Mechanical Drawing II

Code: MAE227

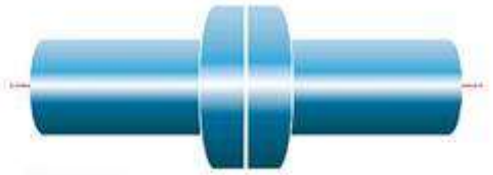
Mechanical Connections

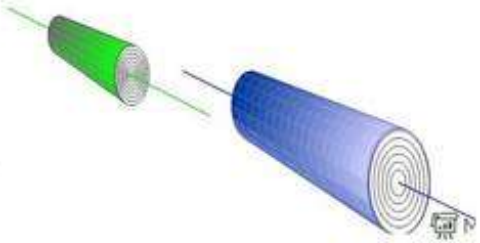
(Shaft Couplings)

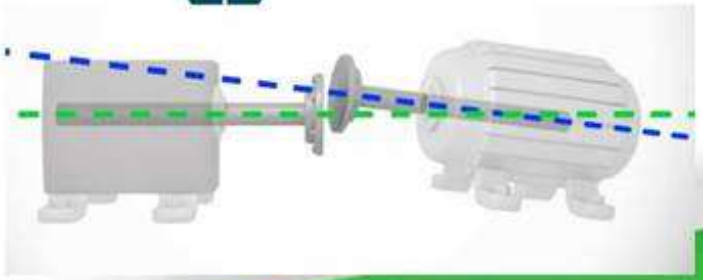
Shaft Couplings:

Shaft couplings are used to join or connect two shafts in such a way that when both the shafts rotate, they act as one unit and transmit power from one shaft to the other.

Shafts to be connected or coupled may have collinear axes, intersecting axes or parallel axes at a small distance.







Shaft Couplings:

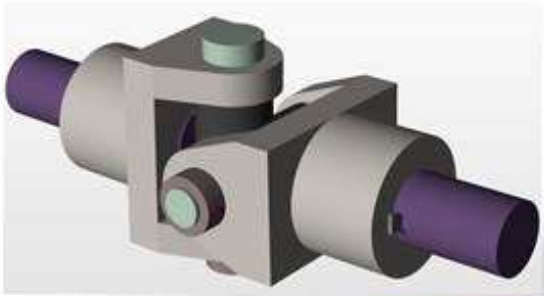
Shaft couplings are classified as:

(i) Rigid couplings.

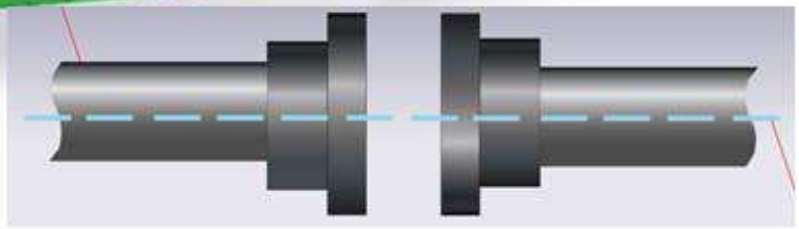
(ii) Flexible couplings.

(iii) loose or dis-engaging couplings.

(iv) non-aligned couplings.



Shaft Couplings:

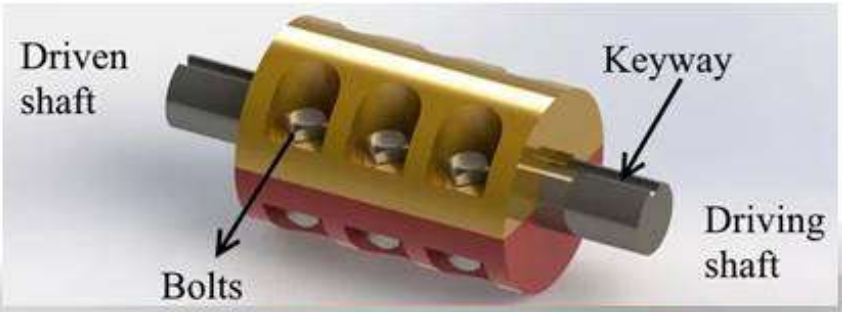


Rigid couplings:

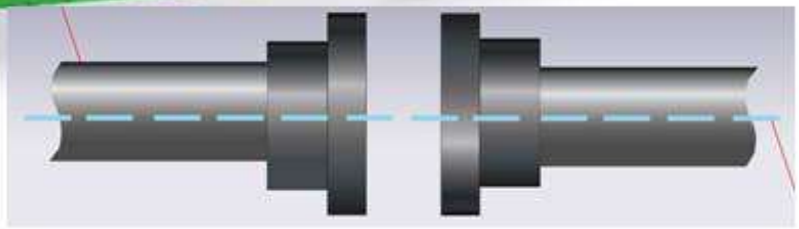
Rigid shaft couplings are used for connecting shafts having collinear axes.

Rigid couplings classified into:

1. Muff or sleeve couplings.
2. Flanged couplings.



Shaft Couplings:



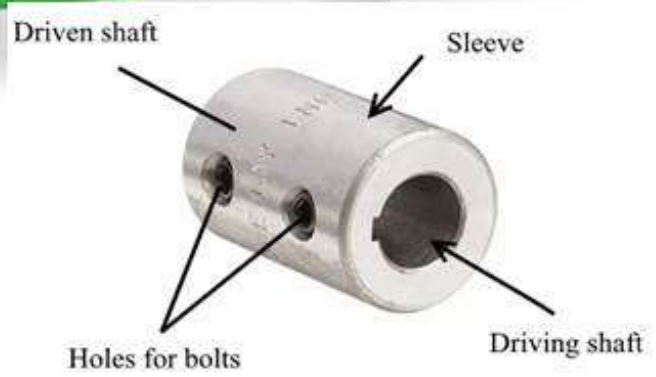
1. Rigid couplings:

1.1. Muff or sleeve couplings:

The simplest of all couplings. It consists of a sleeve called muff, generally made of cast iron, which is fitted over the ends of the shafts to be connected.

After properly aligning the keyways in the shafts and sleeve, a sunk key is driven-in; thus making the coupling. Instead of a single key running the entire length of the sleeve, it is desirable to use two keys, which may be inserted from the outer ends of the sleeve; thus overcoming the possible mis-alignment between the keyways.

Shaft Couplings:

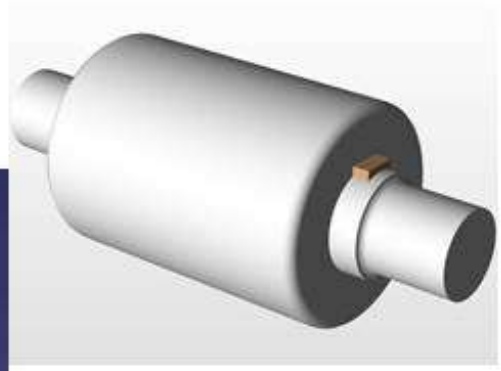


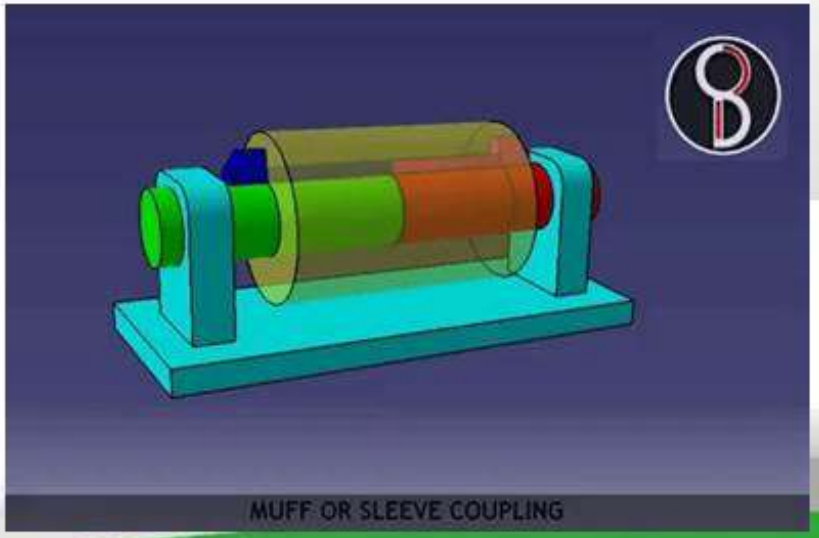
1. Rigid couplings:

1.1. Muff or sleeve couplings:

1.1.1 Butt-muff couplings:

In this, the ends of the two shafts to be coupled butt against each other, with the sleeve keyed to them



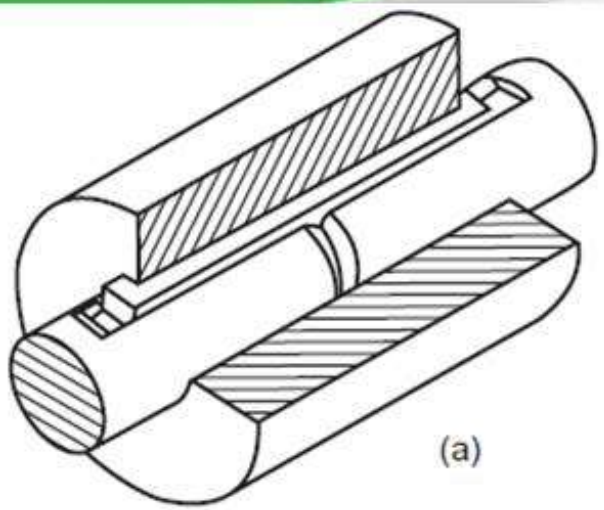


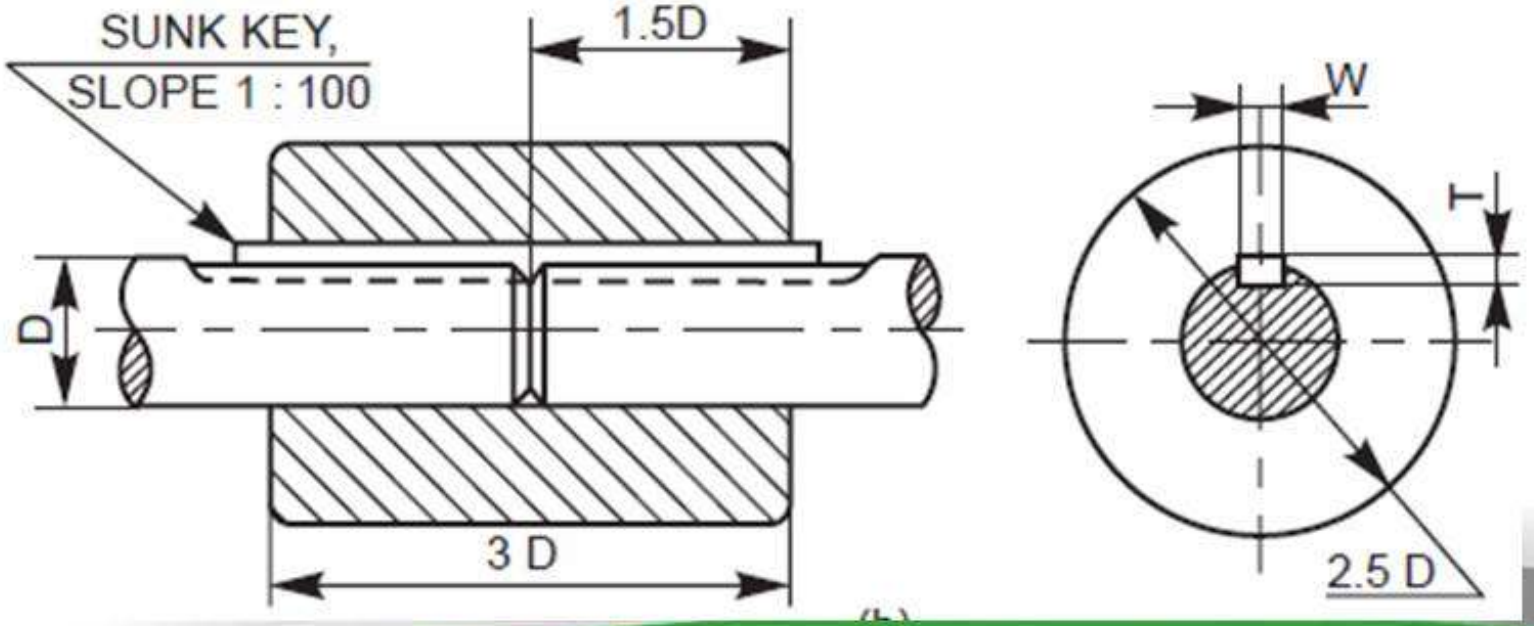
Shaft Couplings:

1. Rigid couplings:

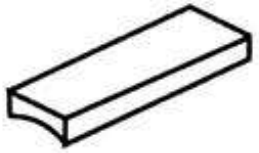
1.1. Muff or sleeve couplings:

1.1.1 Butt-muff couplings:





Shaft Couplings:



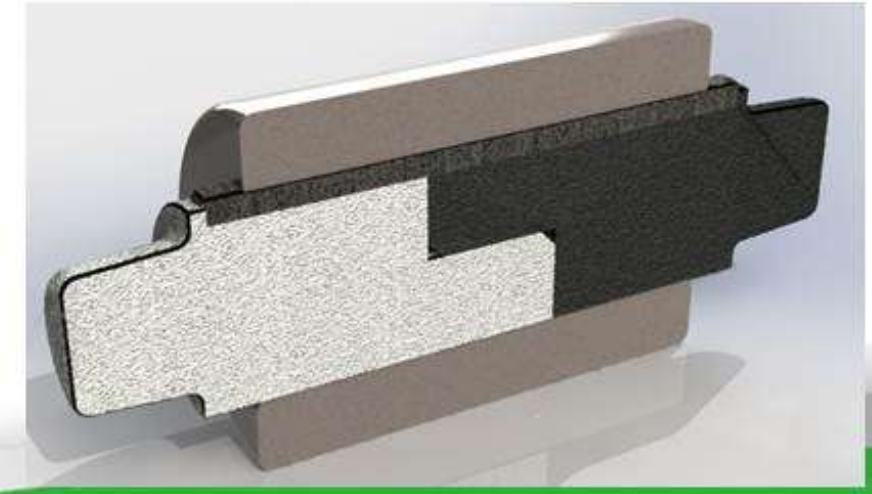
Saddle key W

1. Rigid couplings:

1.1. Muff or sleeve couplings:

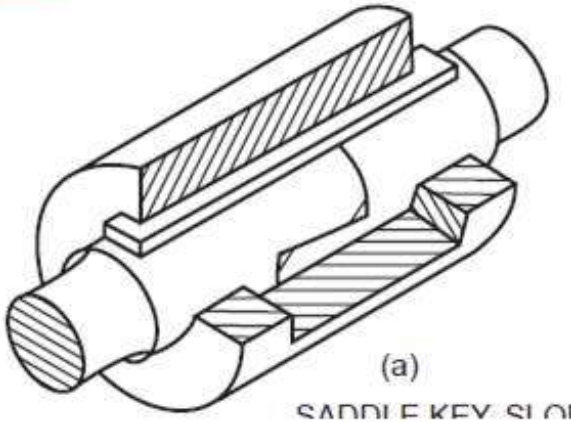
1.1.2 Half-Lap muff couplings:

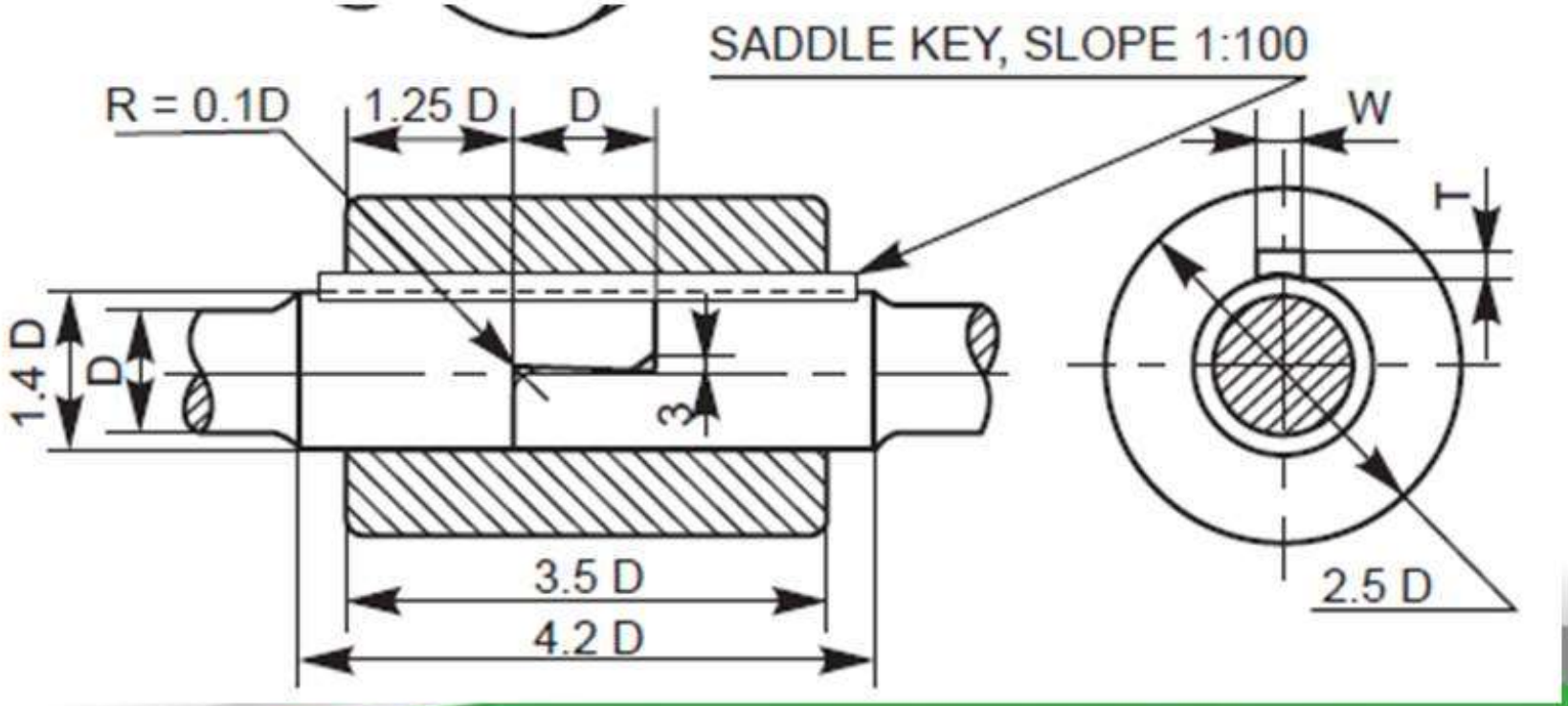
In this, the ends of the shafts overlap each other for a short length. The taper provided in the overlap prevents the axial movement of the shafts. Here too, after placing the muff over the overlapping ends of the shafts, a saddle key(s) is(are) used to make the coupling.



Shaft Couplings:

1. Rigid couplings:
1.1. Muff or sleeve couplings:
1.1.2 Half-Lap muff couplings:





Shaft Couplings:

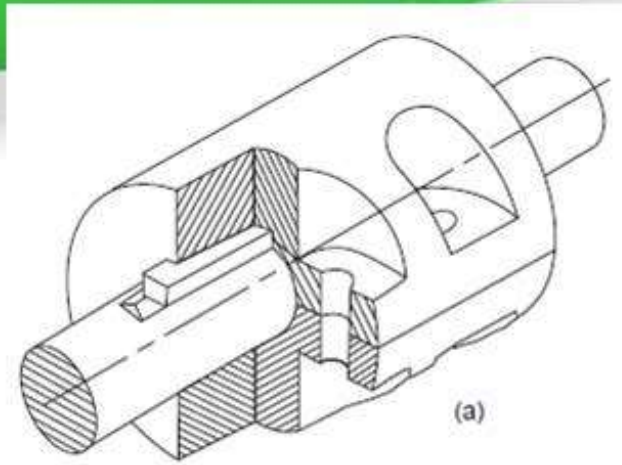
1. Rigid couplings:
1.1. Muff or sleeve couplings:
1.1.3 Split muff couplings:

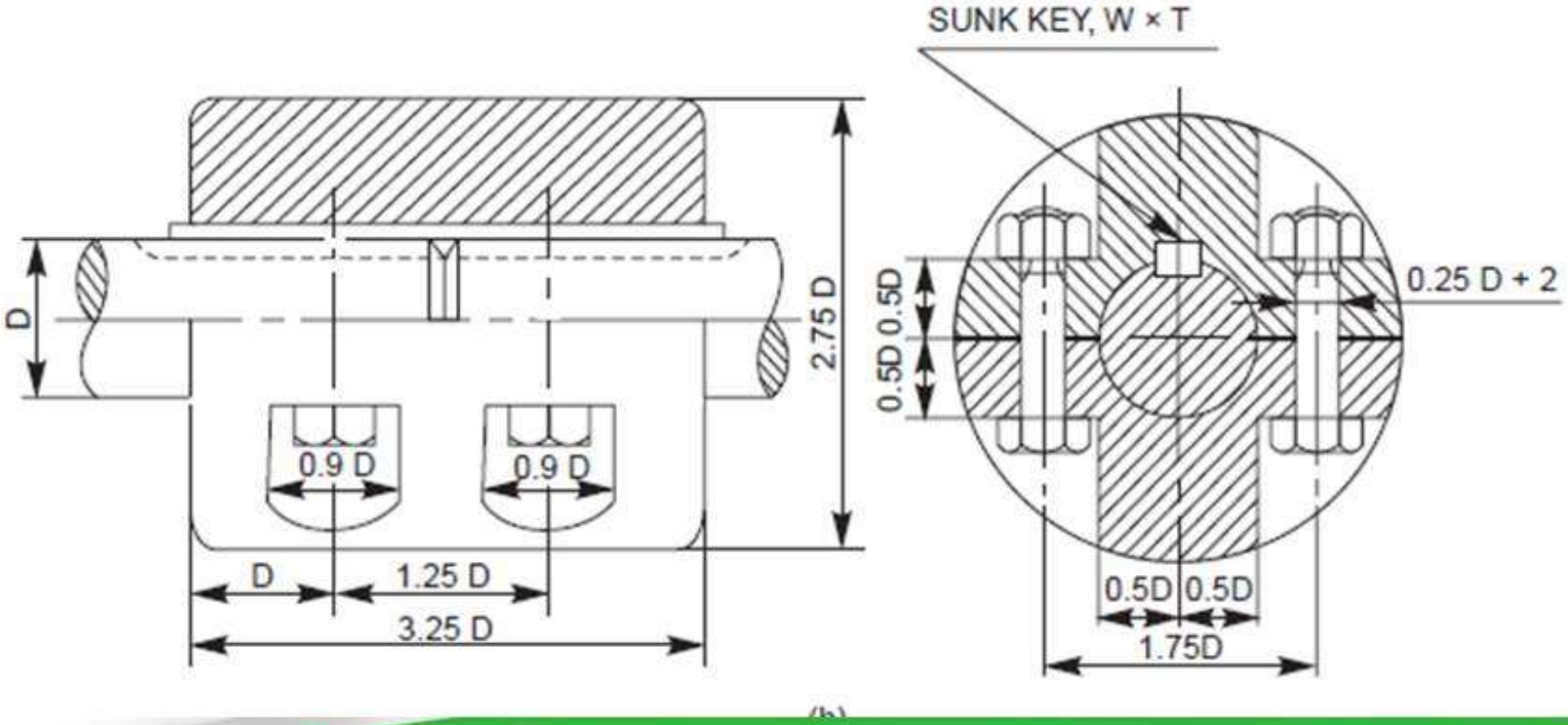
In this, the muff is split into two halves and are recessed. A number of bolts and nuts are used to connect the muff halves and the recesses provided accommodate the bolt heads and nuts.

For making the coupling, a sunk key is first placed in position and then the muff halves are joined by bolts and nuts. This type of coupling is used for heavy duty work, since both the key and friction grip transmit the power (torque).

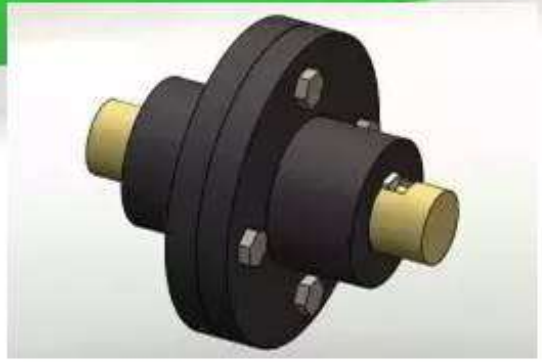
Shaft Couplings:

1. Rigid couplings:
1.1. Muff or sleeve couplings:
1.1.3 Split muff couplings:





Shaft Couplings:

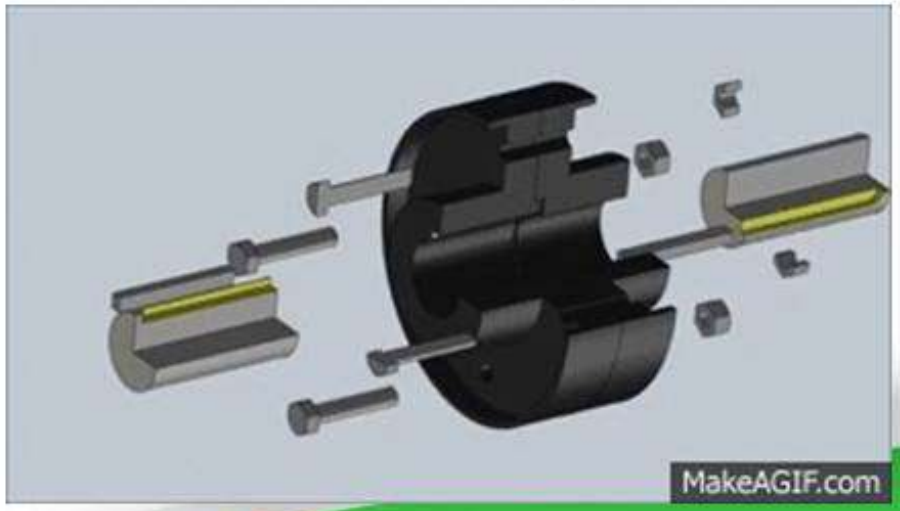


1. Rigid couplings:

1.2. Flanged couplings:

These are the standard forms of couplings, most extensively used. In a flanged coupling, flanges are either fitted or provided at the ends of shafts.

The flanges are fastened together by means of a number of bolts and nuts. The number and size of the bolts depend upon the power to be transmitted and hence, the shaft diameter.



Shaft Couplings:

1. Rigid couplings:

1.2. Flanged couplings:

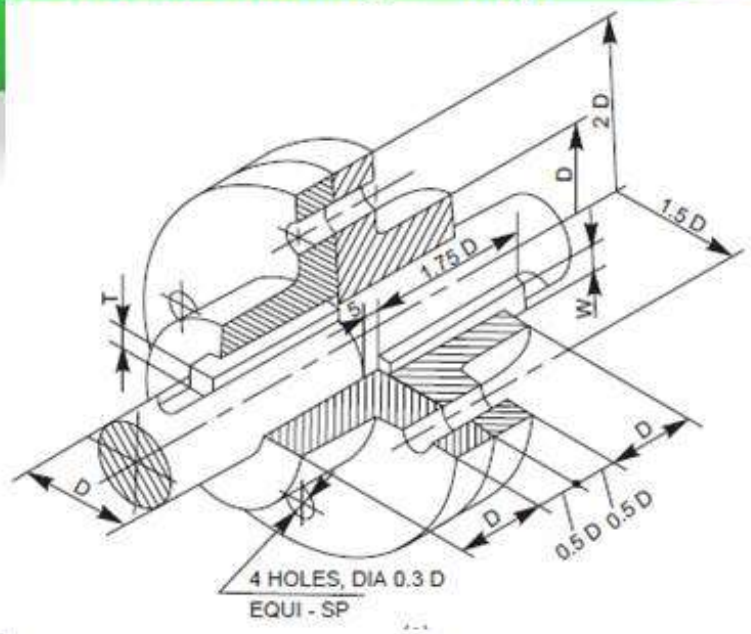
1.2.1. Flanged couplings with Detachable Flanges:

In this, two flanges are keyed, one at the end of each shaft, by means of sunk keys.

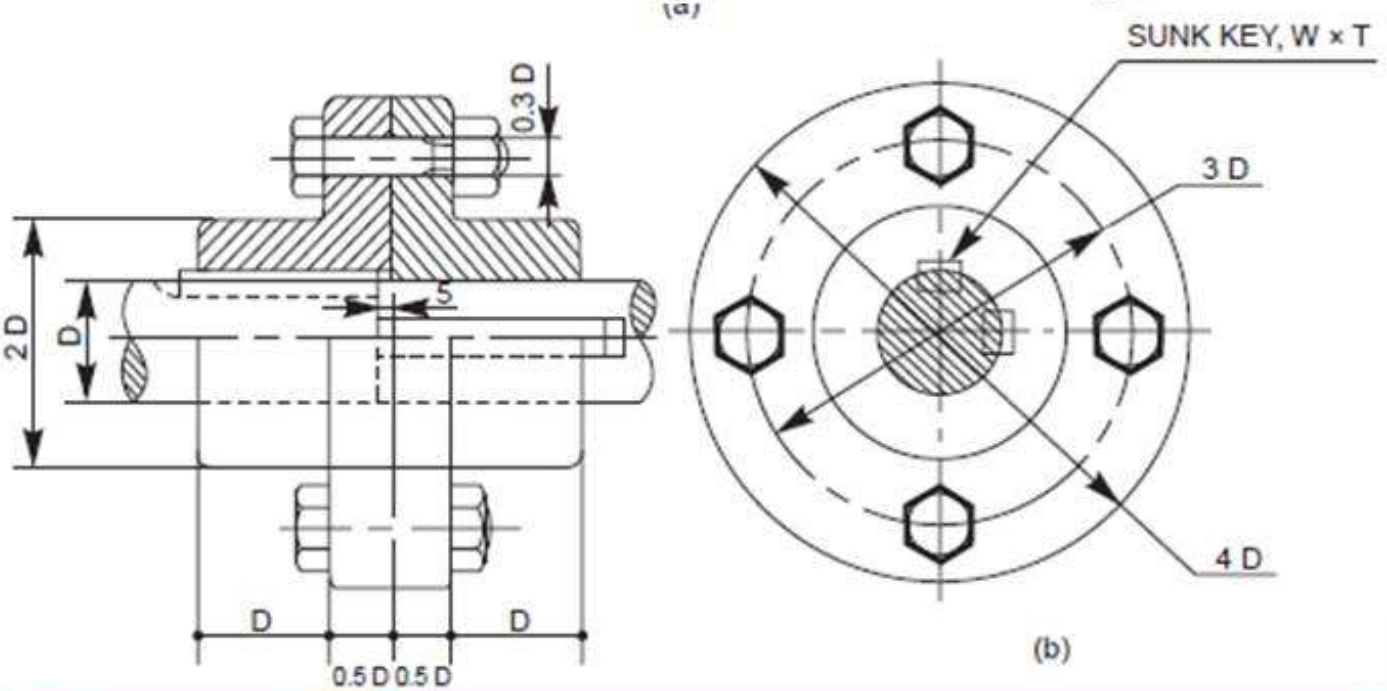
For ensuring correct alignment, a cylindrical projection may be provided on one flange which fits into the corresponding recess in the other.

Shaft Couplings:

1. Rigid couplings:
1.2. Flanged couplings:
1.2.1. Flanged couplings with Detachable Flanges:



(a)



(b)