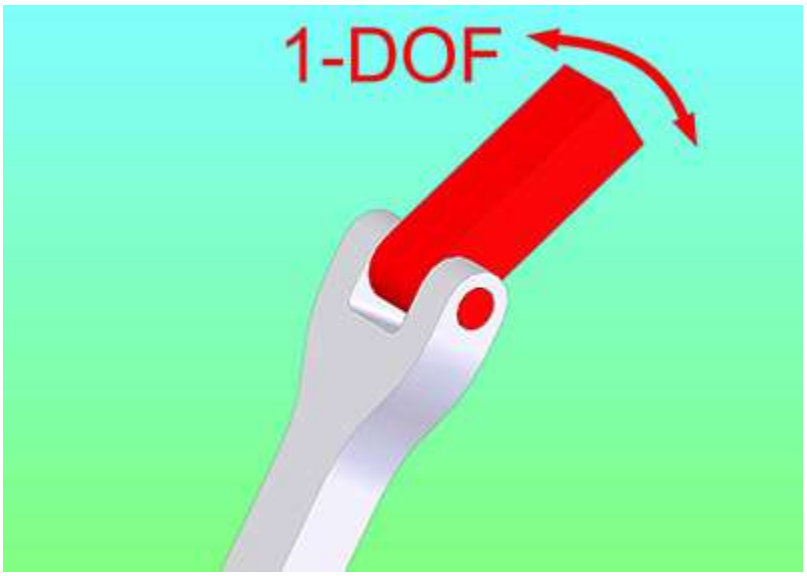
CHAPTER-2

What is a pin joint?

A pin joint is a connection between two objects that allows only relative rotation about a single axis. All translations as well as rotations about any other axis are prevented — the joint therefore has one degree of freedom (1-DOF). A pin joint is formally called a revolute joint in kinematics and may also be referred to as a pivot point when analyzing motion in two dimensions, or as a hinge.

A pin joint is a type of kinematic pair, an idealized description of the motion constraints within a machine, which allows motion analysis. There are many ways that pin joints are constructed, for example hinges and roller bearings. Three surface contacts are typically involved in constraining motion to create a pin joint. A cylindrical surface contact constrains four degrees of freedom (translation in the two radial directions and rotations not about the allowed axis). Two planar surface contacts are typically required to constrain the single degree of freedom of axial translation, with each surface contact resisting surface penetration but not separation.

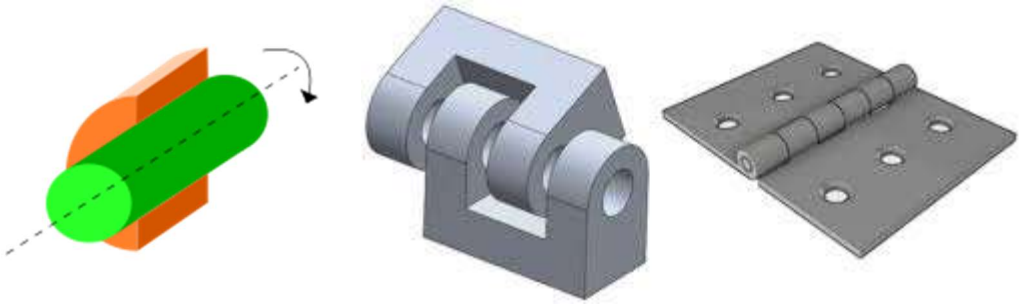
Kinematic pairs are classified as either a higher pair or a lower pair. Higher pairs involve point or line contact, for example a ball or a cylinder rolling over a surface. Lower pairs are normally considered as surface contact. Machines may have many higher pairs such as all the ball bearing contacts within roller bearings.



Is there a moment at a pin?

PINNED SUPPORTS

A pinned support can resist both vertical and horizontal forces but not a moment. They will allow the structural member to rotate, but not to translate in any direction. Many connections are assumed to be pinned connections even though they might resist a small amount of moment in reality.



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For-ELECTRICAL 1ST YEAR (evening)

Subject-BMCE