



UNIT - V UNIT - A BEARINGS BEARINGS

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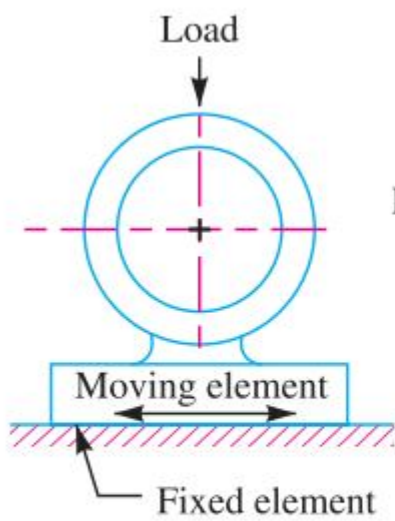
INTRODUCTION

A bearing is a machine element which support another moving machine element (known as journal).

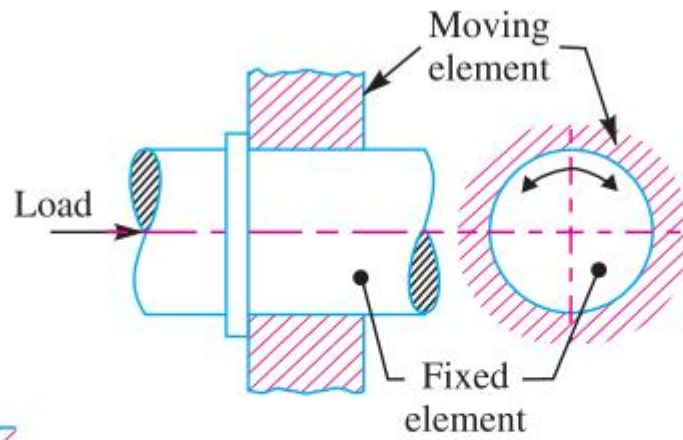
It permits a relative motion between the contact surfaces of the members, while carrying the load.

Classification:

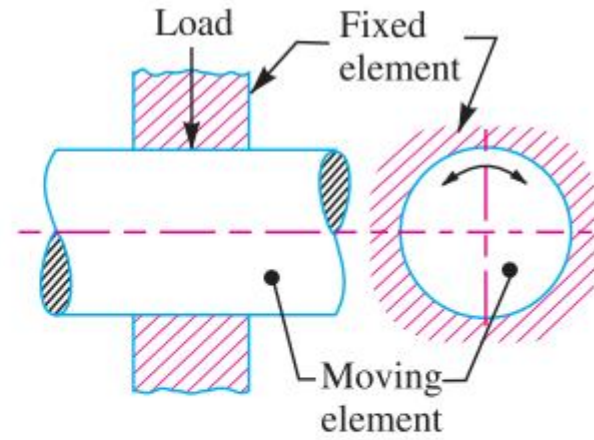
1. Depending upon the direction of load to be supported:
 - (i) Radial bearings
 - (ii) Thrust bearings



(a) Radial bearing.



(b) Radial bearing.



(c) Thrust bearing.

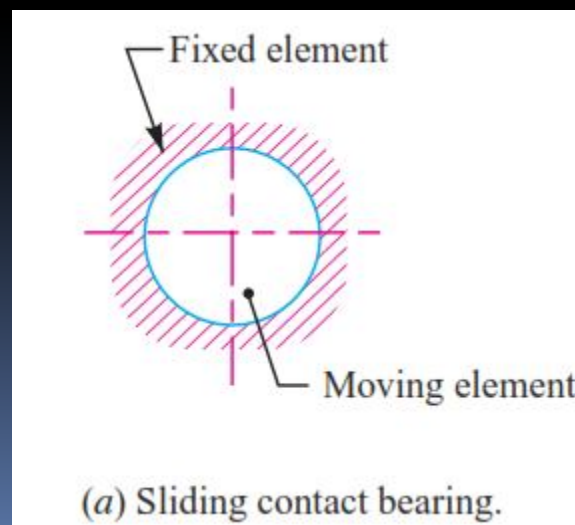
Fig. 26.1. Radial and thrust bearings.

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2. Depending upon the nature of contact:

(i) Sliding contact bearings:

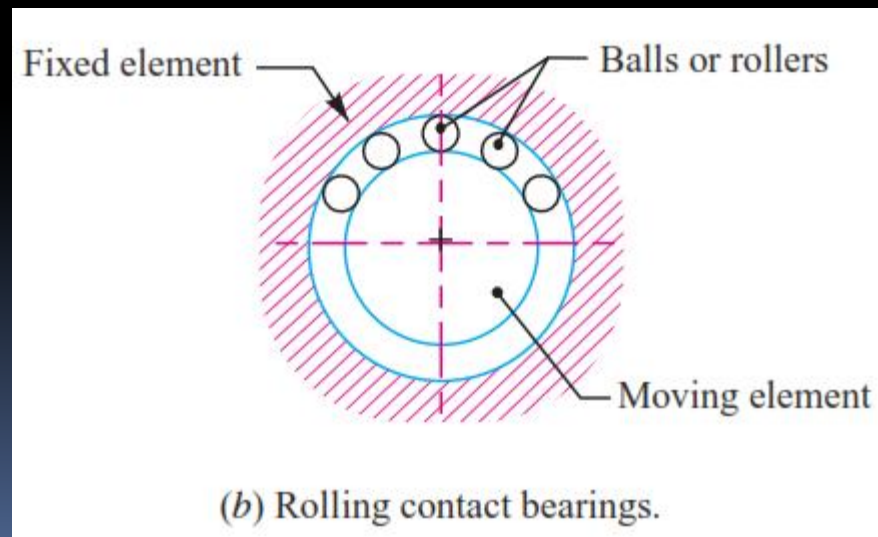
The sliding takes place along the surfaces of contact between the moving element and the fixed element. The sliding contact bearings are also known as plain bearings.



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(ii) Rolling contact bearings:

In rolling contact bearings, the steel balls (or) rollers, are interposed between the moving and fixed elements. The balls offer rolling friction at two points for each ball (or) roller.



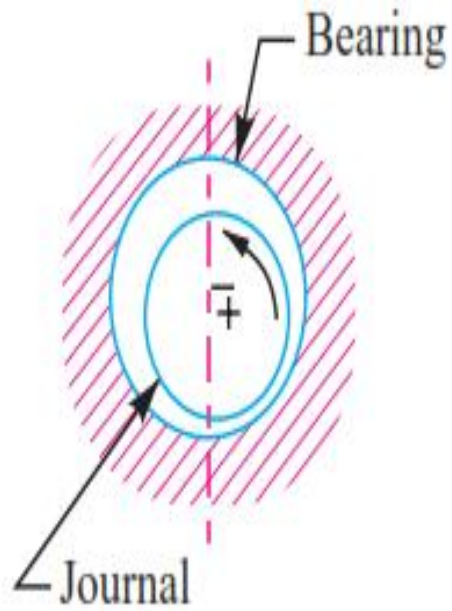
Types of sliding contact bearings

Slipper (or) guide bearings:

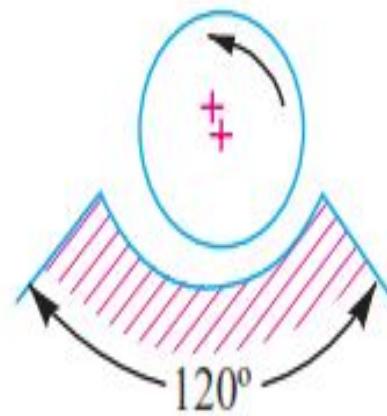
The sliding contact bearing in which the sliding action is guided in a straight line and carrying radial loads, may be called slipper (or) guide bearings.

Journal (or) sleeve bearings:

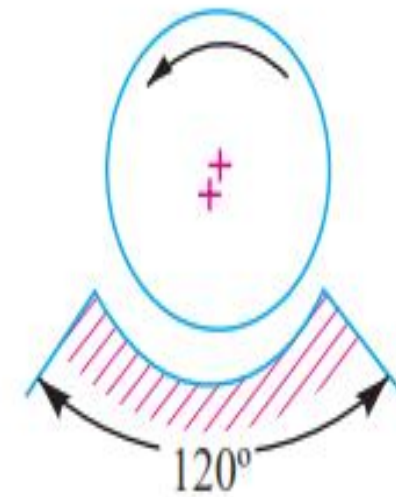
The sliding contact bearings in which the sliding action is along the circumference of a circle (or) an arc of a circle and carrying radial loads are known as journal (or) sleeve bearings.



(a) Full journal bearing.



(b) Partial journal bearing.



(c) Fitted journal bearing.

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1. Thick film bearings:

The thick film bearings are those in which the working surfaces are completely separated from each other by the lubricant. Such type of bearings are also called as **hydrodynamic lubricated bearings**.

2. Thin film bearings:

The thin film bearings are those in which, although lubricant is present, the working surfaces partially contact each other at least part of the time. Such type of bearings are also called **boundary lubricated bearings**.

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3. Zero film bearings:

The zero film bearings are those which operate without any lubricant present.

4. Hydrostatic (or) externally pressurized lubricated bearings:

The hydrostatic bearings are those which can support steady loads without any relative motion between the journal and the bearing.

Elements

1. **Outer race:**

The outer race is stationary and carried by the housing (or) casing.

2. **Inner race:**

The inner race is mounted on the shaft (or) Journal and rotates with it.

3. **Ball (or) Roller:**

A number of balls (or) rollers are provided in between the inner and outer races. These roll about their axis when the shaft rotates.

4. **Cage (or) Retainer:**

It provided to keep the balls (or) rollers in their respective position without touching each other.



END