MODULE-I
CHAPTER 2
HYDRAULIC PUMPS

- Introduction to hydraulic pumps
  - Classification of pumps
  - Construction of pumps

Introduction to hydraulic pumps

- A pump is the heart of a hydraulic system. A pump is a device which is used to convert the mechanical energy into hydraulic energy.
- The mechanical energy is delivered to the pump by a prime mover such as an electric motor.
- The pump creates a partial vacuum at its Inlet due to mechanical action, which permits atmospheric pressure to force the fluid through the inlet line and into the pump.
- The pump is then pushes the fluid into the hydraulic system with high pressure.

Gear pumps
5) Screw pump

- Screw is an axial flow type positive displacement pump. It has a power driven screw mounted on the shaft. This screw is in continuous mesh with a symmetrically opposed idler mating rotor. This idler rotor acts as the rotating seal.
- As the power rotor rotates, it draws the fluid from the inlet chamber, which flows along the screws axially. With continuous rotation more and more fluid is pushed to the outlet chamber, and delivered to the fluid outlet

Piston pumps
3) Radial piston pump

- In radial piston pumps the pistons are located radially around the pump axis, hence the name radial piston pumps.
- The pump Consists of a cylinder block mounted on the drive shaft. The pistons mate in the cylinders and are kept in the housing such that they are in continuous contact with the cam surface. The cylinder block centre is offset from the cam surface centre. The drive shaft rotates the cylinder block along with the pistons, while the cam surface remain stationary. The pistons remain in continuous contact with the cam surface due to the centrifugal force and the back pressure of the oil. The inlet and outlet ports are separated by a pintle.
- In operation, as the cylinder block rotate, tge piston in touch with the cam surface reciprocate due to the eccentricity between the cylinder block and the cam surface centers. The pistons above the pintle move away from the centre thus drawing in the oil from the inlet port in the first half revolution.
- In the next half revolution, the pistons start moving inward thus pushing the oil towards the centre, hence delivering through the outlet port.