



# MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

## Department of Mechanical Engineering

### REPORT OF SKILL BASED MINI PROJECT

Design of Machine Elements (120412)

**Title of Project:** KNUCKLE JOINT

#### Introduction:

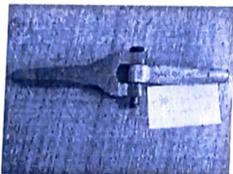
A **knuckle joint** is a mechanical joint used to connect two rods that are under a tensile load when there is a requirement of a small amount of flexibility, or angular moment is necessary. There is always an axial or linear line of action of load.<sup>1</sup>

The knuckle joint assembly consists of the following major components:

1. Single eye.
2. Double eye or fork
3. Knuckle pin.

At one end of the rod, a single eye is formed and a double eye is formed at the other end of the rod. Both, single and double eye are connected by a pin inserted through the eye. The pin has a head at one end and at another end there is a taper pin or split pin. For the gripping purpose, the ends of the rod are of octagonal forms. Now, when the two eyes are pulled apart, the pin holds them together. The solid rod portion of the joint in this case is much stronger than the portion through which the pin passes.

#### Description of Model



Knuckle Joint has mainly three components – eye, fork, and pin. The eye is formed on one of the rods and the fork is formed on the other. The eye fits inside the fork and the pin is passed through both the fork and the eye. This pin is secured in its place by means of a split pin. The ends of the rods are made octagonal to some distance for better grip and are made a square for some portion before it is forged to make the eye and fork shapes.

#### Applications of Model

1. Tie rod joint of roof truss.
2. Tension link in bridge structure.
3. Link of roller chain.
4. Tie rod joint of jib crane.
5. The knuckle joint is also used in tractor.
6. Connecting rods between locomotive wheels.

### What I Learned Through Project:

In this skill-based project, I learned about the application of knuckle joints and various types of load on knuckle joints in different parts of the model.

#### Submitted By

Name and Signature:

ABHIJEET SINGH THAKUR



Enrolment Number: 0901ME201004

Class: IV<sup>th</sup> Sem. Mechanical Engineering



Submitted To

Prof. Rajendra Prasad Kori  
Assistant Professor



Head  
Deptt. of Mechanical Engineering  
Madhav Institute of Tech. & Science  
Gwalior - 05 (India)