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Question:

Define self-energizing and self-locking brake.

Answer:

Self energizing & Self Locking brake

$$R_n \times X = PL + \mu a R_n$$

R_n = Normal reaction, P = Applied force, L = lever length

X = Distance of block from hinge, μ = coefficient of friction, a = distance of drum from hinge

In the above equation when frictional force adds to the breaking torque. In other words, the frictional torque and braking torque are in the same direction its a self locking brake.

In the above equation when $X < \mu a$, P becomes negative

Hence, P is not required for braking and brake gets applied on its own. It is called as self energizing brake.
