

UNIT 1

Two wheeler Engines

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Two wheeler Engines

- All Two wheelers are Internal Combustion Engines
- Power is initially Transmitted to rear driving wheel.
- Depending upon type and use, power output range significantly varies.
- Orientation of engine on the vehicle also differs significantly according to vehicle type
- A lot of research is still going on to improve the performance of these engines.

Classification of Engines

- **With Respect to no of stroke:**

- ✓ Two stroke and four stroke: Most two wheelers use four stroke now a days.

- **With respect to speed and torque output:**

- ✓ High Speed Engines (8000RPM-15000RPM), low torque to medium range torque
- ✓ Medium speed engines (3000-8000rpm), Medium Torque, eg Street commuter bikes.
- ✓ Low speed engines (below 3000rpm), produce high torque, eg. endure bike designed for off road conditions.

- Cruiser bike: Low Speed Engines with medium torque.

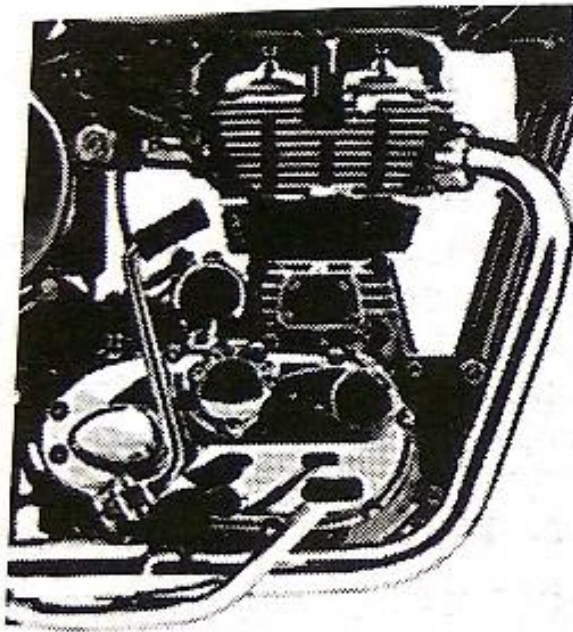
- Sports Bike: High Speed Engines with High torque

- **With Respect to Power Output:**

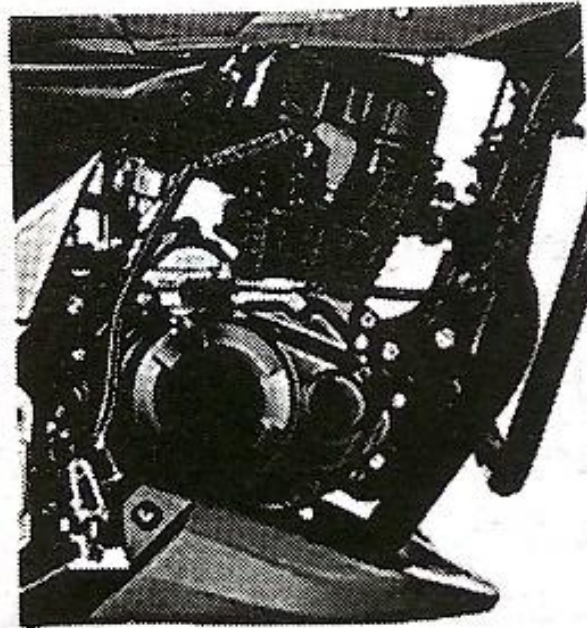
- ✓ Low power: up to 30bhp
- ✓ Medium power: 30 to 50 bhp
- ✓ High Power: more than 50 bhp

□ **Engines are specified with respect to maximum power it develop.**

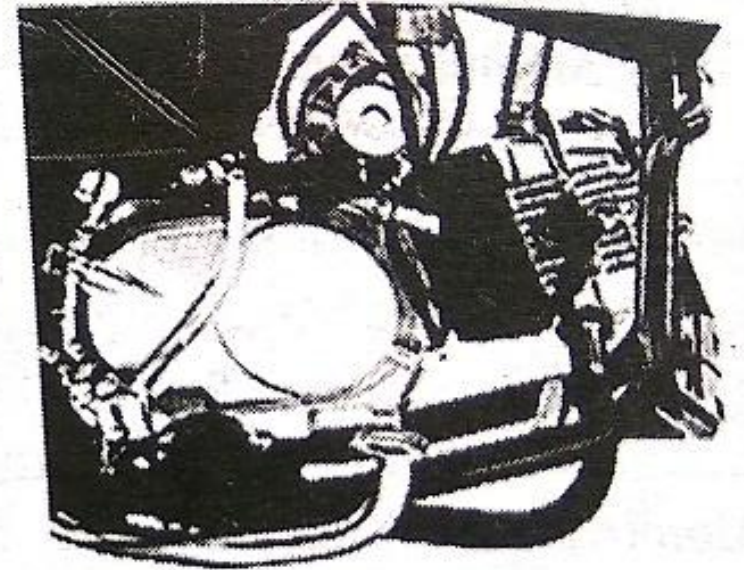
- **With Respect to Cylinder angle:** Classified into three categories based on cylinder axis angle.
- Vertical: (single cylinder with high capacity, low speed and high torque range kept vertical for longitudinal stability)
- Inclined: Multi cylinder engines
- Horizontal: (Low capacity, low speed engines are kept horizontal due to less weight)



(a)



(b)



(c)

Figure 2.2 Vertical, Inclined and Horizontal Engines.

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- With Respect to no. of cylinder:

- One
- Two
- Four
- Six

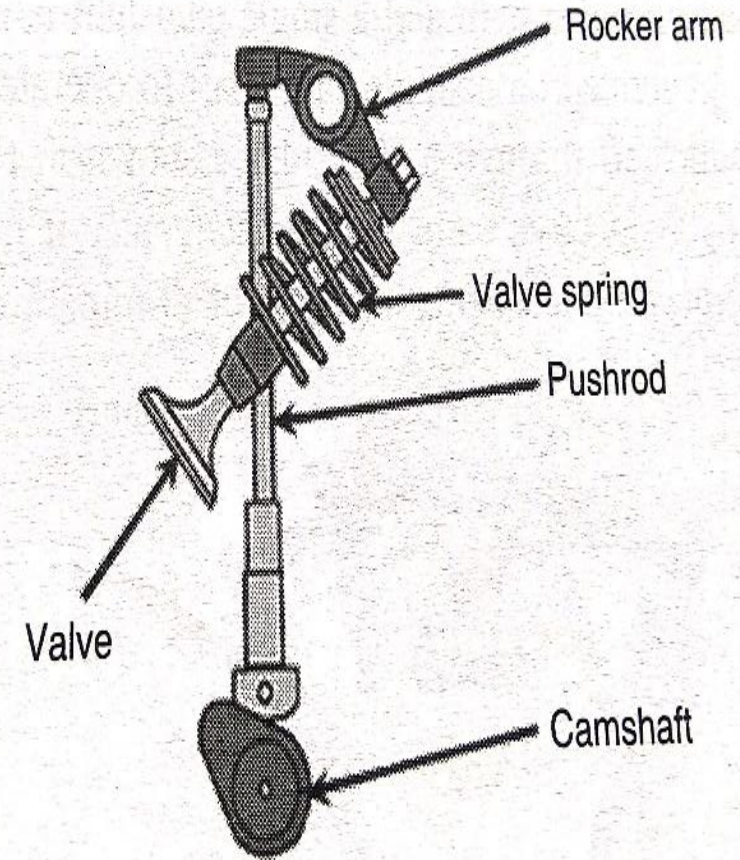
- With Respect to Arrangement of cylinder

- V twin Engine
- Horizontally opposed twin cylinder engines
- Side by side twin cylinder engine
- V four engine
- Horizontally opposed four cylinder engines
- 3 cylinder in-line engine
- 4 cylinder in-line engine
- V five engine
- 6 cylinder in-line engine
- V eight engine

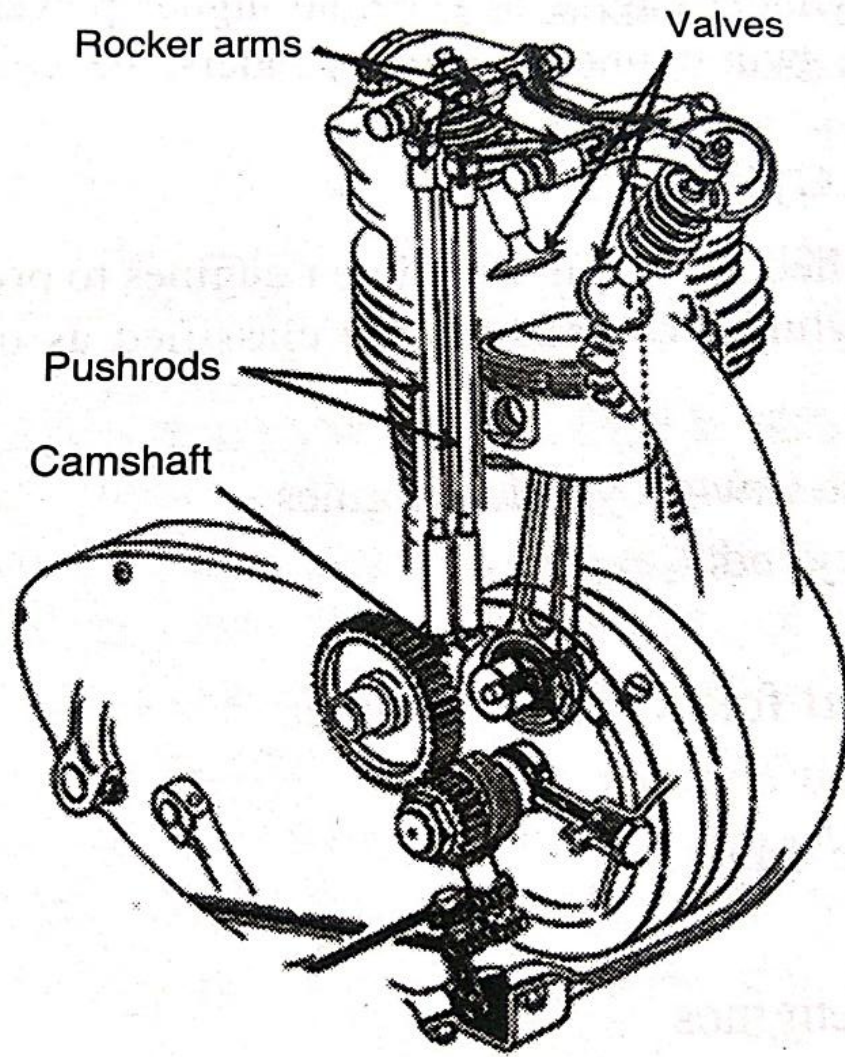
- **With Respect to valve operating mechanism:** mechanism used to operate the valve
 - Pushrod overhead valve
 - Single overhead camshaft
 - Double overhead camshaft
- **With Respect to cooling system:**
 - Air cooled
 - Oil Cooled
 - Water cooled
- **With Respect to Fuel supply**
 - Carbureted
 - Fuel injected engines

Pushrod overhead valve

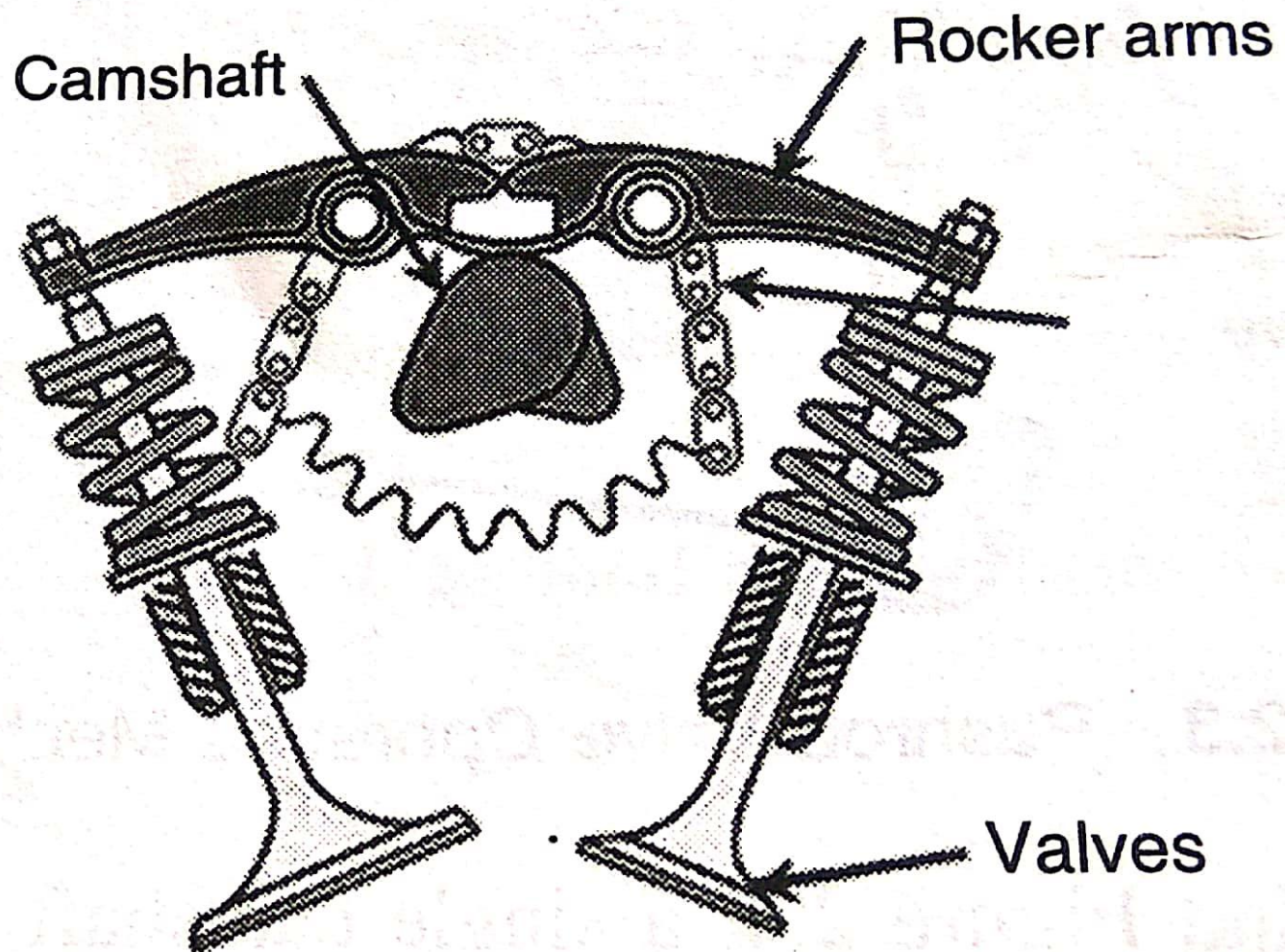
Single cam shaft located in crankcase is driven by crankshaft through gear drive. This camshaft contains two different cams generated on its periphery. These cams push the pushrods of inlet as well exhaust valve when required. Rocker arms are provided in cylinder head and operated by pushrods. Opening and closing time of valves are totally controlled by cam shaft adjustment.

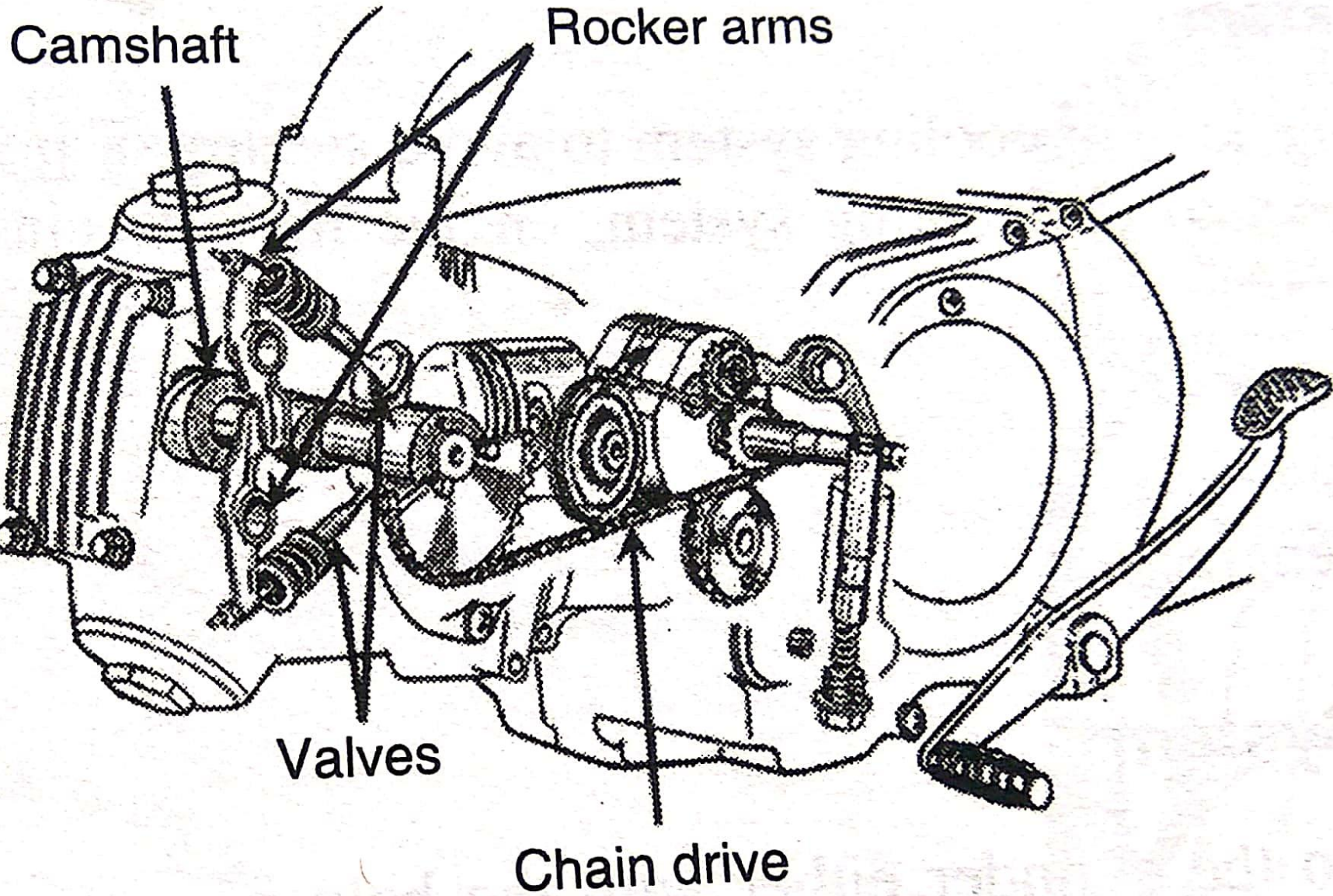


Pushrod overhead valve



Single overhead camshaft





Camshaft

Rocker arms

Valves

Chain drive

Double overhead Camshaft

