UNIT 1

Scavenging

What is Scavenging?

- The process of removing exhaust gases with the help of Fresh charge is known as scavenging.
- Scavenging process plays vital role in 2 stroke engines as it works with ports.
- Fundamental requirement of scavenging system is to push out the exhaust gases from the cylinder without any loss of fresh charge.
- During the process, the increased amount of air helps to clear the cylinder of the gases of combustion.

- The exhaust gas removing process should take place without any mixing and without any heat transfer between fresh charge and exhaust gases.
- This process should continue till all the exhaust gases are replaced by fresh charge inside the cylinder.
- The cylinder should be fully filled with fresh charge when piston reaches to BDC.
- Such a system is not possible in practice because of three reasons:
  - Mixing of fresh charge and exhaust gases is not avoidable due to turbulence.
  - Heat transfer will always take place between low temp fresh charge and high tem exhaust gases.
  - Some of fresh charge will escape with exhaust gases and some exhaust gases will remain in cylinder

Ideal scavenging

- In an ideal scavenging process, the fresh mixture is considered to push the combustion products out of the cylinder without mixing or exchanging heat. This process continues until all burnt gases have been expelled and the cylinder is completely filled with a fresh mixture

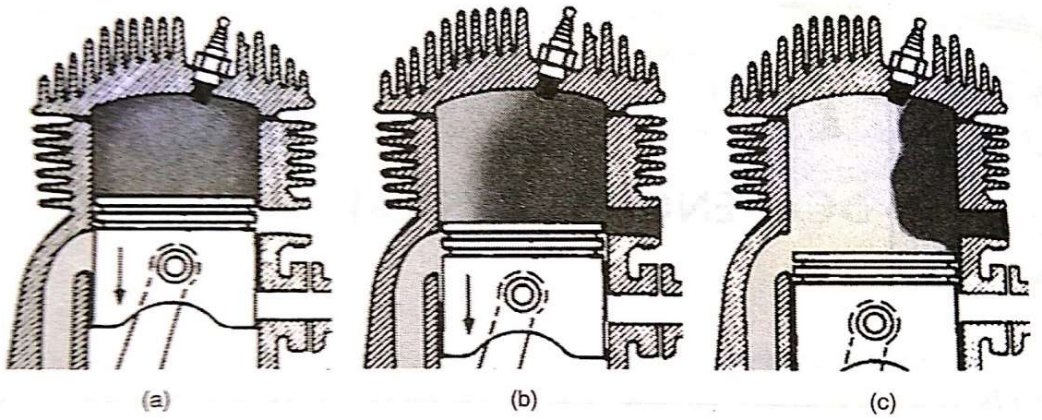

Figure 7.1 Ideal Scavenging Process.

Practical

Can be divided in to Three distinguishable sub processes

- Partially ideal Scavenging (a)
- Mixing (b)
- Short circuiting (c)

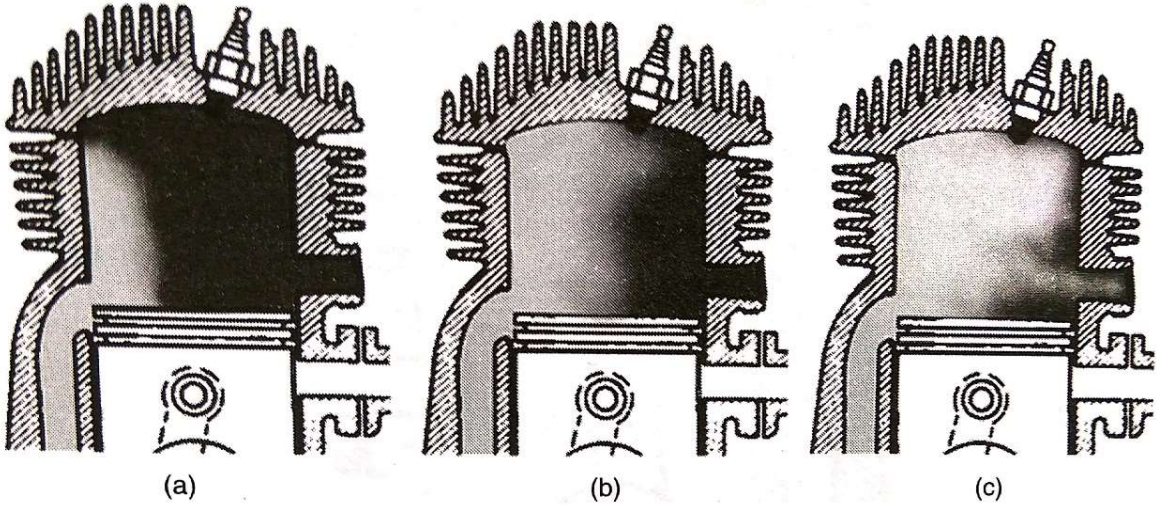

Figure 7.2 Practical Scavenging Process.

- **Partially ideal Scavenging (a):**

➢It is a stage of scavenging process wherein exhaust gases are drawn out of the cylinder through pressure difference between atmosphere and cylinder.

- **Mixing (b):**

➢The incoming fresh charge mixes with the cylinder contents, and a portion of this mixture passes out of the exhaust ports at a rate equal to that entering the cylinder, this homogenous mixture consists initially of products of combustion only and then gradually changes to pure air.

- **Short circuiting (c):**

➢The fresh charge coming from the scavenging manifold directly goes out of the exhaust port without removing any residual gas. This is a dead loss and its occurrence must be avoided.