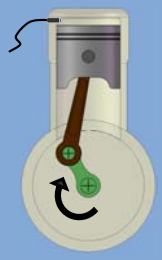
USM ENGINES LAB

COMBUSTION ANALYSIS

Compression

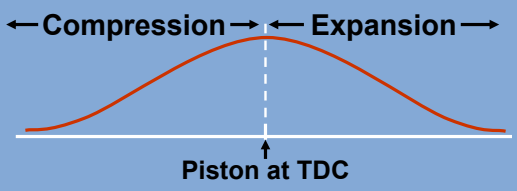


During compression:
PV = NRT

So: P ↑ as V ↓

Isentropic compression:
$P V^K$ = constant

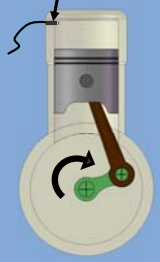
MOTORED (NON-FIRING) PRESSURE



Combustion

During Combustion the pressure rises rapidly due to heat addition from burning fuel. We analyze combustion pressure data for mixture burned fraction, location and value of peak pressure, ignition delay, combustion duration, flame speed & combustion parameters that depend on fuel/air mixing & engine design.

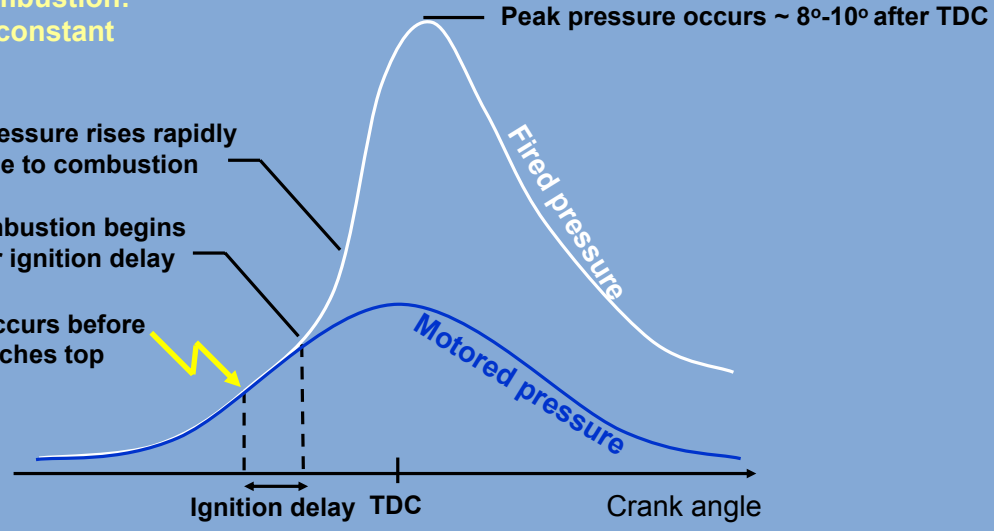
Pressure Sensor

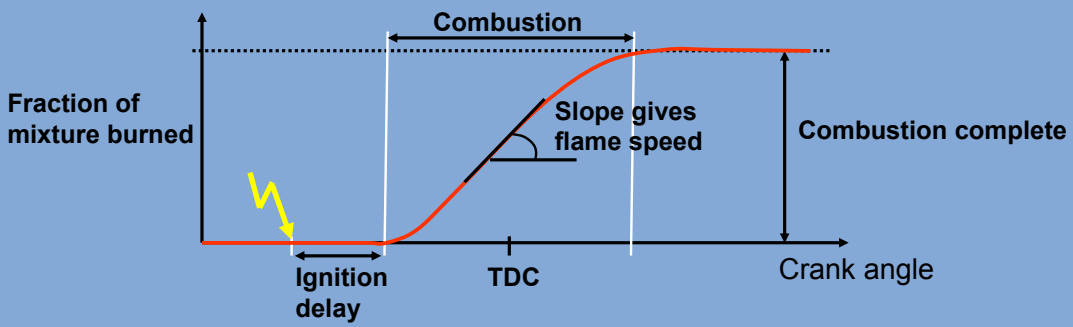


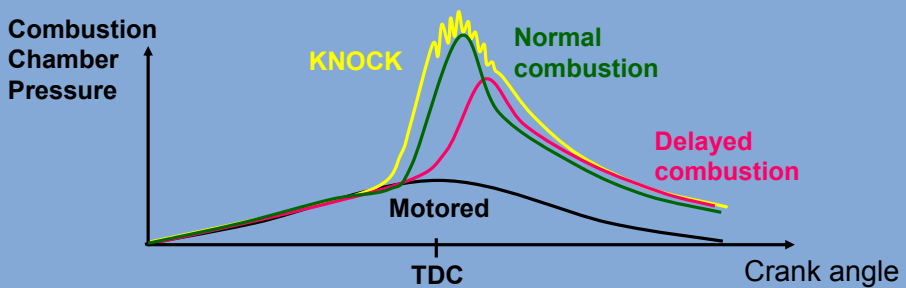
Expansion

Pressure is higher after combustion. Pressure drops as piston descends

After Combustion:
$P V^K$ = constant







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