



Suspension Springs

✶ The main objective of the chassis Spring is to absorb the Shock-imparted to the wheels by road obstacles

✶ A Spring when fitted between the wheel and the frame isolates the body partially from the axle so that the wheel moves up and down without transferring similar movement to the frame

Types of Suspension Spring

- ✶ Metal Spring
 - Laminated or leaf Spring
 - Coil Spring
 - Torsion-bar Spring
- ✶ Rubber Spring
- ✶ Pneumatic Spring



① → ⑩



Leaf Spring:

Leaf Spring are made out of flat plates. The advantage of leaf Spring over helical Spring is that the ends of the Spring may be guided along the definite path. As it deflects to act as a structural member in addition to energy absorbing device. Thus the leaf Spring may carry lateral loads, Brake Torque, Driving Torque in addition to shocks.

Flat Spring [cantilever type]

$$\sigma = \frac{6WL}{nbt^2}$$

$$\delta = \frac{4WL^3}{nEbt^3}$$

Flat Spring [Simply supported type]

$$\sigma = \frac{6WL}{nbt^2}$$

$$\delta = \frac{4WL^3}{nEbt^3}$$



Laminated Leaf Spring

- * A leaf spring commonly used in Automobile is Semi elliptical.
- * It is made up of the number of plates known as leaf
- * The leaves are usually given an initial clearance a cambered.



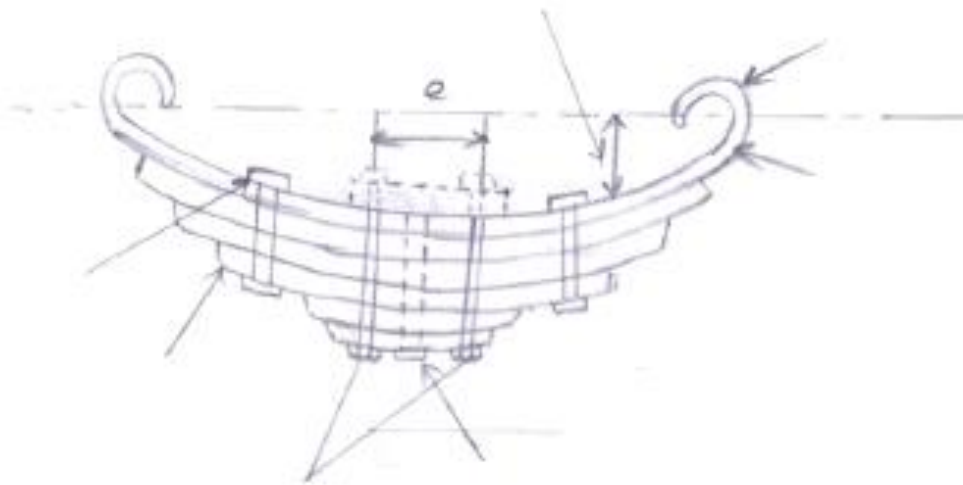
① → ⑫



* So It will tend to straighten under the load.

* The leaf are held together by means of a band shrunk around them at the center or by a hole passing through the center

* The longest leaf known as master leaf has its end formed in a shape of an eye through which the holes are passed to secure the spring to its support





Nipping:



- * By giving a greater radius of curvature to the full length leaves than graduated leaves before the leaves are assembled to form a spring.
- * By doing so, a gap or clearance will be left between the leaves. This initial gap is called nip.
- * When the central bolt holding the leaves is tightened, the full length leaf will bend back and have an initial stress in a direction opposite to that of the normal load.

$$C = \frac{2WL^3}{nEbt^3}$$