Application And Maintenance Of Deep Groove Ball Bearing

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Deep groove ball bearings as a seed in the bearing, because of its wide application, long service life, is widely used in modern equipment manufacturing industry, so that the processing accuracy and quality of equipment has been greatly improved, it can be said that deep groove ball bearings in the future equipment will be a large number of applications, the market prospects will be more broad.

The wide application of deep groove ball bearings has benefited from the common cognition of the equipment workers, and has been accepted by everyone for its excellent performance. I engaged in the maintenance of machinery and equipment for many years, many contacts deep groove ball bearings, the installation of its use and maintenance have more understanding, summed up some experience with you to discuss.

I. Overview

Deep groove ball bearings generally by a pair of rings a group of cages, a group of just ball composition and a group of cages, deep groove ball bearing Type Code 6, is the most common production, the most widely used bearings, deep groove ball bearing structure is simple, easy to use, is the largest production volume, bearing a certain axial load, when the radial clearance of the bearings, The function of angular contact ball bearing can withstand large axial load.

Deep groove ball bearings are mainly used to withstand pure radial loads, but also can withstand both radial and axial loads, when they only withstand pure radial load, the contact angle is zero. When deep groove ball bearings have a large radial clearance, the performance of angular contact bearings can withstand a large axial load. The friction coefficient of deep groove ball bearing is very small, the limit speed is also very high, especially in the high-speed working condition with large axial load, the deep groove ball bearing is more advantageous than thrust ball bearing. Compared with other bearings of the same size, this type of bearing has a small friction factor and high limit speed. In the case of high rotational speed is not suitable for the use of thrust ball bearings can withstand axial load, deep groove ball bearings installed on the shaft, the shaft or housing can be limited to the axial displacement of the bearing axial clearance range. Also, when the housing bore and shaft (or outer ring) are tilted relative to each other (no more than 8-16 is determined by clearance) can still work normally. However, the existence of tilting, it is necessary to reduce the bearing service life.

Deep groove ball bearings in comparison with other types of bearings of the same size, the minimum frictional loss, high limit speed, in the case of high rotational speed should not be used, the thrust ball bearings can be used to withstand pure axial load bearing. If the manufacturing accuracy is improved and the solid cage of bakelite, bronze, hard aluminum and other materials is used, the rotational speed can also be improved.

(a) Characteristics of deep groove ball bearings

Deep groove ball bearing structure is simple, compared with other types of easy to achieve high manufacturing accuracy, so easy to series production, manufacturing costs are low, use is very common. When the large radial clearance is selected, the axial bearing capacity increases, and the contact angle is zero when bearing the pure radial force. When there is axial force, the contact angle is

greater than 0. The general use of stamping wave-shaped cage, car-made solid cage, and sometimes the use of nylon rack. Deep groove ball bearings In addition to the basic type, there are various variants of the structure, such as: deep groove ball bearings with a dust cover, deep groove ball bearings with rubber seals, deep groove ball bearings with a stopper groove, deep groove ball bearings with a large load capacity for ball openings, double row deep groove ball bearings. But they all have the following common features:

1, in the structure of deep groove ball bearing each ring has a cross-section about the ball circumference of one-third of the continuous Groove Raceway, which is mainly used to withstand the radial load, but also can withstand a certain axial load;

2, in the bearing radial clearance increases, with angular contact ball bearing properties, can withstand two direction of alternating axial load;

3, small friction, high speed;

4, simple structure, low manufacturing cost, easy to achieve high manufacturing accuracy;

5, the general use of stamping wave-shaped cage, the inner diameter of more than 200mm or high-speed operation of the bearing, the use of car-based solid cage.

(ii) Installation of application Maintenance

Deep groove ball bearings are the most representative rolling bearings and are widely used. It is suitable for operation with high speed and even very high speed, and it is very durable, low maintenance cost and long running period. However, professional technicians are required to check and maintain regularly to ensure the safety and reliability of operation and to improve the operation cycle and quality.

Assembly of a deep groove ball bearing

The assembly of deep groove ball bearings requires the assembly personnel to have a high degree of expertise in the assembly process to strictly implement the technical requirements and operating procedures.

Bearing installation is good or bad, will affect the accuracy of the bearing, life and performance. Therefore, please fully study the bearing installation, should be in accordance with the following operating standards for bearing installation.

1, cleaning bearings and related parts (grease lubricated bearings and both sides with oil seals or dust caps, sealing ring bearings do not need to be cleaned before installation).

2, check the dimensions and finishing of the relevant parts.

3, installation method bearing installation should be based on the bearing structure, size and bearing parts of the matching nature, the pressure should be directly coupled to the ring end face, not through the rolling body transfer pressure.

(iii) Bearing installation generally uses the following methods

Press FIT: The bearing inner ring and the shaft are tight fit, when the outer ring and the housing bore are loosely matched, a press can be used to press the bearing on the shaft, and the shaft is mounted in the housing bore together with the bearing, and in the case of the bearing inner ring, the assembly sleeve (copper or soft steel) made of a soft metal material, and the outer ring of the bearing is tightly matched with the housing bore When the inner ring and the shaft are loosely matched, the bearing can be pressed into the housing bore first, and the outer diameter of the assembly casing should be slightly smaller than the diameter of the housing bore. If both the bearing ring and the shaft and the housing bore are tightly matched, the mounting chamber and outer ring are pressed into both the shaft and the housing bore, and the structure of the casing should be able to tighten both the bearing inner ring and the end face of the outer ring.

Heating and matching: by heating the bearing or housing, the use of thermal expansion of the tight fit into a loose fit installation method, is a common and labor-saving installation method, this method is suitable for the installation of large surplus bearings, the bearing or separable bearing ring into the tank before the heat load evenly heating 80-100 ?, And then removed from the oil as soon as possible to the shaft, in order to prevent cooling after the inner ring end face and the shaft shoulder is not tight, the bearings can be cooled after the axial tightening. When the bearing outer ring and the light metal bearing seat are in tight coordination, the hot-fitting method of the heated bearing seat can avoid the abrasion of the mating surface. When using the oil tank to heat the bearing, at a certain distance from the bottom of the box should be a grid, or with hooks hanging bearings, bearings can not be placed on the bottom of the box, to prevent sinking impurities into the bearing or uneven heating, the fuel tank must have a thermometer, strictly control oil temperature should not exceed 100 ? to prevent the tempering effect, so that the

The bearing installation method, the general situation is the shaft rotates the situation mostly, therefore the inner ring and the shaft's cooperation is the win cooperation, the bearing outer ring and the bearing Chamber's cooperation is the clearance coordination. Bearing operation inspection after the installation of bearings should be carried out immediately after the inspection, has determined whether the installation is normal.

Second, operation and maintenance

Reliable maintenance work is to ensure long-term bearing operation of the main means, equipment to run a period of time to request professional and technical personnel to check and maintain equipment, mainly in the following aspects:

1, check the operating temperature of the bearing, the requirement is below 65 degrees.

2, check the running parts of the axial channeling momentum, mainly bearing clearance is not in line with the requirements.

3, check the bearings inside and outside the runway has no pitting, corrosion, pits, cracks and other defects.

4, lubricating oil or grease, to be replaced or added in a timely manner, but not too much, the requirements of lubricants One-third to One-second, Grease One-third.

Third, case analysis

Urea depth hydrolysis device as the chemical fertilizer industry wastewater Treatment Terminal device, its core equipment hydrolysis pump for multi-stage, high speed, high temperature, high-pressure equipment, over the years the operation of unstable, so that the production of urea has been greatly affected.

The main performance in the use of the bearing cycle is short, large machine vibration and other failures. After everyone's analysis that the use of the model is not suitable, after careful summary of the characteristics of the hydrolysis pump, decided to use deep groove ball bearings, we have established the use of the bearing and maintenance procedures. Strictly enforced. Through the transformation after the operation of a good state, the operating cycle greatly increased, strong support of our company urea products stable yield.

Iv. Summary

At present, China's bearing demand is more optimistic, such as automobiles, cars, motorcycles, click, home appliances and automatic office machinery, such as the host industry, south-North water Diversion, west-east gas transmission and the current curtain of the Shanghai World Expo, have confirmed that China's complete set of construction equipment and engineering equipment has a larger demand.

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