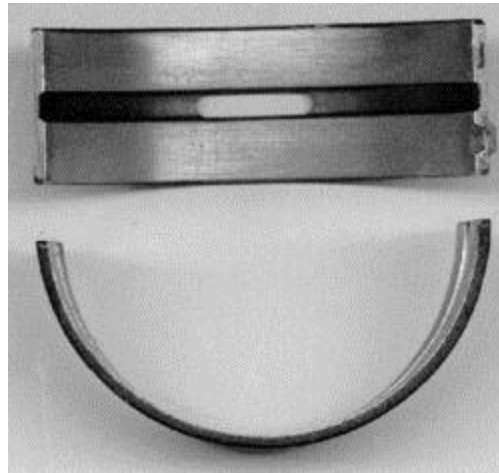


PLAIN BEARING



Crankshaft, babbitt metal, plain bearing shells

A plain bearing is a bearing which carries load by sliding. A plain bearing is often called a 'bushing' or a 'babbit' or 'journal bearing'.

Use

Plain bearings are very widely used and appear in most kinds of equipment, notably as crankshaft and connecting rod bearings in automobile piston engines.

Construction

A typical plain bearing is made of two parts. For example a rotary plain bearing can be just a shaft running through a hole.

A simple linear bearing can be a pair of flat surfaces designed to allow motion, for example a drawer and the slides it rests on.

Working

Plain bearing may carry load in one of several ways depending on their operating conditions, load, relative surface speed (shaft to journal), clearance within the bearing, quality and quantity of lubricant and temperature (affecting lubricant viscosity). If full-film conditions apply, the bearing's load is carried solely by a film of fluid lubricant, there being no contact between the two bearing surfaces. In this condition they are known as fluid bearings. In mix or boundary conditions, load is carried partly by direct surface contacts and partly by a film forming between the two. In a dry condition, the full load is carried by surface to surface contact.

Characterstics

Plain bearings are relatively simple and hence inexpensive. They are also compact, light weight, straightforward to repair and have high load-carrying capacity. However, if operating in dry or boundary conditions plain bearings may wear faster and have higher friction than rolling element bearings. Dry and boundary conditions may be experienced even in a fluid bearing when operating outside of its normal operating conditions, i.e., at startup and shutdown.

A common plain bearing design is to use a hardened and polished steel shaft and a soft bronze bushing. In such designs the softer bronze portion can be allowed to wear away, to be periodically renewed.

Plain 'self-lubricating' bearings utilise porous journals within which a lubricant is held. As the bearing operates and lubricant is displaced from the bearing surface, more is carried in from non-wear parts of the bearing. Dry plain bearings can be made of a variety of materials including PTFE (Teflon) and ceramic. The ceramic is very hard, and

sand and other grit which enter the bearing are simply ground to a fine powder which does not inhibit the operation of the bearing. PTFE based self-lubricating bearings were developed in the United Kingdom, with DU material patented in 1956.

Plain bearings manufactured from high performance polymers are now replacing traditional metal plain bearings. The leading manufacturer in this field is in UK with a wide range of specially developed polymer materials for different applications.

Source : http://engineering.wikia.com/wiki/Plain_bearing