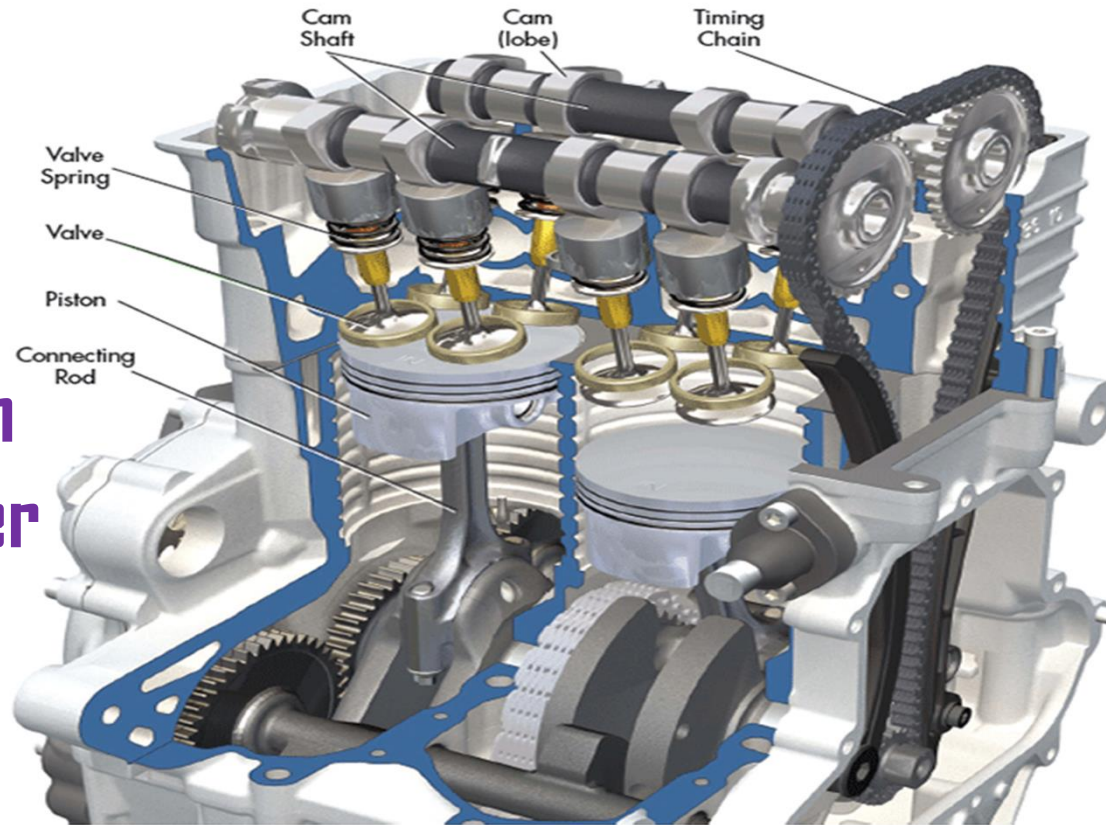


I C Engine, Steam & Nuclear Power



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Factor effecting detonation

→ Compression ratio - as the higher compression ratio increase the pressure and temp of the working mixture, and chances of auto ignition also ↑. ~~It~~ because of this in SI Engine C R are 6-10.

(2) Inlet Temp of mixture → increasing the inlet temp of mixture makes compression temp higher, thereby increasing the tendency of knocking.

(3) Increasing load → increase in load ~~causes~~ then increases the temp of cylinder ~~due to this raising the temp of End~~ charge, and hence knocking tendency is increased.

4) Supercharging \rightarrow Supercharging is the process of the charge to enter at high pressure into the cylinder, Supercharging results in increasing in temp. and hence the chances of detonation also \uparrow .

5) Advancing Sparks \rightarrow When the spark is advance the burning gas is compressed by rising piston and therefore the temp of the charge increased and hence knocking tendency also increases therefore spark must be retarded.

Temperature of combustion chamber walls \rightarrow should be not too high.
Power O/P \uparrow , ~~Knocking~~ Knocking \uparrow , Engine Speed \uparrow , Knocking \downarrow

Flame travelled distance \rightarrow Flame travelled distance must be minimum.

Spark plug location \rightarrow Spark plug must be located centrally so as to reduce flame travelled distance. flame travelled can be also ~~be~~ reduced by using two or more spark plugs in case of large engine.

Location of Exhaust Valve \rightarrow The Exhaust Valve should be located closed to spark plug so that the flame travelled distance from spark plug to Exhaust Valve is min. (The temp of Exhaust valve very high (350-400°C))

Engine size - Flame required longer time to travel across the combustion chamber of large engine, thus for large engine have greater tendency of ~~knocking~~ knocking than smaller engine and hence the bore of SI engine is limited to 100 mm.

(Engine speed)

Turbulence → increase in turbulence result in ↑ in flame speed and hence detonation chances reduce by increasing turbulence.

Octane Rating of Fuel → increase in octane no. result in increase in self ignition temp and hence with increase in octane no. the knocking tendency decreases.