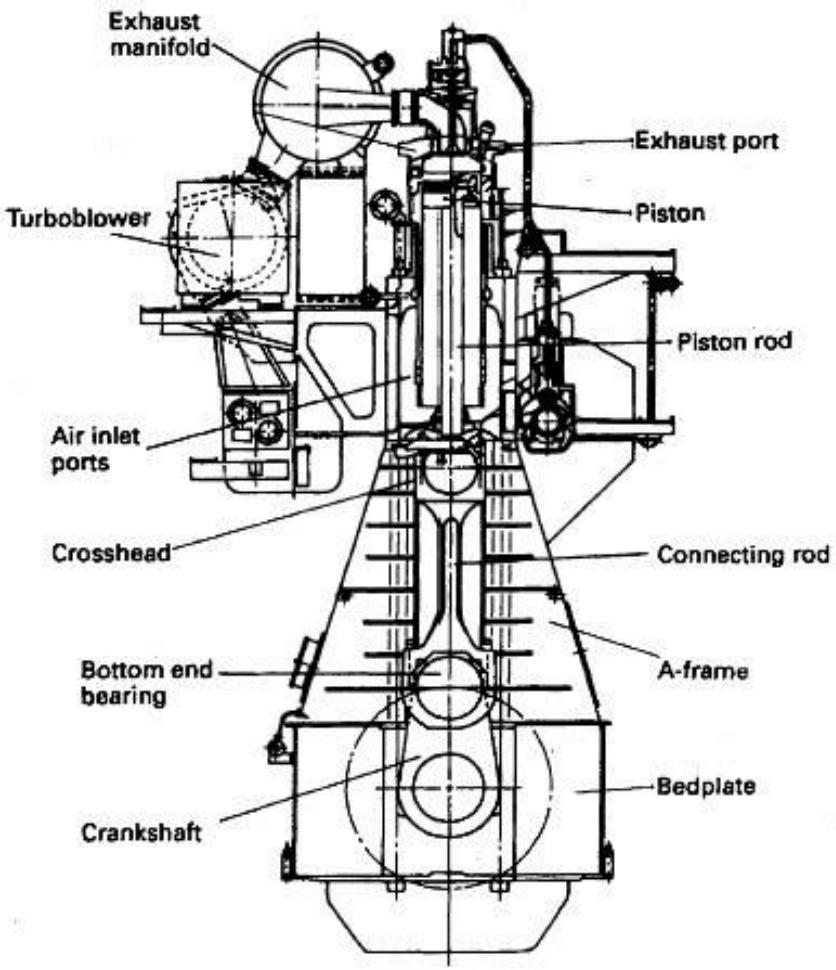
Sectional view of 2 stroke & 4 stroke diesel engines

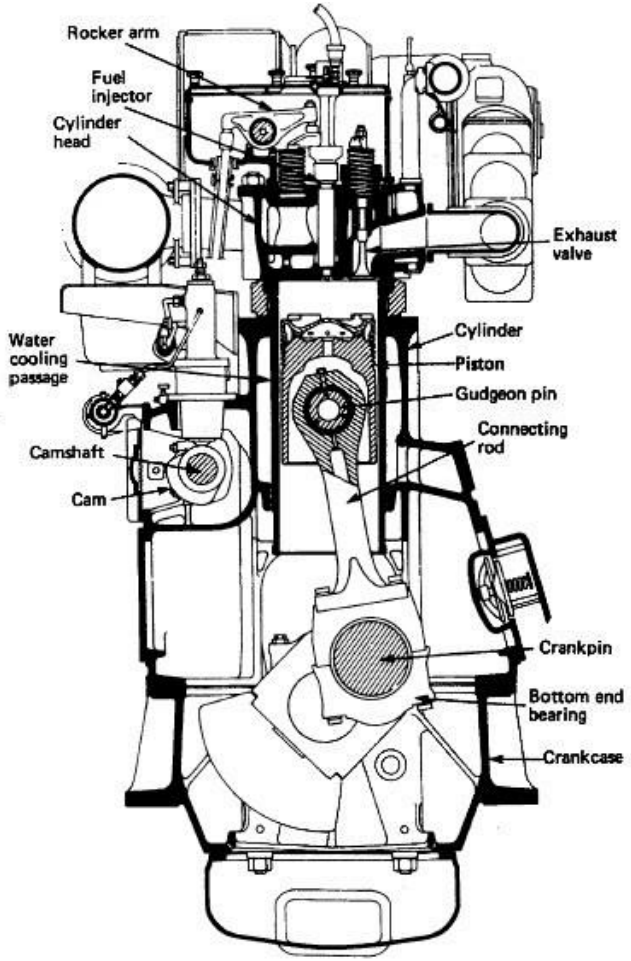
Dr. Rupesh B. Yadav

Asst. Prof.

TCSC, Mumbai.



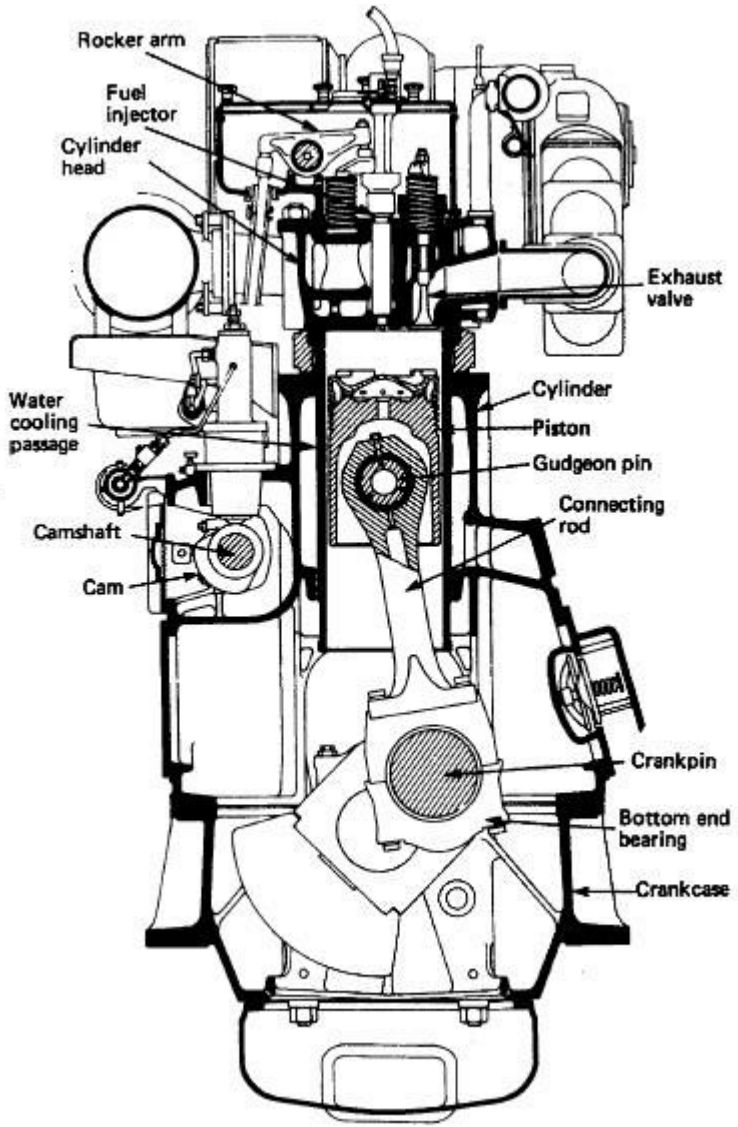
2 Stroke engine



4 Stroke engine

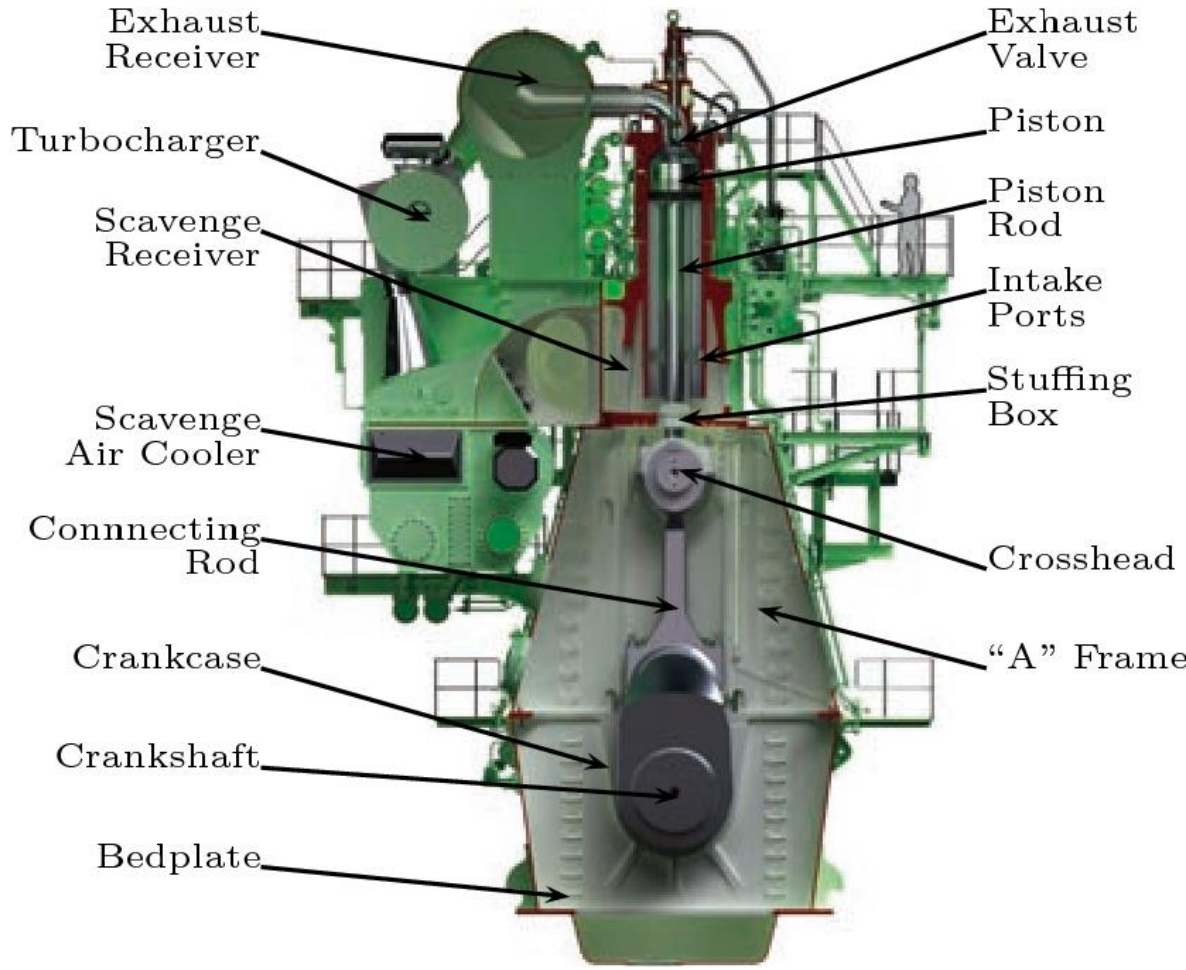
Introduction

- A four-stroke engine in a nutshell is a cylinder-piston assembly in which power is produced in just one of the four strokes.
- It's a heavier complex design that is more fuel-efficient and produces less pollution.
- Similarly, a two-stroke engine is a cylinder-piston assembly in which power is produced each alternating stroke.
- It is simpler by design, is lightweight, produces more torque, and is cheap; but is less efficient by design and causes pollution.



2 stroke engines

- First, the fresh air must be forced in under pressure.
- The incoming air is used to clean out or scavenge the exhaust gases and then to fill or charge the space with fresh air.
- Instead of valves holes, known as 'ports', are used which are opened and closed by the sides of the piston as it moves.



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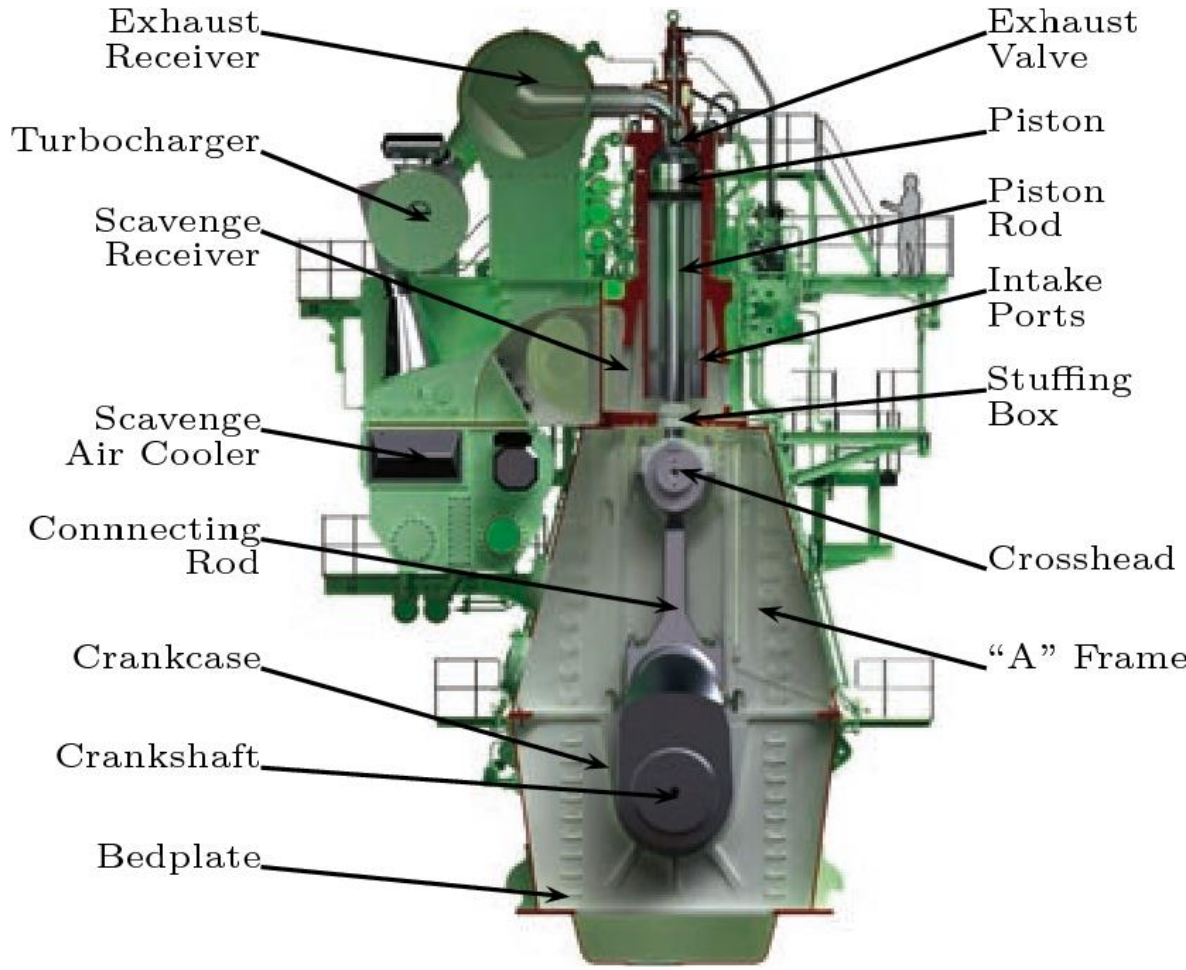
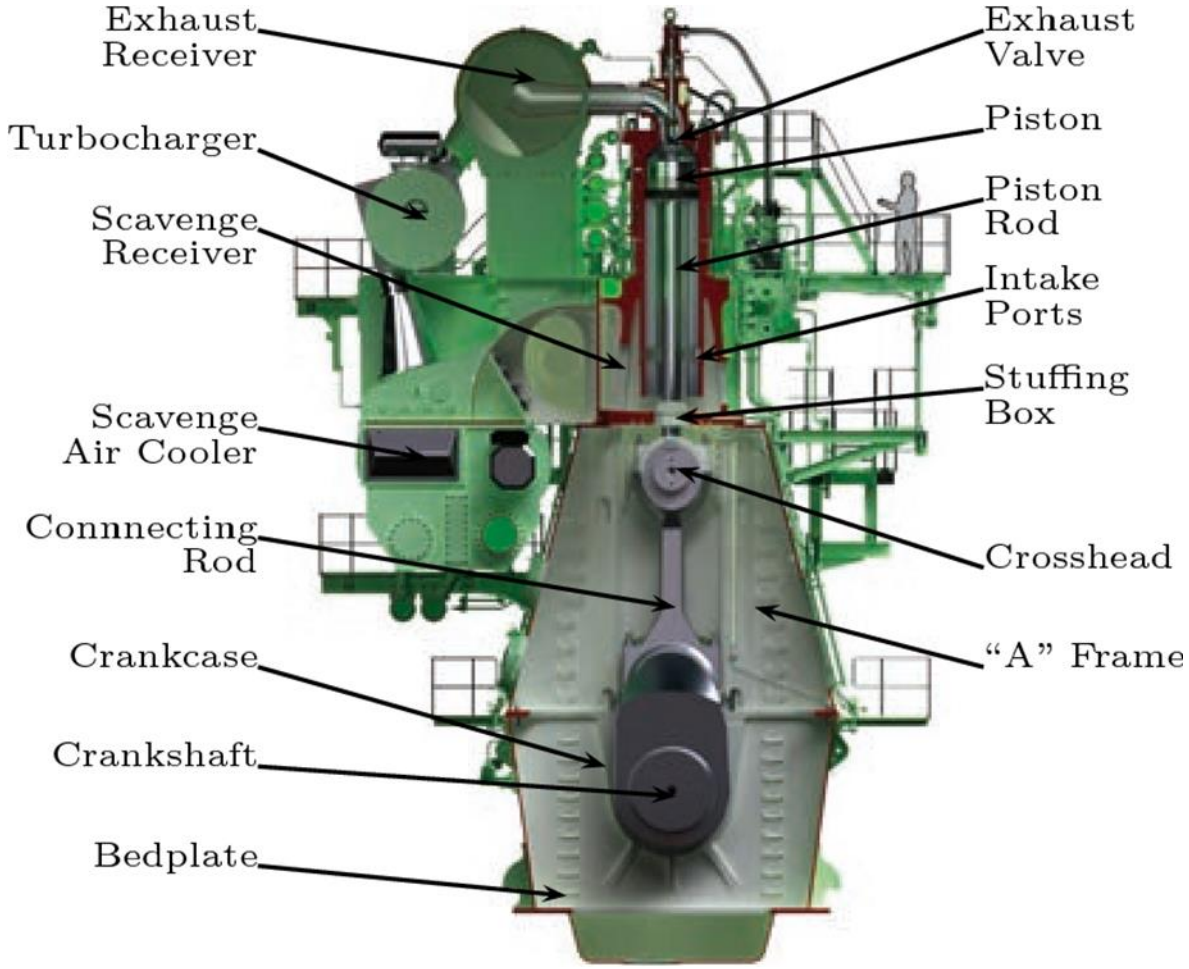


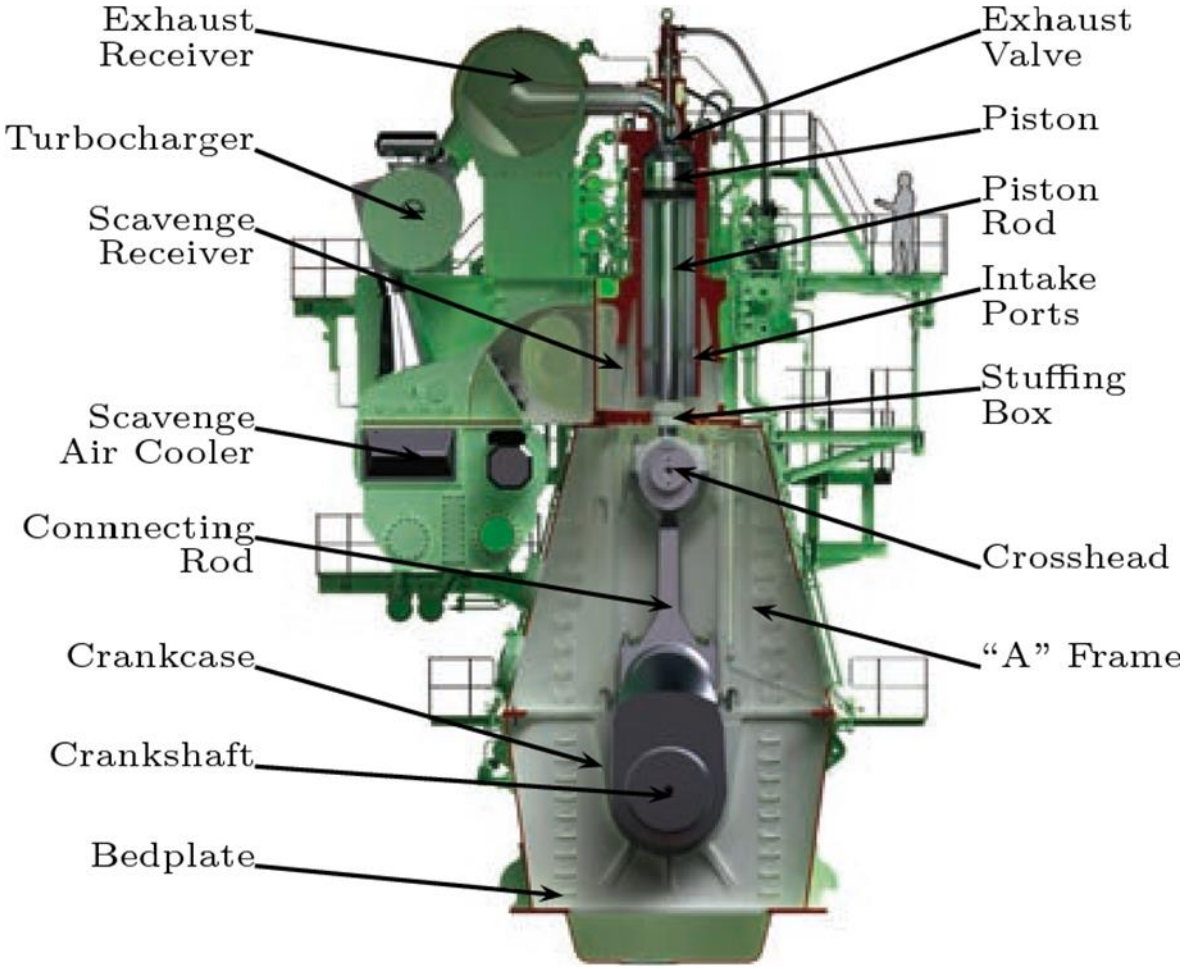
2 stroke engines

- A cross-section of a two-stroke cycle engine is shown in Figure below .
- The piston is solidly connected to a piston rod which is attached to a crosshead bearing at the other end.



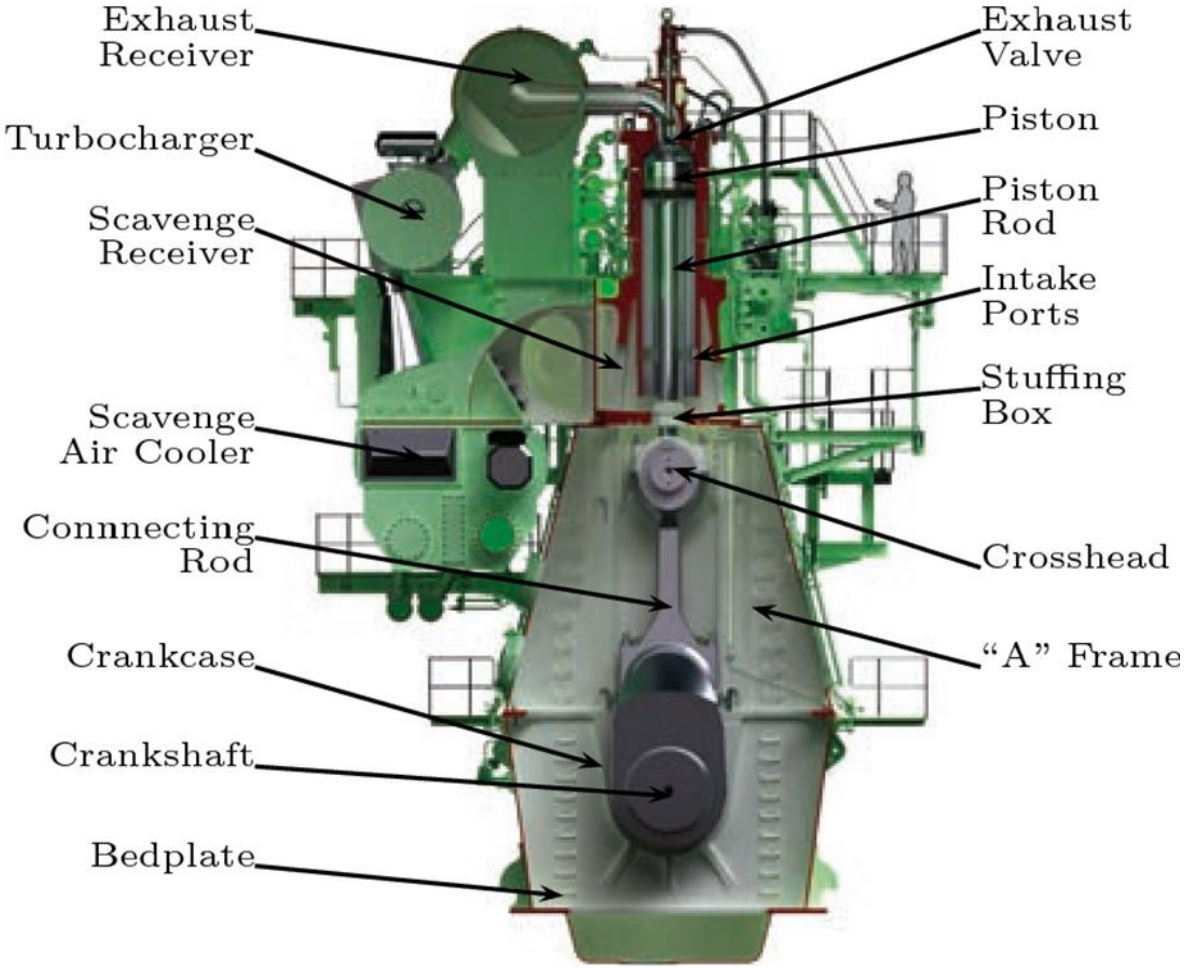
2 stroke engines

- The top end of the connecting rod is also joined to the crosshead bearing.
- Ports are arranged in the cylinder liner for air inlet and a valve in the cylinder head enables the release of exhaust gases.
- The incoming air is pressurized by a turbo-blower which is driven by the outgoing exhaust gases.



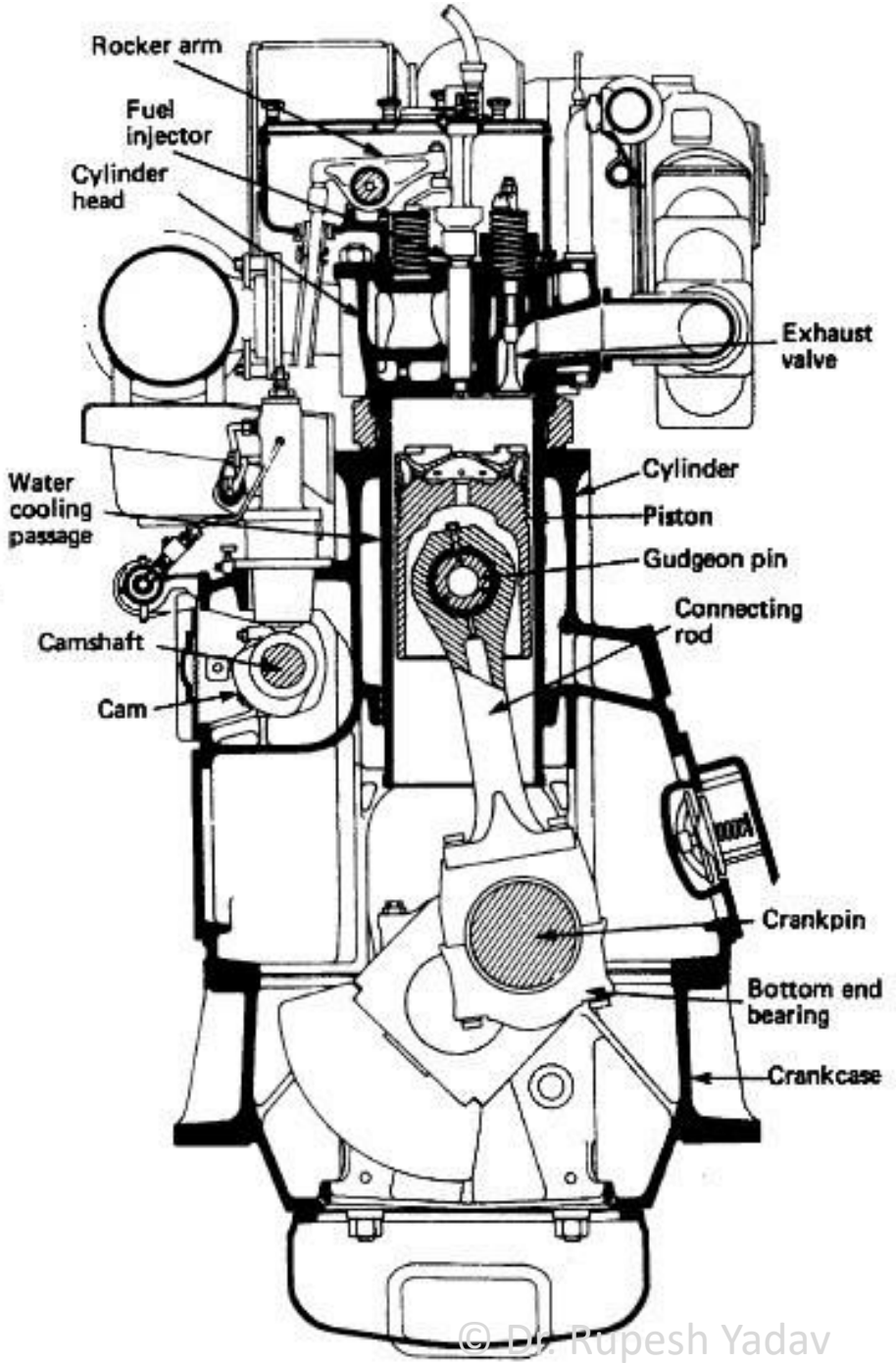
2 stroke engines

- The crankshaft is supported within the engine bedplate by the main bearings.
- A-frames are mounted on the bedplate and house guides in which the crosshead travels up and down.
- The entablature is mounted above the frames and is made up of the cylinders, cylinder heads and the scavenge trunking.



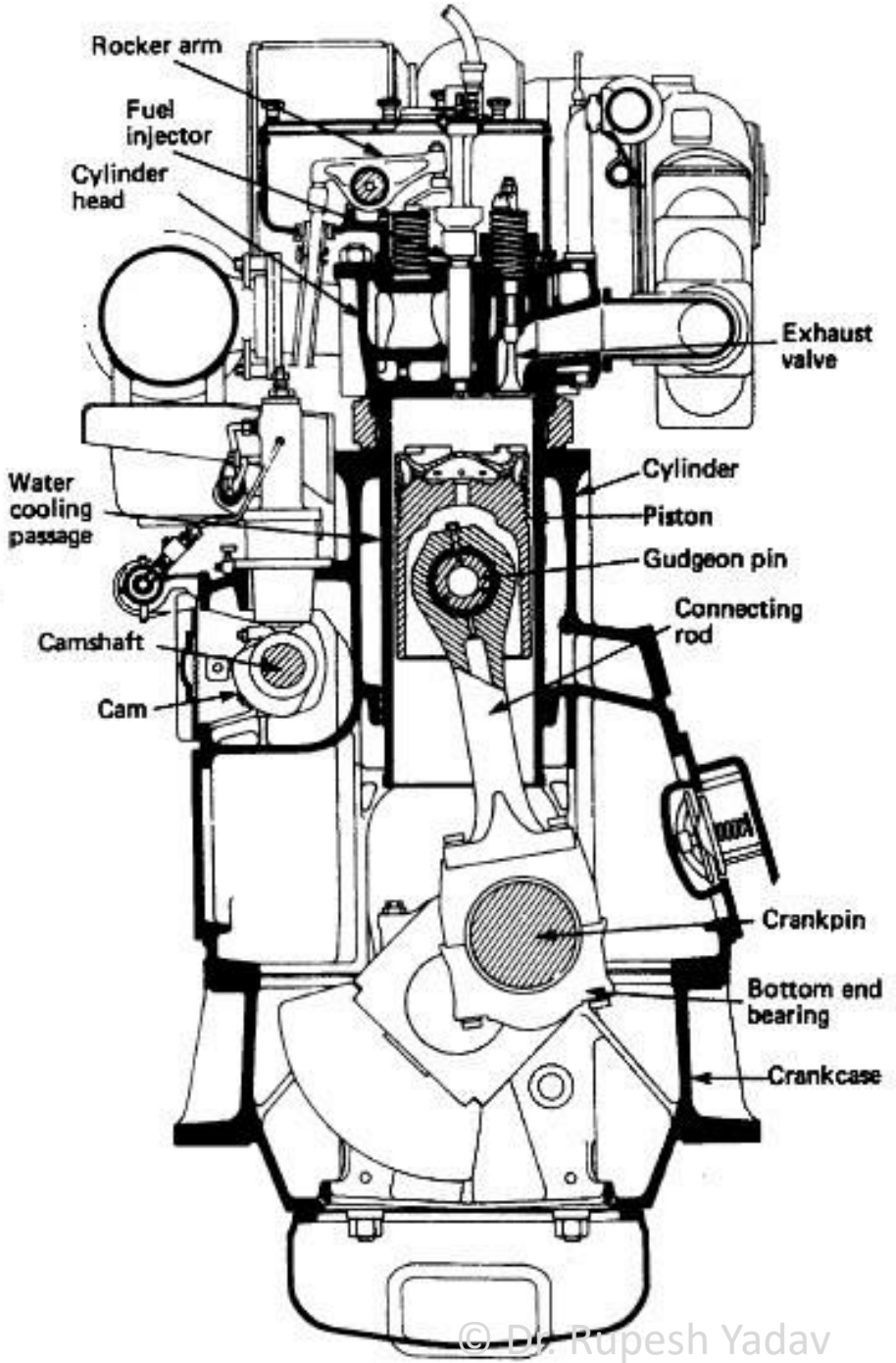
4 stroke engines

- The four-stroke cycle is completed in four strokes of the piston, or two revolutions of the crankshaft.
- In order to operate this cycle the engine requires a mechanism to open and close the inlet and exhaust valves.



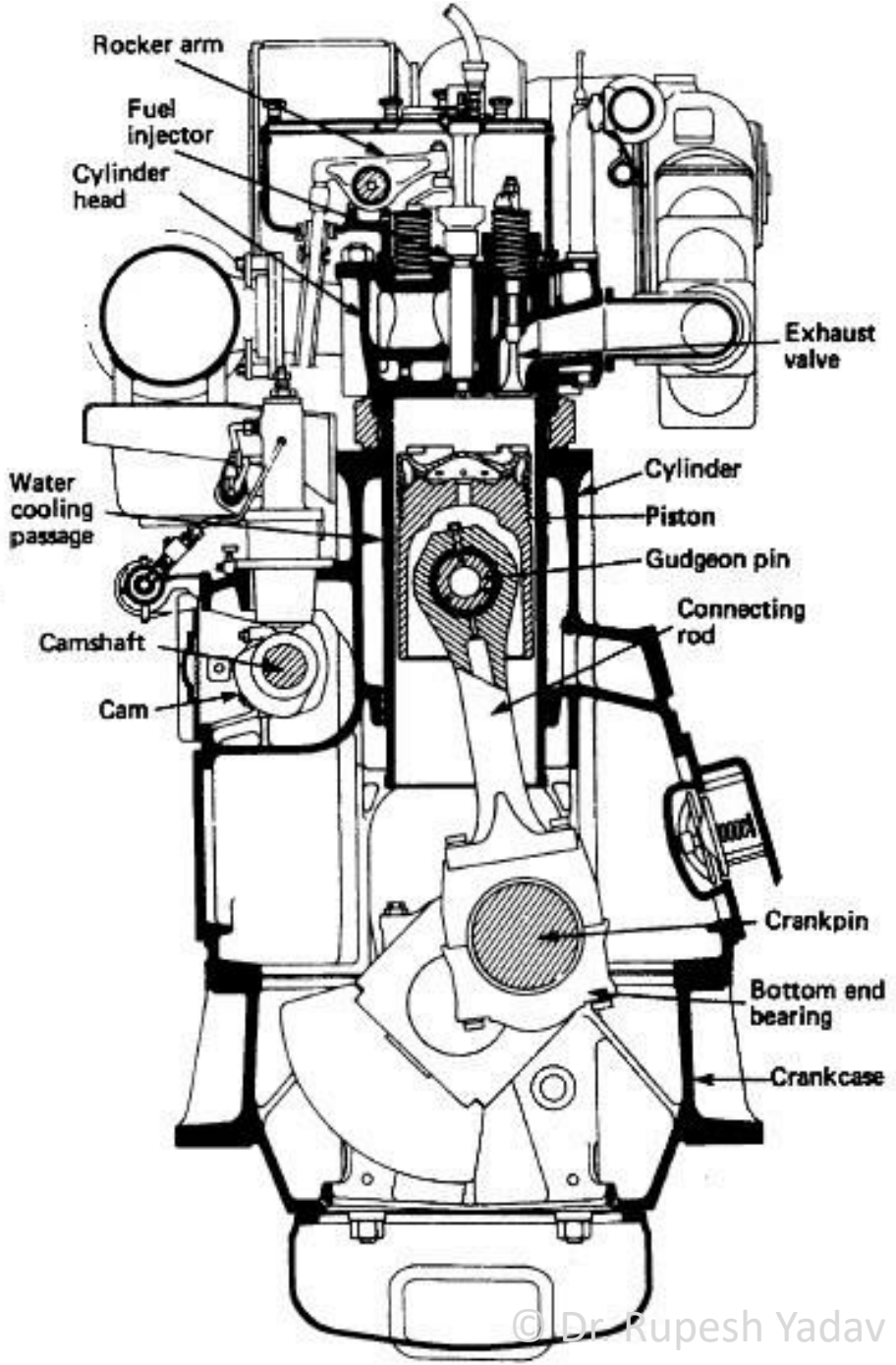
4 stroke engines

- The engine is made up of a piston which moves up and down in a cylinder which is covered at the top by a cylinder head.
- The fuel injector, through which fuel enters the cylinder, is located in the cylinder head.
- The inlet and exhaust valves are also housed in the cylinder head and held shut by springs.
- The piston is joined to the connecting rod by a gudgeon pin.



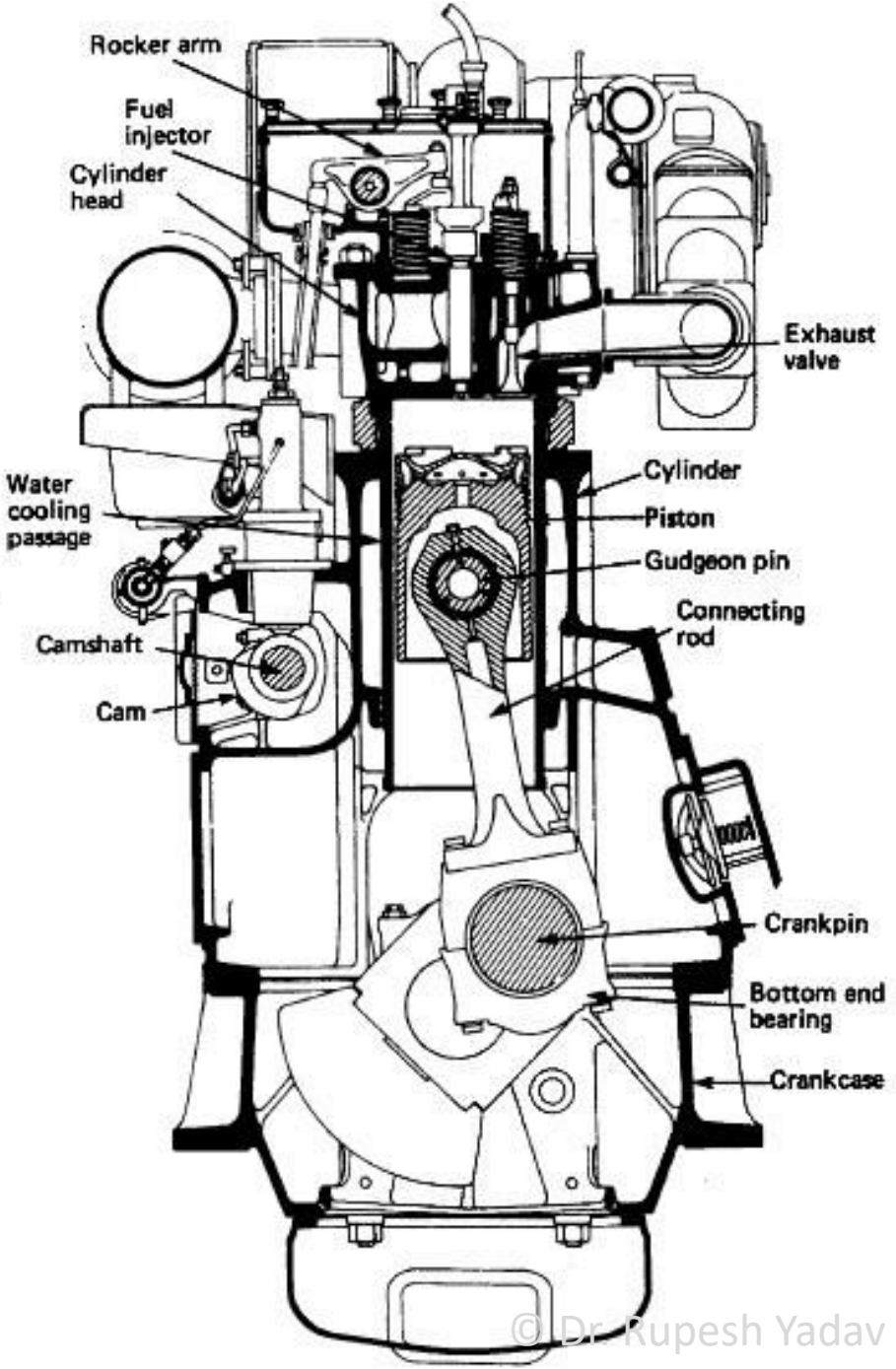
4 stroke engines

- The bottom end or big end of the connecting rod is joined to the crankpin which forms part of the crankshaft.
- With this assembly the linear up-and-down movement of the piston is converted into rotary movement of the crankshaft.



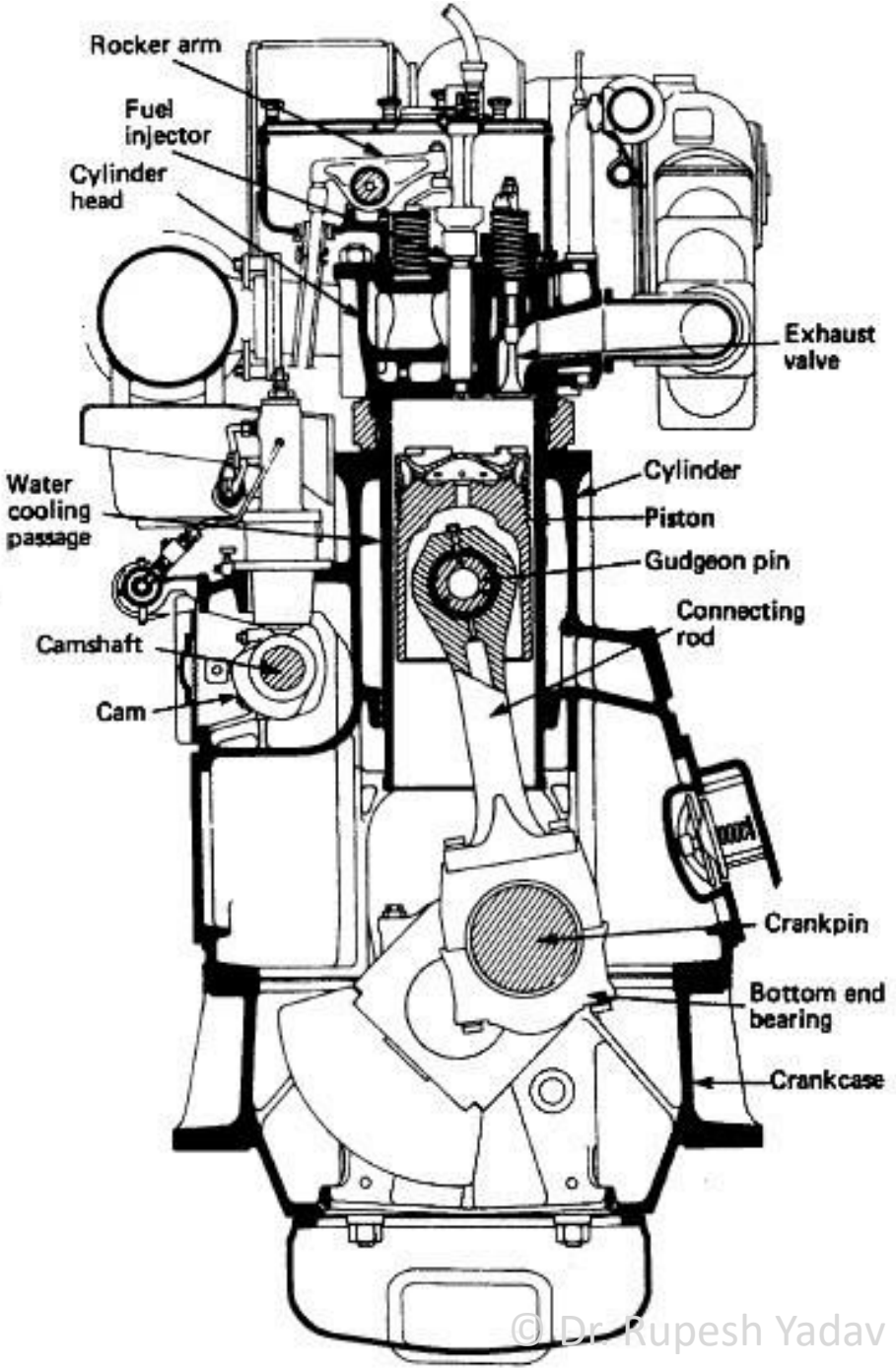
4 stroke engines

- The crankshaft is arranged to drive through gears the camshaft, which either directly or through pushrods operates rocker arms which open the inlet and exhaust valves.
- The camshaft is 'timed' to open the valves at the correct point in the cycle.



4 stroke engines

- The crankshaft is surrounded by the crankcase and the engine framework which supports the cylinders and houses the crankshaft bearings.
- The cylinder and cylinder head are arranged with water-cooling passages around them.

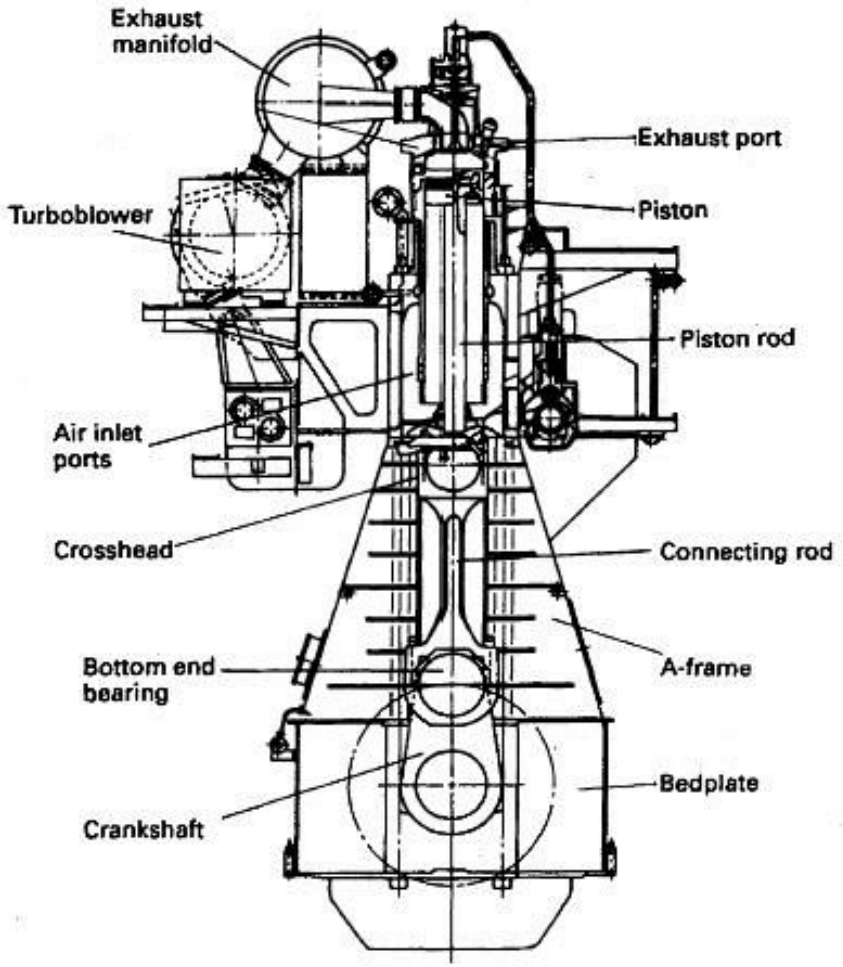


Comparison between 2 stroke cycle diesel engine and 4 stroke engine

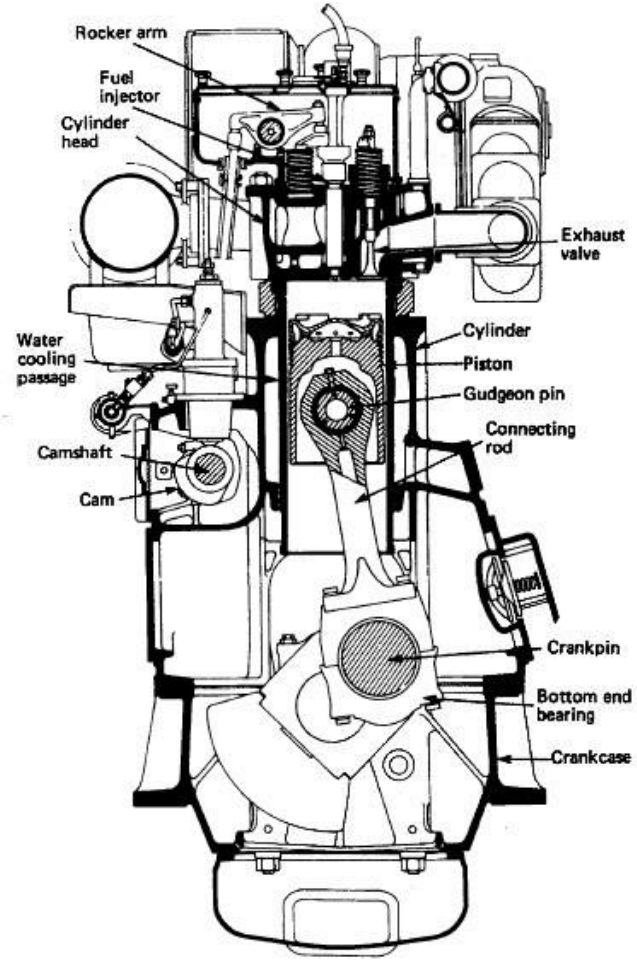
- The main difference between the two cycles is the power developed.
- The two-stroke cycle engine, with one working or power stroke every revolution, will, theoretically, develop twice the power of a four-stroke engine of the same swept volume.
- Inefficient scavenging however and other losses, reduce the power advantage .

Comparison between 2 stroke cycle diesel engine and 4 stroke engine

- As far as engine power is concern, the two-stroke engine will be considerably lighter.
- The four-stroke engine however can operate efficiently at high speeds.



2 Stroke engine



4 Stroke engine

Thank You