FORGING EQUIPMENT

They are classified based on the principle of operation.

1. Forging Hammer

   - The force is supplied by a falling weight of ram.
   - Deformation of work piece is due to the application of the kinetic energy of the ram.

Types of Forging Press

i) Mechanical board hammer:

   - It is a stroke restricted machine.
   - Repeatedly the board (weight) is raised by rolls and is dropped on the die.
   - Rating is in terms of weight of the ram and energy delivered.

![Mechanical Board Hammer](image1)

ii) Steam Hammer (Power Hammer) Range: 5 kN to 200 kN

   - It uses steam in a piston and cylinder arrangement.
   - It has greater forging capacity.
   - It can produce forgings ranging from a few kgs to several tonnes.
   - Preferred in closed die forging

![Steam Hammer](image2)

The total energy supplied in a blow:

It is given by: 

\[ W = \frac{1}{2}mv^2 + pAH = (mg + pA) \]

Where

- \( m \) = mass of ram
- \( v \) = velocity of ram at the start of deformation
- \( g \) = acceleration due to gravity
- \( p \) = air/steam pressure on ram on down stroke
iii) **Hydraulic Press:**

- It is a load restricted machine.
- It has more of squeezing action than hammering action.
- Hence dies can be smaller and have longer life than with a hammer.

![Fig. Hydraulic Press](image)

**Features of Hydraulic Press**

- Full press load is available during the full stroke of the ram.
- Ram velocity can be controlled and varied during the stroke.
- It is a slow speed machine and hence has longer contact time and hence higher die temperatures.
- The slow squeezing action gives close tolerance on forgings.
- Initial cost is higher compared to hammers.