Great wall provides complete solutions for installation high-quality ball mill trunnion bearing

Improved design ensures reliable ball mill operation

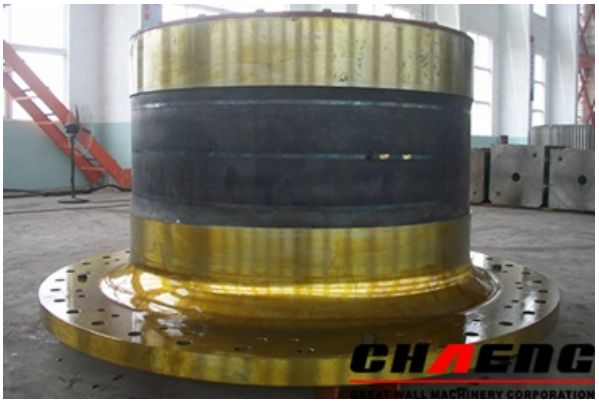
Great wall has 40 years ball mills installed experience and customers worldwide benefit from this extensive experience that ensures a smooth trunnion replacement. Knowledge gained over the years is used for product development and to further improve the supervision and installation services offered around the globe.

High-quality vital mill components

Ball mill trunnions and heads are subject to large alternating stresses during operation. Even though ball mill trunnions are designed for infinite life, there is always a risk of cracks developing due to small casting defects, wear of the inner surface of the trunnion or other damage, such as cutting scars or welding in the high-stressed areas.

To avoid premature failure of such vital mill components, very high quality manufacturing procedures must be used. Great wall only uses trunnions manufactured by a limited number of highly qualified foundries, ensuring the final quality meets the highest standards.

Continuous operation



If wear or a crack is discovered in a trunnion, great wall can provide provisional on-site repair so that the mill can keep operating until a new trunnion is supplied. Any weld repair of a trunnion must be considered as a temporary solution since new cracks will most likely develop and the repair can result in trunnion deformations, which can cause bearing problems and eventually lead to bearing failure. Therefore, it is strongly recommended to order and install a new trunnion as soon as possible to ensure continuous and reliable mill operation.

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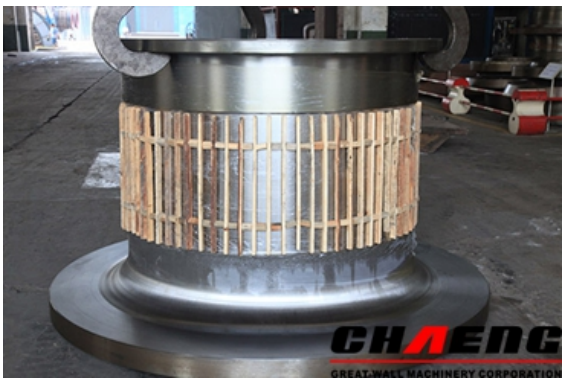
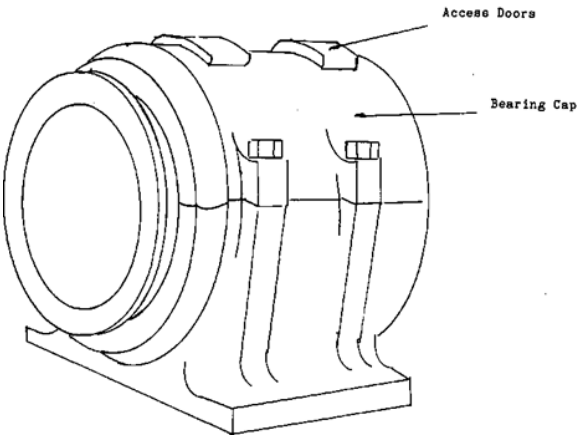
Supervision and installation services

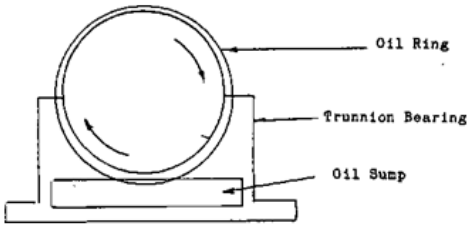


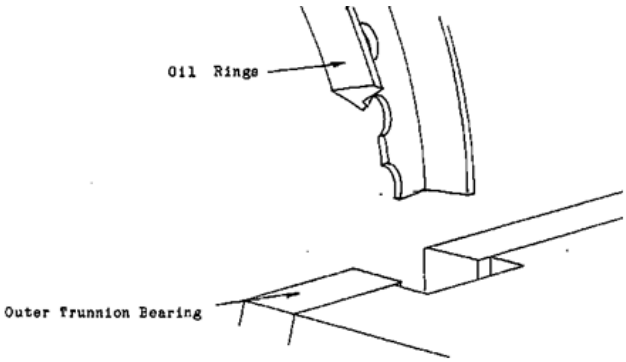
Due to the complexity of a trunnion replacement, plants should make full use of the expert supervision and installation services. To facilitate a trunnion replacement, it is recommended to have a new bearing liner and trunnion liner on stock. Great wall on-site services include providing experienced supervisors, certified fitters and welding technicians, as well as all the necessary tools and equipment transported to the site.

Tunnion bearing assembly



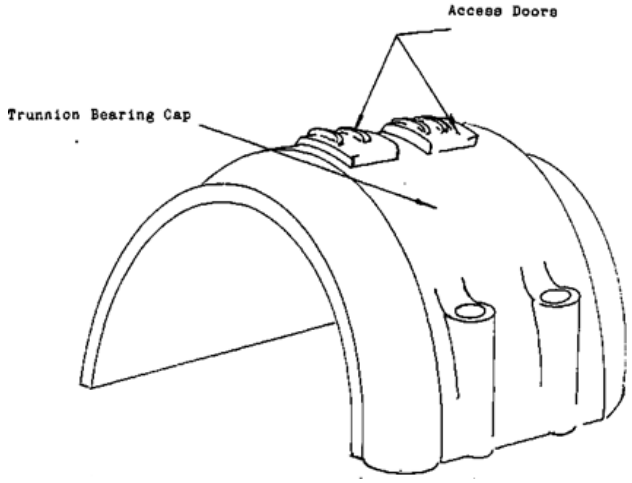
The first part of the mill that we will look at is the trunnion bearing, that is a hydrostatic bearing which is a slow moving bearing that carries a heavy load. Let us start with the base of this bearing. In it you will notice a sump for oil and an oil line that is connected to a pump. In the center of the base is the bearing seat. here is a hole in the middle of the bearing seat to allow the oil from the oil line to come out of. Radiating away from this hole there are oil channels. These are simply grooves cut into the metal to allow the oil to be dispersed over the face of the bearing.





Hydrostatic bearing, it supports a great weight. Because it has a great weight on it, when it is stopped, the oil is squeezed out from between the inner and outer bearing. Before the mill is started up this bearing must have oil injected into it by way of a pump. The pump must be started before the mill begins to turn and must continue until the mill has made at least one revolution. After that one revolution, what is known as the wedge effect, takes place. The oil that is on the surface of the bearing is forced into a wedge shaped portion of the leading edge of the outer

bearing. This will generate enough pressure to lift the entire mill. But if the pump isn't kept pumping for that revolution the weight of the mill as' it turns will force the metal of the bearing surface into the oil channels. Two of the required characteristics of these bearings are that they resist dirt contamination and disperse heat well. The result is that the material that the bearing is constructed from is soft. If an oil film isn't present between the two bearing surfaces, the metal to metal contact will cause this damage to the oil channels. Then the bearing will not be able to get enough oil on start up. In extreme cases the bearing may be destroyed.



Once the mill is turning the bearing is self-lubricated by oil rings. They should be checked periodically. If you look closely at them you will notice that they have holes in them. As the rings revolve with the bearing these holes pick up oil from the sump in the bearing base and carries it to the top of the bearing. This ring is not joined to the bearing but sits on it loosely.

Because of the drag on the ring by the oil in the sump as the ring is revolved through it, and the lubrication of the oil between the ring and the bearing, the ring turns at a slower rate than the mill does. This is necessary to allow the oil to flow out from under the ring and get caught at the contact point of the inner bearing and the outer bearing. The outer bearing then picks up this oil and maintains the wedge effect.

The top of the trunnion bearing assembly is called the trunnion bearing cap and is bolted on over the top of the bearings to protect them.

This cap provides access to the rings and the inner bearing by two access doors on top of the cap. When the bearing and rings are checked through these ports, the person doing the inspecting will be looking at the condition of the bearing surface, verifying that the bearing is being oiled, and that it is free from any grooves or gouges. At the same time, check the rings to be sure they are turning, but at a slower rate than the bearing is.

There is one more piece to complete the assembly, technically it belongs with a following section on liner description, but to avoid confusion I will include it in this portion. It is the trunnion liner, it fits inside the bearing to protect it from wear caused by the ore being washed over the liner and through the bearing as it is fed to or discharged from the mill.

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