

COMPONENTS OF AN I.C ENGINES

An engine is a device that converts thermal energy into mechanical work. The thermal energy is produced by the combustion of air fuel mixture inside the cylinder by means of a spark produced by the spark plug. Since it uses thermal energy it is called as thermal engines. It is a source of power for many applications.

Cylinder:

- v It is the part of the engine in which the conversion of thermal energy to
- v mechanical work takes place. The piston reciprocates inside the cylinder.
- v Since energy conversion takes place inside the cylinder it must withstand high pressure and temperature.
- v It must be able to resist wear and tear and must dissipate heat. So material selection is an important consideration. Ordinary cast iron is used in light duty engines but in heavy duty engines alloy steels are used.
- v The cylinders are provided with liners so that they can be replaced when worn out. Liners are made of nickel chrome iron.

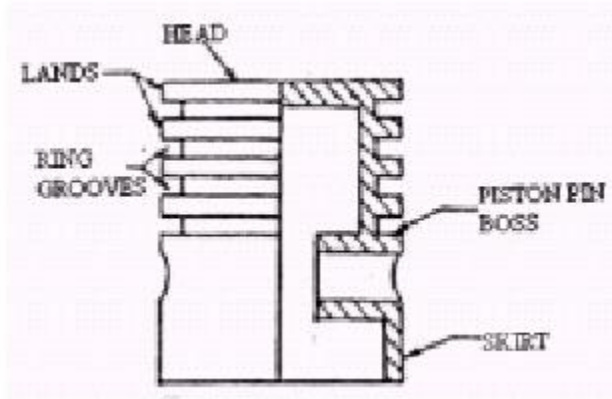
Cylinder head:

- v The cylinder head closes one side of the cylinder. They are usually cast as a single piece and are bolted to the top of the cylinder.
- v Between the cylinder and the cylinder head, gasket is provided Gasket is provided in order to act as sealing (to prevent gases escaping during the expansion stroke) and also to reduce shock.

Piston and piston rings:

- v Piston is the main part of the engine. The main function of the piston is to compress the charge and to transmit the gas force to the connecting rod during the power stroke.

- v Piston rings are circumferential rings that are provided in the piston grooves.
- v The piston rings are not fully circular; there is a clearance (Ring gap) between the two ends.
- v This is provided because during the expansion stroke piston rings expand.



There are two types of piston rings

- v Compression rings
- v Oil scraper rings

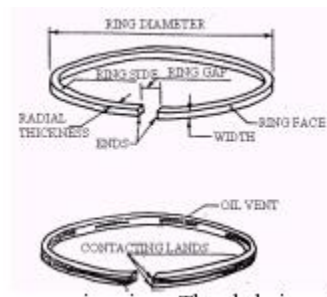


Figure 1

- v The upper rings are the compression rings.
- v They help in sealing and preventing the gas from leaking past the piston into the casing.
- v The lower rings are the oil scraper rings.
- v They are provided to remove the oil film from the cylinder walls

Connecting rod:

- v The connecting rod connects the piston and the crankshaft.
- v The piston is connected to the connecting rod by means of gudgeon pin.
- v It converts the reciprocating motion into rotary motion.
- v The upper end of the connecting rod is called small head that is connected to the piston and the lower end is called big end.

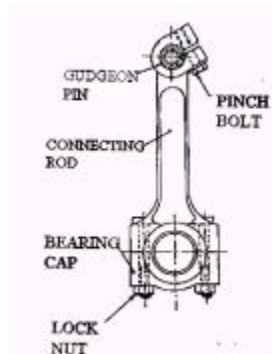


Figure 2

Crankshaft:

- v It is steel forged and smooth finished. Both the ends of the crankshaft are supported in the bearings.
- v One end is provided with the flywheel. The crankshaft is provided with counter weights for balancing.

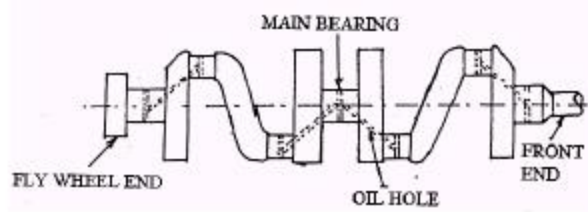


Figure 3

Cam and camshaft:

- v The main function of the camshaft is to open and close the valves at the appropriate time.
The cam is operated by means of gear arrangement driven by the flywheel.
- v The cam converts rotary motion into linear motion that operates the rocker arm. The motion of the rocker arm operates the valves.
- v Sometimes two camshafts are provided to operate inlet valve and exhaust valve separately.

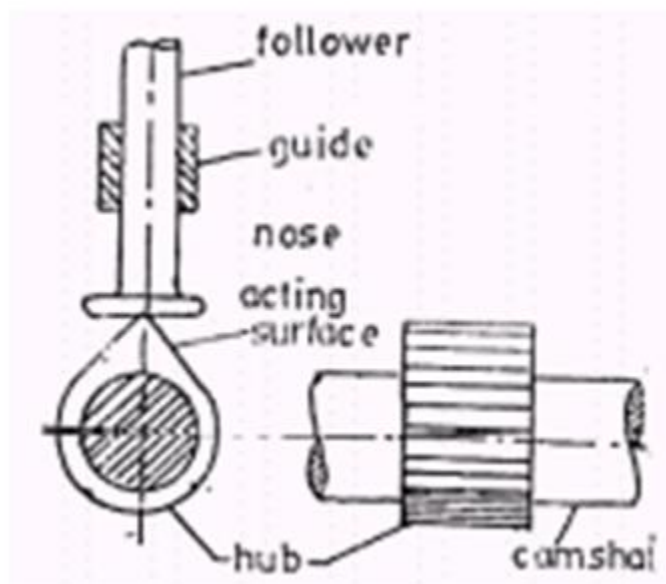
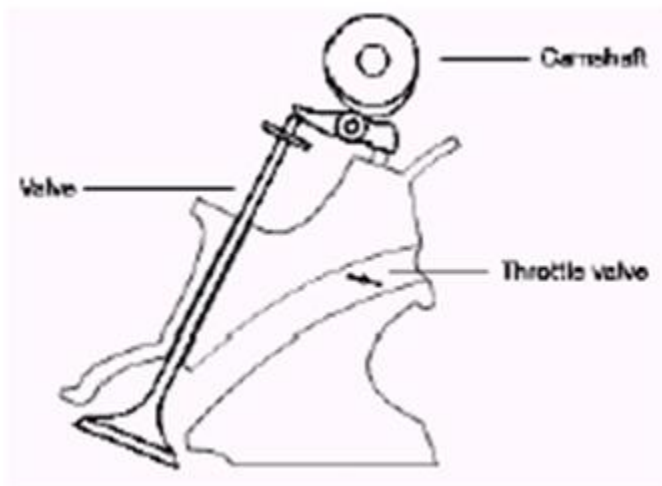


Figure 4

Valves:

- v Valves play a major role in allowing the air fuel mixture into the cylinder (inlet valve) for combustion and also releasing the exhaust gases from the cylinder after combustion (outlet valve).



Manifolds:

- v There are two types of manifolds

Inlet manifold:

- v It is a pipe like structure that connects the carburetor with the inlet
- valves. The air fuel mixture from the carburetor passes through the inlet manifold to
- the inlet valves.

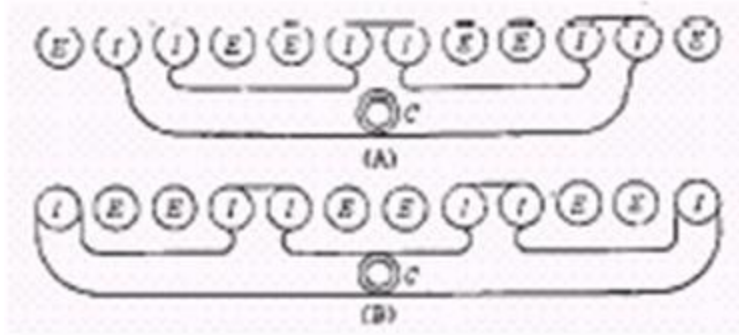


Figure 5

Fig shows A typical six-cylinder manifold

Exhaust manifold:

v This pipe like structure connects the outlet valve to the atmosphere. The exhaust gas from the cylinder passes through the exhaust manifold into the atmosphere.

Source : <http://mediatoget.blogspot.in/2011/10/components-of-ic-engines.html>