

Lecture # 5.1

Cotter Joints - Introductions

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1

1

Cotter Joints

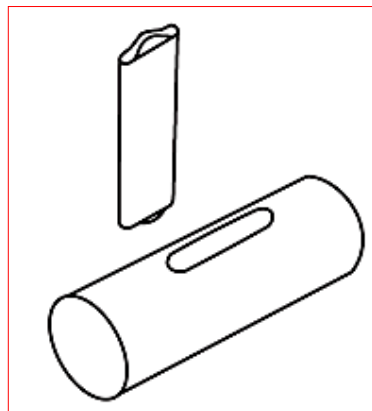
Introduction

A cotter is a flat wedge-shaped piece, made of steel.

It is uniform in thickness but tapering in width, generally on one side; the usual taper being 1:30.

The lateral (bearing) edges of the cotter and the bearing slots are generally made semi-circular instead of straight.

This increases the bearing area and permits drilling while making the slots.



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2

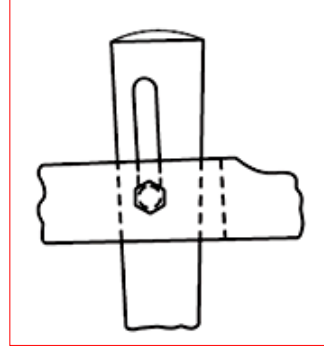
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Cotter Joints

The cotter is locked in position by means of a screw.

Cotter joints are used to connect two rods, subjected to tensile or compressive forces along their axes.

These joints are not suitable, where the members are under rotation.



The following are some of the commonly used cotter joints:

Cotter Joint With Sleeve

Cotter Joint With Spigot & Socket End

Cotter Joint with Gib

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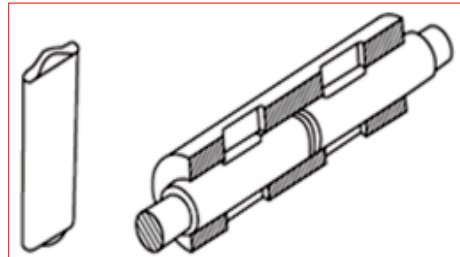
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Cotter Joints

Cotter Joint With Sleeve:

This is the simplest of all cotter joints, used for fastening two circular rods.



To make the joint, the rods are enlarged at their ends and slots are cut.

After keeping the rods butt against each other, a sleeve with slots is placed over them.

After aligning the slots properly, two cotters are driven-in through the slots, resulting in the joint.

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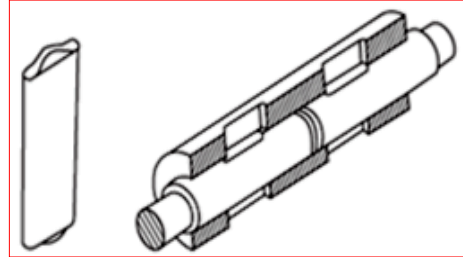
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Cotter Joint With Sleeve:

The rod ends are enlarged to take care of the weakening effect caused by the slots.



The slots in the rods and sleeve are made slightly wider than the width of cotter.

The relative positions of the slots are such, that when a cotter is driven into its position, it permits wedging action and pulls the rod into the sleeve.

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5

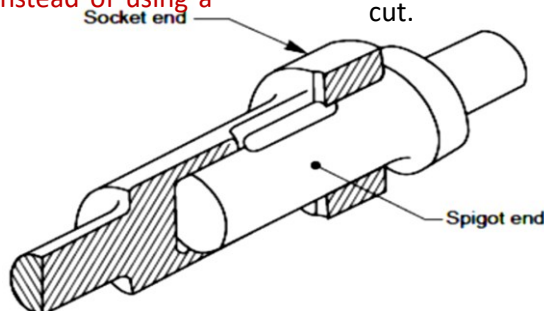
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Cotter Joint With Spigot & Socket End

This joint is used to fasten two circular rods. In this, the rod ends are modified instead of using a sleeve.

One end of the rod is formed into a socket and the other into a spigot and slots are cut.



After aligning the socket and spigot ends, a cotter is driven-in through the slots, forming the joint.

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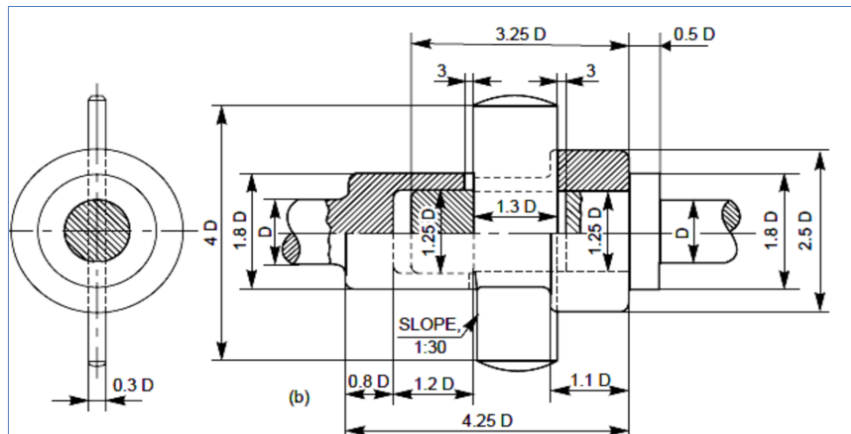
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6

6

Cotter Joints

2D Representaion of Cotter Joint With Spigot & Socket End



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7

7

Cotter Joints

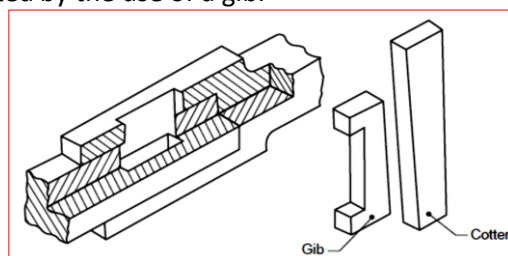
Cotter Joint with Gib:

This joint is generally used to connect two rods of square or rectangular cross-section.

To make the joint, one end of the rod is formed into a U-fork, into which, the end of the other rod fits in.

When a cotter is driven-in, the friction between the cotter and straps of the U-fork, causes the straps to open.

This is prevented by the use of a gib.



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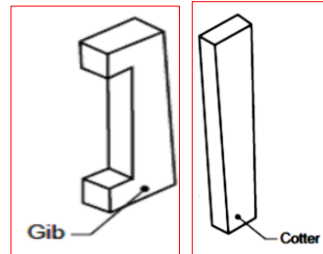
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Cotter Joint with Gib:

A gib is also a wedge-shaped piece of rectangular cross-section with two rectangular projections called lugs.



One side of the Gib is tapered and the other straight.

The tapered side of the Gib bears against the tapered side of the cotter such that, the outer edges of the cotter and gib as a unit are parallel.

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9

9

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Cotter Joint with Gib:

This facilitates making of slots with parallel edges, unlike the tapered edges in case of ordinary cotter joint.

Further, the lugs bearing against the outer surfaces of the fork, prevents the opening tendency of the straps.

For making the joint, first the Gib is placed in position and then the cotter is driven-in.

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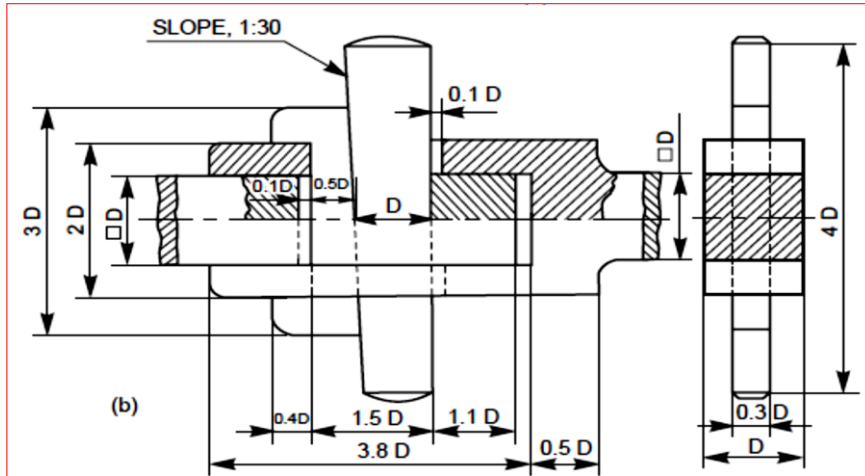
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10

10

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Cotter Joint with Gib:



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11

11

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12

12