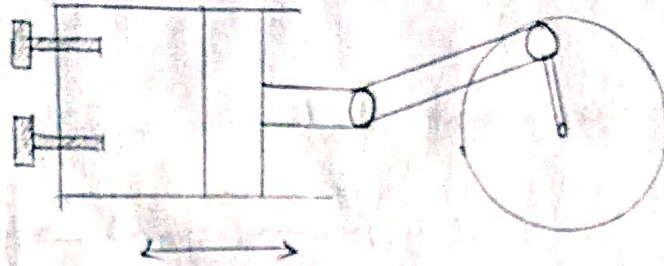


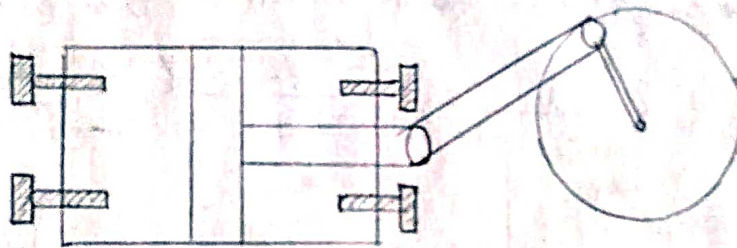
Single Acting Air Compressor

In this compressor only one side of the piston is used to suck the air, compress it and deliver it.

Single acting $\eta = 1 \frac{\text{Cycle}}{\text{revolution}}$.



Double acting Compressor

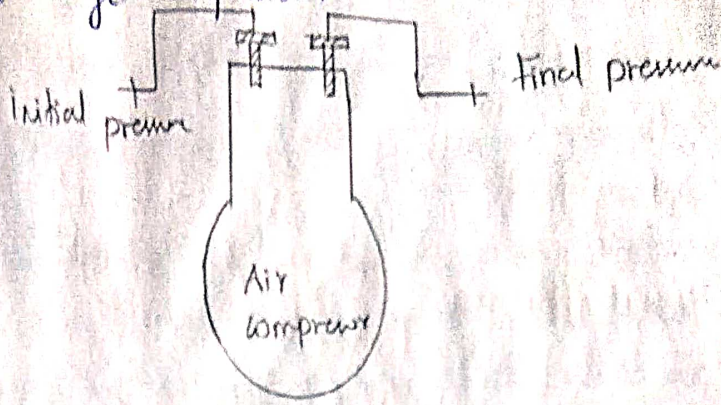


In this Both sides of the piston are used to suck the air, compress it and to deliver the air when suction is occurred in one side, compression and delivery it on the other side.

Two cycles \rightarrow Completed — one revolution of Crank shaft

Double acting $\eta = 2 \frac{\text{Cycles}}{\text{revolution}}$.

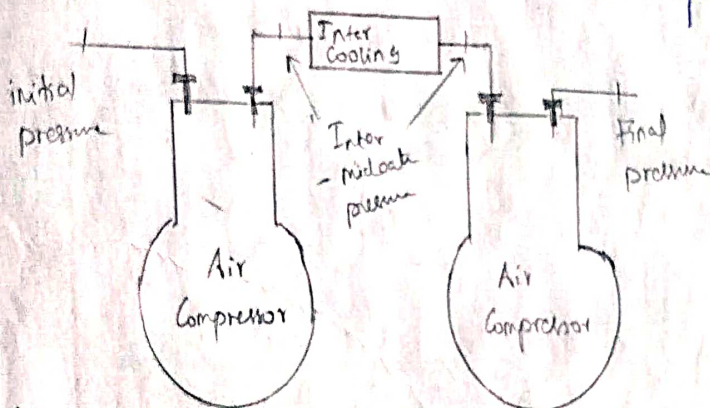
Single Stage Compressor



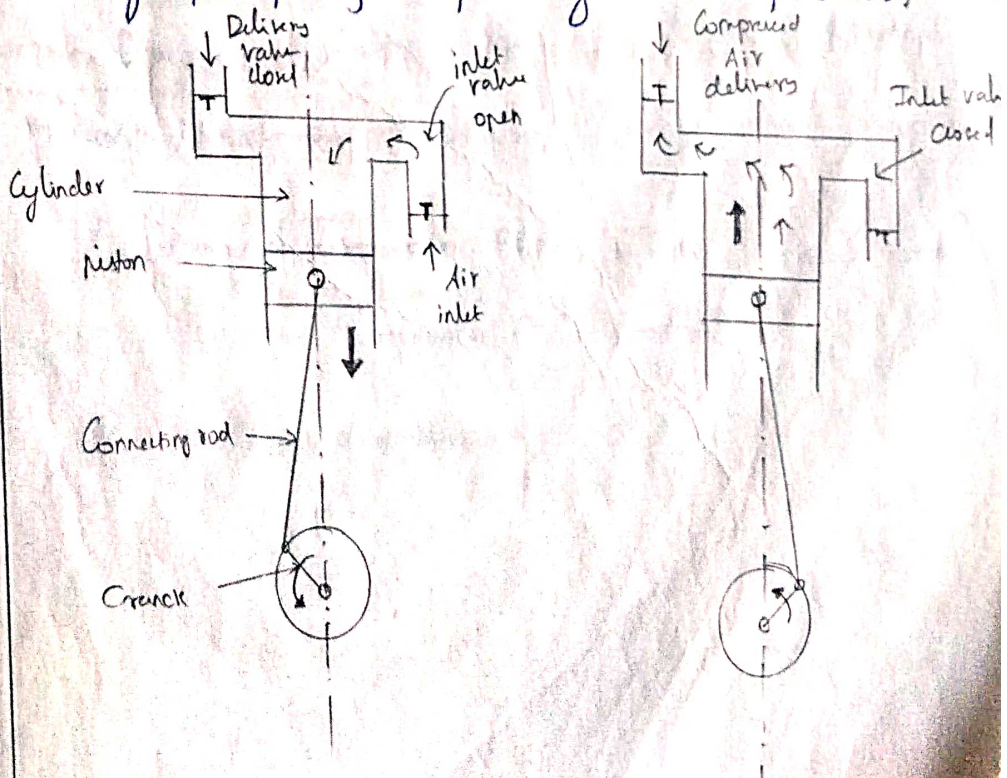
The compression of air from initial pr to final pr is in one cylinder.

Multistage Compressor.

The compression of initial pressure to final pressure is carried out in more than one cylinder.



Working principle of Reciprocating Air Compressor.



The piston moves downwards - Inlet valve opens and fresh air enters the cylinder (Suction stroke)
 Stroke Completed in 90° of crank revolution ($\frac{1}{2}$ rev)

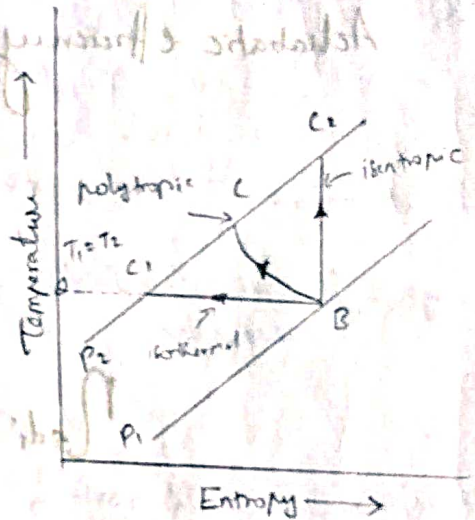
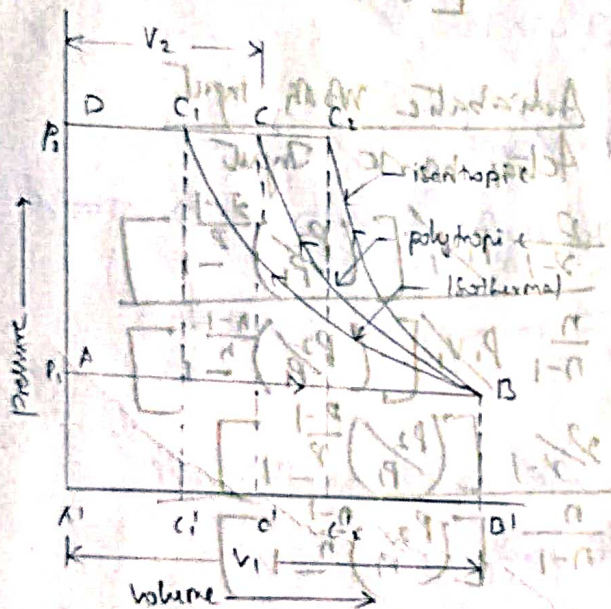
The piston moves upwards during return stroke. Both valves are closed. So compression takes place. when air compressed to (required pressure) Delivery valve opens.

Compressed air is delivered through delivery valve.

Suction, Compression, Delivery \rightarrow one cycle

(a) P-v diagram

(b) T-s diagram



Compression takes place by three different process isothermal or polytropic or isentropic process.

- (i) Isothermal Compression $PV = C$ (without clearance volume)
- (ii) Polytropic Compression $PV^n = \text{Constant}$
- (iii) Isentropic Compression