Classification of IC engines

- **Ignition system:** Battery & Magneto Ignition systems
- **Type of fuel:** Petrol, Diesel, LPG, CNG
- **Working cycle:** Diesel, Otto, Combined cycle
- **Number of strokes:** Two stroke, Four stroke
- **Cooling system:** Air cooling, Water cooling
- **Speed:** Slow, Medium and High speed
- **Number of cylinders:** Single cylinder, Multi cylinder
- **Cylinder arrangement:** Inline, Opposed piston, V-type
Types of 4 cylinder engines

**Inline**
Here all the cylinders of the engine are in a straight line. This is the most popular type of engine in India. The Engine is usually placed vertically or in some rarer cases kept leaning at an angle.

**V-Type**
The cylinders arranged in two banks connected to the same crankshaft.
Different angles are used between the cylinder banks.
V engines offer the car to have more cylinders with a shorter bonnet length, giving better road visibility.
V engines are well balanced, smooth and quiet in operation.

**Flat/Horizontally Opposed/Boxer**
A Boxer engine is a ‘V’ engine with an angle between the cylinder banks of 180 Deg. The pistons look like a boxers fists going back and forth hence the ‘boxer’ name.
These engines offer some benefits, but are complicated in design and expensive to produce & maintain, hence are not widely used.
Major Types of engines

- 4 Stroke Petrol Engine
- 4 Stroke Diesel Engine
- 2 Stroke Petrol Engine
- 2 Stroke Diesel Engine
WORKING OF 4 STROKE PETROL ENGINE

A – INLET VALVE
B – CYLINDER HEAD COVER
C – INLET MANIFOLD
D – CYLINDER HEAD
E – WATER JACKET
F – CARNK CASE
G – CRANK CASE COVER
H – LUBRICATION OIL
I – CAM SHAFT
J – OUTLET VALVE
K – SPARK PLUG
L – OUTLET MANIFOLD
M – CYLINDER
N - PISTON
O - CRANK
P – CRANK SHAFT
A Petrol engine's operation sequence is as follows:

- **Stroke 1 (intake)** – air & fuel enter the cylinder.
- **Stroke 2 (compression)** – air & fuel are compressed.
- **Stroke 3 (power)** – spark plug fires, ignites fuel.
- **Stroke 4 (exhaust)** – burnt gases are expelled from the engine.
WORKING OF 4 STROKE PETROL ENGINE

Stroke 1. Intake
- Petrol/air mixture
- Inlet valve

Stroke 2. Compression
- Piston
WORKING OF 4 STROKE PETROL ENGINE

Stroke 3. Ignition

spark plug

Stroke 4. Exhaust

exhaust out

outlet valve
WORKING OF 4 STROKE PETROL ENGINE

VALVE OPERATING MECHANISM AND IGNITION SYSTEM
WORKING OF 4 STROKE DIESEL ENGINE

Copy of diesel[1].swf
4 stroke 4 cylinder engine
WORKING OF 2 STROKE PETROL ENGINE
COMPARISION BETWEEN 4 STROKE & 2 STROKE ENGINES
COMPARISON BETWEEN PETROL AND DIESEL ENGINES