TIMKEN Tapered Roller Bearings and Crossed Roller Bearings Reference

(1) Tapered roller bearing

Timken is one of the world's largest manufacturers of tapered roller bearings. Timken develops precision TS, TSF, TDO, M-type bearings for the machine tool industry with accuracy ratings from ISO P4 to ISO P2. In general, since the tapered roller is a line contact, the tapered roller bearing of the same outer shape has a much higher rigidity than the ball bearing, but the rotation speed is lower than that of the ball bearing. Because the sliding friction between the large end of the tapered roller bearing roller and the large rib of the inner ring will heat up, The speed of the ordinary tapered bearing cannot be improved. In order to comply with the heavy cutting, high stiffness and high speed requirements of the machine tool industry and to improve the lubrication between the big end of the roller and the large rib of the inner ring, Timken has specially developed TS-MA and TSMR bearings. The design of the TSMA is to open a plurality of axial lubricating oil holes on the large rib of the inner ring, and introduce lubricating oil between the large end surface of the roller and the large rib of the inner ring to improve the lubrication condition and greatly improve the speed of the bearing. The design of the TSMA is to improve the lubrication of the lubricating oil introduced into the large end face of the roller and the large rib of the inner ring by opening a plurality of radial lubricating oil holes in the inner ring of the bearing. In addition, Timken has developed hydraulic rib bearings designed to better optimize the preload of the spindle system. The outer ring of this bearing is floating,

and the rib is in contact with the large end of the roller, unlike the common bearing with a fixed inner ring rib. The floating rib is controlled by hydraulic oil to better control the bearing in operation
Preload in the process, improve spindle accuracy, static and dynamic stiffness, optimize its preload, and apply a wide operating speed
Degree, the machine life is longer when the cutting force is large, and different preloads can be adjusted by manual or computer programming.
Low temperature. Another spring rim bearing designed to optimize the preload of the spindle system. The bearing also has a floating outer raceway. Its floating ribs are positioned by a spring system to achieve control of the preload. The spring rim bearing does not require a hydraulic system relative to the hydraulic rib bearing. In addition, Timken also developed pottery Porcelain tapered roller bearings. Tapered roller bearings can be widely used in machine tools with large cutting capacity and high rigidity.

(2) Crossed roller bearings
Timken has developed high-end cross-tapered roller bearings and is one of the most advanced machine tool bearings available. This type of bearing is widely used in turntables for vertical machine tools, including vertical milling machines, vertical lathes and vertical boring machines. Crossed roller bearings are characterized by two raceways in the bearing and two rows of rollers arranged in a row. The bearing section height is not much higher than the section height of a single row of tapered roller bearings. Therefore, the structure is compact, the volume is small, and the cost is reduced. The two rows of tapered rollers are designed with a small angle of inclination, so the bearing has a wide and effective
The span improves the bearing's ability to resist overturning moments and has better load carrying capacity. At the same time, the crossed tapered roller bearings are precision bearings with extremely high rotation accuracy. The cross-tapered roller bearings manufactured by Timken are made of carburized steel, whose surface is anti-wear and the core is impact-resistant. At the same time, the spindle is short and the thermal expansion is well controlled. The common cross-tapered roller bearing is in the form of 45678. It is easy to install and easy to adjust the original installation form or maintenance method. The inertia force is small and the

starting torque is small.