

Kinematic Link

A kinematic link, element, or link is a resistive body part of the machine that connects other elements that move relative to it. In a reciprocating steam engine, for example, the piston, piston rod, and crosshead are one link; the connecting rod with big and small end bearings is a second link; the crank, crankshaft, and [flywheel](#) are the third link; and the cylinder, engine frame, and main bearings are the fourth link.

Define Kinematic Link

“A kinematic link or element is defined as the part of a machine that has a relative motion with regard to another part of the same machine.”

A link or element must not be rigid, but it must be resistant. A body is said to be resistant if it can transmit the necessary forces with negligible distortion. The kinematic link is a vital part of the [GATE exam](#). As a result, a link should have the following two characteristics:

- It should be capable of relative motion.
- It must be a resistant body.

Types of Kinematic Link

A kinematic link is a machine part or assemblage of parts moving about other machine elements. As an example, consider a piston in an engine. The piston moves about other engine components, such as the cylinder and connecting rod. There are four types of the link which are:

- Rigid Link
- Flexible Link
- Fluid Link
- Floating Link

Rigid Link

A rigid link is one that does not deform when conveying motion. Links, in general, have a flexible nature. They are termed rigid if they do not deform much while conveying motion.

For example, crank and connecting rod.

Flexible Link

A flexible link is one that is partially distorted while conveying motion in such a way that the transmission of motion is not affected.

Examples, Springs, chains, Rope, Belts, etc.

Fluid Link

A fluid link is one that is deformed by having fluid in a closed vessel and transmitting motion via the fluid via pressure.

For example, hydraulic press and hydraulic jack.

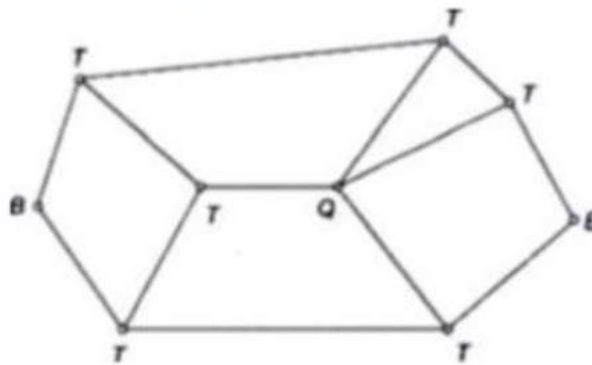
Floating Link

A floating link is a link that is not connected to the frame.

Kinematic Link Diagram

A kinematic link or element is any part of a machine that moves relative to another part. A link can be made up of many elements that are tightly connected together and cannot move relative to one another. The number and end vertices of a link can also be used to classify it:

- Binary Link
- Ternary Link
- Quaternary Link



Binary Link

A binary joint is formed when two links are linked at the same point. As an example, A chain with two binary joints, designated B, can be seen in Figure.

Ternary Link

A ternary joint is formed when three links are linked at a junction. It is regarded as equivalent to two binary joints since repairing any one link results in two binary joints with each of the other two connections. Ternary linkages are denoted as T in Figure.

Quaternary Link

A quaternary joint is formed when four links are linked at a junction. It is regarded as equivalent to three binary joints since fixing any one link forms three. One quaternary joint is shown in Figure.

Kinematic Pair

When two machine linkages or elements come into contact, they are said to create a pair. The pair is known as a [Kinematic pair](#) if the relative motion between them is totally or successfully limited (i.e. in a particular direction). Let us look at the many sorts of limited motions.

