

Date of Issue:
21/02/2017

Course code:
MST

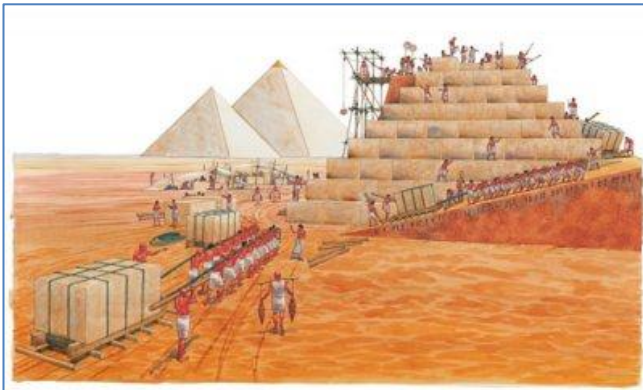
Sheet ref #:
FS-MST-0225

Module title:
Mechanical Systems & Tools

Purpose of Bearings - Radial and Axial Loading

Bearings are simple mechanisms found in many machines that have rotating or sliding parts. It is because of bearings that electric motors and trolley wheels and so on, spin so smoothly and with little noise. If there were no bearings in our life then we would be constantly replacing machines parts worn out from friction.

A bearing is a mechanical device that allows constrained relative motion between two parts, typically either in linear or rotational movement. In doing so, it supports the two parts relative to each other and at the same time reduces the friction between them.



Look at the "roller bearings" used under the sled above. Can you imagine the effort to pull the sled if it were not for these bearings? Note that they *bear* the load and hence the name *bearing*.

Radial and Thrust loading: Bearings typically have to deal with two kinds of loading, namely *radial* and *thrust*. Depending on where the bearing is being used, it may experience all radial loading, or all thrust loading, or a combination of both! Due to the tension on this fan belt, and in addition because of the torque needed

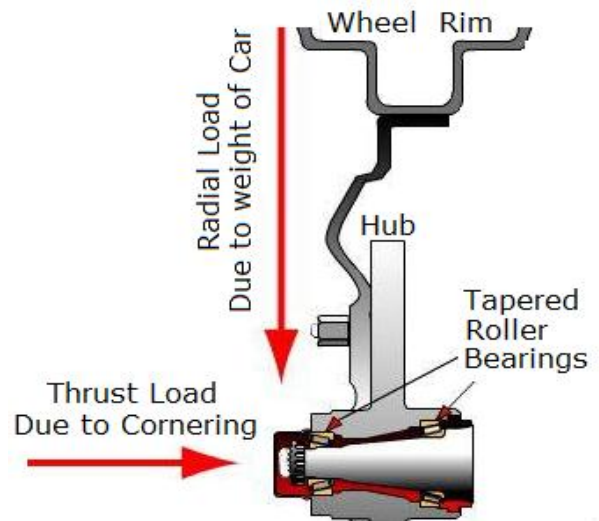


to turn the alternator to generate electricity, there will be a side or *radial loading* on its rotor, that is, the rotor feels a load at right angles to itself. Radial loads are always at right angles to the rotating shaft.

With thrust bearings, however, the load is felt in an *axial* rather than in a *radial* direction. Axial means parallel to the shaft. Look at the guy on the stool to the right. It is a rotating bar stool. The bearing is located between the seat and the seat frame and it supports the load along the axial direction, requiring the use of a thrust bearing.



Some loadings are both radial and axial so require the use of a bearing capable of providing both functions. Examine the wheel hub below, it requires the use of a tapered roller bearing:



Radial load...	Radial Bearing!
Axial load...	Thrust Bearing!
Radial & Axial...	Tapered Bearing!

