Slewing Bearing

Shanghai Chenghui Bearing Co.,Ltd

The large size slewing bearing factory is located in Luoyang. The factory is with 90000 m2 workshop, more than 400 people, modern facilities, designs and manufactures a large variety of ball and roller slewing ring bearings with diameters range from 500mm up to 7500mm in many applications that require long operating life under demandng conditions. Nowadays, we can design and manufacture slewing bearing with outer diameter 12000mm.The Slewing bearings are widely used as components in wind energy turbines, harbor cranes, ship deck cranes, truck cranes, construction cranes, bulk materials handlings, port machinery, ladle turret or ferris wheels etc. For more information regarding our products: Main bearing for direct drive wind turbine generator, Tunnel Boring Machine bearing, Large size slewing bearing etc. Kindly please check with our website or send e-mail to our online service engineer.

Shanghai Chenghui Beairng Co.Ltd
Address: 289 Zheqiao Road, Pudong, Shandhai, China 201206
Tel: +86 21 58356710 Fax:+86 21 58356720
E-mail: jason@chenghuibearing.com
Website: www.chenghuibearing.com

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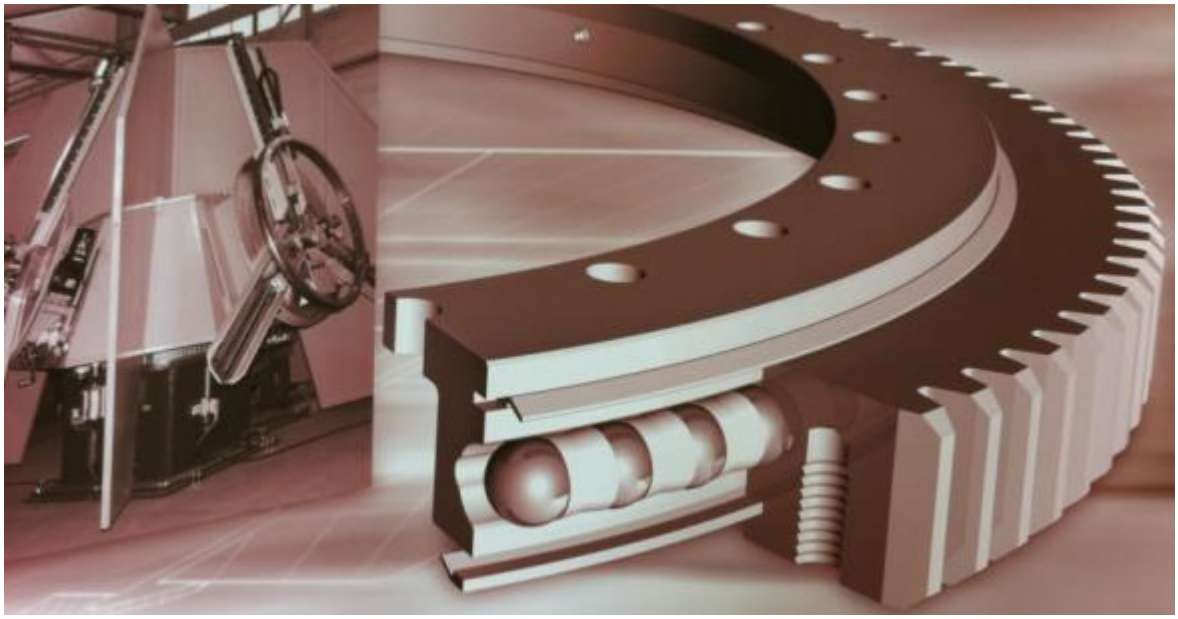

1.1 Product Application

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The slewing bearing is a basic mechanical component for engineering machinery, mining machinery, construction machinery and other machineries that require relative rotary motions of two parts. The slewing bearing serves to transmit movement, bears load, and connect. However, different from bearing applications, the slewing bearing is generally suitable for low speed and heavy load.

The slewing bearing has a wide range of applications including engineering machinery, e.g. truck crane, excavator, and tower crane; mining machinery, e.g. bucket wheel machine; metallurgical industry, e.g. clay gun, ladle turret, furnace cover slewing mechanism, etc. It is also used for port machinery, welding machinery, wind power generating equipment, medical equipment, e.g. CT machine, etc.

 **Tower crane**	 **Truck crane**	 **Excavator**
 **Crawler crane**	 **Concrete pump truck**	 **Port crane**
 **Manned elevator**	 **Lorry-mounted crane**	 **Trailer**
 **Rotary conveying device**	 **Robot**	 **Solar power generator**

Tower Crane

Demand characteristics: The slewing bearing for tower crane is generally required to have more flexible rotation without abnormal noise.

Commonly-used slewing bearing models for tower crane

Product model	Mainframe reference	Product model	Mainframe reference
012.30.1000	QTZ31.5		
011.40.1120	QTZ40		
011.40.1220	QTZ50		
011.45.1250	QTZ63		
011.45.1400	QTZ80		
012.45.1600	QTZ160		
011.50.1600	QTZ250		
011.50.1800	QTZ250		
011.50.2000	QTZ315		

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Truck Crane

Demand characteristics: The slewing bearing for truck crane is generally required to have more flexible rotation, more stable, and smaller gap.

Commonly-used slewing bearing models for Truck crane

Product model	Mainframe reference	Product model	Mainframe reference
013.40.0900	8T	131.36.2600	500T
013.40.1000	12T		
013.40.1120	16T		
011.45.1250	20T		
013.45.1400	25T		
011.45.1435	30T		
013.45.1600	50T		
011.50.1800	70T		
021.35.1800	100T		
131.25.2000	150T		
131.25.2240	200T		
131.30.2240	300T		

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Excavator

Demand characteristics: The slewing bearing for excavator is generally required to be impact to resistance, high intensity, sealability， higher precision, more stable and without noise.

Commonly-used slewing bearing models for excavator

Product model	Mainframe reference	Product model	Mainframe reference
013.22.0730	6T		
013.25.0800	8T		
013.30.1000	13T		
013.32.1201	20T		
013.35.1250	23T		
013.35.1405	36T		

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Crawler Crane

Demand characteristics: The slewing bearing for crawler crane is generally required for high bearing capacity.

Commonly-used slewing bearing models for excavator

Product model	Mainframe reference	Product model	Mainframe reference
013.60.1465	50T		
013.50.1600	70T		
012.50.1600	80T		
013.60.1600	80T		
013.60.1800	90T		
131.25.2000	100T		
131.45.2000	160T		
131.45.2240	220T		
131.45.2500	300T		

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Concrete Pump Truck

Demand characteristics: The slewing bearing for concrete pump truck is generally required for high bearing capacity.

Commonly-used slewing bearing models for concrete pump truck

Product model	Mainframe reference	Product model	Mainframe reference
011.40.1064	37m		
011.35.1116	37m		
011.40.1124	40m		
011.50.1251	44m		
011.50.1390	45m		
071.35.1464	48m		
011.50.1595	52m		

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Port Crane

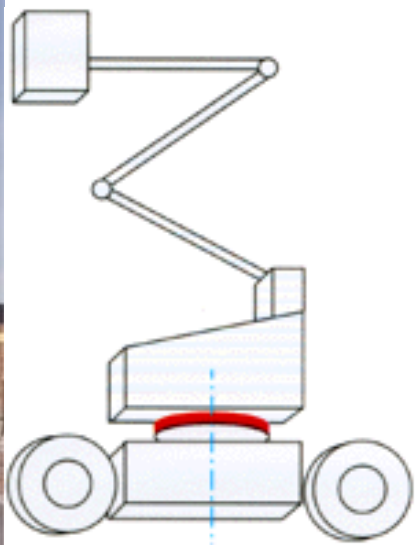
Demand characteristics: The slewing bearing for crawler crane is generally required for high load, heavy work, high fatigue strength .

Commonly-used slewing bearing models for Port crane

Product model	Mainframe reference	Product model	Mainframe reference
010.30.0500			
010.30.0630			
010.30.0710			
071.25.1117			
132.45.2800			
132.50.3150			

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Manned Elevator



Demand characteristics: The slewing bearing for manned elevator is generally required for flexible turn, stable, reliable, bearing less load.

Commonly-used slewing bearing models for manned elevator

Product model	Mainframe reference	Product model	Mainframe reference
011.25.0400			
011.20.0500			
011.30.0630			
012.30.0710			
011.40.0800			

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Lorry-mounted Crane

Demand characteristics: The slewing bearing for Lorry-mounted crane is generally required for flexible turn, stable, reliable, bearing less load.

Commonly-used slewing bearing models for Lorry-mounted crane

Product model	Mainframe reference	Product model	Mainframe reference
011.20.0315	2T		
011.25.0337	4T		
012.28.0425	5T		
012.32.0500	6T		
011.32.0630	8T		
011.32.0710	10T		
013.40.0750	12T		
013.40.0800	14T		
013.40.0900	16T		
013.40.1000			

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Trailer

Demand characteristics: The slewing bearing for trailer is generally required for flexible turn, less load bearing, in light weight.

Commonly-used slewing bearing models for trailer

Product model	Mainframe reference	Product model	Mainframe reference
010.20.0544			
010.20.0644			
010.20.0744			
010.20.0844			
010.20.0944			
010.20.1094			

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Rotary Conveying Device, Wrapping Machine, Filling Machine

Demand characteristics: The slewing bearing for Rotary conveying device, Wrapping machine, filling machineis generally required for high rotate speed, 24-hour continuous running, high gear precision, less load bearing.

Commonly-used slewing bearing models for Rotary conveying device, Wrapping machine, filling machine

Product model	Mainframe reference	Product model	Mainframe reference
010.25.0355		013.40.1000	
010.20.0410		010.40.1120	
012.25.0560		013.45.1400	
010.30.0630			
012.25.0710			
010.20.0800			

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Robot, Welding Machine

Demand characteristics: The slewing bearing for robot, welding machine is generally required for high rigidity, low but constant torque, high accuracy of gear.

Commonly-used slewing bearing models for robot, welding machine

Product model	Mainframe reference	Product model	Mainframe reference
011.25.0336			
011.30.0500			
011.30.0630			
013.30.0630			
010.30.0800			
011.35.1400			

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

Solar Power Generator

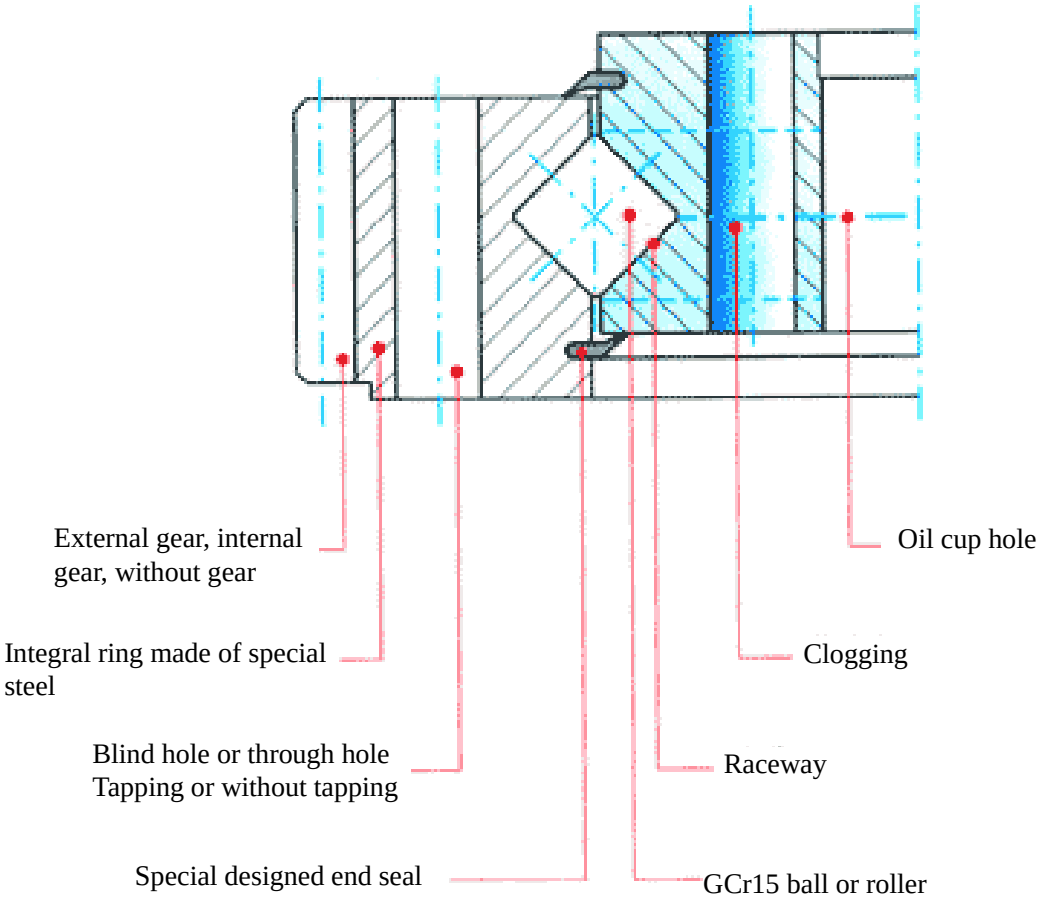
Demand characteristics: The slewing bearing for solar power generator is generally required for high flexibility, long working life.

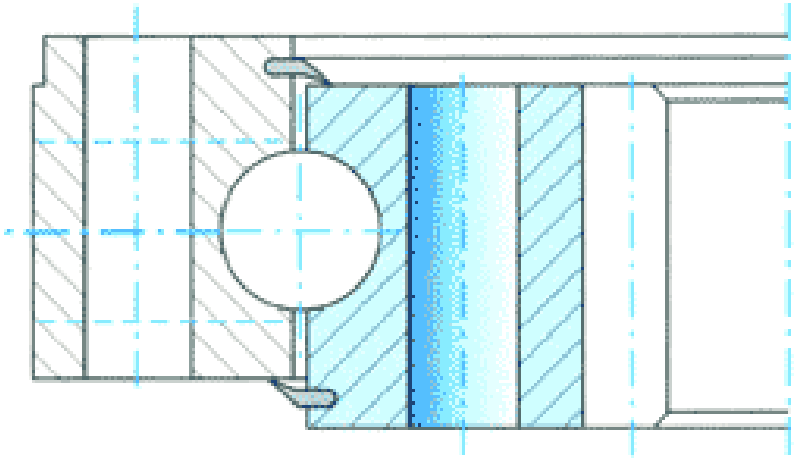
Commonly-used slewing bearing models for excavator

Product model	Mainframe reference	Product model	Mainframe reference
015.22.0223			
015.22.0310			
015.22.0343			
015.22.0422			
015.28.0525			
015.25.0620			

If the above models can't meet your demand, please contact us. You also can further determine the load and working condition and collectively write down the same in the *Slewing Bearing Type Selection Technical Parameter Table*. Our design and development department will recommend the most suitable product.

1.2.1 Basic structure



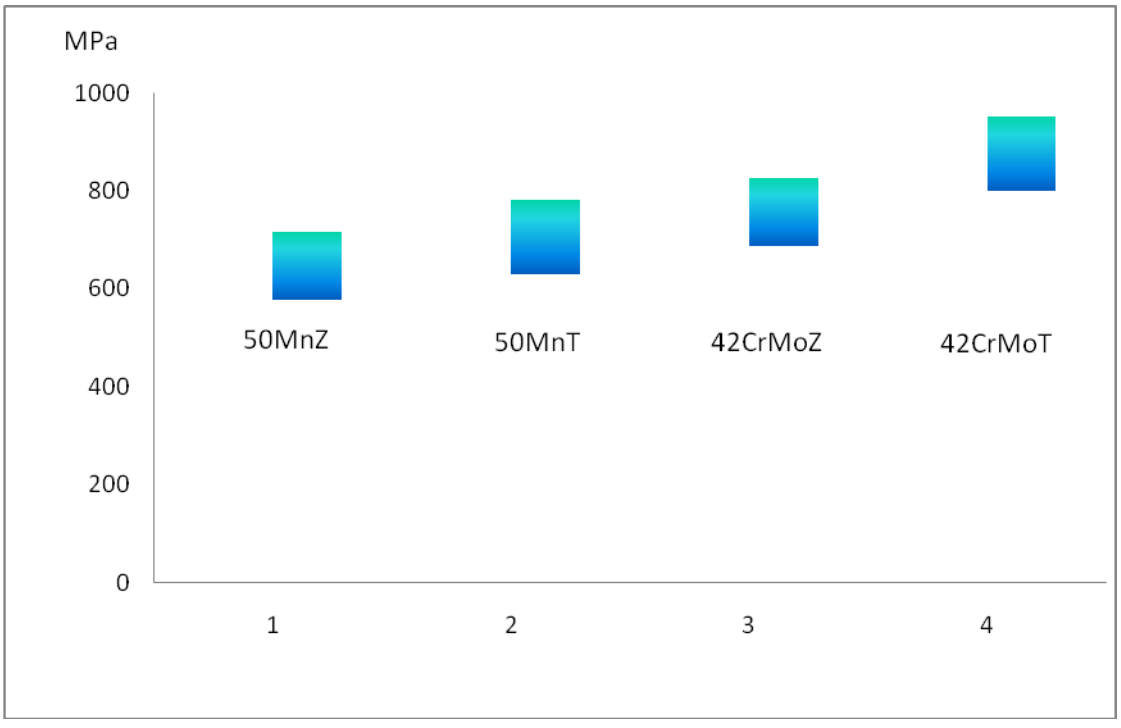


1.2.2 Material

The Company selects the most suitable materials to manufacture slewing bearings to adapt to foreseeable purposes. These materials are manufactured by a recognized steel plant. To ensure product quality, every step in the process is inspected. Tempering heat treatment is needed when the product is subject to high stress.

Customers can select materials from the following tables. Composition of two materials and two heat treatment states: 50MnZ, 50MnT, 42CrMoZ, 42CrMoT, with mechanical performance ranking from low to high. Customers can also specify other materials designations according to their needs.

Standard grade	As-normalized condition	As quenched condition
50Mn	Code Z	Code T
42CrMo	Code Z	Code T



1.2.2 Material (continued)

The following table shows our standard steel material designations and equivalent steel material designations in other countries.

Country	Standard	50Mn code Z/T	42CrMo code Z/T
China	GB	50Mn	42CrMo
Germany	DIN	CK50	42CrMo4
G.B.	B.S.	030A52	708M40
America	AISI	1053	4140,4142
Italy	UNI		42CrMo4
Japan	JIS	S48C,SWRCH50K	SNB7
Spain	UNE		42CrMo4 (F8232)
Sweden	SSSTAHL		2244
Australia	ASA AS		AS 1444-4140
Intern.	ISO	C50E4	42CrMo4

Other materials

Special factors or functional requirements of certain applications will lead to the use of the following materials:

Stainless steel, aluminum-based light alloy, quenched structural steel or alloy, titanium alloy, special steel quenched in protective atmosphere, low-temperature special steel, cemented steel or nitride steel, and plastic composite material.

1.2.3 Rolling Element

The material designation of our rolling element (pin roller and steel ball) is Gr15. The table of comparison with designations in other countries is as follows:

Country	Standard	Rolling element material
China	GB	Gr15
Germany	DIN	100Cr6
America	AISI	E52100
Japan	JIS	SUJ2

The steel ball is generally as per the provisions of GB/T308 (ISO3290,NEQ) and its grade of tolerance is compliant with requirements of the following table:

Steel ball diameter Dw/mm	Steel ball tolerance grade
≤30	G40
>30~50	G60
>50	G100

The pin roller (cylindrical roller) shall be as per provisions of GB/T4661 and its grade of tolerance shall be III.

Note: Any movement of dismantling any bearing or replacing any rolling element shall be absolutely prohibited, otherwise, we will cancel the warranty.

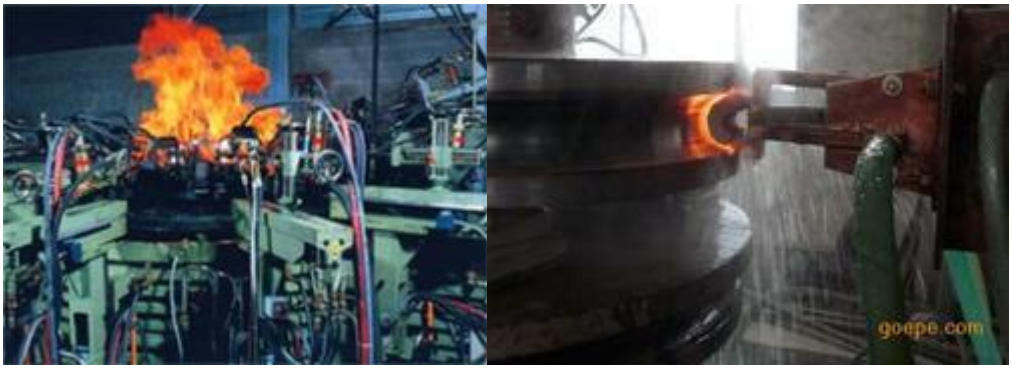
1.2.4 Heat Treatment

The slewing bearing transmits the load of a mechanism from the rotating part to the fixed part. The stress which the rolling element bears on the raceway is calculated according to the hertz law and the modern plasticity standard.

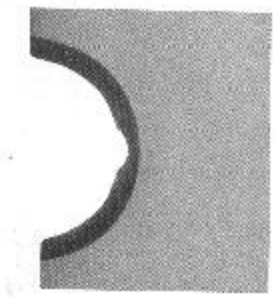
The Company conducts partial induction quenching to attain necessary rigidity and sufficient depth. These requirements can be met both in terms of surface pressure and internal surface fatigue.

According to our product specifications, systemic inspection is conducted during production so that we can ensure quality and workmanship reliability of our slewing bearings.

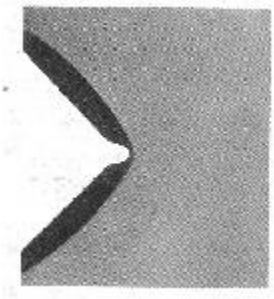
We select necessary treatment modes according to the calculation model and we also use other methods for partial hardening purpose, e.g. carburizing, nitriding, etc.



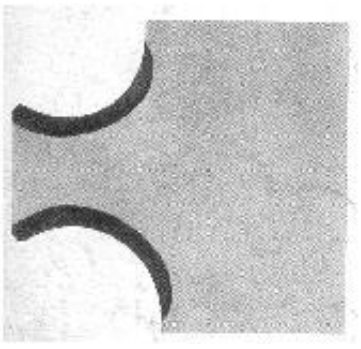
Sketch of raceway nest quenching



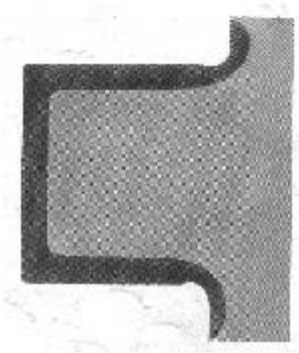
Raceway of sigle-row four-point contacted ball bearing



Raceway of single-row cross roller



Raceway of double-row ball series

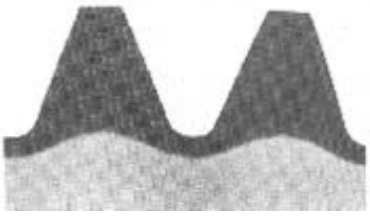


Raceway of tri-row roller series

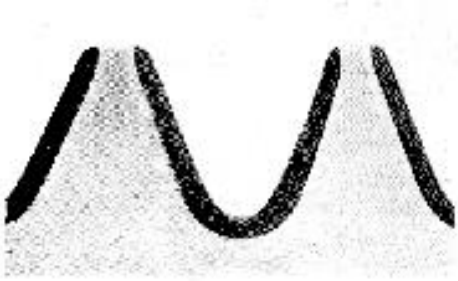
1.2.4 Heat Treatment (Gear Quenching)

Due to the need of transmission force or torque, the slewing bearing generally has teeth on one of its rings. In different application occasions, the gear can go through full teeth quenching or single teeth induction quenching, which comes into teeth face & root quenching and teeth face quenching.

Raceway quenching heat shape diagram



Full teeth quenched



Teeth face & root quenched

Teeth face quenched

1.2.5 Temperature, Speed, Environment, Impact, Vibration

Temperature

The slewing bearing works normally under the temperature ranging between -25℃ and ＋75℃. Lower or higher temperature is allowed, but it's necessary to make a special design by our design and development department.

Environment

The following working environments are very corrosive: marine environment and environments with dust or abrasive materials (sand, coal dust, etc.)

In such environments, it's necessary to take special protective devices, e.g. seal ring, protective cover, and oil pool. Preventive maintenance must be enhanced to ensure normal work.

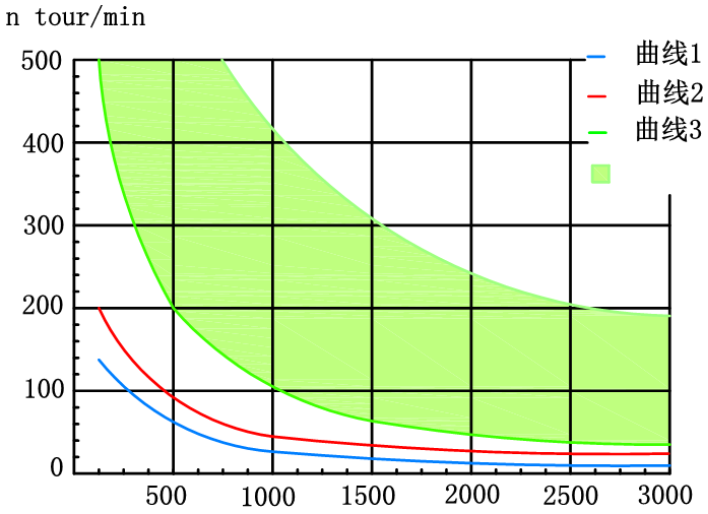
Impact and vibration

The user should make a clear description of the detailed use condition to the design and development department of the Company and consult with the latter in this regard.

Speed

The slewing bearing can make swinging or continuous rotation movements. It's necessary to check whether the circular raceway's peripheral speed is kept within the allowed capacity of the relevant bearing.

Revolving speed



Bearing type	Lubrication type	Limit speed (n.Dm)	
Cross roller raceway	Standard grease	24000 to 35000	Curve 1
Steel ball raceway	Standard grease	40000 to 65000	Curve 2
Steel ball type with retainer	Grease or oil	70000 to 130000	Curve 3

For example: 011.40.1000 slewing bearing, the center diameter D of its raceway is 1000mm, it uses standard grease, limit speed: n.Dm=65000, limit revolving speed: n=65000/1000/3.14=20.7 (tours/min). If the rotate speed is too high, the slewing bearing might have a shortened service life or be damaged. If you want a slewing bearing with higher rotate speed, please contact us. Our engineers and technicians will make a special design for you.

2 Slewing Bearing Selection

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)
——Bearing Capacity

2.2 Bolt Bearing Capacity Computation ——Fastening Capacity

2.3 Gear Selection ——Turning Capacity

2.4 Precision－Tolerance

2.5 Turning Moment

2.6 Seal Ring

2.7 Surface Protection

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

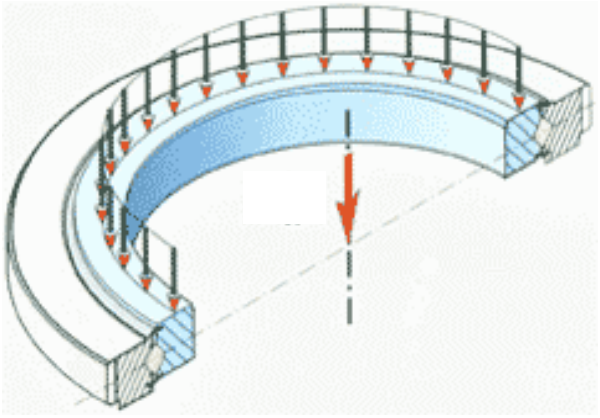
2.1.1 Slewing bearing under load

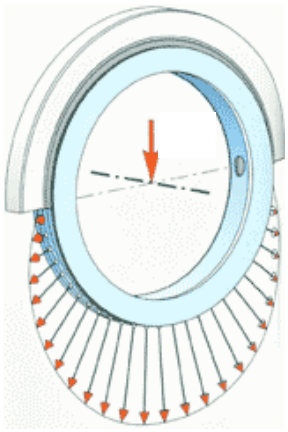
As a connecting part between a moving part and a fixed base, the slewing bearing must be able to transmit the stress of the moving part to the base. To select a slewing bearing with sufficient capability, all stresses borne, including effects generated by weight, load and structure, should be determined precisely. The effect caused by static load and that caused by dynamic load must be differentiated from each other, because the latter constitute the "fatigue" stress. It's necessary to accurately determine the direction of a force applied to the slewing bearing, because only by doing so, can we determine the effective overturning moment.

Slewing bearing under load:

•• Axial loads: Their direction is parallel to the spindle of the slewing bearing. The resultant force of these axial loads is called **Fa**.

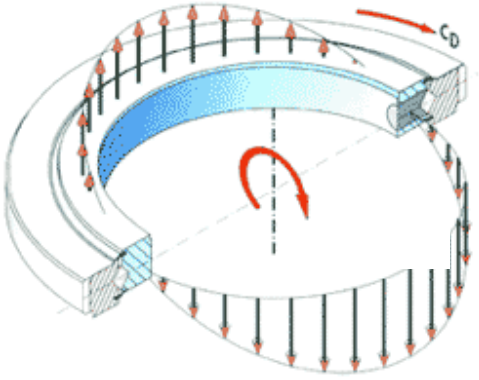
•Radial loads: Within the plane of the vertical spindle, the resultant force of these axial loads is called **Fr**.





• Overturning moment (bend)

Within the plane parallel to the spindle, the moment generated within the plane in which the spindle exists is called **M**.



• **Turning moment**

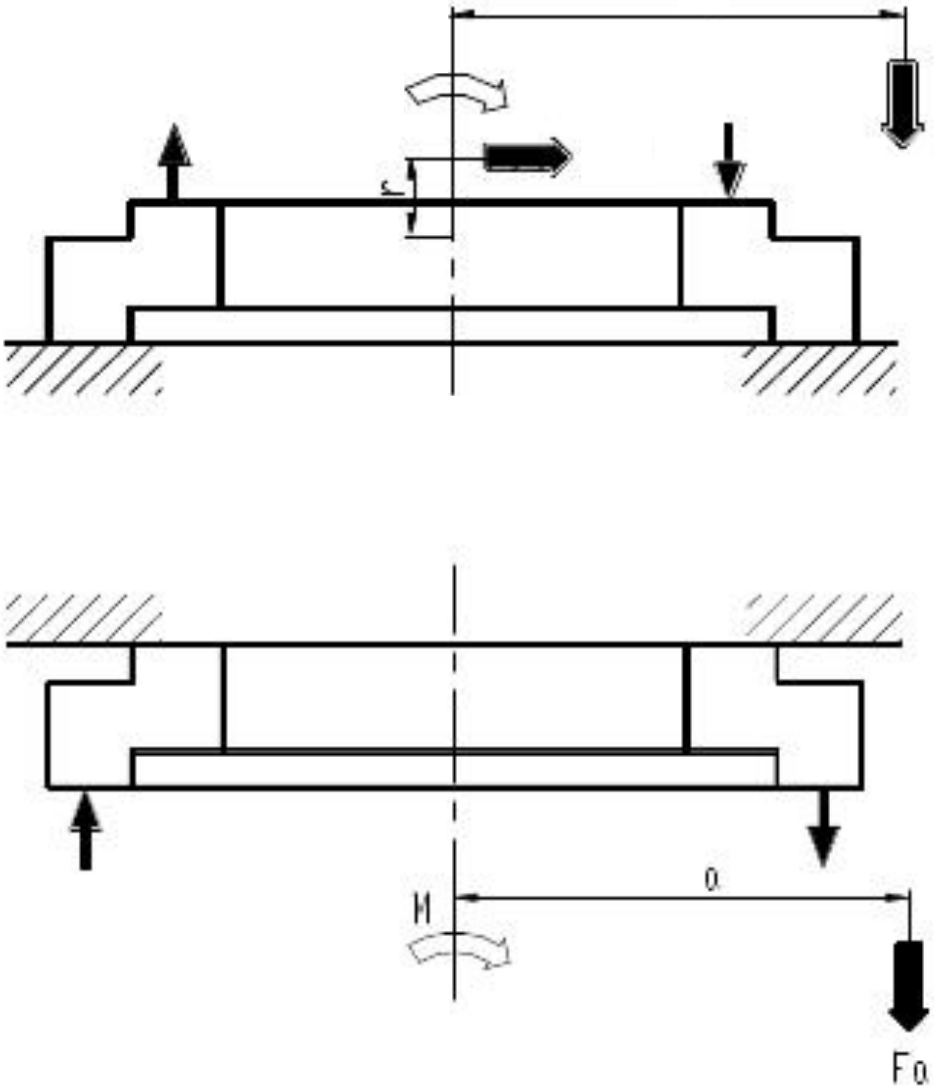
The moment which controls the rotation of the slewing bearing is called $\mathbf{C_D}$.

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

2.1.2 Load-bearing in different installation styles

When being used, the slewing bearing generally bears the combined action of axial force Fa, radial force Fr and overturning moment M. In different application occasions, as the main machine has different working modes and structures, the combined actions of the above-mentioned loads are different. Sometimes, there is the combined action of two loads, and sometimes, there is the sole action of only one load.

Generally, the slewing bearing is installed in two ways as follows: seat type and suspension type. The following is a diagram showing the load carried by the bearing in two installation types:



2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

2.1.3 Technical parameters needed for slewing bearing type selection

- **The following parameters are needed for slewing bearing type selection calculation:**
- Load carried by the slewing bearing
- Percentage of each load and that of its operating time
- Revolving speed or number of revolutions of the slewing bearing under the action of each load
- Peripheral force applied on gear
- Installation dimensions of the slewing bearing
- Other operating conditions: environment, working temperature, vibration, impact load, storage temperature, etc.

The main machine plant can make a preliminary selection of slewing bearings as per the slewing bearing type selection calculation method based on the information provided by the product samples by using the static bearing capacity curve chart (see section 2.1.6 for detail) and confirm the selection together with the design and development department of the Company. It may also provide us with relevant slewing bearing information for us to conduct design and type selection.

If design and type selection is conducted by us, please fill out the *Slewing Bearing Type Selection Technical Parameter Table* (including Appendix A and Appendix B in the parameter table, see section 5.2 of this sample), so that we can submit an accurate, economical and practical slewing bearing type selection proposal to you as soon as possible.

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

2.1.4 Slewing bearing load correction

Load transmitted from one raceway to another one varies with the nature of the load carried. To calculate the dimensions of the raceway, we define that the load equals to all external acting forces within the maximum stress area. According to the situation of application and use, the following factors are adopted to correct these loads:

Static safety factor f_S

It is a factor taking into account application characteristics related to slewing bearing elements. This factor is acquired through our experience and it is set out in the "Application Factor" table.

In principle, the maximum load applied on the bearing must be regarded as the static computation value, where the load must include additional load and test load. For application occasions not listed in the table, selection may be made by referring to the similar working conditions and applications in the table.

Dynamic safety factor f_L

The dynamic safety factor must be used in combination with the dynamic bearing curve (which is not included this sample). It is sourced from experience and test and is a reference value under maximum working load. If it's necessary to select a slewing bearing by service life, please contact with our design and development department.

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

2.1.4 Slewing bearing load correction

Safety factory table

<table>
<tr><th colspan="3">Application occasions</th><th>fs</th><th>fL</th><th>Rated life (n)</th><th>Remarks</th></tr>
<tr><td colspan="3">Floating crane (cargo load)
Truck crane (cargo load)
Marine deck crane (grab bucket)
Welding equipment
Working table (continuous operation)</td><td>1.1</td><td>1</td><td>30,000</td><td rowspan="9">*Upper rotation tower crane
Mf = Reverse overturning moment when idle
M = Overturning moment in greatest range

**For application occasions where static safety factor fs is 1.45, because of high average load and onerous working condition, multi-row raceway type slewing bearing should be selected first

In these application occasions, the working condition changes greatly. For example, the slewing bearing which is used without frequent rotation only needs static check, while the slewing bearing which is used with continuous and intermittent rotations should go through dynamic service life computation.</td></tr>
<tr><td rowspan="4">Tower crane</td><td rowspan="3">*Upper rotation</td><td>Mf ≤ 0.5M</td><td rowspan="5">1.25</td><td>1</td><td>30,000</td></tr>
<tr><td>0.5M ≤ Mf ≤ 0.8M</td><td>1.15</td><td>45,000</td></tr>
<tr><td>Mf ≤ 0.8M</td><td>1.25</td><td>60,000</td></tr>
<tr><td colspan="2">Lower rotation</td><td>1</td><td>30,000</td></tr>
<tr><td colspan="3">Slewing crane (cargo load)
Shipyard’s crane
Rotary crane trolley
Marine unloading machine</td><td>1.15</td><td>45,000</td></tr>
<tr><td colspan="3">Metallurgical crane</td><td rowspan="4">1.45**</td><td>1.5</td><td>100,000</td></tr>
<tr><td colspan="3">Truck crane (grab bucket type or handling onerous tasks)
Slewing crane (grab bucket or sucker)
Rotary crane trolley (grab bucket or sucker)
Bridge crane (grab bucket or sucker)
Floating crane (grab bucket or sucker)</td><td>1.7</td><td>150,000</td></tr>
<tr><td colspan="3">Bucket wheel excavator
Stacker-reclaimer
Cantilever conveyor</td><td>2.15</td><td>300,000</td></tr>
<tr><td colspan="3">Offshore crane</td><td colspan="3">As per special standard</td></tr>
<tr><td colspan="3">Railway crane
Deck crane (cargo load)</td><td>1</td><td rowspan="6"></td><td rowspan="6"></td></tr>
<tr><td colspan="3">Stacker
Delivery wagon</td><td>1.1</td></tr>
<tr><td colspan="3">Rope type excavator/dragline</td><td>1.25</td></tr>
<tr><td colspan="3">1.5m3 or less hydraulic excavator</td><td>1.45</td></tr>
<tr><td colspan="3">1.5m3 or greater hydraulic excavator</td><td colspan="2">As per special standard</td></tr>
<tr><td colspan="3">Ladle turret</td><td>1.75</td></tr>
</table>

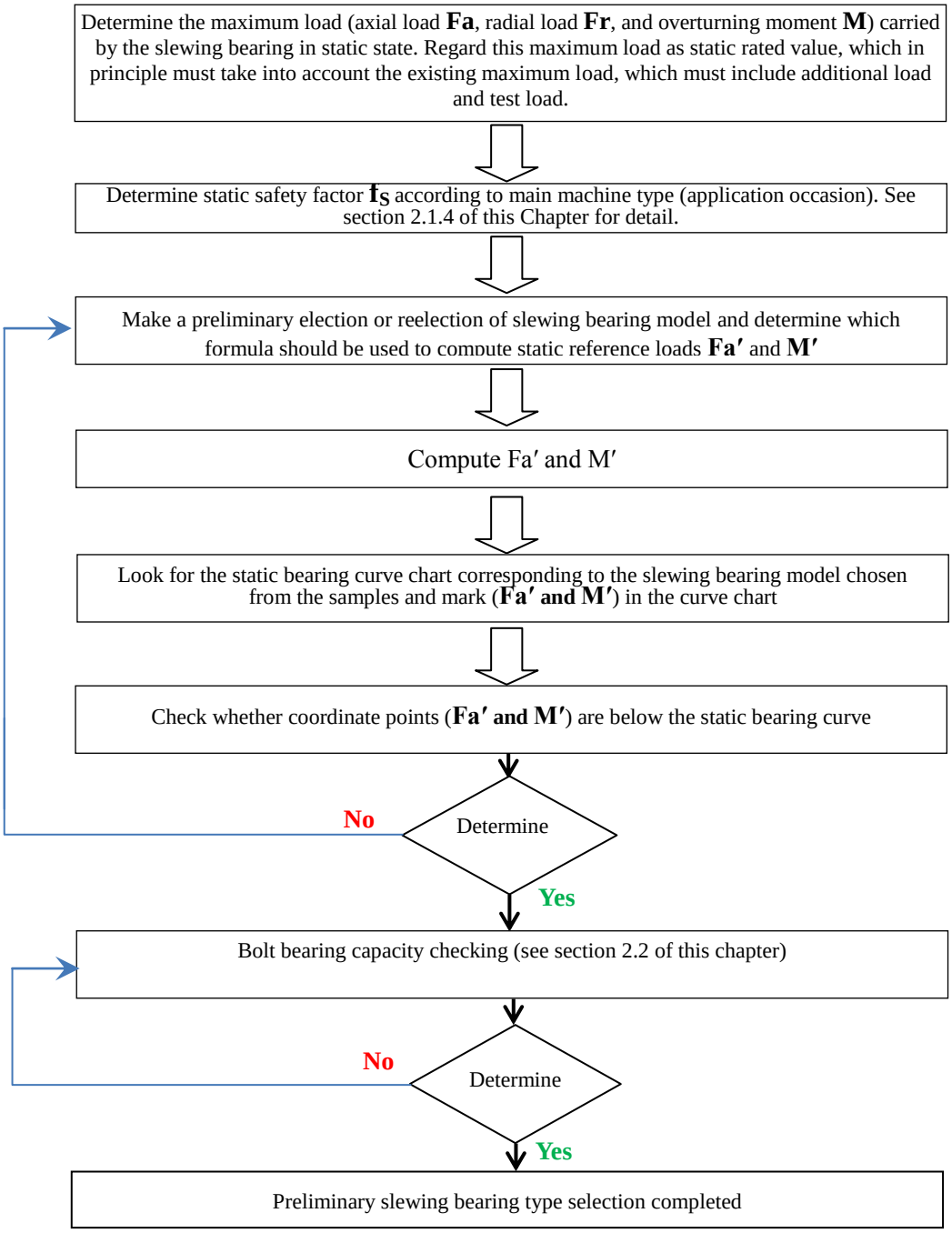
These factors are all got through a great deal of observations and statistics in applications of each model. The rated life conditions are as follows:

• Working under normal climate condition ·Normal application (not special)

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

2.1.5 Static type selection of slewing bearing-preliminary static type selection computation process chart

You can make a preliminary selection of suitable slewing bearing product as per the following flow chart, where the key point is to get the static reference loads **Fa′ and M′** to contrast the slewing bearing's bearing capacity curve chart provided by this sample.

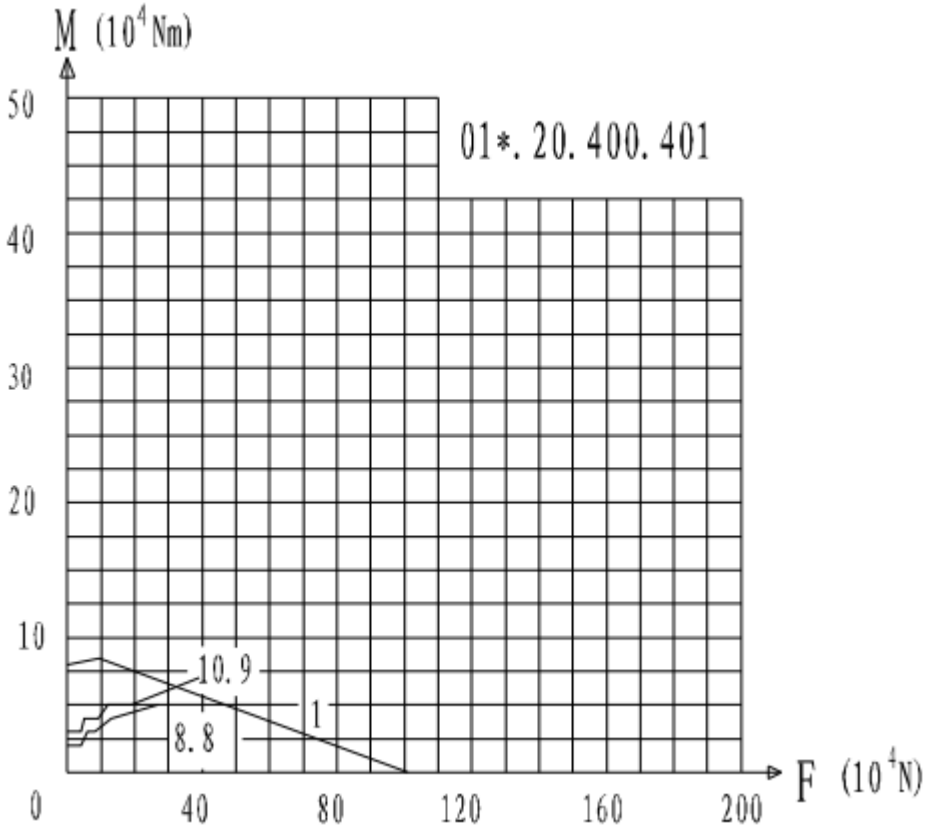


2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

2.1.6 Static type selection of slewing bearing-slewing bearing's bearing capacity curve chart

To make type selection more convenient for customers, every slewing bearing model among the product samples corresponds to a bearing capacity curve, which helps the user to make a preliminary selection of slewing bearing.

There are two type curves in the curve chart, as shown in the following figure:



- One is static bearing curve (line 1 in the chart), which means the maximum load borne by the slewing bearing in static state.

- The other is slewing bearing bolt limit load curve (lines 8.8 and 10.9 in the chart), which is determined when the bolt's clamping length is five times of its nominal diameter and its pre-tightening force is 70% of bolt material's yield limit.

You can judge whether a slewing bearing model meets the load requirement by checking whether the coordinate points **Fa′** and **M′** are below the static bearing curve by using the static reference loads **Fa′** and **M′** got through computation (see section 2.1.7 next page for computing method).

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

2.1.7 Slewing bearing static type selection—Computing method for static reference loads Fa′ and M′

To make computation and chart-checking more convenient, it's necessary to transform resultant force of radial load into radial load of equivalent value by the following formula. The computing method for static reference loads **Fa′** and **M′** is shown as follows:

- **Single-row four-point contact ball type**

Type selection computation for single-row four-point contact ball type slewing bearing is conduct in two cases of bearing angle, i.e. 45 °and 60 °.

I, α=45 °II, α=60 °

Fa′=(1.225•Fa+2.676•Fr)•fsFa′=(Fa+5.046•Fr)•fs

M′ =1.225•M•fs M′ =M•fs

Then find out the above two points on the curve chart, where one of them may be below the curve, and the one below determines the pressure angle. We can see from the formula that the 45 ° pressure angle can bear greater axial pressure, but it bears less overturning moment than the 60 ° pressure angle.

- **Single-row cross pin roller type**

4 Fa′=(Fa+2.05•Fr)•fs

M′ =M•fs

- **Double-row different diameter ball type**

4 Fa′=Fa•fs

M′ =M•fs

In case of type selection computation for double-row different diameter ball slewing bearing, when Fr≤10%Fa, Fr may be ignored; when Fr＞10%Fa, change of pressure angle in raceway must be considered. Please contact with us for its computation.

- **Three-row pin roller type**

4 Fa′=Fa•fs

M′ =M•fs

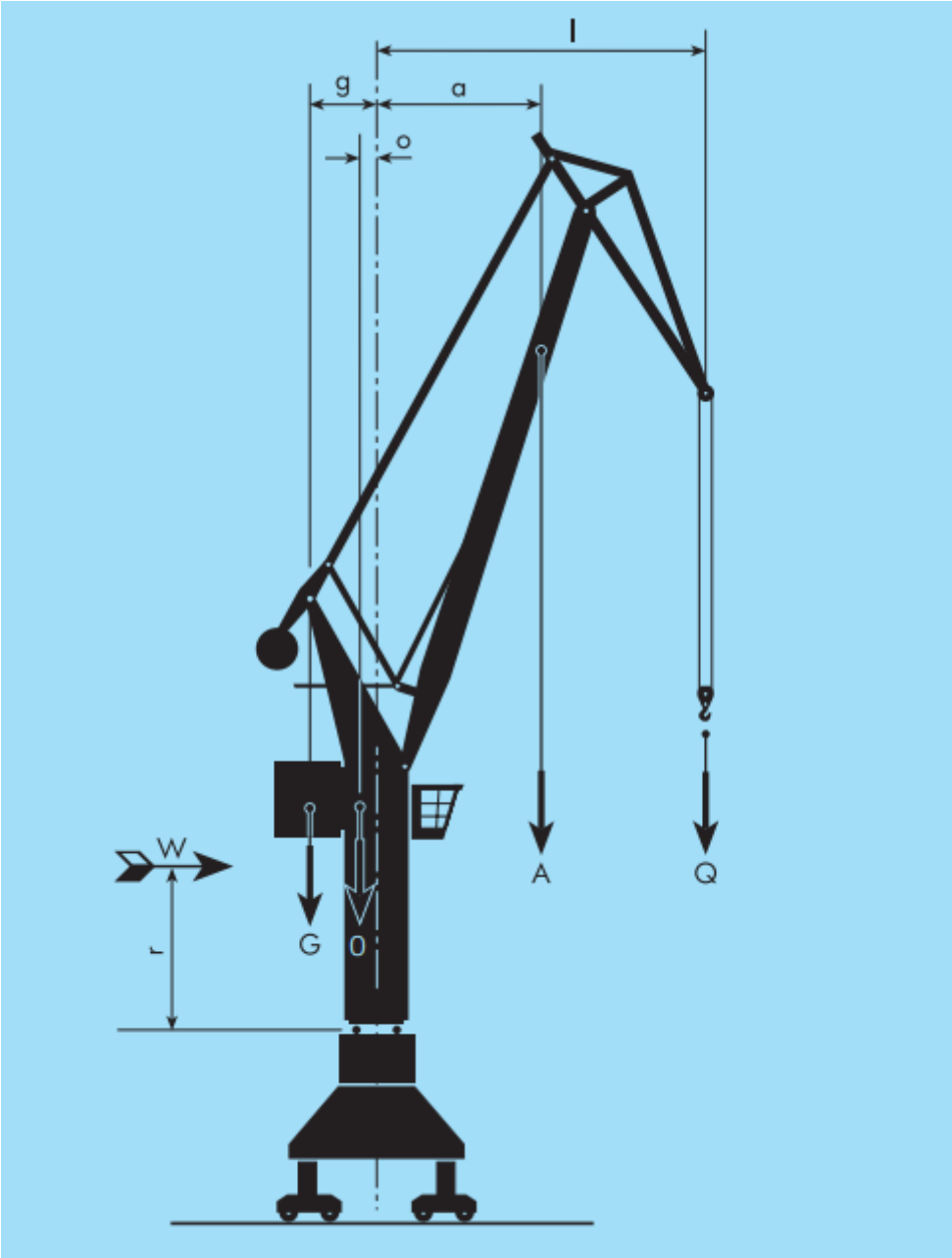
For type selection of three-row pin roller slewing bearing, you only need to compute the function of radial raceway load and overturning moment.

Note: For the slewing bearing to be installed in suspension mode, the radial force should be multiplied by factor 1.2 when Fa' is computed.

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

2.1.8 Static type selection computation examples—Gantry crane (grab bucket)

When bearing capacity curve is adopted for type selection purpose, the maximum load computing method is recommended as follows:



Gantry crane diagram

2.1.8 Static type selection computation examples—Gantry crane (grab bucket)

Before selecting the slewing bearing, the first to do is to determine the static safety factor fs which should be considered for the main machine. This factor can be found in the safety factory table in section 2.1.4: Gantry crane (grab bucket): fs=1.45. When the known maximum static load is at the maximum amplitude, the load is computed as follow:

1) Maximum working load with Grade VIII wind force

Axial force: Fa = Q＋A＋O＋G

Overturning moment: M = Q łmax＋A amax＋W ŗ－O o－G g

2) Load in case of 25% test load, disregarding wind force

Axial force: Fa = 1.25Q＋A＋O＋G

Overturning moment: M = 1.25Q łmax＋A amax－O o－G g

Example: Working load and amplitude of a grab bucket type port crane at amplitude peak are known to be:

Q=260KN	lmax=23m
A=75KN	amax=11m
O=450KN	o=0.75m
G=900KN	g=3m
W=271KN	r=6.5m

3) Maximum working load with Grade VIII wind force

Fa = Q＋A＋O＋G

= 260＋75＋450＋900

= 1685 kN

M = Q łmax＋A amax＋W ŗ－O o－G g

= 260×23＋75×11＋27×6.5－450×0.75－900×3

= 3943 kNm

4) Maximum working load in case of 25% test load, disregarding wind force

Fa= 1.25Q＋A＋O＋G

= 325＋75＋450＋900

= 1750 kN

M = 1.25Q łmax＋A amax－O o－G g

= 325×23＋75×11－45×0.75－900×3

= 5566.3 kNm

5) Maximum working load, disregarding wind force

Fa = 1685 kN

M = Q łmax＋A amax－O o－G g

= 260×23＋75×11－450×0.75－900×3

= 3767.5 kNm

2.1.8 Static type selection computation examples—Gantry crane (grab bucket)

The maximum load exerted on the bearing must serve as the static computed value, thus to select load case 2 as the working load for static computation. As required in the safety factor table in section 2.1.4, the gantry crane (grab bucket) should adopt three-row pin roller slewing bearing. **Therefore, the static reference load of the slewing bearing should be as follows:**

Fa′= 1750 kN× 1.45 = 2537.5 kN

M′ = 5566.3 kNm × 1.45 = 8071.1 kNm

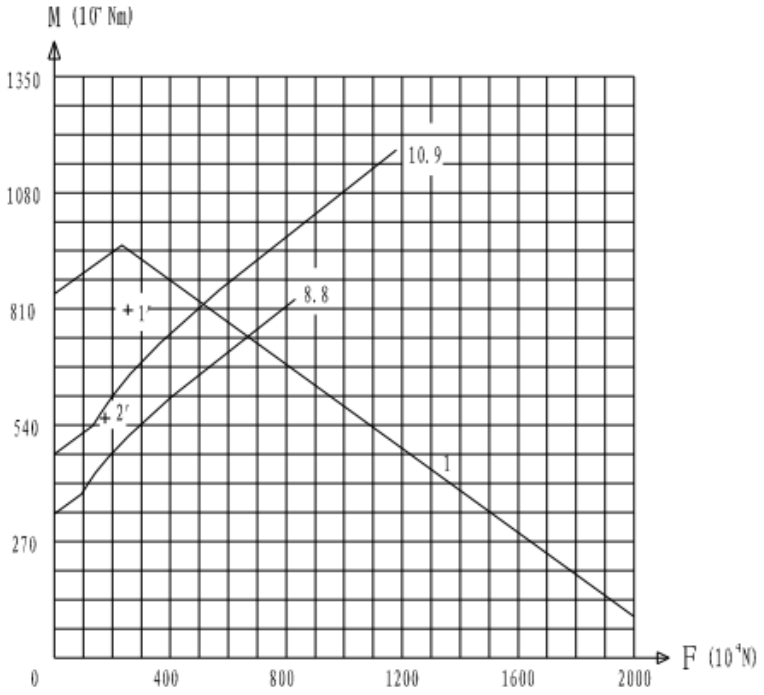
The bolt's computed load should be:

Fa = 1750 kN

M = 5566.3 kNm

Note: The load used in the bolt check table is not the static reference load of the slewing bearing!

According to the above result of computation, you can choose from the bearing capacity curves and determine to select the 13*.45.2000.002.



Line 1 is static bearing capacity curve

8.8 and 10.9 are bolt's bearing curves

1' is static load point

2' is bolt load point

Point 1' is below the raceway static bearing curve 1, so it meets the requirement.

Point 2' is below grade-10.9 bolt bearing curve, so selecting the grade-10.9 bolt can meet the requirement.

2.1 Slewing Bearing Load Computation (Static and Dynamic Loads)

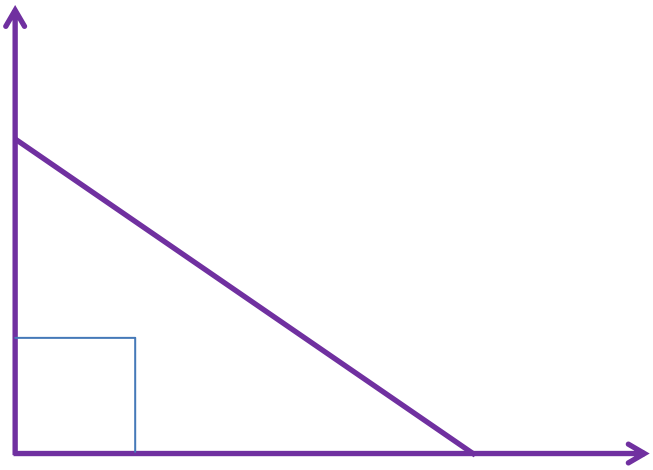
2.1.9 Slewing bearing static type selection and service life estimation

For continuous operation, high-speed rotation and other application occasions with specific requirements for "slewing bearing's life" (e.g. slewing bearings used in rotary conveying device, packer, and filling machine), please contact with our design and development department.

The slewing bearing's bearing capacity depends on:

- External dimensions
- Characteristics of circular material
- Heat treatment
- Characteristics, quantity and size of rolling component
- Contact parameter of rolling element and raceway

As previously mentioned (2.1.6 and 2.1.7), in the bearing capacity curve chart, Axis X represents equivalent axial load, while Axis Y represents heeling moment. To make things easier, a straight line called "**limit curve**" represents capacity curve. By drawing the point representing relevant load on the chart, you can determine the size of the slewing bearing, where the point is called "**application point**". The application point P should be kept below the limit curve.



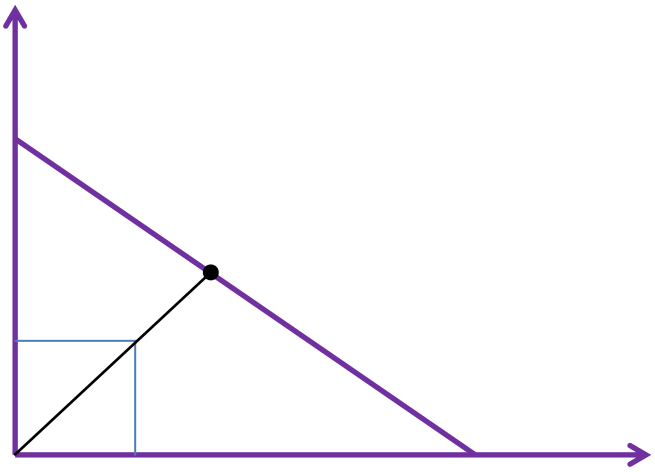
2.1.9 Slewing bearing static type selection and service life estimation

Many external factors pose great effect on service life of bearing:

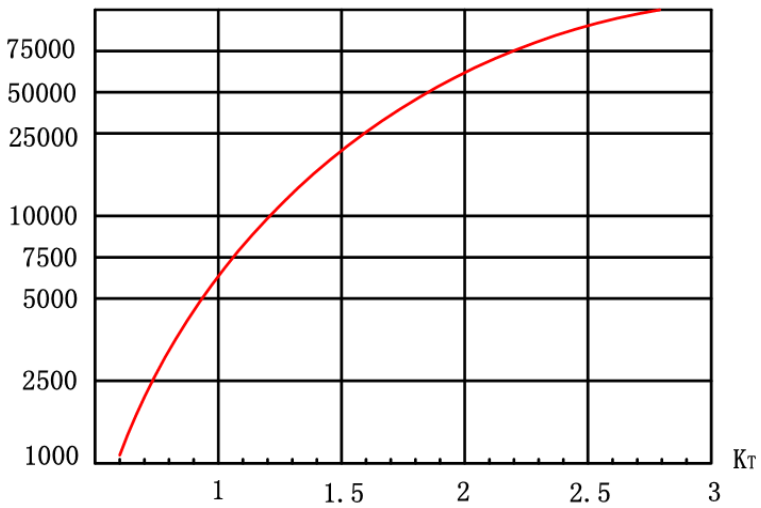
- Geometric accuracy of support
- Structural distortion under load
- Climate condition and environment
- Quality of maintenance work
- Working condition

Use with impact, vibration or violent or intermittent motions for long time will obviously lead to shortened service life.

Comparing the application point with the limit curve to get the **service life's estimation value ratio: K_T**＝OL/OP



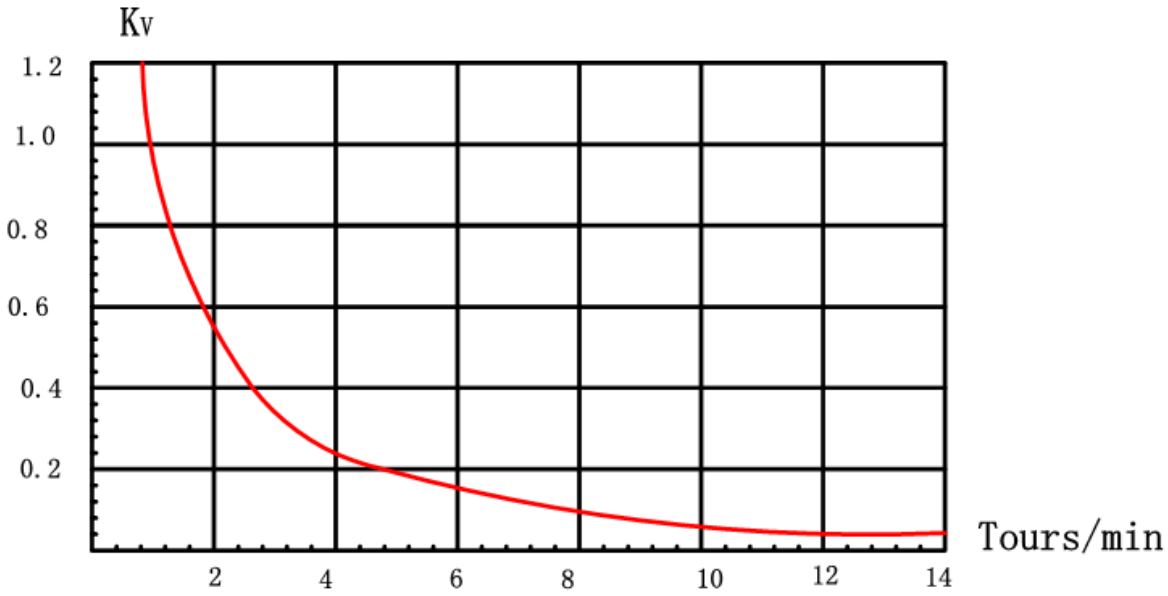
The estimation value D of service life can be got by using the following figure: according to the value K_T on the horizontal axis, you can see the estimation value of service life (hours) directly from the curve. As previously mentioned in 2.1.4, in general cases, when K_T＝1, service life is 6000h.



2.1.9 Slewing bearing static type selection and service life estimation

Correction of service life by revolving speed

Only in case of low revolving speed: 1RPM (1 revolution per minute), is the service life estimation value **D** as shown in the figure effective. This value must be multiplied with speed factor $\mathbf{K_V}$ shown in the right figure according to different speeds.



Service life estimation: $D(n)= K_V$ x L

In case of swinging revolution, the following formula may be used to compute average revolving speed: n average = 0.60 x n actual

2.2 Bolt's Bearing Capacity Computation

2.2.1 Quality requirements of bolt, nut, and washer

To transmit a certain load, the bearing must be mechanically fastened on the connected rack, so that the slewing bearing is rigidly linked to its support. There are many feasible fastening modes, among which the most effective way is connection with bolt and nut. Welding is absolutely prohibited. Selecting suitable bolts and fastening mode in installation are important preconditions for normal function and application safety of the slewing bearing.

Bolt dimensions for the slewing bearing shall accord with provisions of the GB/T5782 and GB/T5783 standards. We recommend Grade 10.9 high-strength bolts manufactured as per GB/T 3098.1, and Grade-8.8 and 12.9 bolts for special cases. If possible, use outside hexagon-headed bolt instead of cylindrical-headed bolt (hexagon socket bolt). Bolt surface treatment should not lead to brittle rupture. Bolt clamping length Lk≥5d (d-bolt diameter).

Minimum requirement of bolt's mechanical properties

Grade	Tensile strength (Mpa)	Yield strength (Mpa)	Fatigue strength (Mpa)	
8.8	800	640	40	special
10.9	1040	940	40	recommend
12.9	1220	1100	40	special

Nut dimensions should accord with provisions of GB/T6170 and GB/T6175 standards, and nut's mechanical properties should accord with provisions of GB/T 3098.2 standard. Nut must be of the same or higher grade of the corresponding bolt. If the bolt's diameter is d, the recommended nut height is 1Xd.

The washer dimensions should accord with the requirements of GB/T97.1 and GB/T97.2 standards and the washer should go through thermal refining. No spring washer may be used. The minimum washer requirements are as follows:

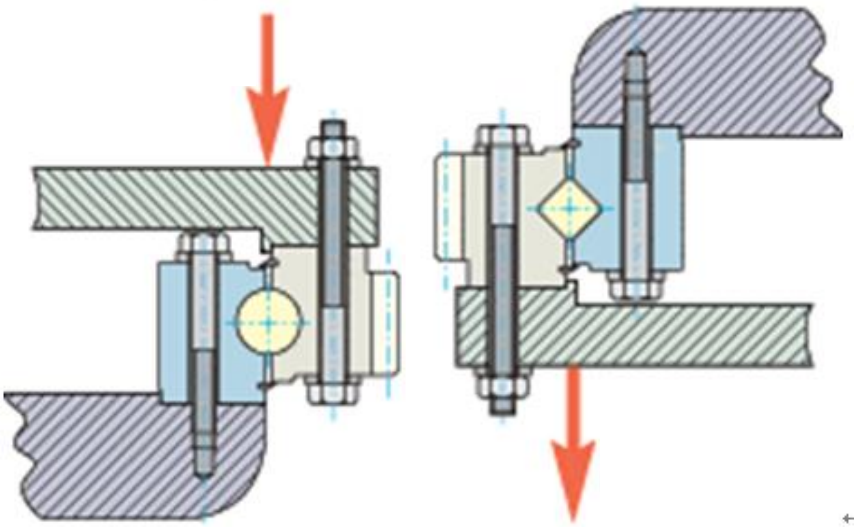
- Yield strength: Greater than or equal to 600 Mpa
- Diameter: DR=2d
- Thickness: h>=0.3d

Company recommendation: Bolt and nut should have mechanical properties compatible with each other and should be pre-lubricated, thus to get the known stable bolt/nut friction factor.

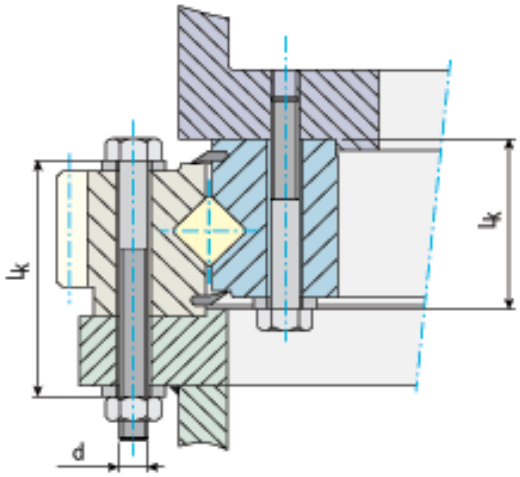
2.2 Bolt's Bearing Capacity Computation

2.2.2 Bolt connection computation assumption

- The support load is pressure
- Bolts are equally spaced and uniformly distributed on pitch circle
- Steel slewing bearing and rack
- Thickness, rigidity and surface flatness of rack compliant with the requirements (refer to "Structure")
- Slewing bearing is directly secured with bolt to rack
- In case of radial heavy load, it's recommended to use centering hole or adhesive bonding to free bolt from shear stress
- Clamping strength should be at least 5 times of bolt diameter: $\mathbf{L_K \geq 5*d}$



Bearing load **Suspension load**



In case of suspended load, please consult our technical department.

2.2 Bolt's Bearing Capacity Computation

2.2.3 Quantity of bolt computation

After the slewing bearing is selected according to use and bearing capacity, the relevant fixing bolt should be determined. Starting from the worst load circumstance, the minimum quantity of fixing bolts should be computed by using the following formula. In summary, sufficient quantity of bolts should be kept to ensure effective connection between slewing bearing and rack to avoid turntable distortion.

$$N=\frac{1.6*F_K(4*M-Fa*Df)}{Df\ (Ts*Fpc)}$$

Where:

N= Number of bolts required in theory

1.6=Fastening factor (assembly error factor)

F_k = Bolt drawing coefficient, see the bolt drawing coefficient diagram below

M= Total overturning moment kNm carried by slewing bearing

Fa = Axial load kN

Df = Fixed round diameter m

Ts= Pre-tightening force

d = Bolt diameter mm

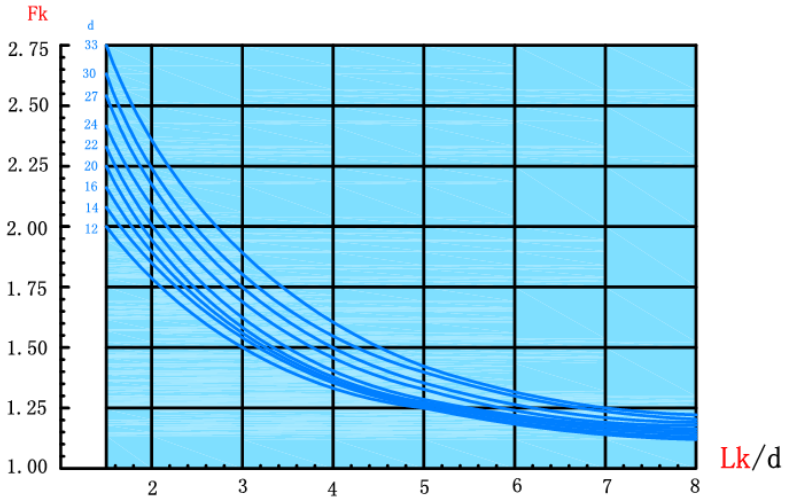
Øm = Raceway nominal diameter m

Fpc= Pre-tightening force loss kN due to creep, see the pre-tightening loss diagram below

L_k = Clamping length mm

Bolt drawing coefficient Fk

This coefficient takes into account geometric dimensions of assembly and is based on bolt diameter and ratio of clamping length to diameter. The optimal fastening is to make a through hole on the slewing bearing and the rack: use bolt and nut, with long fastening length, with sufficient bolt rigidity, and least pre-tightening force loss. If the bolt is fixed at the tapped bearing hole, the hole should be no less than 1.25d in depth.



Bolt drawing coefficient diagram

2.2.3 Quantity of bolt computation

Pre-tightening force: Ts

The pre-tightening force to fix the bolt should be sufficient to ensure firm connection to prevent assembly fatigue.

Minimum pre-tightening force computation:

The standard pre-tightening force for diameter of bolt chosen must be checked to see whether it meets the dynamic stress generated in movement.

$$Ts > \left(\frac{2{,}25}{N}\right)\left[\left(\frac{4xM}{Øm}\right) - Fa + 80\ Nxdx10\text{-}3\right]$$

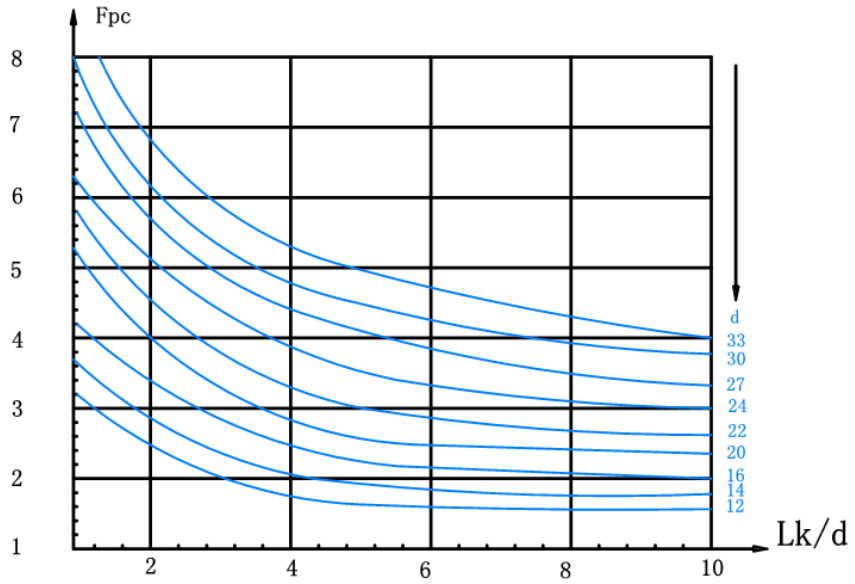
According to the selected bolt diameter: Standard pre-tightening force for connection grade 10.9 is shown in the following table in case of R.80%

Diameter (mm)	12	14	16	20	22	24	27	30	33
Tension (kN)	56	77	106	166	208	239	315	385	480

Pre-tightening force loss: Fpc

Under the effect of fastening and external load, the surface roughness of the two contact parts will reduce bolt pre-drawing to generate pre-tightening force loss, which reduces pre-tightening force in assembly.

Such pre-tightening force loss is shown in the following pre-tightening force loss diagram and it depends on bolt diameter **d** and ratio **LK/d**.



Pre-tightening force loss diagram

2.2 Bolt's Bearing Capacity Computation

2.2.4 Nut contact pressure computation

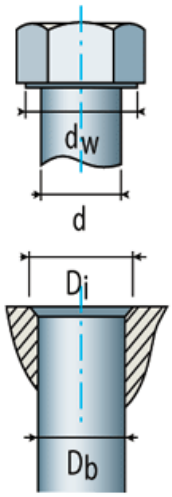
Generally, such computation would be unnecessary, if thermal-treated flat washer is used. Computation (Chc) is needed, if capped bolt is used. The following must be achieved:

$$\frac{F_B \max}{Ac} < P \text{ permit}$$

$$F_B \max = Ts + 0.13 \times F_E$$

$$F_E = \left(\frac{1}{N}\right)\left[\frac{4 \times M}{\varnothing m} - Fa\right]$$

$$Ac = \left(\frac{\pi}{4}\right)\left(d_w^2 - D_i^2\right)$$



Allowable pressure:

Normalizing material: 400 MPa

Tempering material: 620 MPa

Note: Any spring washer of any model is absolutely prohibited. Otherwise, all warranty will be cancelled.

2.3 Gear Selection

All slewing bearings of the Company have a driving mechanism to control revolution of moving parts. This function can be acquired through different means:

1 Gear transmission (in common use)

2 Belt transmission

3 Chain transmission

4 Direct transmission

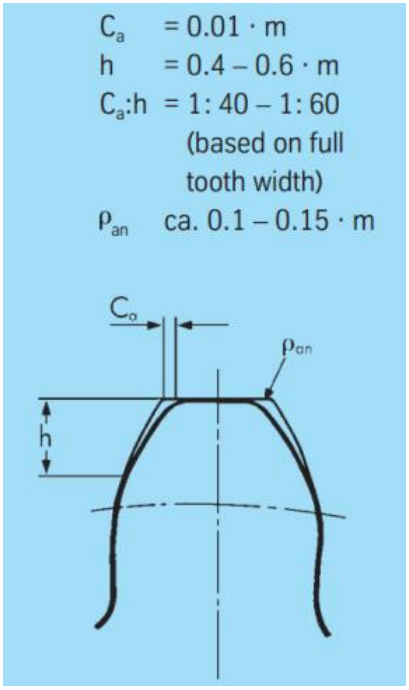
Gear transmission

Cut directly on outer ring into involute teeth, straight teeth or helical teeth, while inner ring may only be straight teeth.

Tooth profile

Most bearings of the Company are toothed and have gone through positive tooth height correction, which can greatly reduce pressure and prevent pinion gear root interference by reducing tooth height. Likewise, it's necessary to make pinion's tooth height corrected to prevent geometrical interference when number of teeth is less than 18. As transmission stress will make axle bent and gear distorted, which harms good engagement, it's recommended that in order to avoid such defect, the pinion's teeth profile should be corrected: e.g. crowned teeth, teeth crest trimming, etc.

Teeth crest trimming: For a pinion under limit load, tip edge radius should be 0.1-0.15 times of modulus, as shown in the following figure:



2.3 Gear Selection

Gear strength

T represents the maximum allowable tangential force of fatigue (peripheral force of gear). Constant operating capacity can be got by using a suitable loading factor.

$T=2\ C_D/Dref$

——C_D= Gear moment

——Dref＝Pitch diameter

The Company can also conduct surface quenching to significantly improve teeth root bending strength and compression strength. In case of heavy load, the Company makes teeth and ring upper teeth totally quenched. If you need better abrasion resistance, surface quenching should be done teeth flank.

Teeth precision

If not stated separately, the Company manufactures gears of the slewing bearing as per standards GB and DIN, e.g. gears with GB9GK, 10GK and 11FH precision. If you need gears of higher precision, e.g. grade 7 or grade 6, teeth surface grinding is necessary (consult our technical department).

The US	ANSI					4	3	2	1				
The US	AGMA		16	15	14	13	12	11	10	9	8	7	6
JAPAN	JIS				0	1	2	3	4	5	6	7	8
INTERN.	ISO	1	2	3	4	5	6	7	8	9	10	11	12
CHINA	GB			3	4	5	6	7	8	9			
GERMANY	DIN	1	2	3	4	5	6	7	8	9	10	11	12
G.B.	BS					A1	A2	B	C	D			
FRANCE	FN				A	B	C	D	E				

Table of Comparison of Gear Grades in Different Countries

Solemn Statement:

In the opinion of the Company, all characteristic parameters of gears of different precision grades defined by GB, DIN or ISO should be met. If a customer only requires one or several particular parameters, the Company can ensure higher precision

2.4 Precision-Tolerance

Standard for geometrical shape selection as follows:

■ Ordinary diameters, without indicated dimensional tolerance (tolerance of hole or axle without match requirement):

≤315	≤1000	≤2000	≤4000
±1.6	±2.0	±3.0	±4.0

■ Hole with match requirement: H9~H10

■ Hole with match requirement: h9~h10

■ Assembly height:

Height dimension range (mm)	Assembly height (mm)	Single-ring height (mm)
~100	±1	0 -1.0
＞100	±1.5	0 -1.5

Installation precision

Location tolerance of bolt hole (including through hole and threaded hole) and diameter tolerance of its pitch circle

Bolt hole pitch circle	~1250	＞1250~2500	＞2500~3550
Hole position accuracy	Φ0.6	Φ0.65	Φ0.8
Hole pitch diameter deviation in boring	±0.6	±0.65	±0.8

For applications on high precision levels such as robots and radars, higher grades can be adopted. The tolerance value will be indicated on the slewing bearing. For a slewing bearing with large diameter and small sectional area, as its inferior radial rigidity, it's installed on the support, the effect of the tolerance value should be considered to ensure roundness of the raceway.

Gear precision

The total gear deviation is indicated in the title bar of the drawing provided by the Company. The size, which includes effect on gear backlash, and tolerance of gear K are also indicated in the drawing.

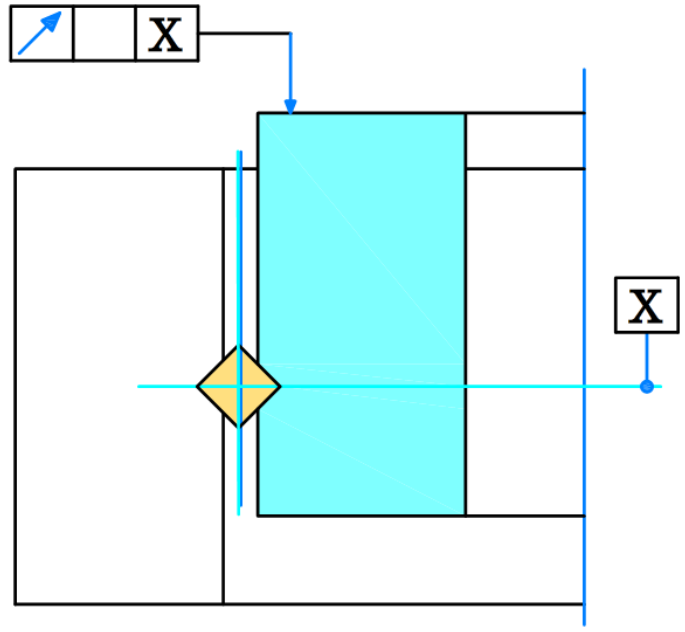
2.4 Precision-Tolerance

Precision of finished slewing bearing

Axial and radial run-out detection method: Put the magnetic base of the dial gage on the fixed ring, make the measuring head contacted with the surface under detection, and turn the ring for a cycle to get the total indication.

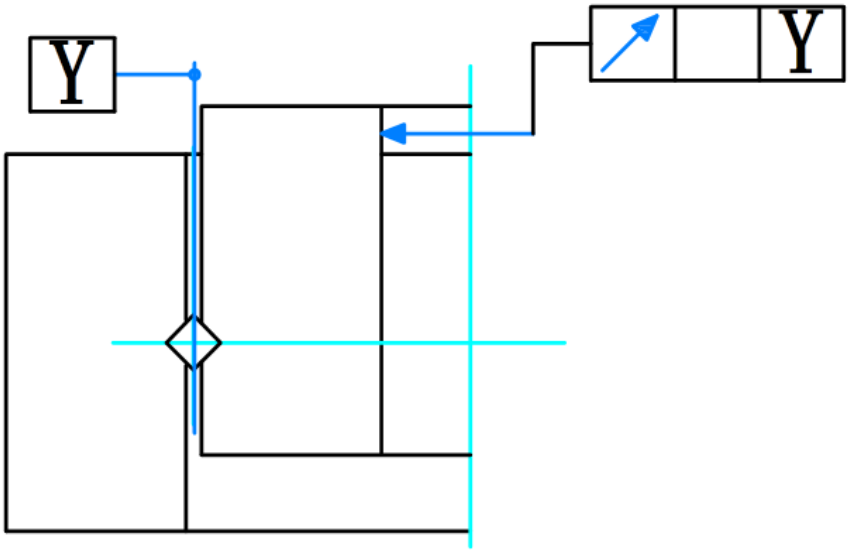
In case of **axial run-out** measurement of slewing bearing, the ring must be turned for at least one cycle.

Axial run-out detection diagram



Diameter run-out with radial installation match requirements should also be measured by turning for at least one cycle.

Radial run-out detection diagram

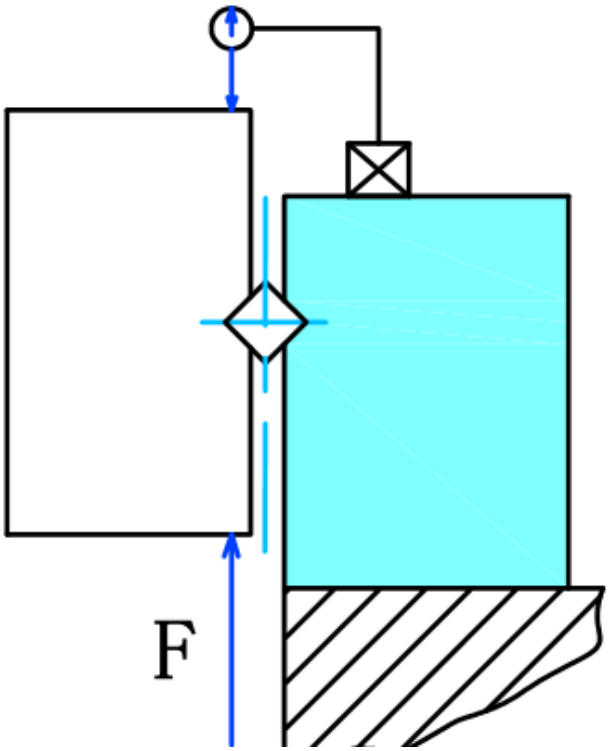


2.4 Precision-Tolerance

Precision of finished slewing bearing

Axial clearance is measured as follows:

Make one ring of the slewing bearing fixed onto the rigid working table and apply pressure onto one point of another ring near raceway. At this moment, axial clearance is shown by a dial gage whose base is fixed onto the ring. The axial clearance of every slewing bearing is measured and recorded at the time of delivery from factory.



Axial clearance detection diagram

2.5 Turning Moment

Turning of slewing bearing is required to be flexible and stable, without clamping stagnation and abnormal sound. Generally, there is no requirement for value of turning moment. However, in special application occasions, e.g. cases where slewing bearing's clearance is negative, the requirement for value of turning moment can be put forward.

To ensure necessary moment computation, the following should be considered:

- Load borne by machine
- Turning quality
- Distance from these objects to spindle
- Speed and acceleration
- Moment of resistance (dependant on bearing flatness and lubrication)

Two kinds of moments should be distinguished:

Starting moment: Cd=Crv+Crc

Accelerating moment: Cg=Crv+Crc+Ca

- Crv = No-load slewing bearing friction moment
- Crc = Bearing turning moment
- Ca = Accelerating moment
- Cd = Starting moment
- Unit of all moments: kNm

Crc: Turning moment under load

The required starting moment takes into account the load on bearing and the friction among parts.

- Ball type slewing bearing:
  Crc = [(13,11 M / Ø m) + 3 Fa + 11,34 Fr] Ø m . 10 -3
- Cross roller slewing bearing
  Crc = [(15,3 MT/ Ø m) + 3,75 Fa + 8,19 Fr] Ø m . 10 -3
  - M=Total moment KNm
  - Øm=Raceway center diameter, measured in the unit of m
  - Fa=Axial load kN
  - Fr=Radial load KN

2.5 Turning Moment

Ca: Accelerating moment

The necessary moment which makes the load run from initial speed to final speed within time (t) should be determined by using the following formula:

Ca = [(π . n . l) / 30 . t] . 10 -3

- t = Acceleration time in the unit of second
- n= Speed change RPM (final speed-initial speed)
- l=Machine's inertia torque kg.m2

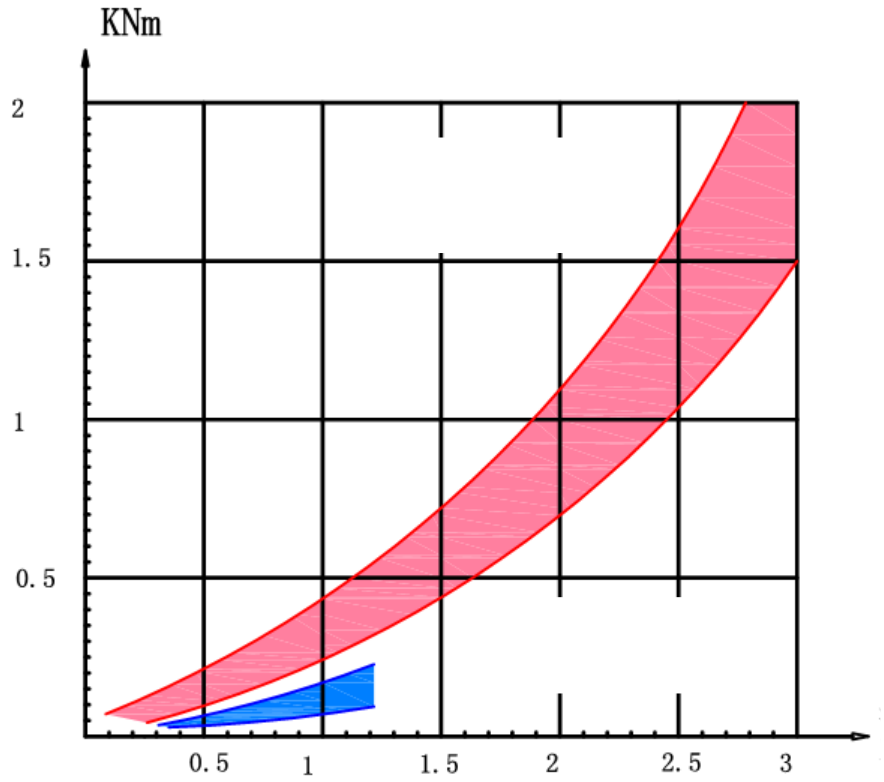
  I＝l1＋l2＋l3＋….ln

  Where, l1to ln=Inertia moment of motion load relative to spindle Kg. m2.

  Generally:

  - l1 = Gl x r12
  - ln = Gn x rn2
    - ✓ G1 to Gn = Weight of all rotating parts, in the unit of Kg.
    - ✓ r1 to rn = Distance from center of all objects to spindle, in the unit of m

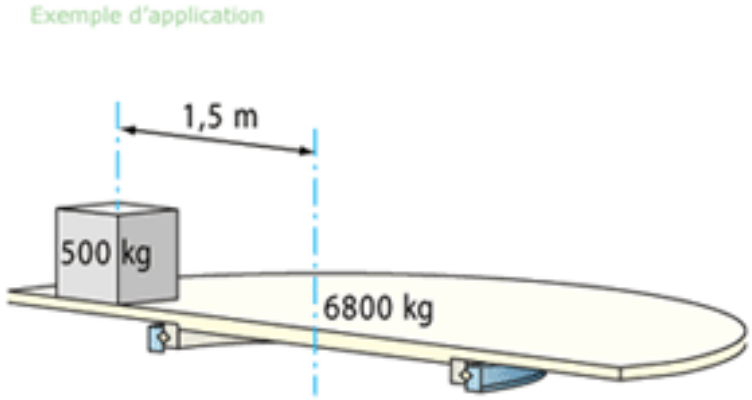
Idle friction moment of slewing bearing Crv is determined as in the following chart. The Company can provide slewing bearings with greater or less friction moment according to customer's needs.



Idle friction moment chart

2.5 Turning Moment

Turning moment application example



Platform diameter: 4 m
Platform mass: 6800Kg
Cube mass: 500Kg
Raceway center diameter of steel ball type slewing bearing: 2 m
Distance from cube to spindle: 1.5 m
Initial speed: 2 tours/min
Final speed: 6 tours/min
Accelerating time: 20s

Load borne by slewing bearing

Axial force Fa: 68 kN + 5 kN = 73 kN
Radial force Fr: 0.29 kN, negligible
Torque M: 5kNx 1.5m＝7.5KNm

Turning moment:

Raceway center diameter=2m
Crv: As per idle friction moment chart: 1kNm
Crc=[(13.11 * 7.5 / 2) + (73*3) + (11.34 * 0)] 2.10-3= 0.536 kNm
Starting turning moment: Cd = 1 + 0.536 = 1.536 kNm
Platform inertia moment: MR ⁋2 = (6800 / 2 ²) / 2 = 13600 Kg.m ²
Cube rotary inertia: Mr ²= 500 * 1.5 ²= 1125 kg.m ²
Total inertia moment: 13600 + 1125 = 14725 Kg.m ²
Accelerating moment: n= 6 - 2 = 4 RPM
Accelerating time: 20s
Ca = (14725 * π * 4) / (20 * 30) 10-3 = 0.3084 kNm
Turning moment in acceleration
Cg = 1 + 0.536 + 0.3084 = 1.845 kNm

2.6 Seal Ring

Slewing bearings of the Company generally have a seal ring at both sides of raceway. The seal ring has the following functions:

- Protect raceway against intrusion of tiny impurities
- Keep lubrication in raceway

If necessary, the Company can design the corresponding protective device separately, e.g.:

- Standard and special sing ring
- Lip-type seal ring
- Combination of two or more seal rings for use

Seal ring washer

Under very abominable working conditions, in order to avoid intrusion of the following objects:

• Metal chip Steel grit Weld particle Mud Sand Water Cutting coolant

The Company strongly recommends installing an effective shield—seal ring washer

Seal ring category table

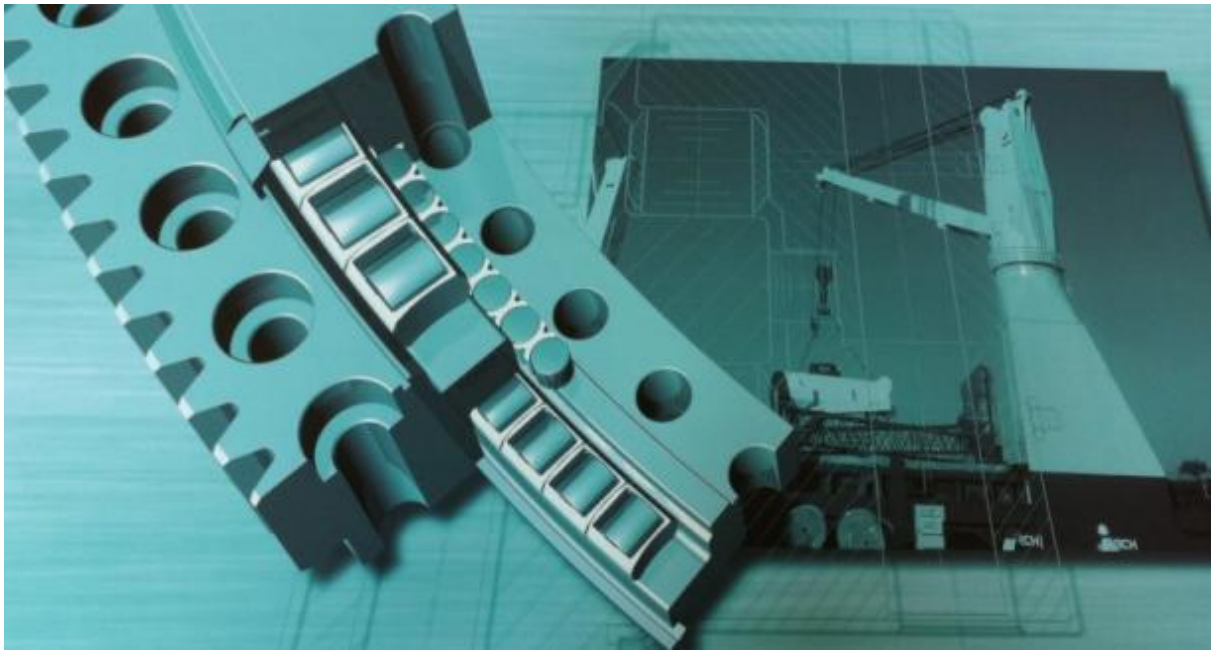
Working condition	Category
Normal” -30℃ à＋70℃	Nitrile rubber
“Extreme” θ＜-30℃； 70℃＜θ＜200℃	Fluoro rubber
“Special”: Erosion by multiple physical or chemical objects	Improved nitrile rubber or others

2.7 Surface Protection

For special applications (e.g. marine application), the Company recommends protective surface treatment:

① Galvanizing (zinc chromate film)
② Nickel-plating
③ Painting
④ Other treatment: e.g. chroming, metal spraying, anodizing, etc. Please contact with our technical department for detail.

3 Installation & Maintenance



3.1 Erection support Design

3.2 Transport, Storage, Unpacking

3.3 Installation

3.4 Post-installation Commissioning and Detection

3.5 Labeling and Signage

3.6 Operation & Maintenance

3.7 Removal of Common Faults

3.1 Erection support Design

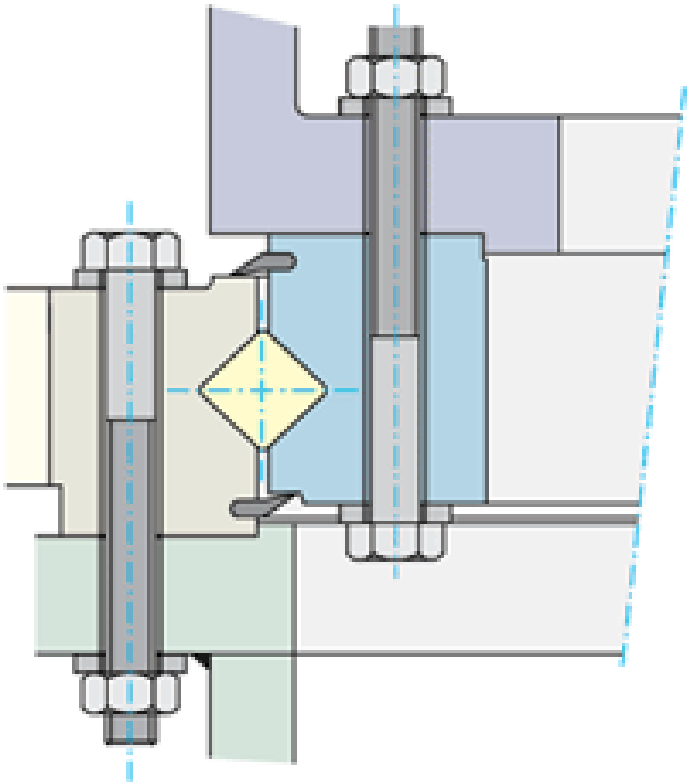
Support thickness and structure reinforcement

The slewing bearing has suitable axial rigidity: As its diameter is much larger than its sectional dimension, it must be installed onto a machined bearing support, so that there will be sufficient rigidity for the load transmitted. In this way, it will be sure that the stress will be distributed uniformly, avoiding distortion generated in operation unfavorable to work of slewing bearing.

Therefore, the pedestal thickness should be no less than the minimum value listed in the following table, and the width of support surface should be no less than the corresponding width of the slewing bearing.

Raceway center dia. (mm)	500	750	1000	1250	1500	2000	2500	3000
Minimum thickness (mm)	25	30	35	40	50	60	70	80

Cylindrical structure is usually adopted for installation of bearing support. The cylinder wall is aligned to the center of raceway. To make load uniform, thick round base is better than thin base with reinforce, as shown in the following figure:



Slewing Bearing Installation Diagram

3.1 Erection support Design

Support flatness

To prevent slewing bearing from partial overload and ensure that it will operate flexibly, the installation rack should, after all welding sequences, be treated with internal stress removal, and installation surface machining. The flatness (including angular deviation of plane) should be controlled within a certain range.

Uneven support will lead to raceway deformation, which lead to accidental shutdown or lockout, shortening service life of slewing bearing. The support flatness (including angular deviation of plane) should be controlled within the range as shown in the following table:

Raceway center circle diameter	Erection support planar deviation P (mm)		
DL(mm)	Single-row four-point contact ball bearing	Double-row ball bearing	Pin roller bearing
～500	0.1	0.15	0.1
＞500～750	0.12	0.17	0.1
＞750～1000	0.15	0.2	0.12
＞1000～1500	0.19	0.25	0.12
＞1500～2000	0.22	0.3	0.15
＞2000～2500	0.25	0.35	0.17
＞2500～3000	0.3	0.4	0.2

Allowable flatness including angular deviation of plane

Support rigidity

The erection support should also have good rigidity. Under maximum allowable load, deflection deformation should be controlled within the range as shown in the following table:

Average track diameter (mm)	500	750	1000	1250	1500	2000	2500	3000
Maximum flexural deformation (mm)	0.25	0.3	0.35	0.45	0.55	0.65	0.8	1

Deflection deformation under maximum allowable load

Plastic binder

If the above-mentioned tolerance can’t be met, epoxy resin may be used to replace surface finishing. According to dimensions and unevenness to be compensated for installation purpose, there are many kinds of plastic binders for option.

3.2 Transport, Storage, Unpacking

Transport

All of our slewing bearings are packed well to avoid damage during transport. The product should be kept in horizontal position during transport and storage. If the slewing bearing is not kept in horizontal position during transport, special measures should be taken.

Like any other precise mechanical device, the slewing bearing should be handled with care. Hoisting of the slewing bearing should be done horizontally with listing bolts. During the process of hoisting, collision, radial collision in particular, must be avoided. Relevant device which can bear weight of the slewing bearing should be used to carry the slewing bearing. Weight of the slewing bearing is indicated in the label.

Storage

A packed slewing bearing has been finished with anti-rust and oil seal surface treatment. Under normal storage condition, the slewing bearing will not rust within 12 months after delivery from plant. For users, if a slewing bearing in stock is still within the above-mentioned period, the slewing bearing can be stored for long time, as long as the original packing is intact. Any slewing bearing which is outside its rust-proof life should be cleaned and oil-sealed again and need replaced packing, if it is still kept in storage.

Any slewing bearing should be filled with oil once every 18 months of storage. (Refer to section 3.6 “Operation & Maintenance”)

Unpacking

When unpacking the slewing bearing before installation, the following precautions should be taken:

- When removing the packing material, be careful to avoid cutting into the real ring.
- When cutting the packing material, it’s better to cut on the external diameter instead of the two ends.

When removing the rust-proof oil at the surface:

- Standard industrial solvent should be used and chlorinated solvent is absolutely prohibited
- Be careful to prevent solvent from flowing into seal ring or raceway
- Before installing the oil cup or connecting the oil tube, the plastic plug or screw plug should be taken off from the oil cup hole.

3.3 Installation

Erection support confirmation

- Be sure that the erection support structure accords with the technical requirements (refer to "3.1 Erection support Design")
- Check whether there is any metal chip, weld grain, rust stain, paint or other impurities, which all should be removed.

Centering

When the load is mainly radial, and in particular, when the bearing is installed vertically, forced centering is necessary. Using structural bonding type LOCTITE 586 is the effective way to limit relative displacement between the slewing bearing and its support.

Positioning

The quenching soft belt mark (external mark "S" or at stopped hole) must be set at a non-loaded zone or a non-frequently-loaded zone, i.e. a location which forms a 90-degree angle with the main loaded axle or the loaded arm.

Fit check

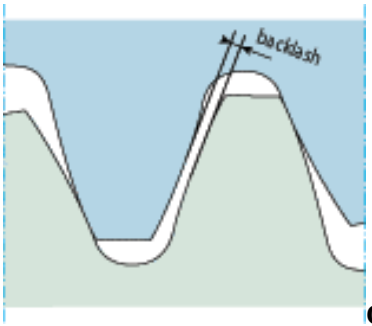
After the slewing bearing is hoisted into place, the flatness of the bonded plane is checked with a filler gauge. If there is any gap, machining should be done again, or the gap should be filled plastic or partial gasket, in order to prevent the bearing from distorting after the bolt is tightened. Distortion will affect the performance and service life of the slewing bearing.

Gear backlash check

Before the mounting bolt is tightened, gear backlash should be adjusted according to the highest point of gear pitch circle radial run-out (three teeth marked with green paint), and after the bolt is tightened, gear backlash check should be done all over the gear ring.

When a pinion is installed:

- Make the drive gear adjusted to the maximum eccentric point of gear ring and mark it with a blue line.
- At this moment, backlash must be limited within the calculated value or 0.05xleast value of modulus.
- When several pinions are used, each of them should be adjusted to the same condition.
- In testing, be sure the pinion is well aligned to the gear ring, so that the gear engagement is well contacted.
- Before startup, gear ring and teeth of pinion should be lubricated. (refer to section 3.6 "Operation & Maintenance")



Check gear backlash

3.3 Installation

Check fasteners

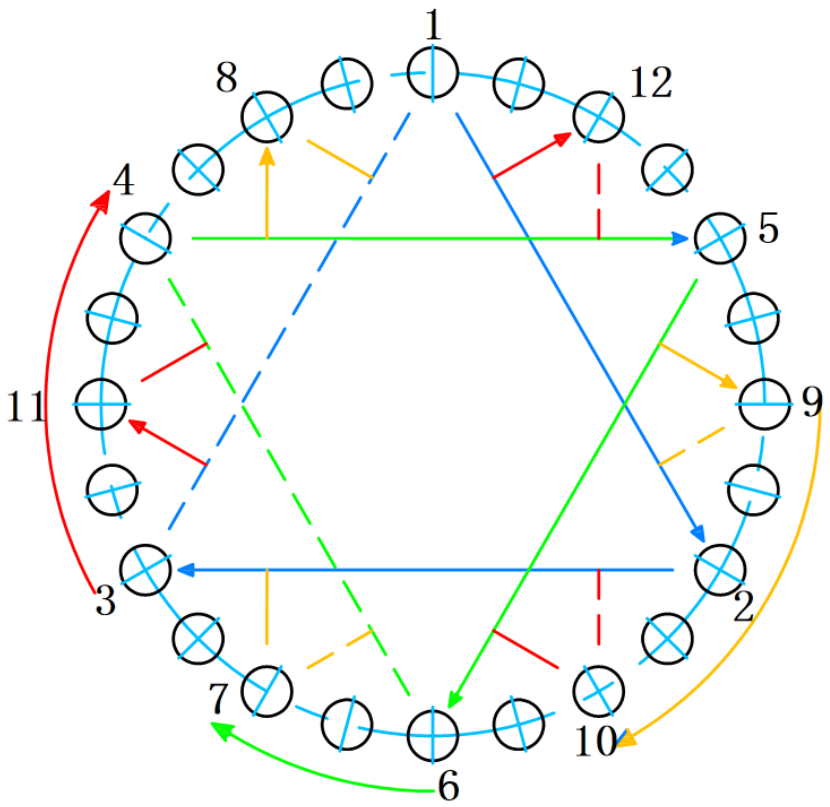
- Whether up to the recommended grade, e.g. marked with 10.9 at the top
- Whether screw thread is lubricated.
- Bolt's clamping length Lk≥5d (d-bolt diameter)
- Tempered flat gasket should meet the following requirements:
  - Yield strength must be equal to or greater than 600Mpa
  - Diameter DR=2xd
  - Thickness h>=0.3xd

Any spring washer or any other type of washer is absolutely prohibited. Otherwise, warranty will be cancelled.

Tightening mode

Install fasteners and tighten them gently. Then further tighten each fastener to the set value. Suitable fixed value torque wrench or hydraulic tool may be used for this purpose.

Tightening in the "star"-chart style can acquire uniform tightening effect all over the periphery. A bolt should be tightened in 180 °directions symmetrically. After the final attempt, be sure the bolt on the periphery has the same pre-tightening force.



Star-chart method

3.3 Installation

Pre-tightening torque and pre-tightening force

As regards the way of bolt tightening, according to main machine design provisions, certain pre-tightening force should be ensured. Unless otherwise provided, pre-tightening force should generally be 0.7 times of bolt's yield limit. See the following table for pre-tightening torque or pre-tightening force.

Bolt specification (GB/T5782 GB/T5783)	Mounting hole dia. (mm)	Bolt strength grade (GB/T3098.1)	
		8.8	10.9
		Bolt material yield strength limit σsmin(N/mm^2)	
		640	900
		Pre-tightening torsion MA(Nm)	
M10	11	44	62
M12	13.5	77.5	110
M14	15.5	120	170
M16	18	190	265
M18	20	260	365
M20	22	370	520
M22	24	500	700
M24	26	640	900
M27	30	950	1350
M30	33	1300	1800
		Pre-tightening force FA(10^3N)	
M33	36	293	412
M36	39	344	484
M39	42	414	581
M42	45	473	665
M45	48	553	777
M48	52	623	876
M52	56	749	1054
M56	62	863	1214
M60	66	1008	1418

Note: (1) When bolt dimensions are not in conformity with GB/T5782 or GB/T5783, the values in the table should be calculated separately.

(2) Total friction factor between bolt head and clamped surface μ=0.14, with screw thread slightly coated with light oil

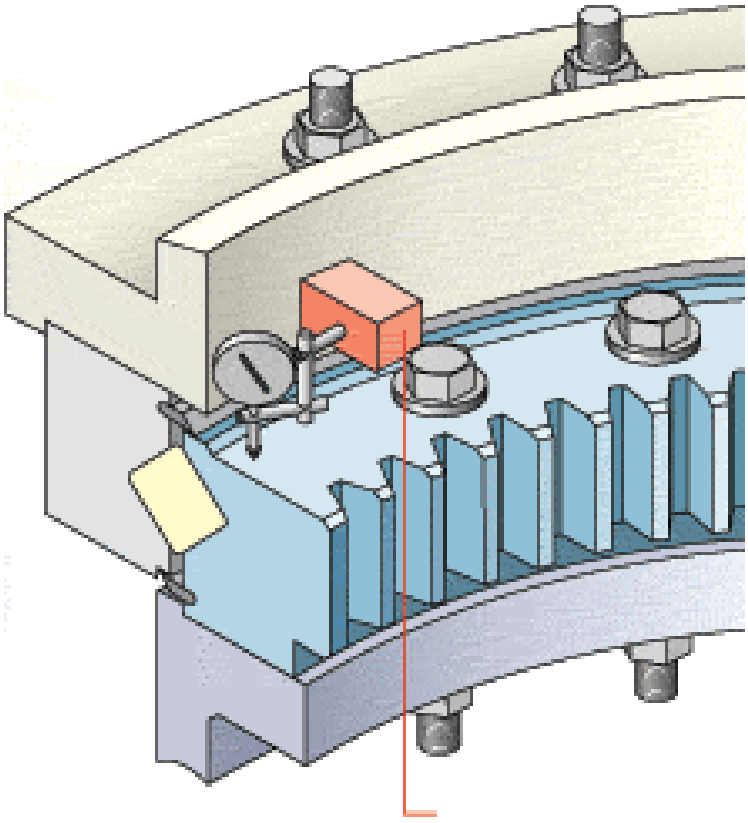
3.4 Post-installation Commissioning and Detection

After all fasteners are tightened:

- Turn the ring for at least three rounds
- Check the gear engagement backlash value on the whole periphery.
- Measure the total axial clearance under standard load mark the check point.
- All these data are recorded in the equipment maintenance manual. See “Section 5.1 Acceptance Documents” for detail.

Axial clearance detection procedure

- Put the dial gage in between the two rings, near the raceway of main loaded axle as most as possible
- Calibrate it to zero under known load
- Apply measured load
- Read out the oscillating quantity value at the point
- Conduct measurement again at each marked point
- Consider distortion of bearing base and stretch of fastener relative to instrument location.



3.5 Labeling and Signage

Labeling

Every slewing bearing has its own metal nameplate, which is riveted to the area near clogging of the toothless ring.

Description on nameplate:

- Slewing bearing model
- Finished product number
- Weight (kg)

Installation signage

For the purpose of installing the bearing correctly, the Company attaches the following signs to the slewing bearing:

✧ **Quenching soft belt sign**

- Clogging of toothless ring (ball charge opening)
- A red circle drawn on toothed ring and marked with “Steel S”

The soft belt should be set at non-loaded zone or non-frequently-loaded zone, if possible.

✧ **Gear run-out**

Maximum run-out point of gear is also marked: three green lines drawn on corresponding tooth root

Backlash of driving gear at that area should be adjusted.

3.6 Operation & Maintenance

Suitable lubrication is necessary for durability of raceway and gear. Lubricating grease improves capability and service life of slewing bearing, while working condition, e.g. load, temperature, speed, and vibration, determines lubricant selection.

Characteristics of recommended lubricant for slewing bearing:

- ✧ Lithium base grease
- ✧ Minimum viscosity of base oil: 150 mm2/S
- ✧ NLGI consistency grade: 2
- ✧ Anti-friction and extreme pressure additive
- ✧ Working temperature: -300 Ca+1200 C
- ✧ Four-ball test: Clinkering load STMD 2596 (NT24)>300
- ✧ Maximum NDM value (revolving speed x raceway center diameter)
  - ✓ For ball slewing bearing=60000
  - ✓ For pin roller slewing bearing=30000

Lubricating grease compatibility table

According to our experience, the lubricating greases listed in the following table are compatible with each other and with all parts of slewing bearing. Any other grease which is deemed compatible with any of the lubricating greases recommended by the Company is usable. However, molybdenum-containing disulphide M_OS_2 is strictly prohibited.

Grease for raceway of slewing bearing	Lubricating grease designation	Grease for gear
Aralub HLP2	**ARAL**	Aralub LFZ1
Rhus L 474/2	**MOTUL/bECHEM**	Berulit GA 400
Energrease LS-EP2	**BP**	EnergolwRL/GR 154 GS
Grease LMX	**CASTROL**	
Epexa2/Epexelf2	**ELF**	Cardrexa DC1
Beacon EP2	**ESSO**	Surret Fluid NX
Mobilux EP2	**MOBIL**	Mobilgear OGL 007
Retina EP2-Alvania EPLF2	**SHELL**	Malleus GL 205
Multis EP2-Lical EP2	**TOTAL FINA ELF**	Ceran AD

This table is subject to update by manufacturer.

3.6 Operation & Maintenance

Slewing bearing upon delivery from plant:

- When the slewing bearing is delivered from plant, a small amount of No.2 extreme pressure lithium base grease (GB7324). When the slewing bearing is started, the user should refill new lubricating grease according to its working condition.
- The surface of gear and bearing is coated with rust-proof oil for anti-oxidation protection.

Slewing bearing in use:

- Raceway of the slewing bearing should be lubricated periodically. The lubrication cycle depends on the operation condition and environment. We recommend:
  - ✓ Lubrication should be conducted once every 150 hours generally
  - ✓ Lubrication should be conducted once every 50 hours, if the operation requirements are strict, and the operation environment is humid with much dust.
  - ✓ Sufficient grease should be refilled before and after long-term disuse.
  - ✓ Lubrication should be conducted once every 6 months during long-term disuse.
- Because there are many comprehensive job factors, users can choose their best grease at will according to specific needs. For example, Mobilux EP 2 and Shell Alvania EP(LF) 2 lubricating grease can be adopted for raceway.
- When filling lubricating grease, turn the slewing bearing slowly to make the grease filled uniformly. In every time of lubrication, the slewing bearing should be turned slowly for at least two rounds until the grease is oozed out of the seal. Every lubricating hole should be lubricated with grease.
- Quantity of lubricating grease may be calculated specifically by our technical department. The practical formula for determining the necessary minimum "Q" (cm^3) is shown as follows:

  Q＝0.005/3x D x H

  D = Slewing bearing's raceway center diameter mm

  H = Slewing bearing's total height mm

  In summary, trace of small amount of oozed new grease should be seen at the lip of the seal ring.
- The gear face should be cleaned frequently to remove all impurities and lubricated with relevant grease. Whether by spraying or by brushing, the lubricating grease should completely cover pinion and gear face with gear ring.
- In use, it's prohibited to flush the slewing bearing directly with water, which may lead to entry of water into raceway. Hard impurities are strictly prevented from approaching or entering gear engagement area.
- In use, attention should be paid to operation of the slewing bearing. If noise, impact or power increases suddenly, the machine should be stopped immediately for checkup and troubleshooting. Overhauling should be done, if necessary.

Special application:

Our design and development department can provide lubricating methods for special working conditions in respect of temperature and speed according to user's requirements.

3.6 Operation & Maintenance

Preventive maintenance

- Leak tightness check

  Judge whether the seal ring is intact by visual inspection:

  a) No excessive stretch or damage
  b) Positioned correctly
  c) Rub the wear beside the lip

Please replace the sealing element, if necessary. After re-lubricating, wipe out the old grease and check whether there is any pollutant such as sand, coal dust or metal particle.

- Fastener check

It is very important that as the fastener of a slewing bearing will necessarily be trouble with work fatigue, the bolts should be checked to see whether they still maintain the required pre-tightening force.

It is our recommendation that after two to four months of use (100 working hours), every bolt should be re-tightened and should be checked at least once every year (500 working hours) thereafter. If any bolt is found loose, further check must be done and then necessary preventive measure must be taken. Some regulations require that a fastener must be replaced once every seven years or 14,000 working hours.

- Gear check

When conducting cleanup before re-lubricating the gear:

a) Check the tooth root, ring and pinion carefully for any impurity
b) Check the load exerted by pinion on full tooth width of gear to see whether it is uniformly distributed, and rectify the skewed axle, if necessary
c) Check gear backlash

Limit of serviceability

All slewing bearings provided by the Company have pre-tightening force to ensure normal work and safety in use. When the slewing bearing is in use, due to decrease of pre-tightening force, the axial clearance of the slewing bearing under load would increase significantly. When the clearance increases to the extent that the machine can't work normally and the material used can't meet the safety conditions, the slewing bearing should be replaced.

To quantify the coefficient of wear, it's necessary to know the change in axial clearance of the slewing bearing under load.

- Being brand new: J0
- Being checked: J1

These data are got through measurement under conditions which are same as the initial conditions after checking the condition of fasteners (see "3.4 Post-Installation Commissioning & Detection of Slewing Bearing). The measured data should be included in the corresponding machine maintenance manual.

Abrasion loss: u=J1-J0.

- When u>=J0, bearing should be checked more frequently
- When u>=1.5 J0, bearing replacement should be considered
- When u>=2J0, bearing replacement must be done.

3.7 Removal of Common Faults

Difficult turning of slewing bearing_1

Every slewing bearing goes through strict inspection and test run before being released from plant, so all of them are acceptable products. As the slewing bearing has pre-tightening force on its sealing face and frictional force of the sealing face should be overcome for turning, it's normal that certain starting moment is needed when it is turned.

In case of clamping stagnation in turning, the following method should be taken to remove the trouble:

Case	Cause analysis	Troubleshooting methods
Inflexible idling of new product	The slewing bearing has been stored for long time (e.g. over a half year) or the ambient temperature is low, which results in less liquidity of the grease inside, leading to inflexible operation. This case is prominent in cold regions and in winter.	After force is exerted, if it works well without any abnormal sound, it can serve for normal serve, but new grease should be filled until it is oozed from the seal. If operation is accompanied with any abnormal sound, check whether there is any damage caused during transport or storage and feedback the information to our after-sale service department for a solution.
Inflexible operation after installation	The mounting surface of the main machine does not match well with that of the slewing bearing, resulting in that after installation, axial clearance of the slewing bearing can't compensate for deformation of the slewing bearing, raceway of the slewing bearing is distorted, and the roller moves with difficulty in raceway (sometimes with abnormal sound).	Rework mounting surface of the main machine to make it in compliance with the requirements; or treat the surface by filling in plastic or partial washer. If flatness is still unacceptable after completion of surface treatment, try to exchange for a slewing bearing with larger clearance.
	Bad gear engagement is caused by failure to adjust gear backlash according to radial top point of gear pitch circle (three teeth marked with green paint). Deformation is caused by compressing the slewing bearing at the top point, resulting in difficult turning or abnormal sound.	Adjust gear and pinion engagement and gear backlash again as required.
	Impurities are jammed in the gear and pinion.	Check and be sure that gear and pinion engagement is free of impurities.

3.7 Removal of Common Faults

Difficult turning of slewing bearing_2

Case	Cause analysis	Troubleshooting methods
Inflexible operation in use	The sealing strip is broken, resulting in entry of impurities into raceway.	Replace sealing strip or take effective sealing protection measures, e.g. installing guard plates.
	Failure to lubricate it with sufficient grease periodically according to the maintenance requirement, resulting in abnormal wear and tear of raceway.	Lubricate it with sufficient grease until grease is oozed out from the sealing strip. It's noted that every oil cup should be oiled, and operation should be kept in oiling, if possible. If wear and tear is serious, the slewing bearing should be replaced. If you continue using it in short time, lubricate it with more amount of grease until grease overflows, so that the scrap iron is discharged as most as possible.
	Abnormal engagement between gear and pinion, with impurities or broken teeth	Remove impurities (if any); replace the slewing bearing, if there is any broken tooth.

3.7 Removal of Common Faults

Abnormal sound_1

A slewing bearing just released from plant would make uniform sounds of a rolling steel ball when idling, which is normal. It is not normal if the uniform normal sounds are accompanied with abnormal and loud sounds. Abnormal sounds in use are generally extended phenomena of difficult turning—abnormal sound would be generated if a slewing bearing which rotates with difficulty are turned by force. There are similarities between the causes for the two.

Case	Cause analysis	Troubleshooting methods
Abnormal sound of new product	Slight abnormal sound of new product when being idle. Such abnormal sound would disappear naturally after the product rotates for dozens of rounds. If it does not disappear, it's possible that the slewing bearing is a little deformed during transport or storage. However, if it operates flexibly, just install it and put it into normal use at ease, and the abnormal sound will disappear naturally after the run-in period.	If the abnormal sounds are loud or still remain after a certain period (3 months), please contact with our after-sale service department.
Abnormal sound after installation	The mounting surface of the main machine does not match well with that of the slewing bearing, resulting in that after installation, axial clearance of the slewing bearing can't compensate for deformation of the slewing bearing, raceway of the slewing bearing is distorted, and the roller moves with difficulty in raceway, even produces abnormal sound, when it is serious.	Rework mounting surface of the main machine to make it in compliance with the requirements; or treat the surface by filling in plastic or partial washer. If flatness is still unacceptable after completion of surface treatment, try to exchange for a slewing bearing with larger clearance.
	Bad gear engagement is caused by failure to adjust gear backlash according to radial top point of gear pitch circle (three teeth marked with green paint). Deformation is caused by compressing the slewing bearing at the top point, resulting in difficult turning or abnormal sound.	Adjust gear and pinion engagement and gear backlash again as required.
	Impurities are jammed in gear and pinion.	Check and be sure that gear and pinion engagement is free of impurities.

3.7 Removal of Common Faults

Abnormal sound_2

Case	Cause analysis	Troubleshooting methods
Abnormal sound in use	If any abnormal sound is produced during use, the first to do is to determine whether it is produced by the slewing bearing. Some sound generated by steel structure or other structural element is often mistaken for sound produced by slewing bearing.	Judge the source of sound by stopping rotation of the slewing bearing (e.g. make the reducer come away) and making other parts run.
	Failure to lubricate it with sufficient grease periodically, resulting in abnormal wear and tear of raceway.	Lubricate it with sufficient grease until grease is oozed out from the sealing strip. It's noted that every oil cup should be oiled, and operation should be kept in oiling, if possible. If wear and tear is serious, the slewing bearing should be replaced. If you continue using it in short time, lubricate it with more amount of grease until grease overflows, so that the scrap iron is discharged as most as possible.
	Damage of sealing, leading to entry of impurities such as sand or scrap iron into raceway	Replace sealing strip or take effective sealing protection measures, e.g. installing guard plates.
	Failure to check bolt's pre-tightening force periodically according to the maintenance requirements. The mounting bolt is loose, resulting in deformation of the slewing bearing, which leads to distortion of raceway. The roller moves with difficulty in raceway and produces abnormal sounds, if it is serious.	Tighten bolts again and check pre-tightening force strictly as scheduled.

3.7 Removal of Common Faults

Too much rocking (clearance)

After a new slewing bearing is installed, the axial clearance (rocking quantity) after installation should be measured. Clearance after loading is about 3-5 times that when being idle upon delivery from plant. Any value within this range is normal. If the value is outside this range, the following approach should be taken to get rid of the trouble:

Case	Cause analysis	Troubleshooting methods
Too much rocking after installation	Insufficient pre-tightening force of mounting bolt	Make the bolt tightened in place with the required value of bolt's pre-tightening force
	Insufficient structural rigidity of erection support, resulting in overall rocking.	Make the support structure more flexible according to design requirement of the erection support
Too much rocking in use	Increase of clearance under load within serviceability limits is normal wear.	When clearance increases to 3 times of initial clearance under load, i.e. 9-15 times of idle clearance when delivered from plant, the slewing bearing should be replaced.
	Overloaded operation which leads to crushing of raceway, which is accompanied by large amount of scrap iron contained in grease oozed out as a result of over-oiling.	The slewing bearing should be replaced. If it is still in service for short time, large amount of grease should be filled until it is oozed out, so that the worn scrap iron can be discharged as most as possible.

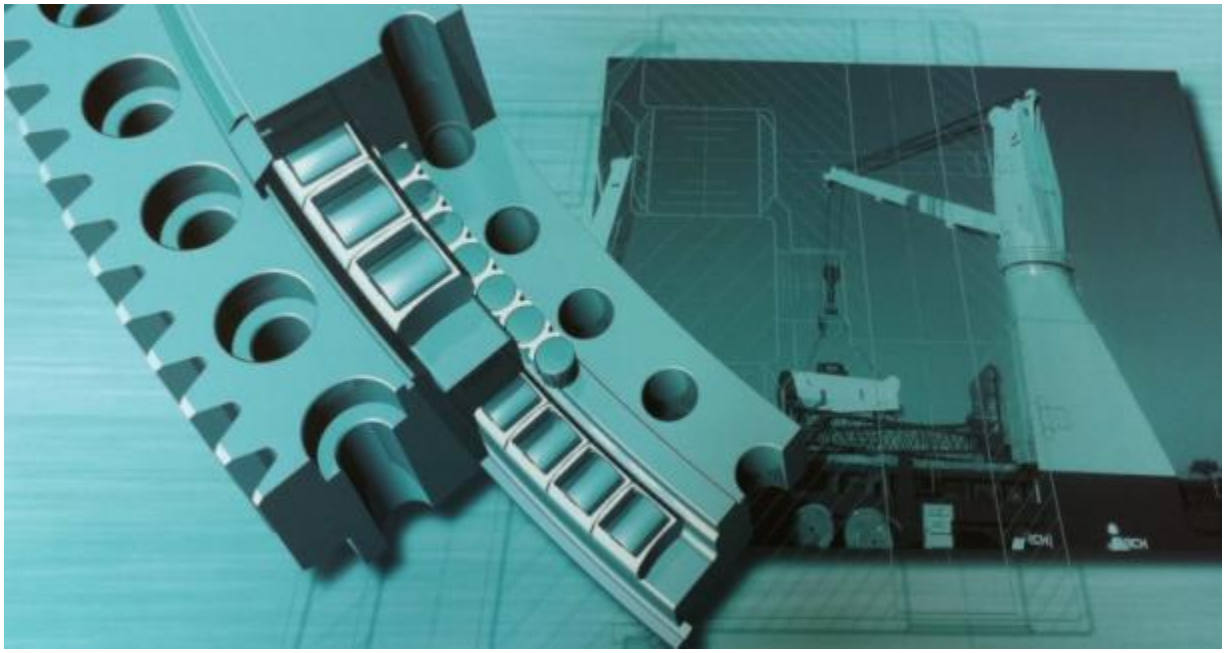
3.7 Removal of Common Faults

Broken tooth

If the slewing bearing is troubled with broken tooth or breakage, please preserve the scene and immediately contact with our after-sale service department for analysis and treatment of the case.

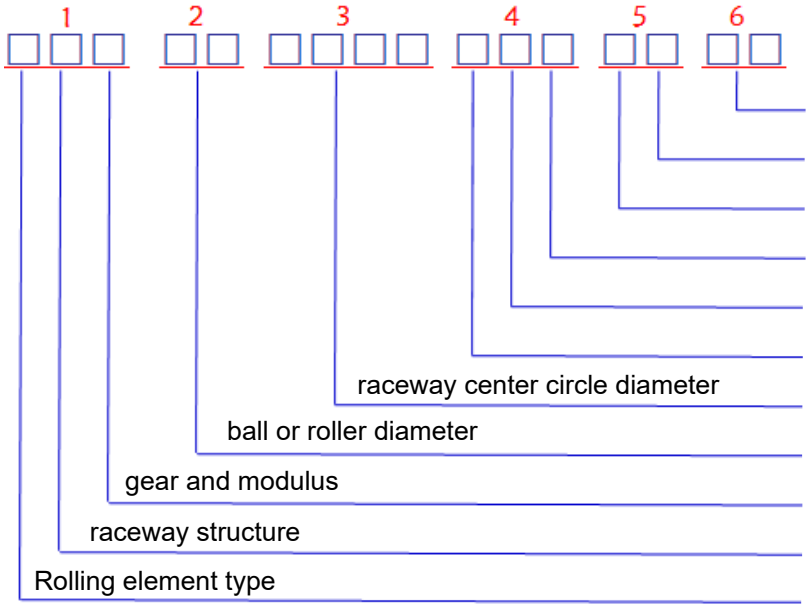
Case	Cause analysis	Preventive methods
Broken tooth	In installation, axis of gear is not parallel to that of pinion, resulting in uneven stress on engagement of gear and pinion, so broken tooth is caused if the case is serious	Put soft material (e.g. fuse wire) on the gear engagement area to check evenness of upper and lower part of the engagement. If there is significant difference between upper and lower deformation of the soft material, it means the installation axes are not parallel to each other, and readjustment is needed.
	Bad gear engagement is caused by failure to adjust gear backlash according to radial top point of gear pitch circle (three teeth marked with green paint). The slewing bearing is compressed at the top point, resulting in broken teeth, if the case is serious.	Rotate for one round, then observe and detect gear backlash with a feeler gauge. If compression appears, gear backlash should be readjusted as if the compression point is the top point.
	Mounting bolt for slewing bearing is not tightened enough. Abnormal engagement between gear and pinion is caused by rocking and deformation of bearing. Broken teeth or breakage of slewing bearing is caused, if the case is serious.	Check bolt's pre-tightening force strictly as scheduled.
	Operation against rules: Overload and high-speed revolution; main machine collides with (sweeps) an obstacle, etc.	Strictly observe the main machine operation rules.
	Accidental impact collision (e.g. being impacted by collapsing objects lifted during hoisting) occurs, resulting in broken teeth or even breakage of slewing bearing, if the case is serious.	Sufficient observation and preparation should be made before operation to prevent accidental events from happening.
	Impurities are jammed in the area of engagement between slewing bearing and pinion.	Check it constantly and be sure gear and pinion engagement free of any impurity.

4 Product catalogue



4.1 Slewing Bearing Numbering Method

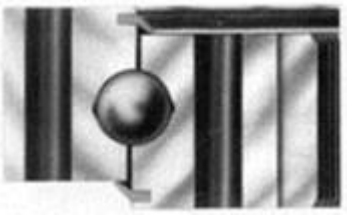
The Company's slewing bearing numbering accords with the requirements of the JB/T 2300 standard. Meaning of numbering is described as follows:



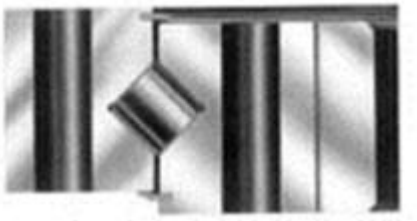
1	**Roller type**	**Raceway structure type**	**Raceway gear engagement type**
	0—Roll ball 1—Pin roller	1—Single-row four-point contact ball or cross pin roller type 2—Double-row different diameter ball type 3—Three-row pin roller type	1—External teeth with lesser modulus 2—External teeth with larger modulus 3—Internal teeth with lesser modulus 4—Internal teeth with larger modulus
4	**Sealing type**	**Mounting hole type**	**Configuration**
	0—No seal 1—Single seal 2—Double seal	0—Through hole 1—Threaded hole 2—Inner ring with threaded hole and outer ring with plain hole 3—Inner ring with plain hole and outer ring with threaded hole	0—Without tang 1—With tang 3—Gear ring without tang
5	**Configuration**	**Gear heat treatment code**	
	4—Standard accuracy grade 3—High accuracy grade 2—Precision grade	0—Non-quenched 1—Tooth face quenched 2—Tooth face/root quenching 3—Totally quenched	
6	**Bearing material**	**Example: 011.35.1000.101.04.11** **Meaning of numbering: Single-row four-point contact ball type, external teeth with lesser modulus, roller diameter 35mm, raceway center circle diameter 1000mm, with tang, through mounting hole, single seal, non-quenched teeth, standard accuracy grade, material: 50MnT**	
	03—42CrMoT 04—42CrMoZ 11—50MnT 12—50MnZ 15—S48C		

4.2 Main Types of Slewing Bearing

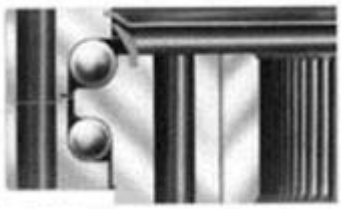
The Company provides four main types of slewing bearings, as shown in the following figure:



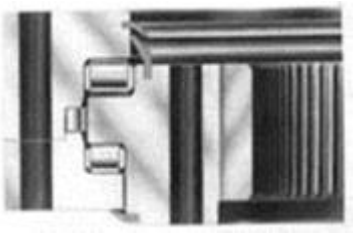
Single-row four-point contact ball series 01



Single-row crossed roller series 11



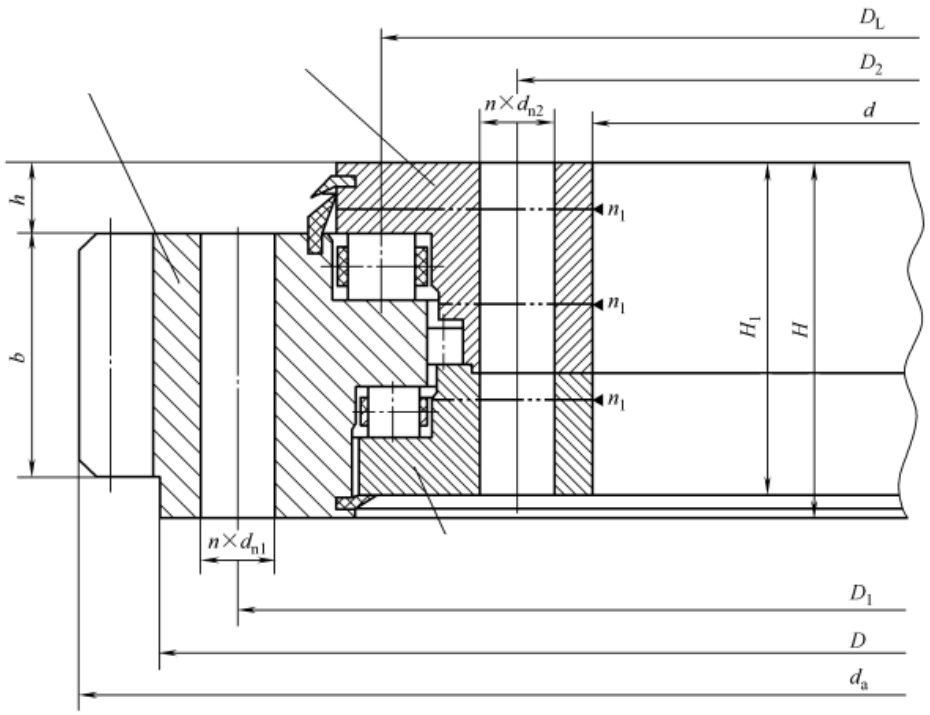
Double-row ball series 02



Tri-row pin roller series 13

The Company can also design and manufacture other types of slewing bearings according to user's needs, e.g. double-row ball slewing bearing, ball-pin combined slewing bearing, and light-weighted slewing bearing, etc.

4.3 Name and Symbol of All Parts of Slewing Bearing



(External teeth type three-row pin roller slewing bearing as example)

Symbol	Name	Symbol	Name
D_L	(Upper row) raceway center diameter	n	Number of mounting holes
D_W	(Upper row) roller diameter	n_1	Number of oil holes
D_1	Outer circle mounting hole distribution diameter	d_{n1}	Outer ring mounting hole diameter
D_2	Inner circle mounting hole distribution diameter	d_{n2}	Inner ring mounting hole diameter
D	Nominal outer diameter	d_{m1}	Outer ring mounting threaded hole diameter
d	Nominal inner diameter	d_{m2}	Inner ring mounting threaded hole diameter
d_1	Outer ring inner diameter	L	Mounting hole thread length
D_3	Inner ring outer diameter	D_a	Tip diameter
H	Total height	m	Modulus
H_1	Inner/outer ring height	x	Gear addendum modification coefficient
h	Height difference between end faces of inner and outer ring	z	Number of teeth
DS	Effective case depth	b	Tooth width

010——Single-row four-point contact slewing bearing without teeth Design standard JB/T2300																						4.4 Product catalogue-Structural parameters		
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter						Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H_1 mm	h mm	b mm	m mm	z	x	k		normalizing Kn	Tempering Kn	
103	010.20.0200.001		280	120	60	248	152	12	16	14	2	201	199	50	10									18
103	010.20.0224.001		304	144	60	272	176	12	16	14	2	225	223	50	10									20
103	010.20.0250.001		330	170	60	298	202	18	16	14	2	251	249	50	10									21
103	010.20.0280.001		360	200	60	328	232	18	16	14	2	281	279	50	10									30
103	010.25.0315.001		408	222	70	372	258	20	18	16	2	316	314	60	10									38
103	010.25.0355.001		448	262	70	412	298	20	18	16	2	356	354	60	10									43
104	010.25.0400.001		493	307	70	457	343	24	18	16	2	401	399	60	10									49
104	010.25.0450.001		543	357	70	507	393	24	18	16	2	451	449	60	10									56
104	010.30.0500.001		602	398	80	566	434	20	18	16	4	501	498	70	10									82
104	010.25.0500.001		602	398	80	566	434	20	18	16	4	501	499	70	10									82
104	010.30.0560.001		662	458	80	626	494	20	18	16	4	561	558	70	10									92
104	010.25.0560.001		662	458	80	626	494	20	18	16	4	561	559	70	10									81
105	010.30.0630.001		732	528	80	696	564	24	18	16	4	631	628	70	10									104
105	010.25.0630.001		732	528	80	696	564	24	18	16	4	631	629	70	10									104
105	010.30.0710.001		812	608	80	776	644	24	18	16	4	711	708	70	10									118
105	010.25.0710.001		812	608	80	776	644	24	18	16	4	711	709	70	10									118
105	010.40.0800.001		922	678	100	878	722	30	22	20	6	801	798	90	10									199
105	010.30.0800.001		922	678	100	878	722	30	22	20	6	801	798	90	10									199
106	010.40.0900.001		1022	778	100	978	822	30	22	20	6	901	898	90	10									226
106	010.30.0900.001		1022	778	100	978	822	30	22	20	6	901	898	90	10									226
106	010.40.1000.001		1122	878	100	1078	922	36	22	20	6	1001	998	90	10									250
106	010.30.1000.001		1122	878	100	1078	922	36	22	20	6	1001	998	90	10									250

010——Single-row four-point contact slewing bearing without teeth Design standard JB/T2300																						4.4 Product catalogue-Structural parameters		
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter						Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H_1 mm	h mm	b mm	m mm	z	x	k		normalizing Kn	Tempering Kn	
80106	010.40.1120.001		1242	998	100	1198	1042	36	22	20	6	1121	1118	90	10									282
106	010.30.1120.001		1242	998	100	1198	1042	36	22	20	6	1121	1118	90	10									282
107	010.45.1250.001		1390	1110	110	1337	1163	40	26	24	5	1252	1248	100	10									396
107	010.35.1250.001		1390	1110	110	1337	1163	40	26	24	5	1251	1248	100	10									396
107	010.45.1400.001		1540	1260	110	1487	1313	40	26	24	5	1402	1398	100	10									447
107	010.35.1400.001		1540	1260	110	1487	1313	40	26	24	5	1401	1398	100	10									447
107	010.45.1600.001		1740	1460	110	1687	1513	45	26	24	5	1602	1598	100	10									512
107	010.35.1600.001		1740	1460	110	1687	1513	45	26	24	5	1601	1598	100	10									512
108	010.45.1800.001		1940	1660	110	1887	1713	45	26	24	5	1802	1798	100	10									580
108	010.35.1800.001		1940	1660	110	1887	1713	45	26	24	5	1801	1798	100	10									580
108	010.60.2000.001		2178	1825	144	2110	1891	48	33	30	8	2002	1998	132	12									1058
108	010.40.2000.001		2178	1825	144	2110	1891	48	33	30	8	2001	1998	132	12									1058
108	010.60.2240.001		2418	2065	144	2350	2131	48	33	30	8	2242	2238	132	12									1195
108	010.40.2240.001		2418	2065	144	2350	2131	48	33	30	8	2241	2238	132	12									1195
109	010.60.2500.001		2678	2325	144	2610	2391	56	33	30	8	2502	2498	132	12									1329
109	010.40.2500.001		2678	2325	144	2610	2391	56	33	30	8	2501	2498	132	12									1329
109	010.60.2800.001		2978	2625	144	2910	2691	56	33	30	8	2802	2798	132	12									1501
109	010.40.2800.001		2978	2625	144	2910	2691	56	33	30	8	2801	2798	132	12									1501
109	010.75.3150.001		3376	2922	174	3286	3014	56	45	42	8	3152	3147	162	12									2613
109	010.50.3150.001		3376	2922	174	3286	3014	56	45	42	8	3152	3148	162	12									2613

010——Single-row four-point contact slewing bearing without teeth Design standard JB/T10839																						4.4 Product catalogue-Structural parameters	
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
110	010.20.0450.001		546	354	70	508	392	12	17	16	2	451	449	60	10								58
111	010.20.0500.001		596	404	70	558	442	14	17	16	2	501	499	60	10								65
111	010.20.0560.001		656	464	70	618	502	14	17	16	2	561	559	60	10								72
111	010.20.0630.001		726	534	70	688	572	16	17	16	2	631	629	60	10								80
111	010.20.0710.001		806	614	70	768	652	18	17	16	2	711	709	60	10								91
111	010.20.0800.001		896	704	70	858	742	20	17	16	2	801	799	60	10								102
112	010.25.0800.001		908	692	78	864	736	18	22	20	2	801	799	68	10								130
112	010.25.0900.001		1008	792	78	964	836	20	22	20	4	901	899	68	10								146
112	010.25.1000.001		1108	892	78	1064	936	24	22	20	4	1001	999	68	10								162
113	010.32.1000.001		1124	876	90	1074	926	24	24	22	4	1001	998	80	10								223
113	010.32.1120.001		1244	996	90	1194	1046	28	24	22	4	1121	1118	80	10								237
113	010.32.1250.001		1374	1126	90	1324	1176	32	24	22	4	1251	1248	80	10								264
113	010.32.1400.001		1524	1276	90	1474	1326	36	24	22	4	1401	1398	80	10								285
114	010.40.1250.001		1394	1108	102	1336	1164	32	26	24	4	1251	1248	90	12								351
114	010.40.1400.001		1544	1258	102	1486	1314	36	26	24	4	1401	1398	90	12								393
114	010.40.1600.001		1744	1458	102	1686	1514	40	26	24	4	1601	1598	90	12								455
114	010.40.1800.001		1944	1658	102	1886	1714	44	26	24	4	1801	1798	90	12								507
115	010.50.1600.001		1766	1434	124	1704	1496	40	30	27	4	1602	1598	112	12								647
115	010.50.1800.001		1966	1634	124	1904	1696	44	30	27	4	1802	1798	112	12								730

010——Single-row four-point contact slewing bearing without teeth Design standard JB/T10839																							4.4 Product catalogue-Structural parameters
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
115	010.50.2000.001		2166	1834	124	2104	1896	48	30	27	6	2002	1998	112	12								812
116	010.50.2240.001		2406	2074	124	2344	2136	54	30	27	6	2242	2238	112	12								909
116	010.50.2500.001		2666	2334	124	2604	2396	60	30	27	6	2502	2498	112	12								1015

011/012——Single-row four-point contact slewing bearing with external teeth Design standard JB/T2300 4.4 Product catalogue-Structural parameters

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
103	011.20.0200.001	300	280	120	60	248	152	12	16	14	2	201	199	50	10	40	3	98	0	0	12	17	16
103	011.20.0224.001	321	304	144	60	272	176	12	16	14	2	225	223	50	10	40	3	105	0	0	12	17	18
103	011.20.0250.001	352	330	170	60	298	202	18	16	14	2	251	249	50	10	40	4	86	0	0	16	23	19
103	011.20.0280.001	384	360	200	60	328	232	18	16	14	2	281	279	50	10	40	4	94	0	0	16	23	27
103	011.25.0315.001	435	408	222	70	372	258	20	18	16	2	316	314	60	10	50	5	85	0	0	26	36	34
103	011.25.0355.001	475	448	262	70	412	298	20	18	16	2	356	354	60	10	50	5	93	0	0	26	36	34
104	011.25.0400.001	528	493	307	70	457	343	24	18	16	2	401	399	60	10	50	6	86	0	0	31	43	42
104	011.25.0450.001	576	543	357	70	507	393	24	18	16	2	451	449	60	10	50	6	94	0	0	31	43	49
104	011.30.0500.001	629	602	398	80	566	434	20	18	16	2	501	498	70	10	60	5	123	+0.5	0.1	37	52	89
	012.30.0500.001	628.8															6	102			45	62	89
104	011.25.0500.001	629	602	398	80	566	434	20	18	16	2	501	499	70	10	60	5	123	+0.5	0.1	37	52	89
	012.25.0500.001	628.8															6	102			45	62	89
104	011.30.0560.001	689	662	458	80	626	494	20	18	16	4	561	558	70	10	60	5	135	+0.5	0.1	37	52	100
	012.30.0560.001	688.8															6	112			45	62	100
104	011.25.0560.001	689	662	458	80	626	494	20	18	16	4	561	559	70	10	60	5	135	+0.5	0.1	37	52	100
	012.25.0560.001	688.8															6	112			45	62	100
105	011.30.0630.001	772.8	732	528	80	696	564	24	18	16	4	631	628	70	10	60	6	126	+0.5	0.1	45	62	118
	012.30.0630.001	774.4															8	94			60	83	118
105	011.25.0630.001	772.8	732	528	80	696	564	24	18	16	4	631	629	70	10	60	6	126	+0.5	0.1	45	62	118
	012.25.0630.001	774.4															8	94			60	83	118

011/012——Single-row four-point contact slewing bearing with external teeth Design standard JB/T2300																								
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
105	011.30.0710.001	850.8	812	608	80	776	644	24	18	16	4	711	708	70	10	60	6	139	+0.5	0.1	45	62	131
	012.30.0710.001	854.4															8	104			60	83	131
105	011.25.0710.001	850.8	812	608	80	776	644	24	18	16	4	711	709	70	10	60	6	139	+0.5	0.1	45	62	131
	012.25.0710.001	854.4															8	104			60	83	131
105	011.40.0800.001	966.4	922	678	100	878	722	30	22	20	6	801	798	90	10	80	8	118	+0.5	0.1	80	111	219
	012.40.0800.001	968															10	94			100	140	219
105	011.30.0800.001	966.4	922	678	100	878	722	30	22	20	6	801	798	90	10	80	8	118	+0.5	0.1	80	111	219
	012.30.0800.001	968															10	94			100	140	219
106	011.40.0900.001	1062.4	1022	778	100	978	822	30	22	20	6	901	898	90	10	80	8	130	+0.5	0.1	80	111	244
	012.40.0900.001	1068															10	104			100	140	244
106	011.30.0900.001	1062.4	1022	778	100	978	822	30	22	20	6	901	898	90	10	80	8	130	+0.5	0.1	80	111	244
	012.30.0900.001	1068															10	104			100	140	244
106	011.40.1000.001	1188	1122	878	100	1078	922	36	22	20	6	1001	998	90	10	80	10	116	+0.5	0.1	100	140	294
	012.40.1000.001	1185.6															12	96			120	167	284
106	011.30.1000.001	1188	1122	878	100	1078	922	36	22	20	6	1001	998	90	10	80	10	116	+0.5	0.1	100	140	294
	012.30.1000.001	1185.6															12	96			120	167	284
106	011.40.1120.001	1298	1242	998	100	1198	1042	36	22	20	6	1121	1118	90	10	80	10	127	+0.5	0.1	100	140	318
	012.40.1120.002	1305.6															12	106			120	167	318
106	011.30.1120.001	1298	1242	998	100	1198	1042	36	22	20	6	1121	1118	90	10	80	10	127	+0.5	0.1	100	140	318
	012.30.1120.002	1305.6															12	106			120	167	318

011/012——Single-row four-point contact slewing bearing with external teeth Design standard JB/T2300																								
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
107	011.45.1250.001	1449.6	1390	1110	110	1337	1163	40	26	24	5	1252	1248	100	10	90	12	118	+0.5	0.1	135	188	438
	012.45.1250.001	1453.2															14	101			158	219	438
107	011.35.1250.001	1449.6	1390	1110	110	1337	1163	40	26	24	5	1251	1248	100	10	90	12	118	+0.5	0.1	135	188	438
	012.35.1250.001	1453.2															14	101			158	219	438
107	011.45.1400.001	1605.6	1540	1260	110	1487	1313	40	26	24	5	1402	1398	100	10	90	12	131	+0.5	0.1	135	188	501
	012.45.1400.001	1607.2															14	112			158	219	501
107	011.35.1400.001	1605.6	1540	1260	110	1487	1313	40	26	24	5	1401	1398	100	10	90	12	131	+0.5	0.1	135	188	501
	012.35.1400.001	1607.2															14	112			158	219	501
107	011.45.1600.001	1817.2	1740	1460	110	1687	1513	45	26	24	5	1602	1598	100	10	90	14	127	+0.5	0.1	158	219	584
	012.45.1600.001	1820.8															16	111	+0.5	0.1	181	250	584
107	011.35.1600.001	1817.2	1740	1460	110	1687	1513	45	26	24	5	1601	1598	100	10	90	14	127	+0.5	0.1	158	219	584
	012.35.1600.001	1820.8															16	111	+0.5	0.1	181	250	584
108	011.45.1800.001	2013.2	1940	1660	110	1887	1713	45	26	24	5	1802	1798	100	10	90	14	141	+0.5	0.1	158	219	652
	012.45.1800.001	2012.8															16	123			181	250	639
108	011.35.1800.001	2013.2	1940	1660	110	1887	1713	45	26	24	5	1801	1798	100	10	90	14	141	+0.5	0.1	158	219	652
	012.35.1800.001	2012.8															16	123			181	250	639
108	011.60.2000.001	2268.8	2178	1825	144	2110	1891	48	33	30	8	2002	1998	132	12	120	16	139	+0.5	0.1	241	333	1202
	012.60.2000.001	2264.4															18	123			271	375	1169
108	011.40.2000.001	2268.8	2178	1825	144	2110	1891	48	33	30	8	2001	1998	132	12	120	16	139	+0.5	0.1	241	333	1202
	012.40.2000.001	2264.4															18	123			271	375	1169

011/012——Single-row four-point contact slewing bearing with external teeth Design standard JB/T2300																								
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
108	011.60.2240.001	2492.8	2418	2065	144	2350	2131	48	33	30	8	2242	2238	132	12	120	16	153	+0.5	0.1	241	333	1294
	012.60.2240.001	2498.4															18	136			271	375	1294
108	011.40.2240.001	2492.8	2418	2065	144	2350	2131	48	33	30	8	2241	2238	132	12	120	16	153	+0.5	0.1	241	333	1294
	012.40.2240.001	2498.4															18	136			271	375	1294
109	011.60.2500.001	2768.4	2678	2325	144	2610	2391	56	33	30	8	2502	2498	132	12	120	18	151	+0.5	0.1	271	375	1509
	012.60.2500.001	2776															20	136			301	418	1509
109	011.40.2500.001	2768.4	2678	2325	144	2610	2391	56	33	30	8	2501	2498	132	12	120	18	151	+0.5	0.1	271	375	1509
	012.40.2500.001	2776															20	136			301	418	1509
109	011.60.2800.001	3074.4	2978	2625	144	2910	2691	56	33	30	8	2802	2798	132	12	120	18	168	+0.5	0.1	271	375	1696
	012.60.2800.001	3076															20	151			301	418	1696
109	011.40.2800.001	3074.4	2978	2625	144	2910	2691	56	33	30	8	2801	2798	132	12	120	18	168	+0.5	0.1	271	375	1696
	012.40.2800.001	3076															20	151			301	418	1696
109	011.75.3150.001	3476	3376	2922	174	3286	3014	56	45	42	8	3152	3147	162	12	150	20	171	+0.5	0.1	377	522	2873
	012.75.3150.001	3471.6															22	155			415	574	2873
109	011.50.3150.001	3476	3376	2922	174	3286	3014	56	45	42	8	3152	3148	162	12	150	20	171	+0.5	0.1	377	522	2873
	012.50.3150.001	3471.6															22	155			415	574	2873

011/012——Single-row four-point contact slewing bearing with external teeth Design standard JB/T10839 4.4 Product catalogue-Structural parameters

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
110	011.20.0450.001	572	544	354	70	508	392	12	17	16	2	451	449	60	10	50	4	142	-0.5		16	23	65
	012.20.0450.001	570															5	113			20	28	64
111	011.20.0500.001	624	594	404	70	558	442	14	17	16	2	501	499	60	10	50	4	155	-0.5		16	23	74
	012.20.0500.001	625															5	124			20	28	74
111	011.20.0560.001	680	654	464	70	618	502	14	17	16	2	561	559	60	10	50	4	169	-0.5		20	28	78
	012.20.0560.001	685															5	136			26	36	79
111	011.20.0630.001	748	724	534	70	688	572	16	17	16	2	631	629	60	10	50	4	186	-0.5		20	28	86
	012.20.0630.001	755															5	150			26	36	88
111	011.20.0710.001	835	804	614	70	768	652	18	17	16	2	711	709	60	10	50	5	166	-0.5		26	36	99
	012.20.0710.001	840															6	139			31	43	101
111	011.20.0800.001	930	894	704	70	858	742	20	17	16	2	801	799	60	10	50	6	154	-0.5		31	43	114
	012.20.0800.001	936															8	116			41	57	114
112	011.25.0800.001	942	904	692	78	864	736	18	22	20	2	801	799	68	10	58	6	156	-0.5		36	50	143
	012.25.0800.001	952															8	118			48	66	147
112	011.25.0900.001	1048	1004	792	78	964	836	20	22	20	4	901	899	68	10	58	8	130	-0.5		48	66	162
	012.25.0900.001	1060															10	105			60	83	168
112	011.25.1000.001	1152	1104	892	78	1064	936	24	22	20	4	1001	999	68	10	58	8	143	-0.5		48	66	182
	012.25.1000.001	1160															10	115			60	83	185
113	011.32.1000.001	1160	1120	876	90	1074	926	24	24	22	4	1001	998	80	10	70	8	144	-0.5		58	80	250
	012.32.1000.001	1170															10	116			72	100	257
113	011.32.1120.001	1300	1240	996	90	1194	1046	28	24	22	4	1121	1118	80	10	70	10	129	-0.5		72	100	272
	012.32.1120.001	1308															12	108			87	120	275

011/012——Single-row four-point contact slewing bearing with external teeth Design standard JB/T10839																								4.4 Product catalogue-Structural parameters
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
113	011.32.1250.001	1430	1370	1126	90	1324	1176	32	24	22	4	1251	1248	80	10	70	10	142	-0.5		72	100	302
	012.32.1250.001	1440															12	119			87	120	309
113	011.32.1400.001	1584	1520	1276	90	1474	1326	36	24	22	4	1401	1398	80	10	70	12	131	-0.5		87	120	337
	012.32.1400.001	1596															14	113			101	141	347
114	011.40.1250.001	1450	1390	1108	102	1336	1164	32	26	24	4	1251	1248	90	12	80	10	144	-0.5		83	115	396
	012.40.1250.001	1452															12	120			99	138	392
114	011.40.1400.001	1608	1540	1258	102	1486	1314	36	26	24	4	1401	1398	90	12	80	12	133	-0.5		99	138	448
	012.40.1400.001	1610															14	114			116	161	443
114	011.40.1600.001	1812	1740	1458	102	1686	1514	40	26	24	4	1601	1598	90	12	80	12	150	-0.5		99	138	528
	012.40.1600.001	1820															14	129			116	161	534
114	011.40.1800.001	2016	1940	1658	102	1886	1714	44	26	24	4	1801	1798	90	12	80	14	143	-0.5		116	161	583
	012.40.1800.001	2032															16	126			133	184	607
115	011.50.1600.001	1824	1762	1434	124	1704	1496	40	30	27	4	1602	1598	112	12	100	12	151	-0.5		124	172	714
	012.50.1600.001	1834															14	130			145	201	727
115	011.50.1800.001	2044	1962	1634	124	1904	1696	44	30	27	4	1802	1798	112	12	100	14	145	-0.5		145	201	845
	012.50.1800.001	2048															16	127			166	230	843
115	011.50.2000.001	2240	2162	1834	124	2104	1896	48	30	27	6	2002	1998	112	12	100	16	139	-0.5		166	230	912
	012.50.2000.001	2250															18	124			187	259	927
116	011.50.2240.001	2480	2402	2074	124	2344	2136	54	30	27	6	2242	2238	112	12	100	16	154	-0.5		166	230	1020
	012.50.2240.001	2502															18	138			187	259	1078
116	011.50.2500.001	2754	2662	2334	124	2604	2396	60	30	27	6	2502	2498	112	12	100	18	152	-0.5		187	259	1171
	012.50.2500.001	2760															20	137			208	288	1175

013/014——Single-row four-point contact slewing bearing with inner teeth Design standard JB/T2300																								
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
103	013.25.0315.001	190	408	222	70	372	258	20	18	16	2	316	314	60	10	50	5	40	0	0	26	36	40
103	013.25.0355.001	235	448	262	70	412	298	20	18	16	2	356	354	60	10	50	5	49	0	0	26	36	46
104	013.25.0400.001	276	493	307	70	457	343	24	18	16	2	401	399	60	10	50	6	48	0	0	31	43	53
104	013.25.0450.001	324	543	357	70	507	393	24	18	16	2	451	449	60	10	50	6	56	0	0	31	43	60
104	013.30.0500.001	367	602	398	80	566	434	20	18	16	4	501	498	70	10	60	5	74	+0.5	0.2	37	52	90
	014.30.0500.001	368.4															6	62			45	62	90
104	013.25.0500.001	367	602	398	80	566	434	20	18	16	4	501	499	70	10	60	5	74	+0.5	0.2	37	52	90
	014.25.0500.001	368.4															6	62			45	62	90
104	013.30.0560.001	427	662	458	80	626	494	20	18	16	4	561	558	70	10	60	5	86	+0.5	0.2	37	52	102
	014.30.0560.001	428.4															6	72			45	62	102
104	013.25.0560.001	427	662	458	80	626	494	20	18	16	4	561	559	70	10	60	5	86	+0.5	0.2	37	52	102
	014.25.0560.001	428.4															6	72			45	62	102
105	013.30.0630.001	494.4	732	528	80	696	564	24	18	16	4	631	628	70	10	60	6	83	+0.5	0.2	45	62	102
	014.30.0630.001	491.2															8	62			60	83	102
105	013.25.0630.001	494.4	732	528	80	696	564	24	18	16	4	631	629	70	10	60	6	83	+0.5	0.2	45	62	102
	014.25.0630.001	491.2															8	62			60	83	102
105	013.30.0710.001	572.4	812	608	80	776	644	24	18	16	4	711	708	70	10	60	6	96	+0.5	0.2	45	62	132
	014.30.0710.001	571.2															8	72			60	83	132
105	013.25.0710.001	572.4	812	608	80	776	644	24	18	16	4	711	709	70	10	60	6	96	+0.5	0.2	45	62	132
	014.25.0710.001	571.2															8	72			60	83	132
105	013.40.0800.001	635.2	922	678	100	878	722	30	22	20	6	801	798	90	10	80	8	80	+0.5	0.2	80	111	224
	014.40.0800.001	634															10	64			100	140	224

013/014——Single-row four-point contact slewing bearing with inner teeth Design standard JB/T2300																								
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
105	013.30.0800.001	635.2	922	678	100	878	722	30	22	20	6	801	798	90	10	80	8	80	+0.5	0.2	80	111	224
	014.30.0800.001	634															10	64			100	140	224
106	013.40.0900.001	739.2	1022	778	100	978	822	30	22	20	6	901	898	90	10	80	8	93	+0.5	0.2	80	111	252
	014.40.0900.001	734															10	74			100	140	252
106	013.30.0900.001	739.2	1022	778	100	978	822	30	22	20	6	901	898	90	10	80	8	93	+0.5	0.2	80	111	252
	014.30.0900.001	734															10	74			100	140	252
106	013.40.1000.001	824	1122	878	100	1078	922	36	22	20	6	1001	998	90	10	80	10	83	+0.5	0.2	100	140	292
	014.40.1000.001	820.8															12	69			120	167	292
106	013.30.1000.001	824	1122	878	100	1078	922	36	22	20	6	1001	998	90	10	80	10	83	+0.5	0.2	100	140	292
	014.30.1000.001	820.8															12	69			120	167	292
106	013.40.1120.001	944	1242	998	100	1198	1042	36	22	20	6	1121	1118	90	10	80	10	95	+0.5	0.2	100	140	333
	014.40.1120.001	940.8															12	79			120	167	333
106	013.30.1120.001	944	1242	998	100	1198	1042	36	22	20	6	1121	1118	90	10	80	10	95	+0.5	0.2	100	140	333
	014.30.1120.001	940.8															12	79			120	167	333
107	013.45.1250.001	1048.8	1390	1110	110	1337	1163	40	26	24	5	1252	1248	100	10	90	12	88	+0.5	0.2	135	188	467
	014.45.1250.001	1041.6															14	75			158	219	467
107	013.35.1250.001	1048.8	1390	1110	110	1337	1163	40	26	24	5	1251	1248	100	10	90	12	88	+0.5	0.2	135	188	467
	014.35.1250.001	1041.6															14	75			158	219	467
107	013.45.1400.001	1192.8	1540	1260	110	1487	1313	40	26	24	5	1402	1398	100	10	90	12	100	+0.5	0.2	135	188	467
	014.45.1400.001	1195.6															14	86			158	219	467
107	013.35.1400.001	1192.8	1540	1260	110	1487	1313	40	26	24	5	1401	1398	100	10	90	12	100	+0.5	0.2	135	188	467
	014.35.1400.001	1195.6															14	86			158	219	467

013/014——Single-row four-point contact slewing bearing with inner teeth Design standard JB/T2300																								
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
107	013.45.1600.001	1391.6	1740	1460	110	1687	1513	45	26	24	5	1602	1598	100	10	90	14	100	+0.5	0.2	158	219	607
	014.45.1600.001	1382.4															16	87			181	250	620
107	013.35.1600.001	1391.6	1740	1460	110	1687	1513	45	26	24	5	1601	1598	100	10	90	14	100	+0.5	0.2	158	219	607
	014.35.1600.001	1382.4															16	87			181	250	620
108	013.45.1800.001	1573.6	1940	1660	110	1887	1713	45	26	24	5	1802	1798	100	10	90	14	113	+0.5	0.2	158	219	721
	014.45.1800.001	1574.4															16	99			181	250	721
108	013.35.1800.001	1573.6	1940	1660	110	1887	1713	45	26	24	5	1801	1798	100	10	90	14	113	+0.5	0.2	158	219	721
	014.35.1800.001	1574.4															16	99			181	250	721
108	013.60.2000.001	1734.4	2178	1825	144	2110	1891	48	33	30	8	2002	1998	132	12	120	16	109	+0.5	0.2	241	333	1265
	014.60.2000.001	1735.2															18	97			271	375	1265
108	013.40.2000.001	1734.4	2178	1825	144	2110	1891	48	33	30	8	2001	1998	132	12	120	16	109	+0.5	0.2	241	333	1265
	014.40.2000.001	1735.2															18	97			271	375	1265
108	013.60.2240.001	1990.4	2418	2065	144	2350	2131	48	33	30	8	2242	2238	132	12	120	16	125	+0.5	0.2	241	333	1393
	014.60.2240.001	1987.2															18	111			271	375	1393
108	013.40.2240.001	1990.4	2418	2065	144	2350	2131	48	33	30	8	2241	2238	132	12	120	16	125	+0.5	0.2	241	333	1393
	014.40.2240.001	1987.2															18	111			271	375	1393
109	013.60.2500.001	2239.2	2678	2325	144	2610	2391	56	33	30	8	2502	2498	132	12	120	18	125	+0.5	0.2	271	375	1580
	014.60.2500.001	2228															20	112			301	418	1580
109	013.40.2500.001	2239.2	2678	2325	144	2610	2391	56	33	30	8	2501	2498	132	12	120	18	125	+0.5	0.2	271	375	1580
	014.40.2500.001	2228															20	112			301	418	1580
109	013.60.2800.001	2527.2	2978	2625	144	2910	2691	56	33	30	8	2802	2798	132	12	120	18	141	+0.5	0.2	271	375	1800
	014.60.2800.001	2528															20	127			301	418	1800

013/014——Single-row four-point contact slewing bearing with inner teeth Design standard JB/T2300																								
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
109	013.40.2800.001	2527.2	2978	2625	144	2910	2691	56	33	30	8	2801	2798	132	12	120	18	141	+0.5	0.2	271	375	1800
	014.40.2800.001	2528															20	127			301	418	1800
109	013.75.3150.001	2828	3376	2922	174	3286	3014	56	45	42	8	3152	3147	162	12	150	20	142	+0.5	0.2	377	522	2840
	014.75.3150.001	2824.8															22	129			415	574	2840
109	013.50.3150.001	2828	3376	2922	174	3286	3014	56	45	42	8	3152	3148	162	12	150	20	142	+0.5	0.2	377	522	2840
	014.50.3150.001	2824.8															22	129			415	574	2840

013/014—— Single-row four-point contact slewing bearing with inner teeth Design standard JB/T10839																						4.4 Product catalogue-Structural parameters		
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter						Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n1	D3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k		Normalizing Kn	Tempering Kn	
110	013.20.0450.001	328	546	354	70	508	392	12	17	16	2	451	449	50	10	50	4	83	+0.5			20	27	62
	014.20.0450.001	325															5	66				25	34	62
111	013.20.0500.001	376	596	404	70	558	442	14	17	16	2	501	499	50	10	50	4	95	+0.5			20	27	70
	014.20.0500.001	375															5	76				25	34	70
111	013.20.0560.001	440	656	468	70	618	502	14	17	16	2	561	559	60	10	50	4	111	+0.5			25	34	76
	013.20.0560.001	435															5	88				31	43	77
111	013.20.0630.001	512	726	538	70	688	572	16	17	16	2	631	629	60	10	50	4	129	+0.5			25	34	84
	013.20.0630.001	505															5	102				31	43	86
111	013.20.0710.001	585	806	618	70	768	652	18	17	16	2	711	709	60	10	50	5	118	+0.5			31	43	97
	014.20.0710.001	582															6	98				37	52	97
111	013.20.0800.001	672	896	708	70	858	742	20	17	16	2	801	799	60	10	50	6	113	+0.5			37	52	110
	014.20.0800.001	664															8	84				50	69	111
112	013.25.0800.001	654	908	694	78	864	736	18	22	20	2	801	799	68	10	58	6	110	+0.5			43	60	142
	014.25.0800.001	648															8	82				58	80	142
112	013.25.0900.001	744	1008	794	78	964	836	20	22	20	4	901	899	68	10	58	8	94	+0.5			58	80	163
	014.25.0900.001	740															10	75				72	100	162
112	013.25.1000.001	848	1108	894	78	1064	936	24	22	20	4	1001	999	68	10	58	8	107	+0.5			58	80	178
	014.25.1000.001	840															10	85				72	100	179
113	013.32.1000.001	832	1124	880	90	1074	926	24	24	22	4	1001	998	80	10	70	8	105	+0.5			70	97	231
	014.32.1000.001	830															10	84				87	121	240
113	013.32.1120.001	940	1244	1000	90	1194	1046	28	24	22	4	1121	1118	80	10	70	10	95	+0.5			87	121	263
	014.32.1120.001	936															12	79				105	146	262

013/014—— Single-row four-point contact slewing bearing with inner teeth Design standard JB/T10839																						4.4 Product catalogue-Structural parameters		
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter						Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n1	D3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k		Normalizing Kn	Tempering Kn	
113	013.32.1250.001	1070	1374	1130	90	1324	1176	32	24	22	4	1251	1248	80	10	70	10	108	+0.5			87	121	294
	014.32.1250.001	1068															12	90				105	146	290
113	013.32.1400.001	1212	1524	1280	90	1474	1326	36	24	22	4	1401	1398	80	10	70	12	102	+0.5			105	146	333
	014.32.1400.001	1204															14	87				123	170	336
114	013.40.1250.001	1050	1394	1110	102	1336	1164	32	26	24	4	1251	1248	90	12	80	10	106	+0.5			100	140	388
	014.40.1250.001	1044															12	88				120	167	388
114	013.40.1400.001	1188	1544	1260	102	1486	1314	36	26	24	4	1401	1398	90	12	80	12	100	+0.5			120	167	444
	014.40.1400.001	1190															14	86				14	194	424
114	013.40.1600.001	1392	1744	1460	102	1686	1514	40	26	24	4	1601	1598	90	12	80	12	117	+0.5			120	166	509
	014.40.1600.001	1386															14	100				140	194	511
114	013.40.1800.001	1582	1944	1660	102	1886	1714	44	26	24	4	1801	1798	90	12	80	14	114	+0.5			140	194	576
	014.40.1800.001	1568															16	99				160	222	591
114	013.50.1600.001	1368	1766	1438	124	1704	1496	40	30	27	4	1602	1598	112	12	100	12	115	+0.5			150	208	714
	014.50.1600.001	1358															14	98				175	243	723
115	013.50.1800.001	1568	1966	1638	124	1904	1696	44	30	27	4	1802	1798	112	12	100	14	113	+0.5			175	243	794
	014.50.1800.001	1552															16	98				200	278	818
115	013.50.2000.001	1760	2166	1838	124	2104	1896	48	30	27	6	2002	1998	112	12	100	16	111	+0.5			200	278	891
	014.50.2000.001	1746															18	98				226	313	913
116	013.50.2240.001	1984	2406	2078	124	2344	2136	54	30	27	6	2242	2238	112	12	100	16	125	+0.5			200	278	1044
	014.50.2240.001	1980															18	111				226	313	1041
116	013.50.2500.001	2250	2666	2338	124	2604	2396	60	30	27	6	2502	2498	112	12	100	18	126	+0.5			226	313	1132
	014.50.2500.001	2240															20	113				251	347	1148

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
118	110.25.0500.001		602	398	75	566	434	20	18	16	4	498	502	65	10								77
118	110.25.0560.001		662	458	75	626	494	20	18	16	4	558	562	65	10								87
118	110.25.0630.001		732	528	75	696	564	24	18	16	4	628	632	65	10								95
118	110.25.0710.001		812	608	75	776	644	24	18	16	4	708	712	65	10								111
118	110.28.0800.001		922	678	82	878	722	30	22	20	6	798	802	72	10								167
118	110.28.0900.001		1022	778	82	978	822	30	22	20	6	898	902	72	10								186
119	110.28.1000.001		1122	878	82	1078	922	36	22	20	6	998	1002	72	10								204
119	110.28.1120.001		1242	998	82	1198	1042	36	22	20	6	1118	1122	72	10								233
119	110.32.1250.001		1390	1110	91	1337	1163	40	26	24	5	1248	1252	81	10								337
119	110.32.1400.001		1540	1260	91	1487	1313	40	26	24	5	1398	1402	81	10								369
119	110.32.1600.001		1740	1460	91	1687	1513	45	26	24	5	1598	1602	81	10								425
119	110.32.1800.001		1940	1660	91	1887	1713	45	33	24	5	1798	1802	81	10								525
120	110.40.2000.001		2178	1825	112	2110	1891	48	33	30	8	1997	2003	100	12								815
120	110.40.2240.001		2418	2065	112	2350	2131	48	33	30	8	2237	2243	100	12								944
120	110.40.2500.001		2678	2325	112	2610	2391	56	33	30	8	2497	2503	100	12								1026
120	110.40.2800.001		2978	2625	112	2910	2691	56	33	30	8	2797	2803	100	12								1375
120	110.50.3150.001		3376	2922	134	3286	3014	56	45	42	8	3147	3153	122	12								2097

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
118	111.25.0500.001	629	602	398	75	566	434	20	18	16	4	498	502	65	10	60	5	123	+0.5	0.1	37	52	84
	112.25.0500.001	628.8															6	102			45	62	84
118	111.25.0560.001	689	662	458	75	626	494	20	18	16	4	558	562	65	10	60	5	135	+0.5	0.1	37	52	92
	112.25.0560.001	688.8															6	112			45	62	92
118	111.25.0630.001	772.8	732	528	75	696	564	24	18	16	4	628	632	65	10	60	6	126	+0.5	0.1	45	62	111
	112.25.0630.001	774.4															8	94			60	83	111
118	111.25.0710.001	850.8	812	608	75	776	644	24	18	16	4	708	712	65	10	60	6	139	+0.5	0.1	45	62	125
	112.25.0710.001	854.4															8	104			60	83	125
118	111.28.0800.001	966.4	922	678	82	878	722	30	22	20	6	798	802	72	10	65	8	118	+0.5	0.1	65	91	179
	112.28.0800.001	968															10	94			81	114	179
118	111.28.0900.001	1062.4	1022	778	82	978	822	30	22	20	6	898	902	72	10	65	8	130	+0.5	0.1	65	91	200
	112.28.0900.001	1068															10	104			81	114	200
119	111.28.1000.001	1188	1122	878	82	1078	922	36	22	20	6	998	1002	72	10	65	10	116	+0.5	0.1	81	114	242
	112.28.1000.001	1185.6															12	96			97	136	242
119	111.28.1120.001	1298	1242	998	82	1198	1042	36	22	20	6	1118	1122	72	10	65	10	127	+0.5	0.1	81	114	261
	112.28.1120.001	1305.6															12	106			97	136	261
119	111.32.1250.001	1449.6	1390	1110	91	1337	1163	40	26	24	5	1248	1252	81	10	75	12	118	+0.5	0.1	113	157	362
	112.32.1250.001	1453.2															14	101			132	182	362
119	111.32.1400.001	1605.6	1540	1260	91	1487	1313	40	26	24	5	1398	1402	81	10	75	12	131	+0.5	0.1	113	157	417
	112.32.1400.001	1607.2															14	112			132	182	411
119	111.32.1600.001	1817.2	1740	1460	91	1687	1513	45	26	24	5	1598	1602	81	10	75	14	127	+0.5	0.1	132	182	488
	112.32.1600.001	1820.8															16	111			151	209	484

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
119	111.32.1800.001	2013.2	1940	1660	91	1887	1713	45	33	24	5	1798	1802	81	10	75	14	141	+0.5	0.1	132	182	530
	112.32.1800.001	2012.8															16	123			151	209	530
120	111.40.2000.001	2268.8	2178	1825	112	2110	1891	48	33	30	8	1997	2003	100	12	90	16	139	+0.5	0.1	181	250	935
	112.40.2000.001	2264.4															18	123			203	281	935
120	111.40.2240.001	2492.8	2418	2065	112	2350	2131	48	33	30	8	2237	2243	100	12	90	16	153	+0.5	0.1	181	250	1008
	112.40.2240.001	2498.4															18	136			203	281	1008
120	111.40.2500.001	2768.4	2678	2325	112	2610	2391	56	33	30	8	2497	2503	100	12	90	18	151	+0.5	0.1	203	281	1147
	112.40.2500.001	2776															20	136			226	313	1147
120	111.40.2800.001	3074.4	2978	2625	112	2910	2691	56	33	30	8	2797	2803	100	12	90	18	168	+0.5	0.1	203	281	1320
	112.40.2800.001	3076															20	151			226	313	1320
120	111.50.3150.001	3476	3376	2922	134	3286	3014	56	45	42	8	3147	3153	122	12	110	20	171	+0.5	0.1	276	383	2222
	112.50.3150.001	3471.6															22	155			304	421	2222

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
118	113.25.0500.001	367	602	398	75	566	434	20	18	16	4	498	502	65	10	60	5	74	+0.5	0.2	37	52	85
	114.25.0500.001	368.4															6	62			45	62	85
118	113.25.0560.001	427	662	458	75	626	494	20	18	16	4	558	562	65	10	60	5	86	+0.5	0.2	37	52	96
	114.25.0560.001	428.4															6	72			45	62	96
118	113.25.0630.001	494.4	732	528	75	696	564	24	18	16	4	628	632	65	10	60	6	83	+0.5	0.2	45	62	110
	114.25.0630.001	491.2															8	62			60	83	110
118	113.25.0710.001	572.4	812	608	75	776	644	24	18	16	4	708	712	65	10	60	6	96	+0.5	0.2	45	62	126
	114.25.0710.001	571.2															8	72			60	83	122
118	113.28.0800.001	635.2	922	678	82	878	722	30	22	20	6	798	802	72	10	65	8	80	+0.5	0.2	65	91	186
	114.28.0800.001	634															10	64			81	114	186
118	113.28.0900.001	739.2	1022	778	82	978	822	30	22	20	6	898	902	72	10	65	8	93	+0.5	0.2	65	91	208
	114.28.0900.001	734															10	74			81	114	208
119	113.28.1000.001	824	1122	878	82	1078	922	36	22	20	6	998	1002	72	10	65	10	83	+0.5	0.2	81	114	220
	114.28.1000.001	820.8															12	69			97	136	220
119	113.28.1120.001	944	1242	998	82	1198	1042	36	22	20	6	1118	1122	72	10	65	10	95	+0.5	0.2	81	114	273
	114.28.1120.001	940.8															12	79			97	136	273
119	113.32.1250.001	1048.8	1390	1110	91	1337	1163	40	26	24	5	1248	1252	81	10	75	12	88	+0.5	0.2	113	157	386
	114.32.1250.001	1041.6															14	75			132	182	390
119	113.32.1400.001	1192.8	1540	1260	91	1487	1313	40	26	24	5	1398	1402	81	10	75	12	100	+0.5	0.2	113	157	441
	114.32.1400.001	1195.6															14	86			132	182	441
119	113.32.1600.001	1391.6	1740	1460	91	1687	1513	45	26	24	5	1598	1602	81	10	75	14	100	+0.5	0.2	132	182	502
	114.32.1600.001	1382.4															16	87			151	224	517

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size						Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
119	113.32.1800.001	1573.6	1940	1660	91	1887	1713	45	33	24	5	1798	1802	81	10	75	14	113	+0.5	0.2	132	182	605
	114.32.1800.001	1574.4															16	99			151	224	605
120	113.40.2000.001	1734.4	2178	1825	112	2110	1891	48	33	30	8	1997	2003	100	12	90	16	109	+0.5	0.2	181	250	977
	114.40.2000.001	1735.2															18	97			203	281	977
120	113.40.2240.001	1990.4	2418	2065	112	2350	2131	48	33	30	8	2237	2243	100	12	90	16	125	+0.5	0.2	181	250	1072
	114.40.2240.001	1987.2															18	111			203	281	1072
120	113.40.2500.001	2239.2	2678	2325	112	2610	2391	56	33	30	8	2497	2503	100	12	90	18	125	+0.5	0.2	203	281	1211
	114.40.2500.001	2228															20	112			226	313	1211
120	113.40.2800.001	2527.2	2978	2625	112	2910	2691	56	33	30	8	2797	2803	100	12	90	18	141	+0.5	0.2	203	281	1396
	114.40.2800.001	2528															20	127			226	313	1396
120	113.50.3150.001	2828	3376	2922	134	3286	3014	56	45	42	8	3147	3153	122	12	110	20	142	+0.5	0.2	276	383	2344
	114.50.3150.001	2824.8															22	129			304	421	2344

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
121	020.25.0500.002		616	384	106	580	420	20	18	16	4	482	477	96	26								121
121	020.25.0560.002		676	444	106	640	480	20	18	16	4	543	537	96	26								136
121	020.25.0630.002		746	514	106	710	550	24	18	16	4	613	607	96	26								152
121	020.25.0710.002		826	594	106	790	630	24	18	16	4	692	687	96	26								172
121	020.30.0800.002		942	658	124	898	702	30	22	20	6	777	771	114	29								284
121	020.30.0900.002		1042	758	124	998	802	30	22	20	6	877	871	114	29								316
122	020.30.1000.002		1142	858	124	1098	902	36	22	20	6	977	971	114	29								349
122	020.30.1120.002		1262	978	124	1218	1022	36	22	20	6	1097	1091	114	29								394
122	020.40.1250.002		1426	1074	160	1374	1126	40	26	24	5	1215	1214	150	39								709
122	020.40.1400.002		1576	1224	160	1524	1272	40	26	24	5	1365	1364	150	39								787
122	020.40.1600.002		1776	1424	160	1724	1476	45	26	24	5	1565	1564	150	39								899
122	020.40.1800.002		1976	1624	160	1924	1676	45	26	24	5	1765	1764	150	39								1018
123	020.50.2000.002		2215	1785	190	2149	1851	48	33	30	8	1965	1962	178	47								1586
123	020.50.2240.002		2455	2025	190	2389	2091	48	33	30	8	2206	2202	178	47								1789
123	020.50.2500.002		2715	2285	190	2649	2351	56	33	30	8	2465	2462	178	47								1990
123	020.50.2800.002		3015	2585	190	2949	2651	56	33	30	8	2765	2762	178	47								2243
123	020.60.3150.002		3428	2872	226	3338	2962	56	45	42	8	3104	3102	214	56								3762

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size						Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D1 mm	D2 mm	n	Φ mm	M mm	n1	D3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
121	021.25.0500.002	644	616	384	106	580	420	20	18	16	4	523	518	96	26	60	5	126	+0.5	0.1	37	52	130
	022.25.0500.002	646.8															6	105			45	62	130
121	021.25.0560.002	704	676	444	106	640	480	20	18	16	4	583	578	96	26	60	5	138	+0.5	0.1	37	52	146
	022.25.0560.002	706.8															6	115			45	62	147
121	021.25.0630.002	790.8	746	514	106	710	550	24	18	16	4	653	648	96	26	60	6	129	+0.5	0.1	45	62	173
	022.25.0630.002	790.4															8	96			60	83	170
121	021.25.0710.002	862.8	826	594	106	790	630	24	18	16	4	733	728	96	26	60	6	141	+0.5	0.1	45	62	190
	022.25.0710.002	862.4															8	105			60	83	187
121	021.30.0800.002	982.4	942	658	124	898	702	30	22	20	6	829	823	114	29	80	8	120	+0.5	0.1	80	111	305
	022.30.0800.002	988															10	96			100	140	307
121	021.30.0900.002	1086.4	1042	758	124	998	802	30	22	20	6	929	923	114	29	80	8	133	+0.5	0.1	80	111	349
	022.30.0900.002	1088															10	106			100	140	348
122	021.30.1000.002	1198	1142	858	124	1098	902	36	22	20	6	1029	1023	114	29	80	10	117	+0.5	0.1	100	140	396
	022.30.1000.002	1197.6															12	97			120	167	391
122	021.30.1120.002	1318	1262	978	124	1218	1022	36	22	20	6	1148	1143	114	29	80	10	129	+0.5	0.1	100	140	445
	022.30.1120.002	1317.6															12	107			120	167	439
122	021.40.1250.002	1497.6	1426	1074	160	1374	1126	40	26	24	5	1286	1282	150	39	90	12	122	+0.5	0.1	135	188	784
	022.40.1250.002	1495.2															14	104			158	219	774
122	021.40.1400.002	1641.6	1576	1224	160	1524	1272	40	26	24	5	1436	1432	150	39	90	12	134	+0.5	0.1	135	188	870
	022.40.1400.002	1649.2															14	115			158	219	878
122	021.40.1600.002	1845.2	1776	1424	160	1724	1476	45	26	24	5	1636	1635	150	39	90	14	129	+0.5	0.1	158	219	995
	022.40.1600.002	1852.8															16	113			181	250	1003

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D1 mm	D2 mm	n	Φ mm	M mm	n1	D3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
122	021.40.1800.002	2055.2	1976	1624	160	1924	1676	45	26	24	5	1836	1835	150	39	90	14	144	+0.5	0.1	158	219	1147
	022.40.1800.002	2060.8															16	126			181	250	1151
123	021.50.2000.002	2300.8	2215	1785	190	2149	1851	48	33	30	8	2038	2035	178	47	120	16	141	+0.5	0.1	241	333	1794
	022.50.2000.002	2300.4															18	125			271	375	1780
123	021.50.2240.002	2540.8	2455	2025	190	2389	2091	48	33	30	8	2278	2275	178	47	120	16	156	+0.5	0.1	241	333	2017
	022.50.2240.002	2552.4															18	139			271	375	2048
123	021.50.2500.002	2804.4	2715	2285	190	2649	2351	56	33	30	8	2538	2532	178	47	120	18	153	+0.5	0.1	271	375	2246
	022.50.2500.002	2816															20	138			301	418	2280
123	021.50.2800.002	3110.4	3015	2585	190	2949	2651	56	33	30	8	2838	2832	178	47	120	18	170	+0.5	0.1	271	375	2553
	022.50.2800.002	3116															20	153			301	418	2563
123	021.60.3150.002	3536	3428	2872	226	3338	2962	56	45	42	8	3198	3196	214	56	150	20	174	+0.5	0.1	377	522	4428
	022.60.3150.002	3537.6															22	158			415	574	4414

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size						Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
121	023.25.0500.002	357	616	384	106	580	420	20	18	16	4	482	477	96	26	60	5	72	+0.5	0.2	37	52	126
	024.25.0500.002	350.4															6	59			45	62	128
121	023.25.0560.002	417	676	444	106	640	480	20	18	16	4	542	537	96	26	60	5	84	+0.5	0.2	37	52	143
	024.25.0560.002	410.4															6	69			45	62	144
121	023.25.0630.002	482.4	746	514	106	710	550	24	18	16	4	612	607	96	26	60	6	81	+0.5	0.2	45	62	160
	024.25.0630.002	475.2															8	60			60	83	162
121	023.25.0710.002	560.4	826	594	106	790	630	24	18	16	4	692	687	96	26	60	6	94	+0.5	0.2	45	62	183
	024.25.0710.002	555.2															8	70			60	83	184
121	023.30.0800.002	619.2	942	658	124	898	702	30	22	20	6	777	771	114	29	80	8	78	+0.5	0.2	80	111	300
	024.30.0800.002	614															10	62			100	140	301
121	023.30.0900.002	715.2	1042	758	124	998	802	30	22	20	6	877	871	114	29	80	8	90	+0.5	0.2	80	111	337
	024.30.0900.002	714															10	72			100	140	335
122	023.30.1000.002	814	1142	858	124	1098	902	36	22	20	6	977	971	114	29	80	10	82	+0.5	0.2	100	140	371
	024.30.1000.002	796.8															12	67			120	167	383
122	023.30.1120.002	924	1262	978	124	1218	1022	36	22	20	6	1097	1091	114	29	80	10	93	+0.5	0.2	100	140	429
	024.30.1120.002	916.8															12	77			120	167	432
122	023.40.1250.002	1012.8	1426	1074	160	1374	1126	40	26	24	5	1215	1214	150	39	90	12	85	+0.5	0.2	135	188	746
	024.40.1250.002	1013.6															14	73			158	219	741
122	023.40.1400.002	1156.8	1576	1224	160	1524	1272	40	26	24	5	1365	1364	150	39	90	12	97	+0.5	0.2	135	188	850
	024.40.1400.002	1153.6															14	83			158	219	850
122	023.40.1600.002	1349.6	1776	1424	160	1724	1476	45	26	24	5	1565	1564	150	39	90	14	97	+0.5	0.2	158	219	979
	024.40.1600.002	1350.4															16	85			181	250	972

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Gear force of periphery		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
122	023.40.1800.002	1545.6	1976	1624	160	1924	1676	45	26	24	5	1765	1764	150	39	90	14	111	+0.5	0.2	158	219	1117
	024.40.1800.002	1542.4															16	97			181	250	1116
123	023.50.2000.002	1702.4	2215	1785	190	2149	1851	48	33	30	8	1965	1962	178	47	120	16	107	+0.5	0.2	241	333	1733
	024.50.2000.002	1699.2															18	95			271	375	1732
123	023.50.2240.002	1942.4	2455	2025	190	2389	2091	48	33	30	8	2206	2202	178	47	120	16	122	+0.5	0.2	241	333	1956
	024.50.2240.002	1933.2															18	108			271	375	1973
123	023.50.2500.002	2203.2	2715	2285	190	2649	2351	56	33	30	8	2465	2462	178	47	120	18	123	+0.5	0.2	271	375	2164
	024.50.2500.002	2188															20	110			301	418	2204
123	023.50.2800.002	2491.2	3015	2585	190	2949	2651	56	33	30	8	2765	2762	178	47	120	18	139	+0.5	0.2	271	375	2486
	024.50.2800.002	2488															20	125			301	418	2485
123	023.60.3150.002	2768	3428	2872	226	3338	2962	56	45	42	8	3104	3102	214	56	150	20	139	+0.5	0.2	377	522	4137
	024.60.3150.002	2758.8															22	126			415	574	4167

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Load bearing curve page		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
124	130.25.0500.002		634	366	148	598	402	24	18	16	4	474	463	138	32								191
124	130.25.0560.002		694	426	148	658	462	24	18	16	4	534	523	138	32								214
124	130.25.0630.002		764	496	148	728	532	28	18	16	4	604	593	138	32								240
124	130.25.0710.002		844	576	148	808	612	28	18	16	4	684	673	138	32								272
124	130.32.0800.002		964	636	182	920	680	36	22	20	4	770	759	172	40								459
124	130.32.0900.002		1064	736	182	1020	780	36	22	20	4	870	859	172	40								519
125	130.32.1000.002		1164	836	182	1120	880	40	22	20	5	970	959	172	40								577
125	130.32.1120.002		1284	956	182	1240	1000	40	22	20	5	1090	1079	172	40								650
125	130.40.1250.002		1445	1055	220	1393	1107	45	26	24	5	1213	1200	210	50								1038
125	130.40.1400.002		1595	1205	220	1543	1257	45	26	24	5	1363	1350	210	50								1170
125	130.40.1600.002		1795	1405	220	1743	1457	48	26	24	6	1563	1550	210	50								1341
125	130.40.1800.002		1995	1605	220	1943	1657	48	26	24	6	1763	1750	210	50								1518
126	130.45.2000.002		2221	1779	231	2155	1845	60	33	30	6	1967	1945	219	54								1949
126	130.45.2240.002		2461	2019	231	2395	2085	60	33	30	6	2207	2185	219	54								2197
126	130.45.2500.002		2721	2279	231	2655	2345	72	33	30	8	2467	2445	219	54								2590
126	130.45.2800.002		3021	2579	231	2955	2645	72	33	30	8	2767	2745	219	54								2932
126	130.50.3150.002		3432	2868	270	3342	2958	72	45	42	8	3104	3090	258	65								4551

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Load bearing curve page		Ref. weight Kg
		De mm	D mm	d mm	H mm	D1 mm	D2 mm	n	Φ mm	M mm	n1	D3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
124	131.25.0500.002	664	634	366	148	598	402	24	18	16	4	537	526	138	32	80	5	130	+0.5	0.1	50	70	200
	132.25.0500.002	664.8															6	108			60	83	200
124	131.25.0560.002	724	694	426	148	658	462	24	18	16	4	597	586	138	32	80	5	142	+0.5	0.1	50	70	224
	132.25.0560.002	724.8															6	118			60	83	224
124	131.25.0630.002	808.8	764	496	148	728	532	28	18	16	4	667	656	138	32	80	6	132	+0.5	0.1	60	83	262
	132.25.0630.002	806.4															8	98			80	111	257
124	131.25.0710.002	886.8	844	576	148	808	612	28	18	16	4	747	736	138	32	80	6	145	+0.5	0.1	60	83	295
	132.25.0710.002	886.4															8	108			80	111	291
124	131.32.0800.002	1006.4	964	636	182	920	680	36	22	20	4	841	830	172	40	120	8	123	+0.5	0.1	121	167	490
	132.32.0800.002	1008															10	98			151	209	487
124	131.32.0900.002	1102.4	1064	736	182	1020	780	36	22	20	4	941	930	172	40	120	8	135	+0.5	0.1	121	167	549
	132.32.0900.002	1108															10	108			151	209	562
125	131.32.1000.002	1218	1164	836	182	1120	880	40	22	20	5	1041	1030	172	40	120	10	119	+0.5	0.1	151	209	631
	132.32.1000.002	1221.6															12	99			181	251	631
125	131.32.1120.002	1338	1284	956	182	1240	1000	40	22	20	5	1161	1150	172	40	120	10	131	+0.5	0.1	151	209	710
	132.32.1120.002	1341.6															12	109			181	251	710
125	131.40.1250.002	1509.6	1445	1055	220	1393	1107	45	26	24	5	1300	1287	210	50	150	12	123	+0.5	0.1	226	314	1137
	132.40.1250.002	1509.2															14	105			263	366	1126
125	131.40.1400.002	1665.6	1595	1205	220	1543	1257	45	26	24	5	1450	1437	210	50	150	12	136	+0.5	0.1	226	314	1299
	132.40.1400.002	1663.2															14	116			263	366	1281
125	131.40.1600.002	1873.2	1795	1405	220	1743	1457	48	26	24	6	1650	1637	210	50	150	14	131	+0.5	0.1	263	366	1501
	132.40.1600.002	1868.8															16	114			302	417	1471

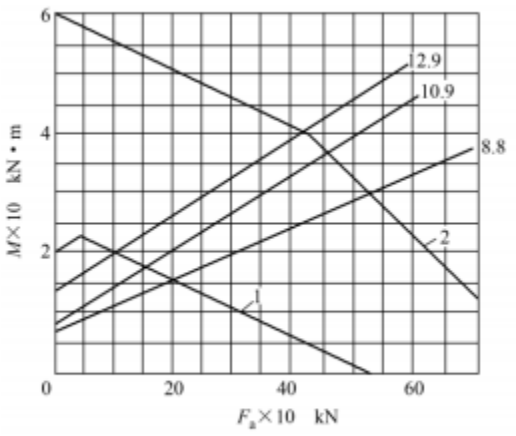
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Load bearing curve page		Ref. weight Kg
		De mm	D mm	d mm	H mm	D1 mm	D2 mm	n	Φ mm	M mm	n1	D3 mm	d1 mm	H1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
125	131.40.1800.002	2069.2	1995	1605	220	1943	1657	48	26	24	6	1850	1837	210	50	150	14	145	+0.5	0.1	263	366	1682
	132.40.1800.002	2076.8															16	127			302	417	1697
126	131.45.2000.002	2300.8	2221	1779	231	2155	1845	60	33	30	6	2055	2033	219	54	160	16	141	+0.5	0.1	322	445	2147
	132.45.2000.002	2300.4															18	125			362	501	2129
126	131.45.2240.002	2556.8	2461	2019	231	2395	2085	60	33	30	6	2295	2273	219	54	160	16	157	+0.5	0.1	322	445	2501
	132.45.2240.002	2552.4															18	139			362	501	2461
126	131.45.2500.002	2822.4	2721	2279	231	2655	2345	72	33	30	8	2555	2533	219	54	160	18	154	+0.5	0.1	362	501	2786
	132.45.2500.002	2816															20	138			402	556	2731
126	131.45.2800.002	3110.4	3021	2579	231	2955	2645	72	33	30	8	2855	2833	219	54	160	18	170	+0.5	0.1	362	501	3067
	132.45.2800.002	3116															20	153			402	556	3079
126	131.50.3150.002	3536	3432	2868	270	3342	2958	72	45	42	8	3213	3196	258	65	180	20	174	+0.5	0.1	452	626	5025
	132.50.3150.002	3537.6															22	158			498	689	5009

Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size					Gear parameter					Load bearing curve page		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
124	133.25.0500.002	337	634	366	148	598	402	24	18	16	4	474	463	138	32	80	5	68	+0.5	0.2	50	70	198
	134.25.0500.002	338.4															6	57			60	83	198
124	133.25.0560.002	397	694	426	148	658	462	24	18	16	4	534	523	138	32	80	5	80	+0.5	0.2	50	70	222
	134.25.560.002	398.4															6	67			60	83	220
124	133.25.0630.002	458.4	764	496	148	728	532	28	18	16	4	604	593	138	32	80	6	77	+0.5	0.2	60	83	253
	134.25.0630.002	459.2															8	58			80	111	251
124	133.25.0710.002	536.4	844	576	148	808	612	28	18	16	4	684	673	138	32	80	6	90	+0.5	0.2	60	83	288
	134.25.0710.002	539.2															8	68			80	111	284
124	133.32.0800.002	595.2	964	636	182	920	680	36	22	20	4	770	759	172	40	120	8	75	+0.5	0.2	121	167	483
	134.32.0800.002	594															10	60			151	209	481
124	133.32.0900.002	691.2	1064	736	182	1020	780	36	22	20	4	870	859	172	40	120	8	87	+0.5	0.2	121	167	551
	134.32.0900.002	694															10	70			151	209	545
125	133.32.1000.002	784	1164	836	182	1120	880	40	22	20	5	970	959	172	40	120	10	79	+0.5	0.2	151	209	618
	134.32.1000.002	784.8															12	66			181	251	613
125	133.32.1120.002	904	1284	956	182	1240	1000	40	22	20	5	1090	1079	172	40	120	10	91	+0.5	0.2	151	209	698
	134.32.1120.002	904.8															12	76			181	251	691
125	133.40.1250.002	988.8	1445	1055	220	1393	1107	45	26	24	5	1213	1200	210	50	150	12	83	+0.5	0.2	226	314	1123
	134.40.1250.002	985.6															14	71			263	366	1122
125	133.10.1400.002	1144.8	1595	1205	220	1543	1257	45	26	24	5	1363	1350	210	50	150	12	96	+0.5	0.2	226	314	1254
	134.40.1400.002	1139.6															14	82			263	366	1258
125	133.40.1600.002	1335.6	1795	1405	220	1743	1457	48	26	24	6	1563	1550	210	50	150	14	96	+0.5	0.2	263	366	1454
	134.40.1600.002	1334.4															16	84			302	417	1448

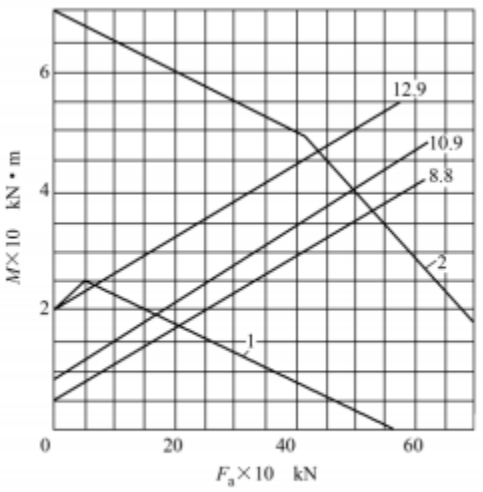
Load curve page	Model D_L mm	Overall dimension				Installation dimension					Structure size						Gear parameter					Load bearing curve page		Ref. weight Kg
		De mm	D mm	d mm	H mm	D_1 mm	D_2 mm	n	Φ mm	M mm	n_1	D_3 mm	d_1 mm	H_1 mm	h mm	b mm	m mm	z	x	k	Normalizing Kn	Tempering Kn	
125	133.40.1800.002	1531.6	1995	1605	220	1943	1657	48	26	24	6	1763	1750	210	50	150	14	110	+0.5	0.2	263	366	1658
	134.40.1800.002	1526.4															16	96			302	417	1663
126	133.45.2000.002	1702.4	2221	1779	231	2155	1845	60	33	30	6	1967	1945	219	54	160	16	107	+0.5	0.2	322	445	2114
	134.45.2000.002	1699.2															18	95			362	501	2112
126	133.45.2240.002	1926.4	2461	2019	231	2395	2085	60	33	30	6	2207	2185	219	54	160	16	121	+0.5	0.2	322	445	2447
	134.45.2240.002	1933.2															18	108			362	501	2407
126	133.45.2500.002	2185.2	2721	2279	231	2655	2345	72	33	30	8	2467	2445	219	54	160	18	122	+0.5	0.2	362	501	2862
	134.45.2500.002	2188															20	110			402	556	2834
126	133.45.2800.002	2491.2	3021	2579	231	2955	2645	72	33	30	8	2767	2745	219	54	160	18	139	+0.5	0.2	362	501	3211
	134.45.2800.002	2488															20	125			402	556	3209
126	133.50.3150.002	2768	3432	2868	270	3342	2958	72	45	42	8	3104	3090	258	65	180	20	139	+0.5	0.2	452	626	4954
	134.50.3150.002	2758.8															22	126			498	689	4988

4.5 Slewing Bearing_Load bearing Curve

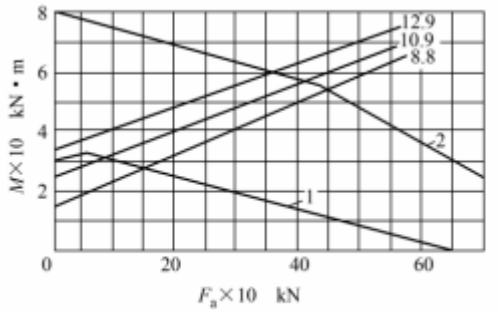
4.5.1 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T2300



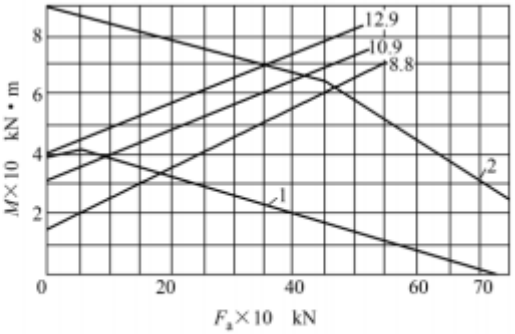
01×.20.200



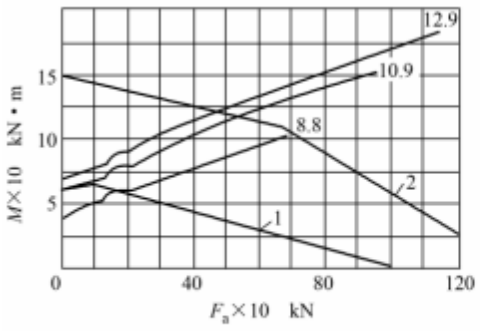
02×.20.224



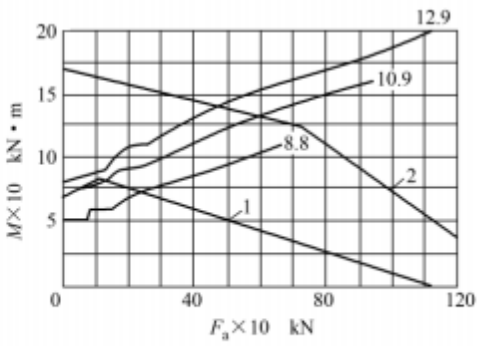
01×.20.250



01×.20.280

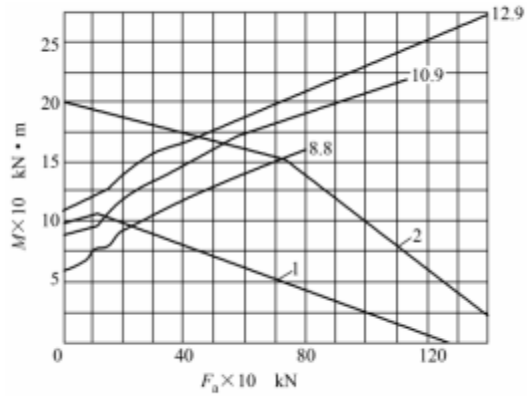


01×.25.315

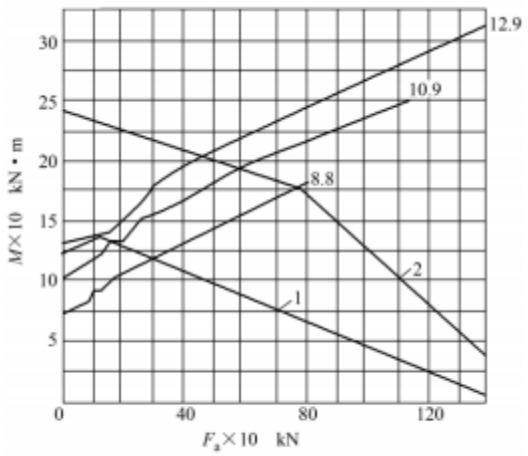


01×.25.355

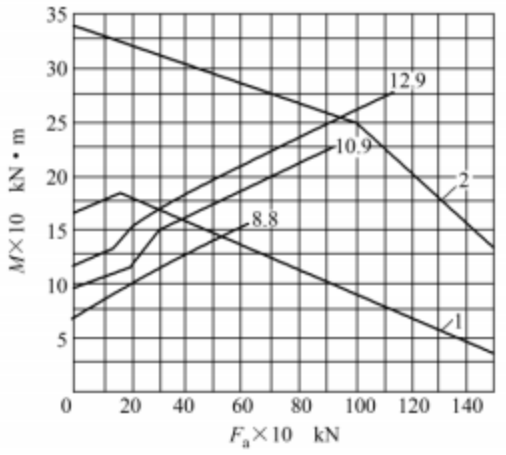
4.5.1 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T2300



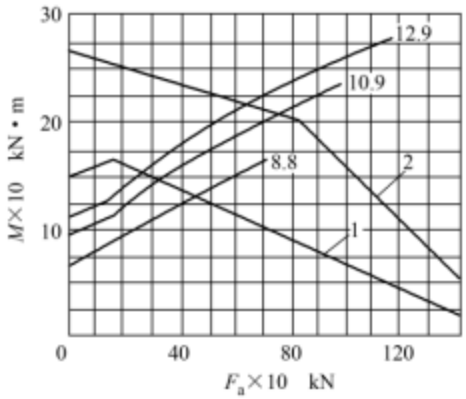
01×.25.400



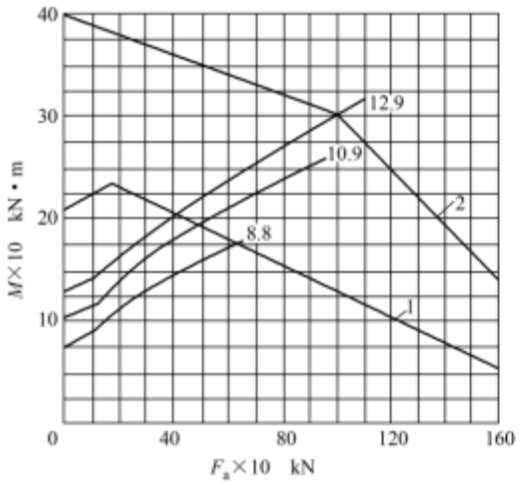
01×.25.450



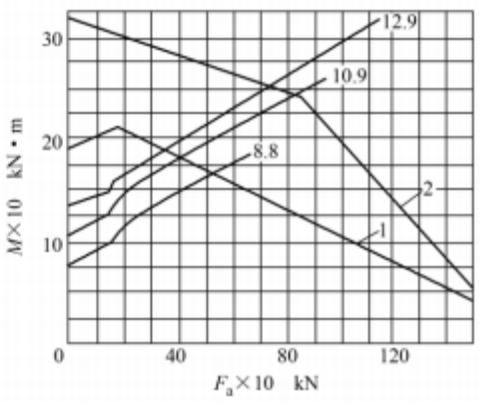
01×.30.500



01×.25.500

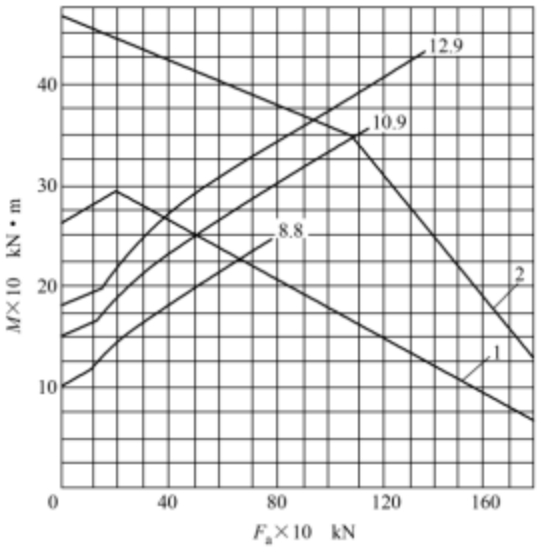


01×.30.560

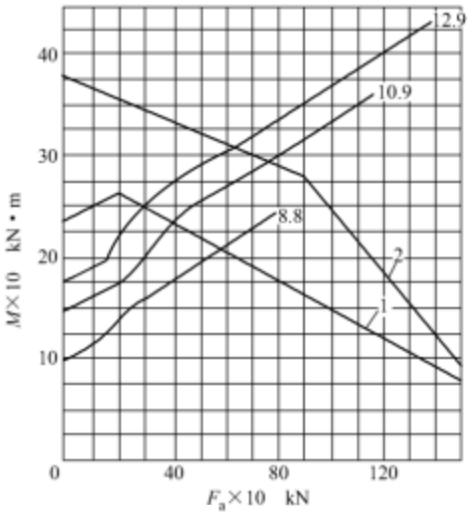


01×.25.560

4.5.1 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T2300



01×.30.630



01×.25.630

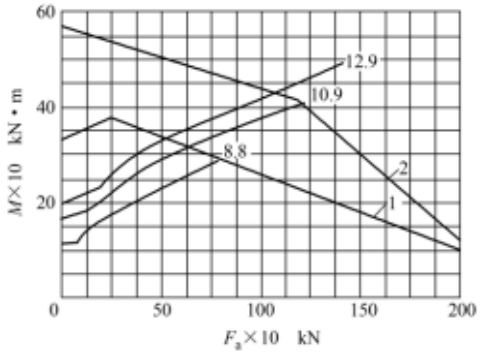


图 B.15 01×.30.710

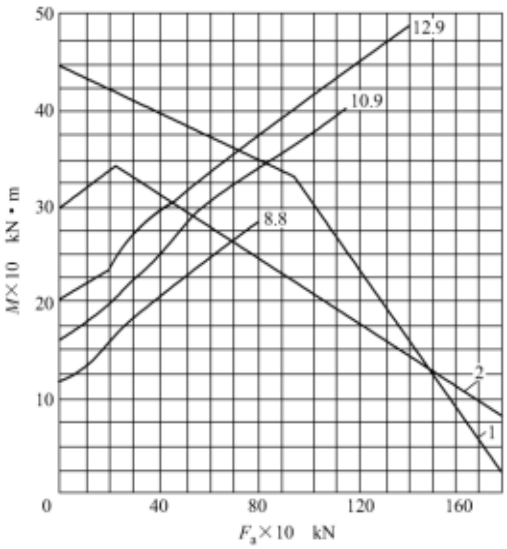
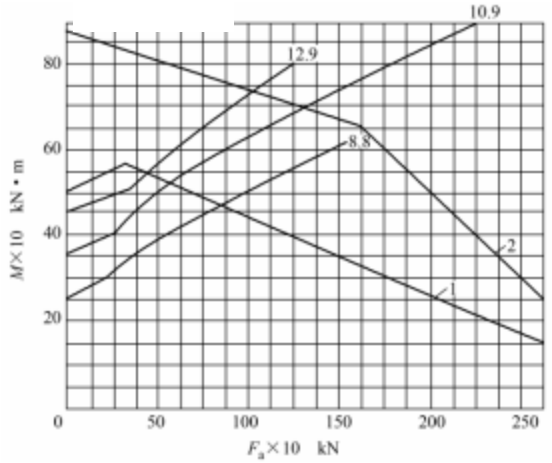
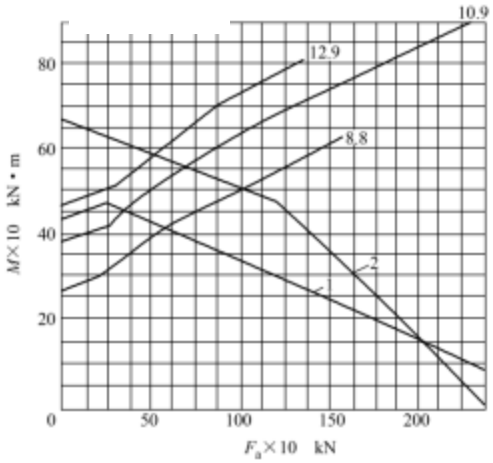


图 B.16 01×.25.710

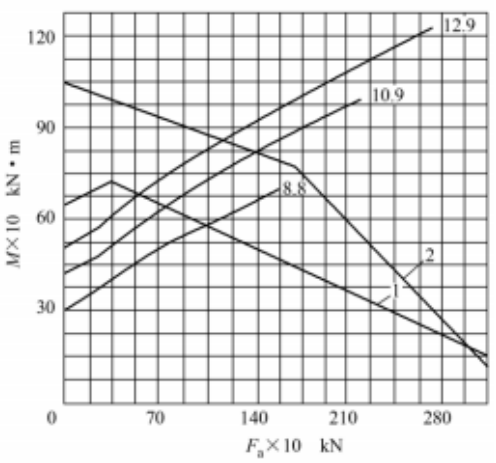


01×.40.800

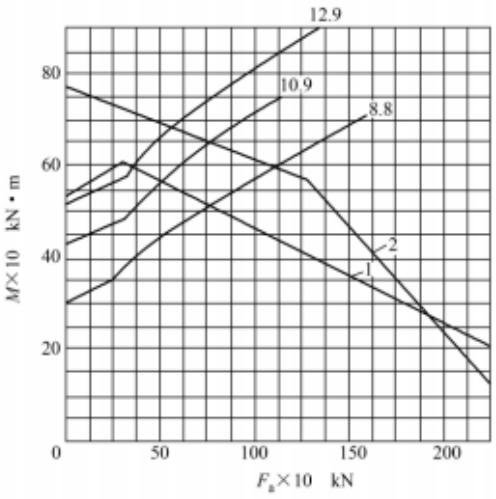


01×.30.800

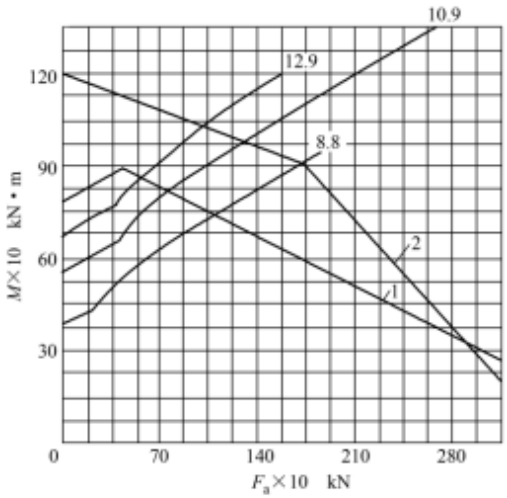
4.5.1 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T2300



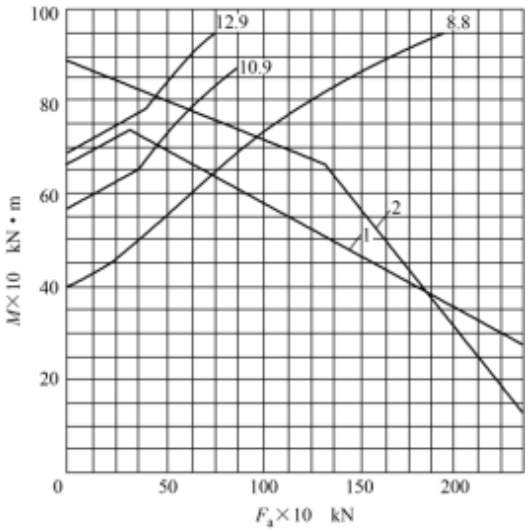
01×.40.900



1×.30.900



01×.40.1000



01×.30.1000

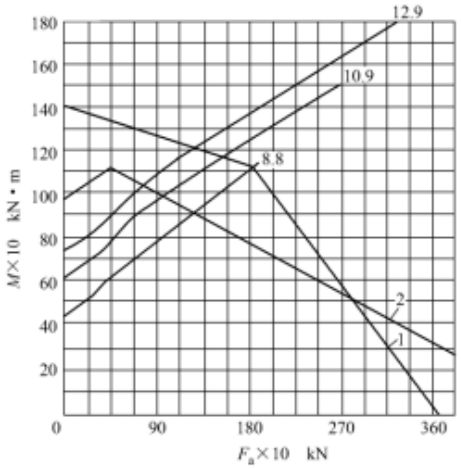


图 B.23 01×.40.1120

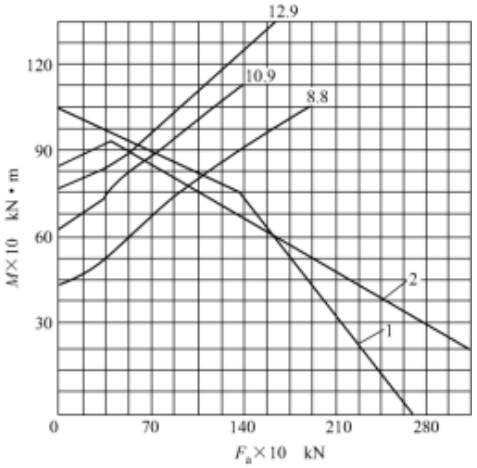
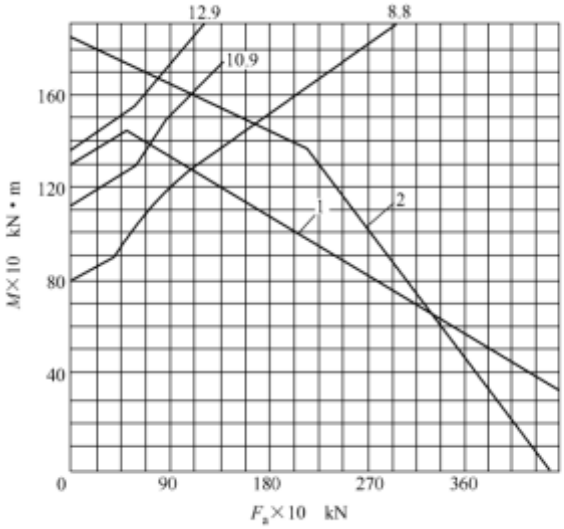
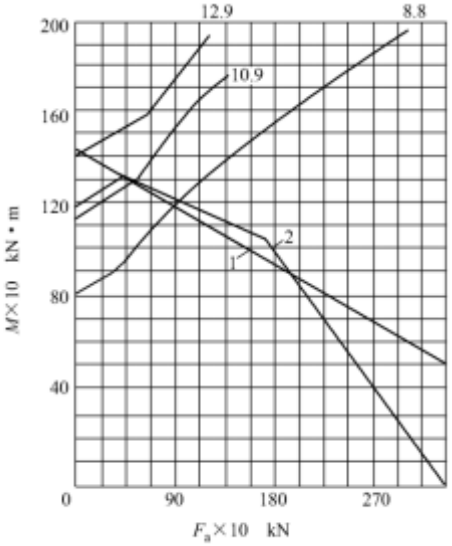


图 B.24 01×.30.1120

4.5.1 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T2300



01×.45.1250



01×.35.1250

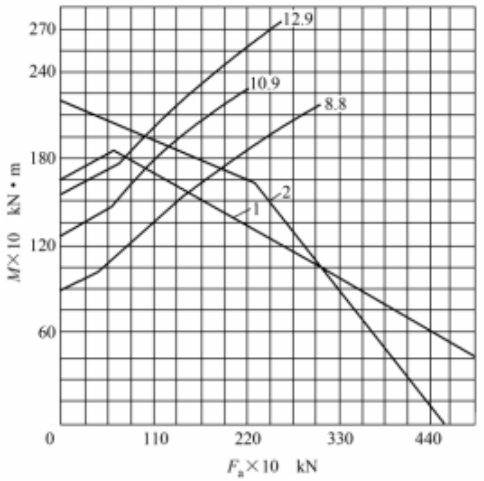


图 B.27 01×.45.1400

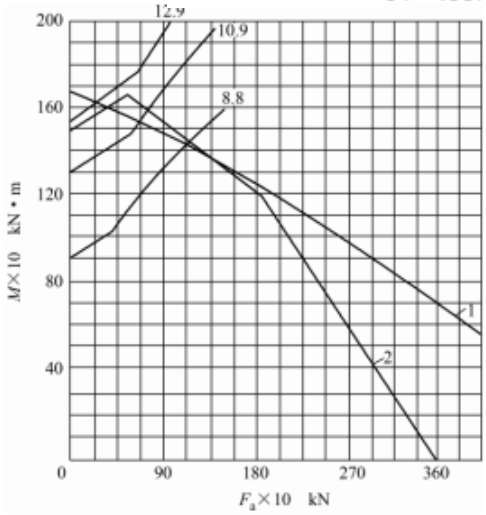
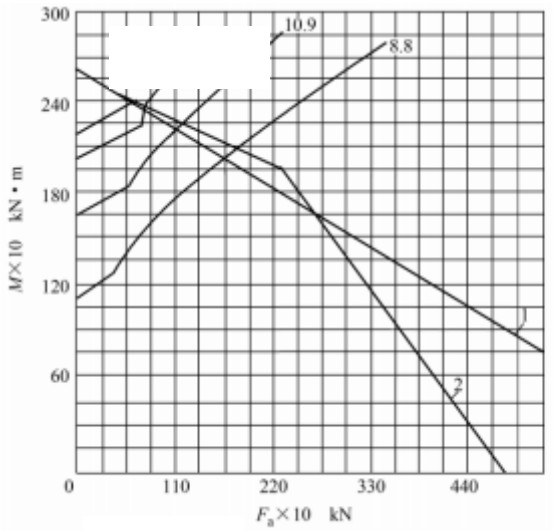
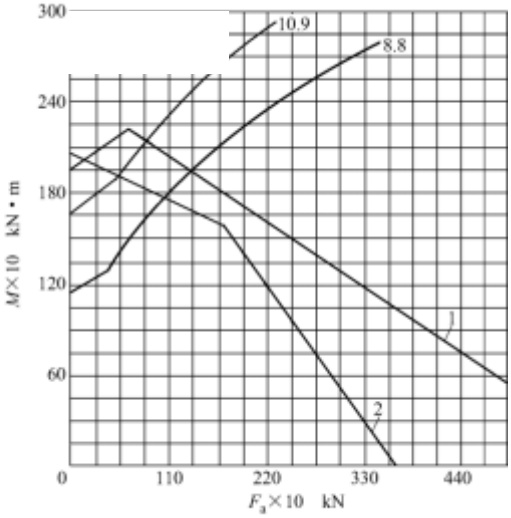


图 B.28 01×.35.1400

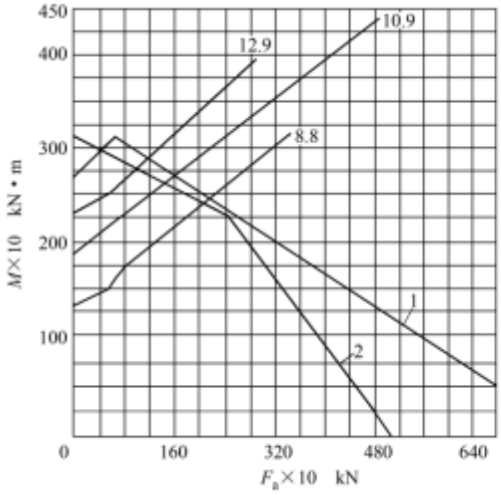


01×.45.1600

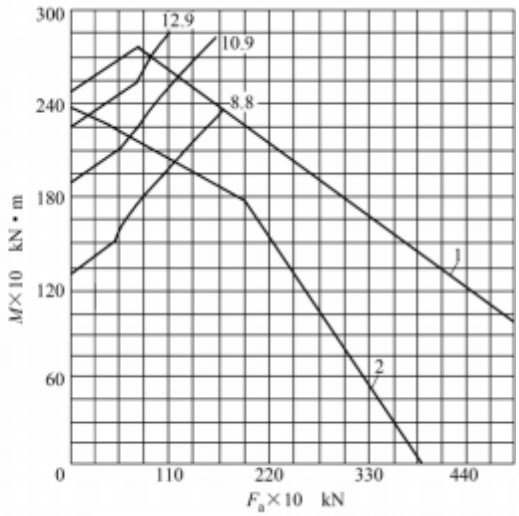


01×.35.1600

4.5.1 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing **Design standard JB/T2300**



01×.45.1800



01×.35.1800

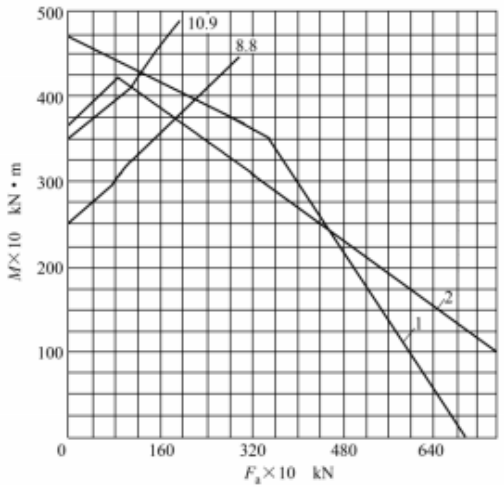


图 B.33 01×.60.2000

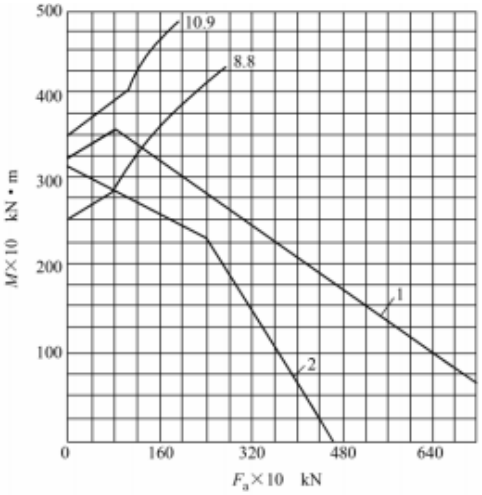
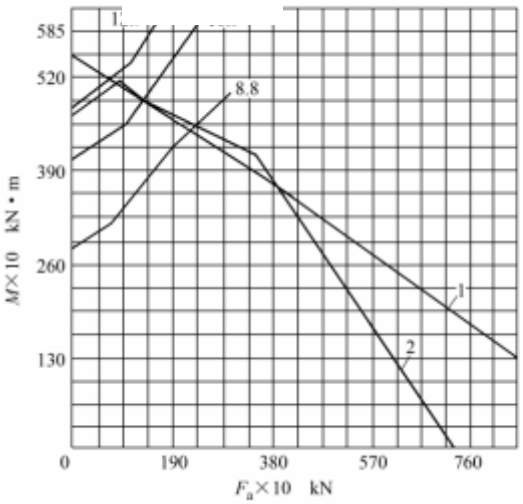
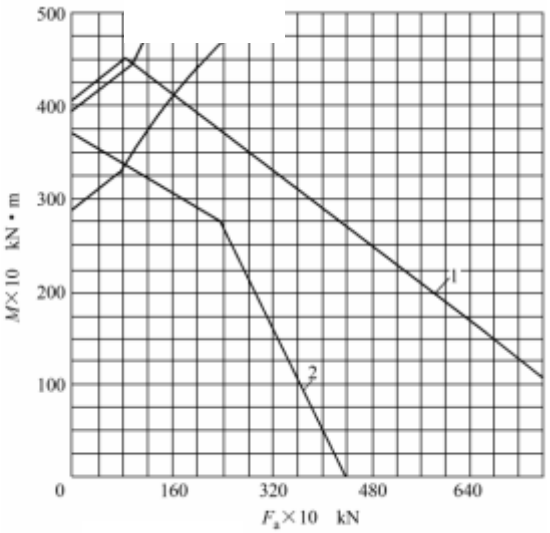


图 B.34 01×.40.2000

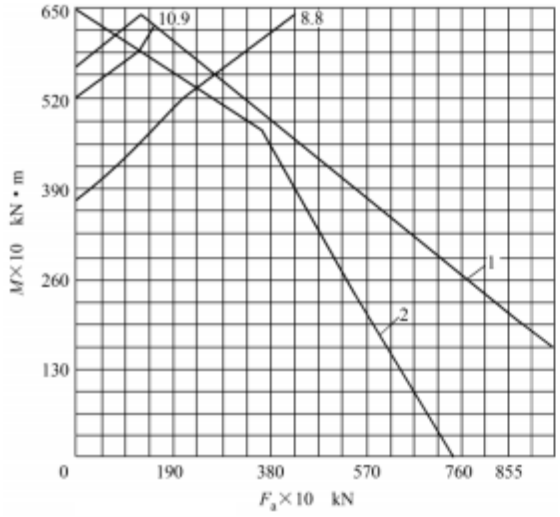


01×.60.2240

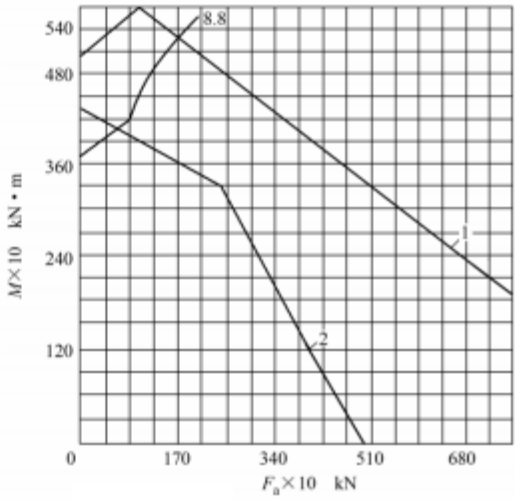


01×.40.2240

4.5.1 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T2300



01×.60.2500



01×.40.2500

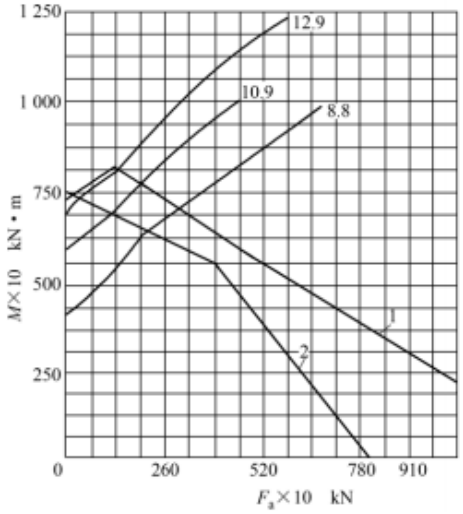


图 B.39 01×.60.2800

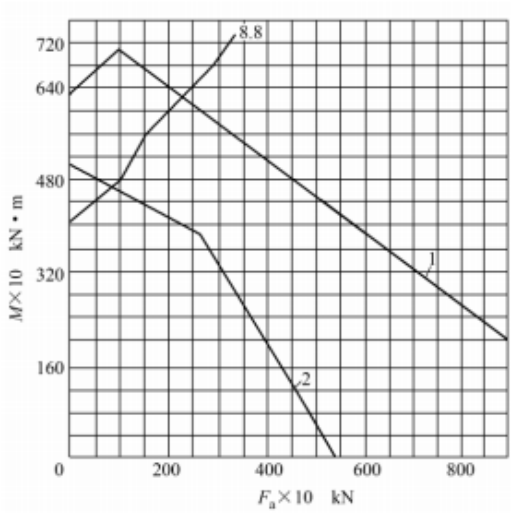
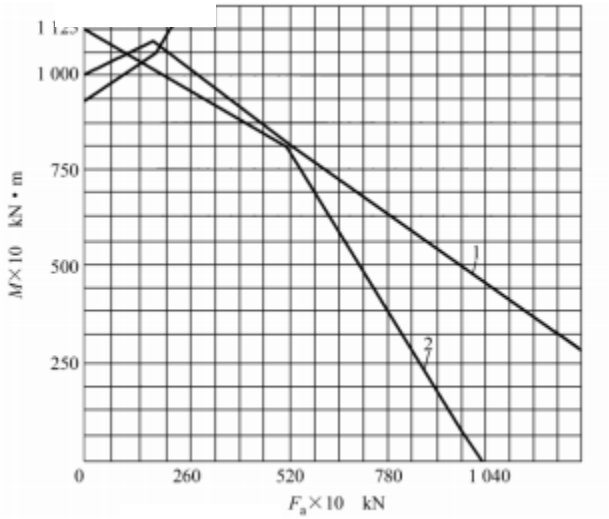
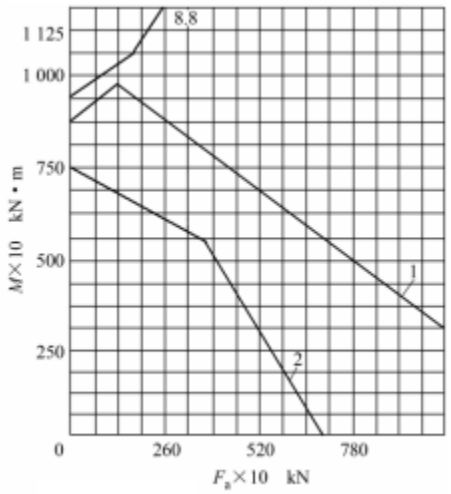


图 B.40 01×.40.2800

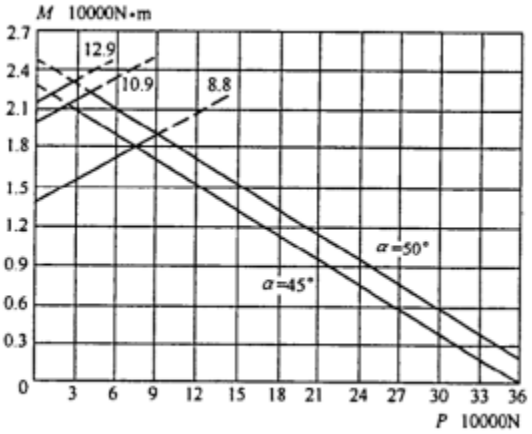


01×.75.3150

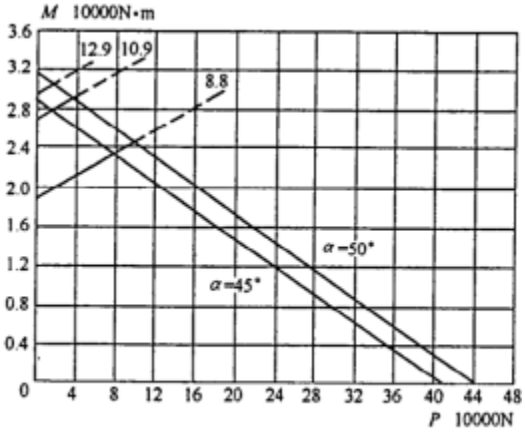


01×.50.3150

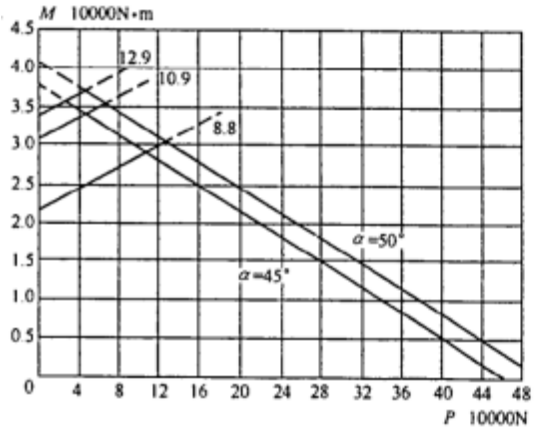
4.5.2 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T 10839



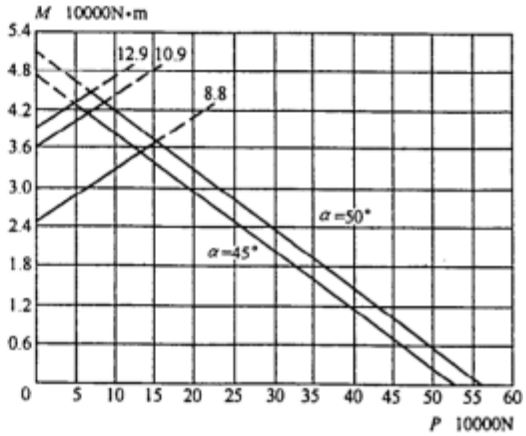
D_0=280mm d_0=16mm



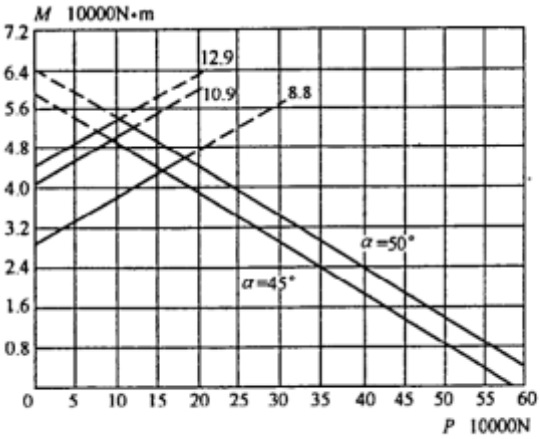
D_0=315mm d_0=16mm



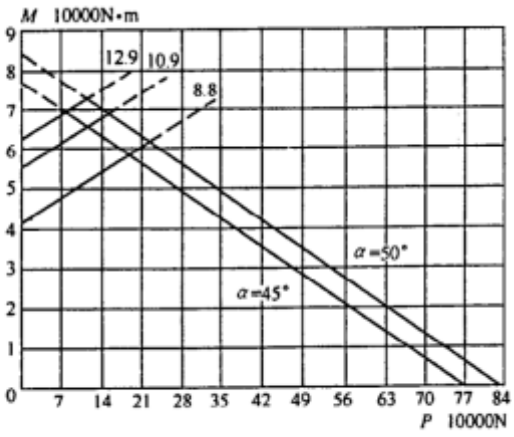
D_0=355mm d_0=16mm



D_0=400mm d_0=16mm

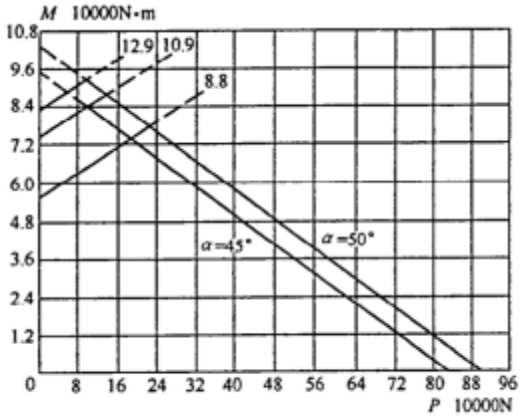


D_0=450mm d_0=16mm

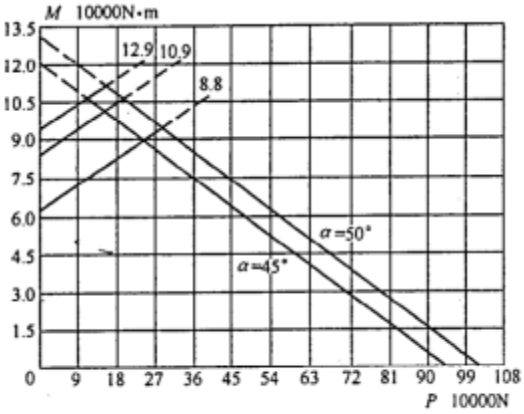


D_0=450mm d_0=20mm

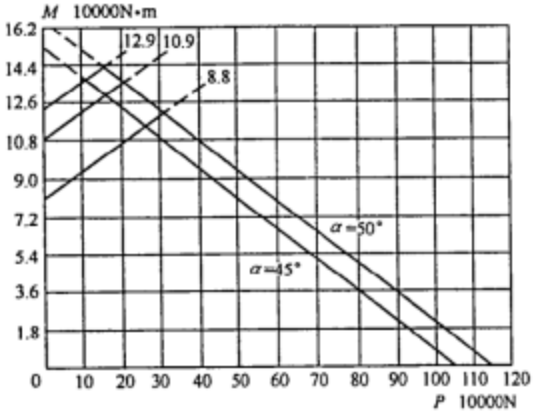
4.5.2 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T 10839



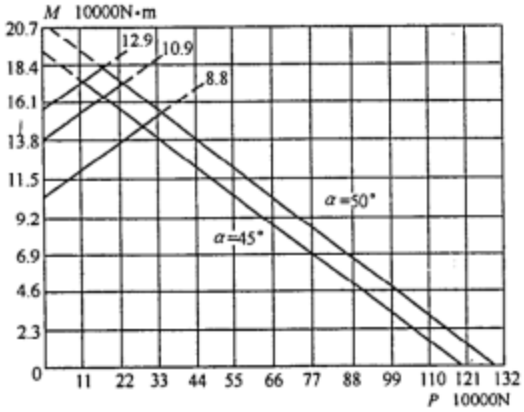
D_0=500mm d_0=20mm



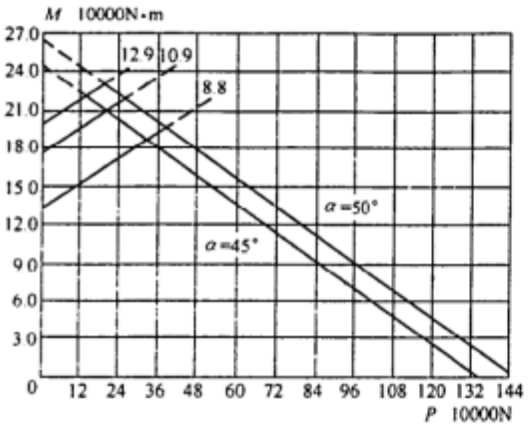
D_0=560mm d_0=20mm



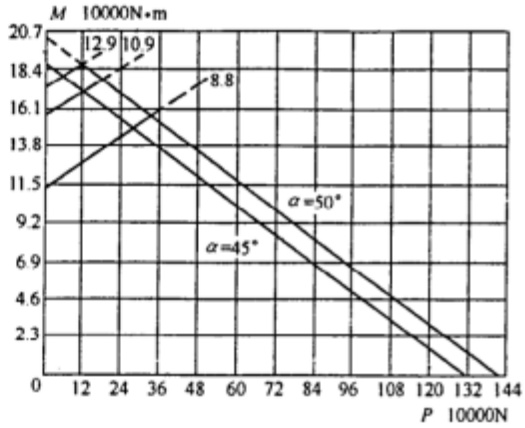
D_0=630mm d_0=20mm



D_0=710mm d_0=20mm

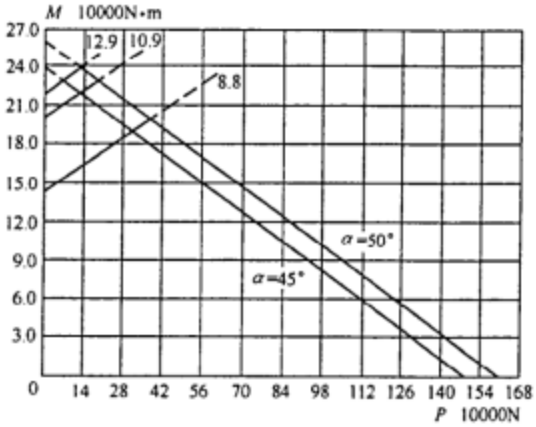


D_0=800mm d_0=20mm

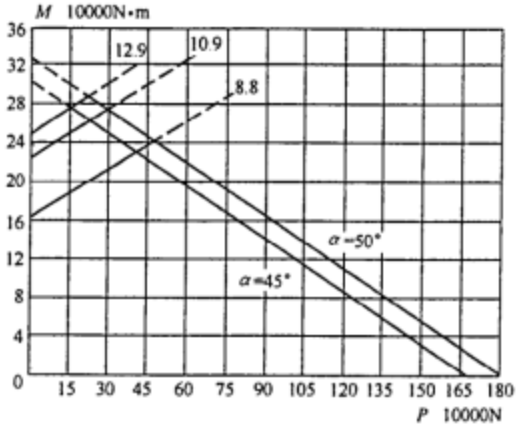


D_0=630mm d_0=25mm

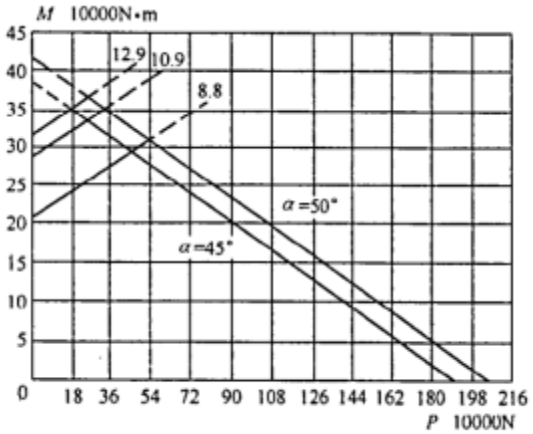
4.5.2 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T 10839



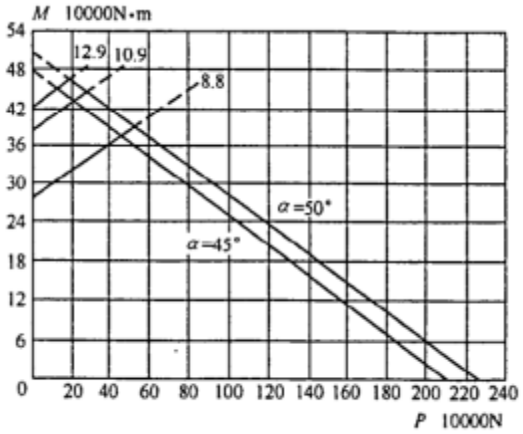
D_0=710mm d_0=25mm



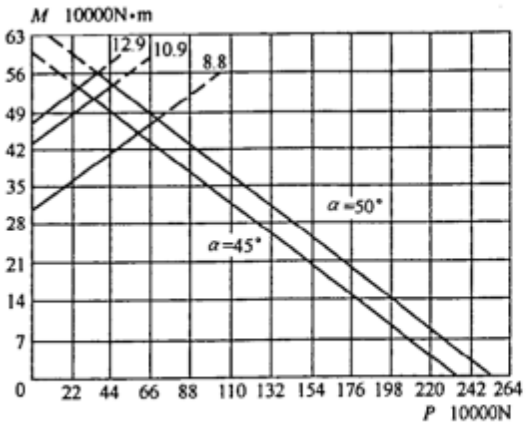
D_0=800mm d_0=25mm



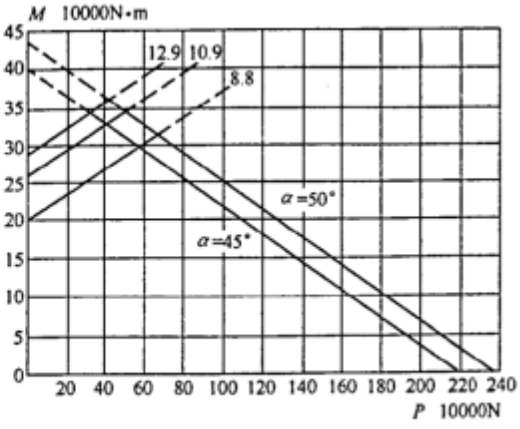
D_0=900mm d_0=25mm



D_0=1000mm d_0=25mm

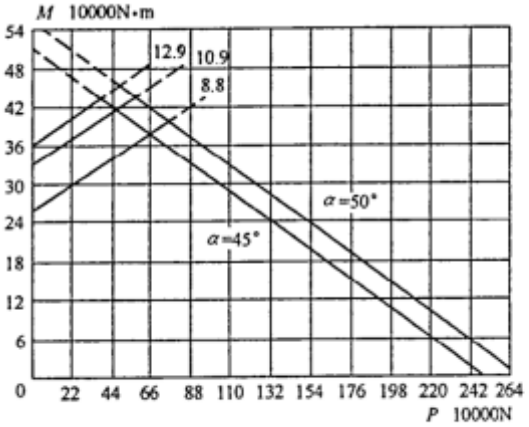


D_0=1120mm d_0=25mm

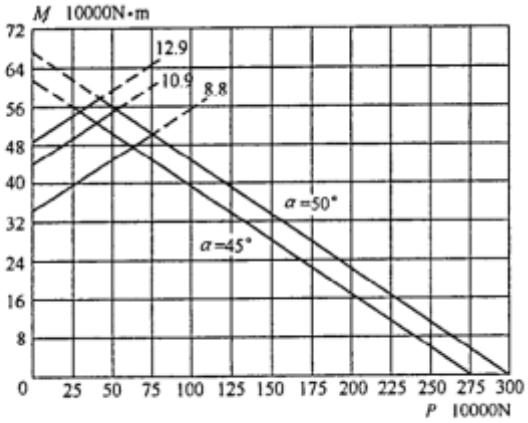


D_0=800mm d_0=32mm

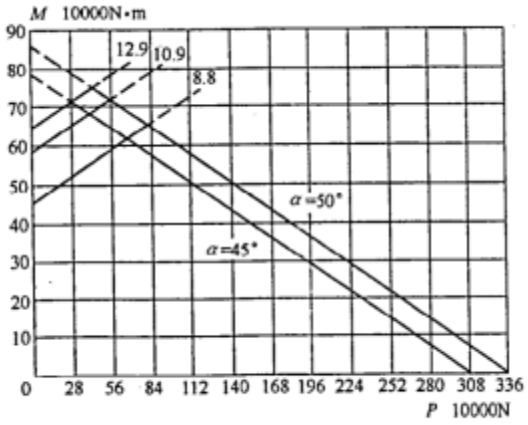
4.5.2 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T 10839



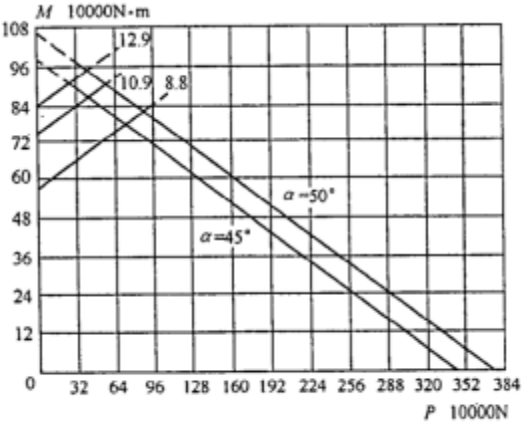
D_0=900mm d_0=32mm



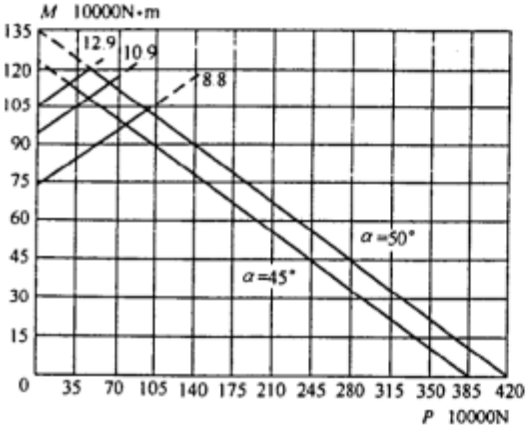
D_0=1000mm d_0=32mm



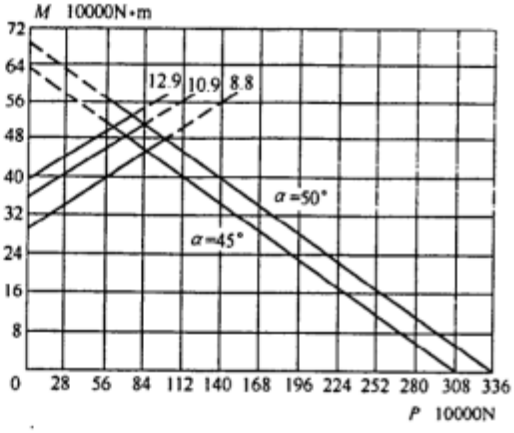
D_0=1120mm d_0=32mm



D_0=1250mm d_0=32mm

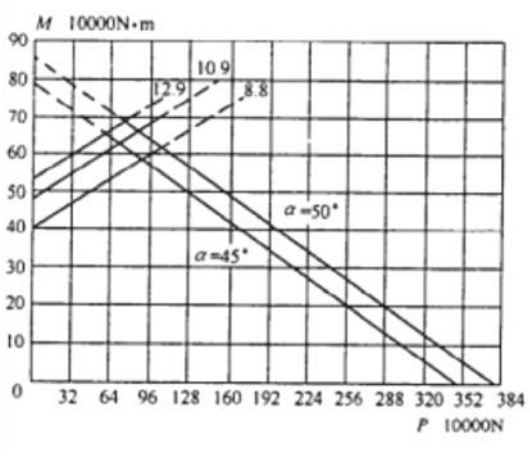


D_0=1400mm d_0=32mm

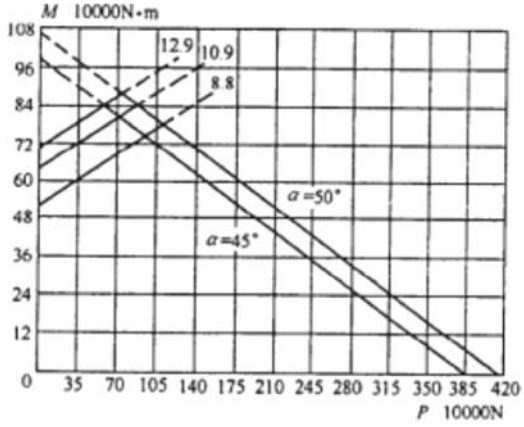


D_0=900mm d_0=40mm

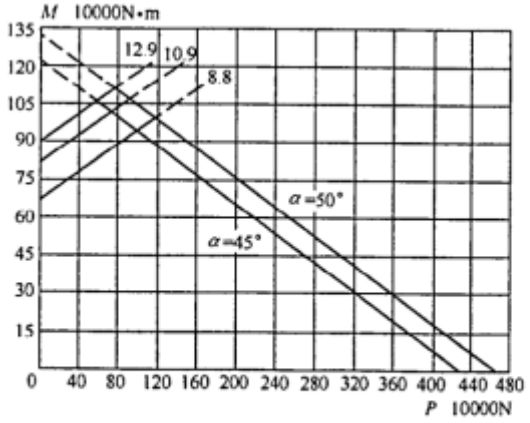
4.5.2 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T 10839



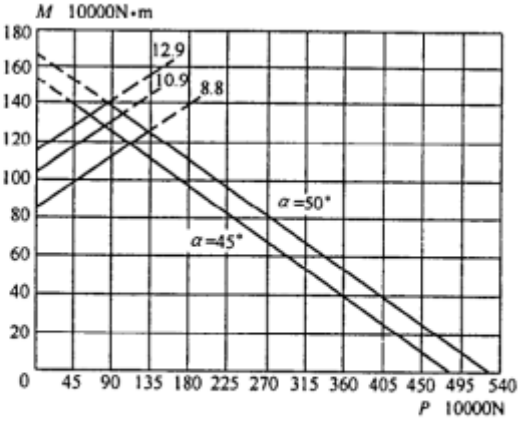
D_0=1000mm d_0=40mm



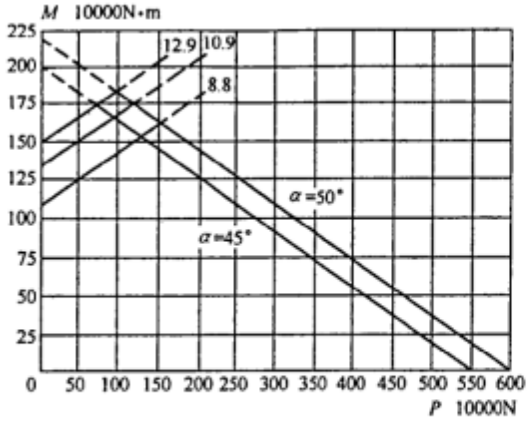
D_0=1120mm d_0=40mm



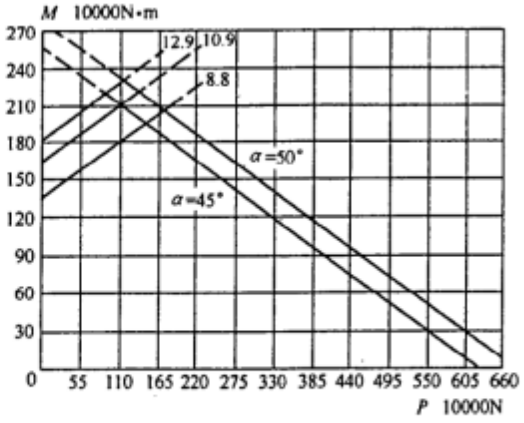
D_0=1250mm d_0=40mm



D_0=1400mm d_0=40mm

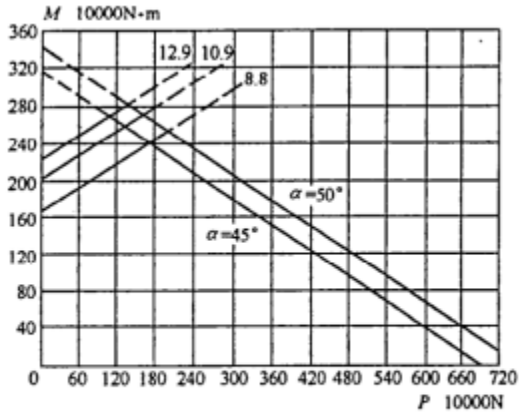


D_0=1600mm d_0=40mm

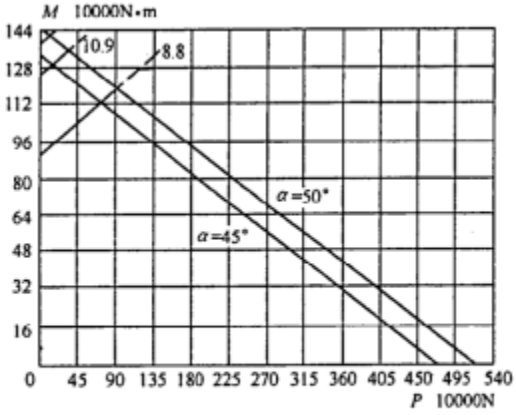


D_0=1800mm d_0=40mm

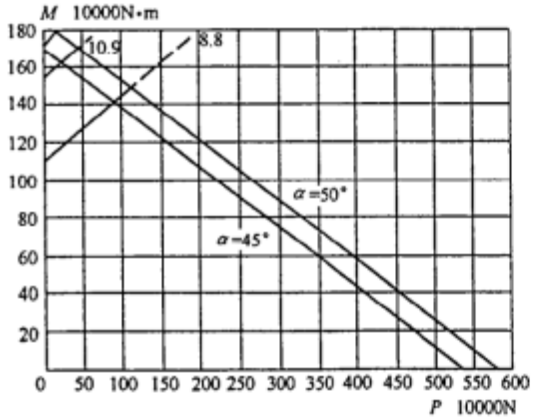
4.5.2 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T 10839



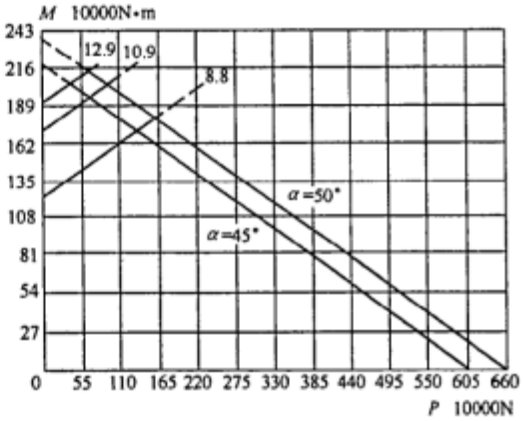
D_0=2000mm d_0=40mm



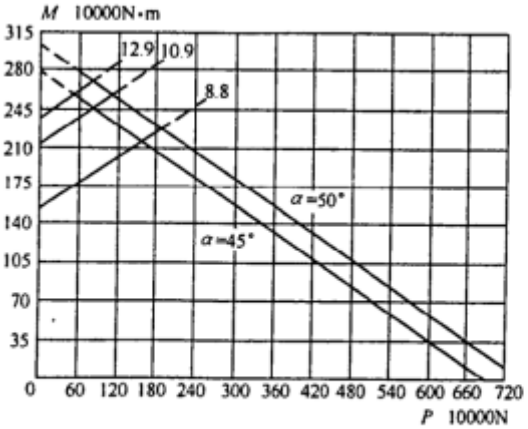
D_0=1250mm d_0=50mm



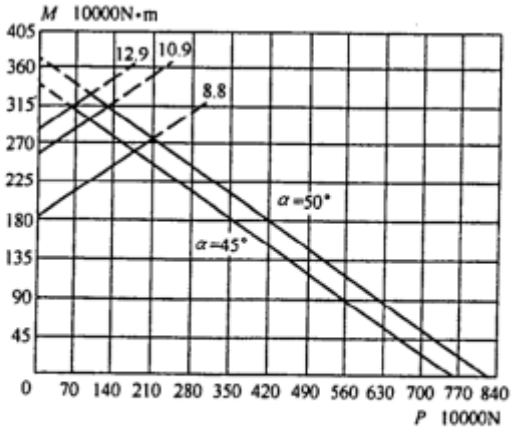
D_0=1400mm d_0=50mm



D_0=1600mm d_0=50mm

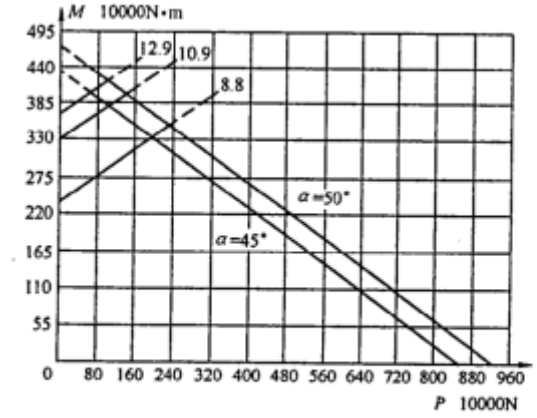


D_0=1800mm d_0=50mm

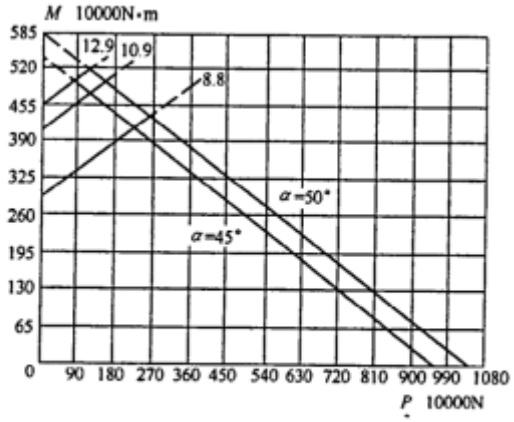


D_0=2000mm d_0=50mm

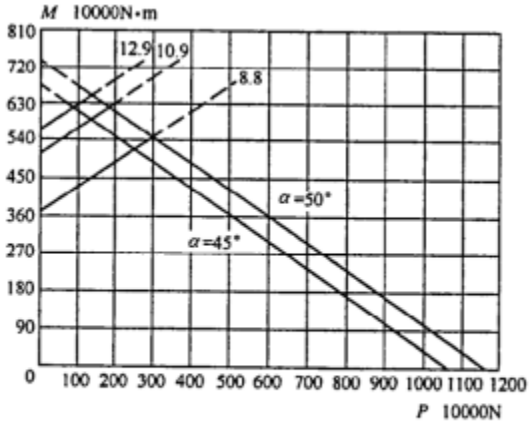
4.5.2 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T 10839



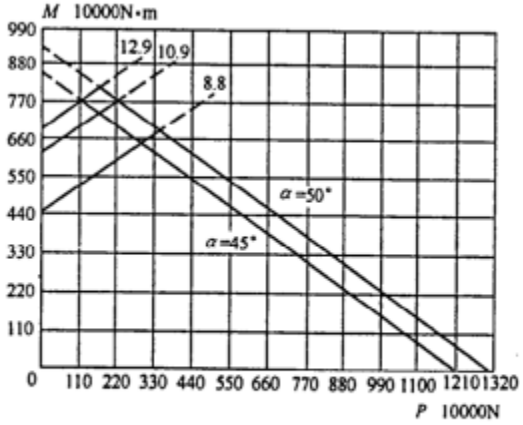
D_0=2240mm d_0=50mm



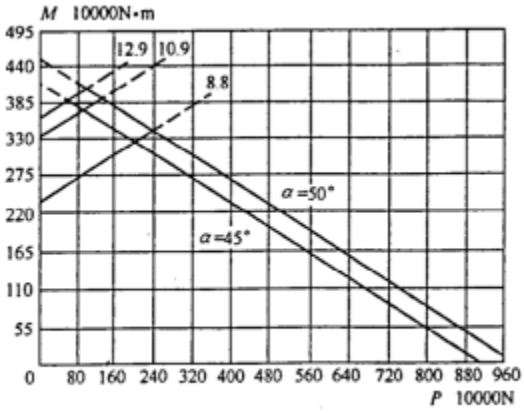
D_0=2500mm d_0=50mm



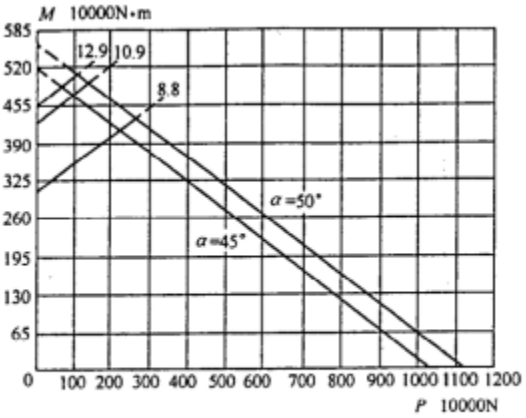
D_0=2800mm d_0=50mm



D_0=3150mm d_0=50mm

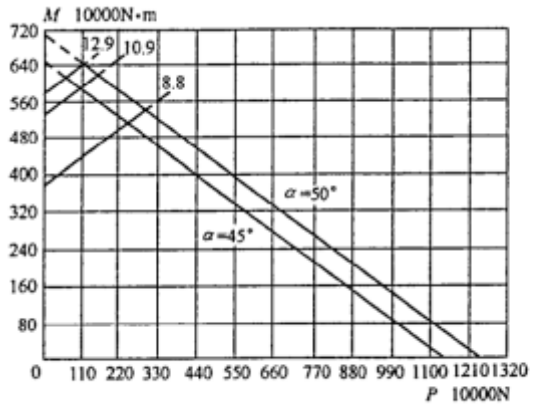


D_0=2000mm d_0=60mm

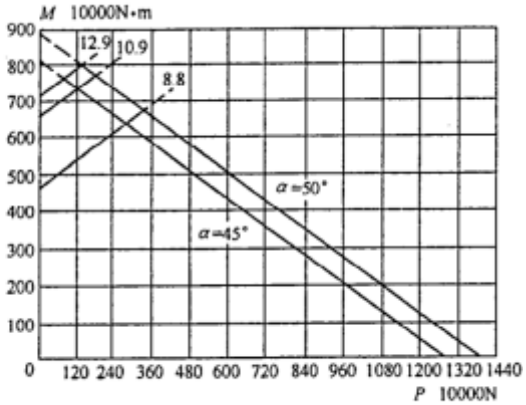


D_0=2240mm d_0=60mm

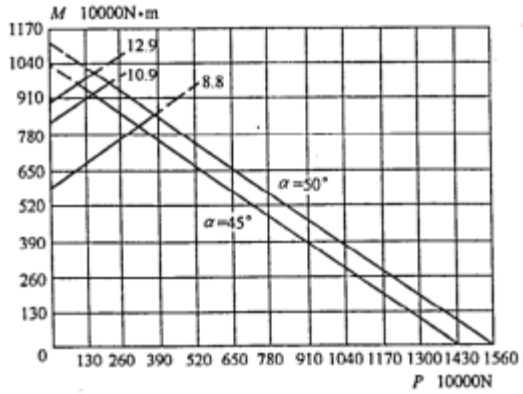
4.5.2 Load bearing Curve_Single Row Four-Point Contact Slewing Bearing Design standard JB/T 10839



D_0=2500mm d_0=60mm

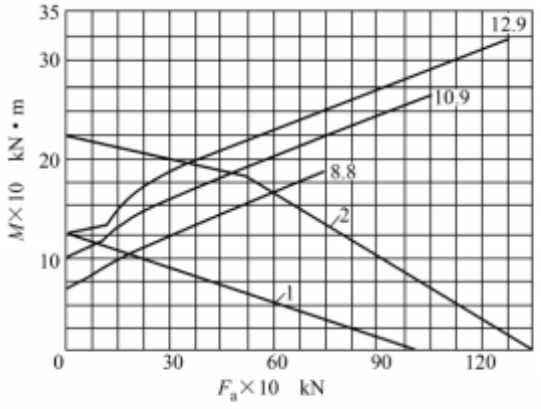


D_0=2800mm d_0=60mm

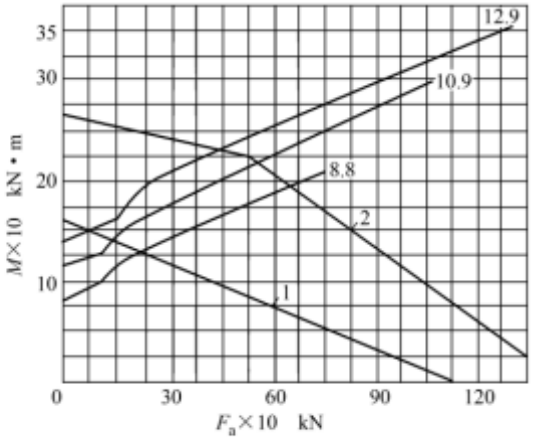


D_0=3150mm d_0=60mm

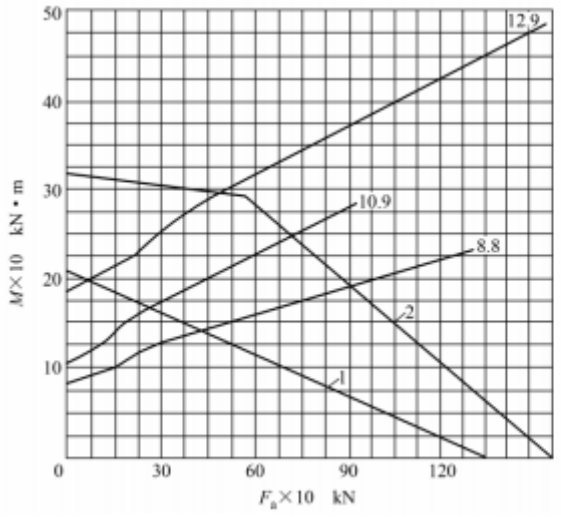
4.5.3 Load bearing Curve_Single Row Crossed Roller Series — Design Standard JB/T 2300



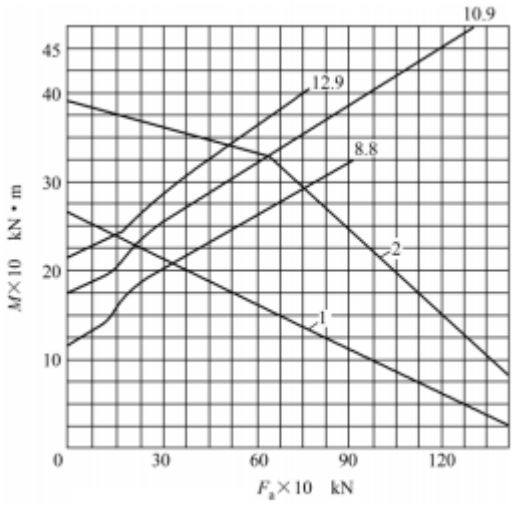
11×.25.500



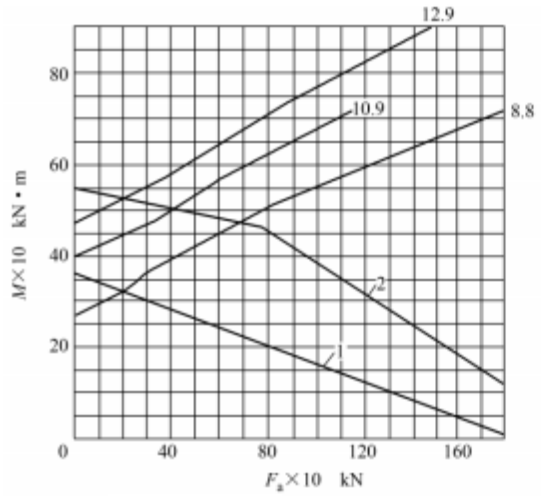
11×.25.560



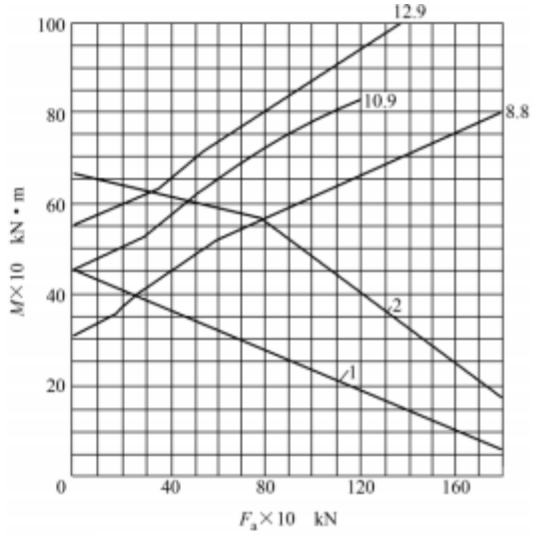
11×.25.630



11×.25.710

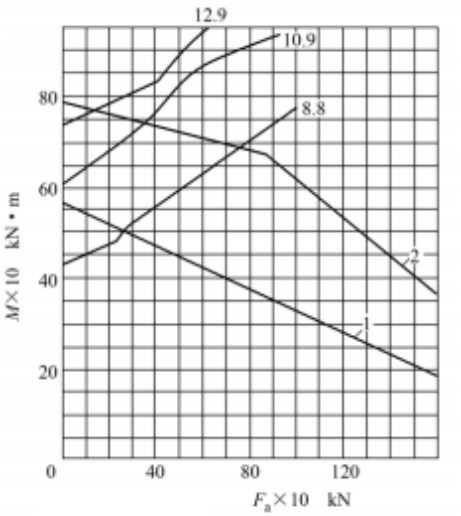


11×.28.800

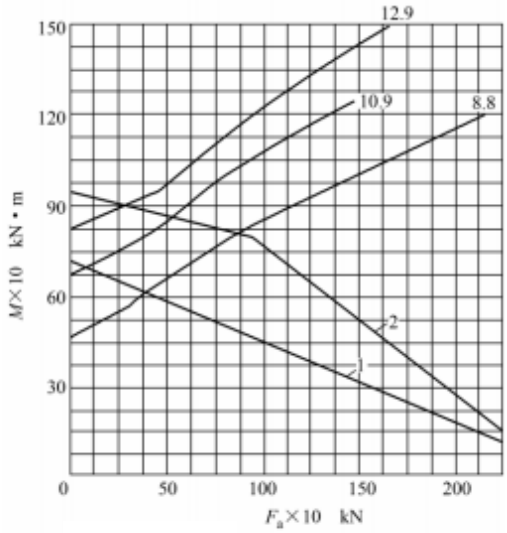


11×.28.900

4.5.3 Load bearing Curve_Single Row Crossed Roller Series Design Standard JB/T 2300



11×.28.1000



11×.28.1120

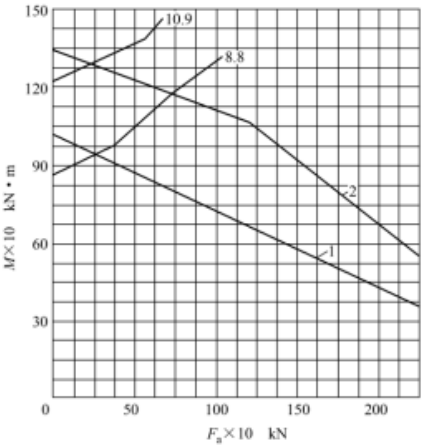


图 B.77 11×.32.1250

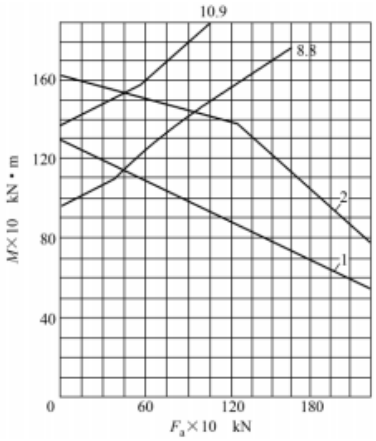
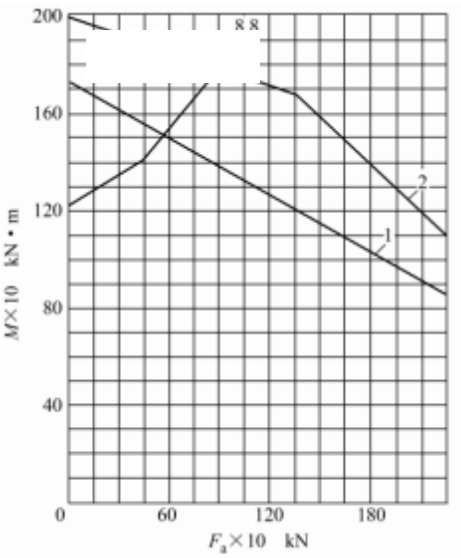
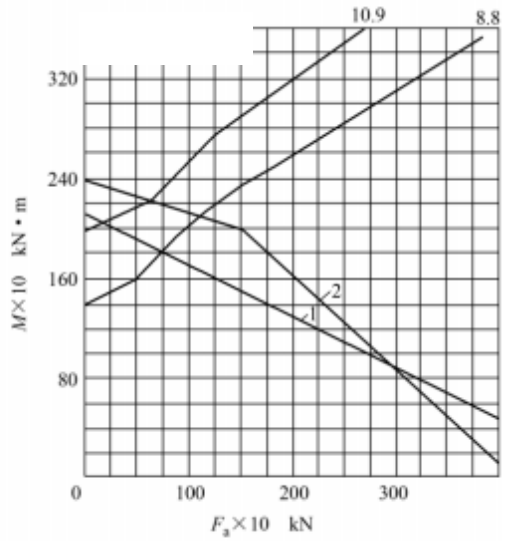


图 B.78 11×.32.1400

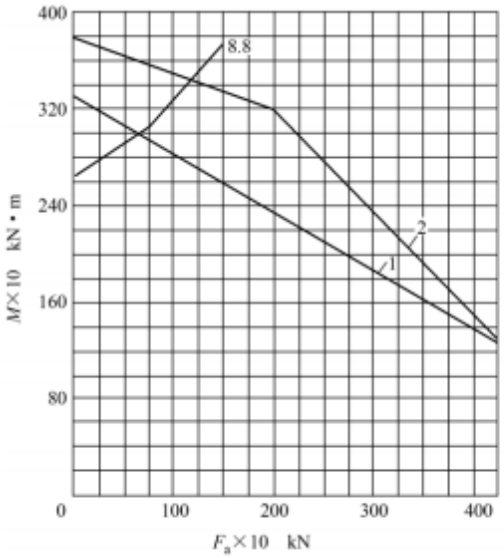


11×.32.1600

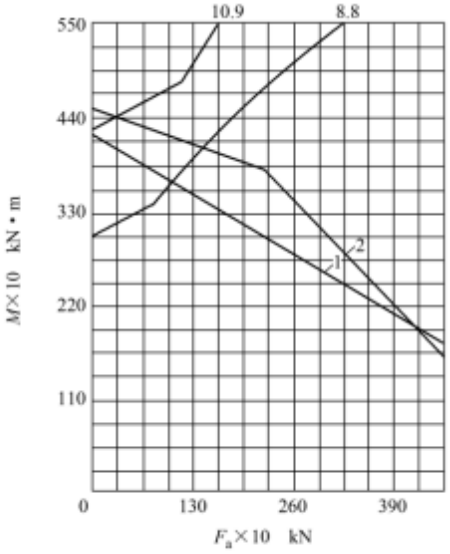


11×.32.1800

4.5.3 Load bearing Curve_Single Row Crossed Roller Series Design Standard JB/T 2300



11×.40.2000



11×.40.2240

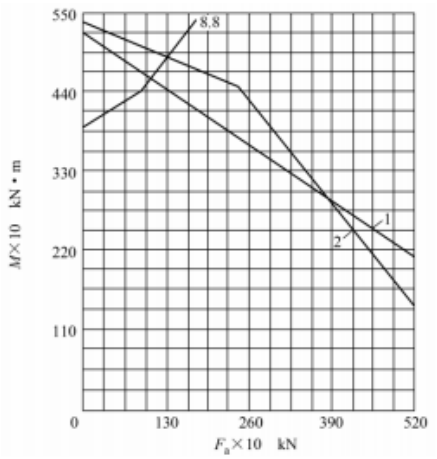


图 B.83 11×.40.2500

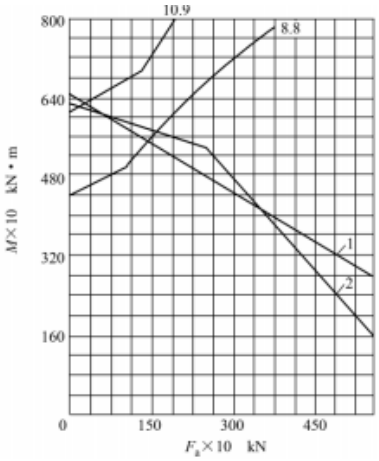
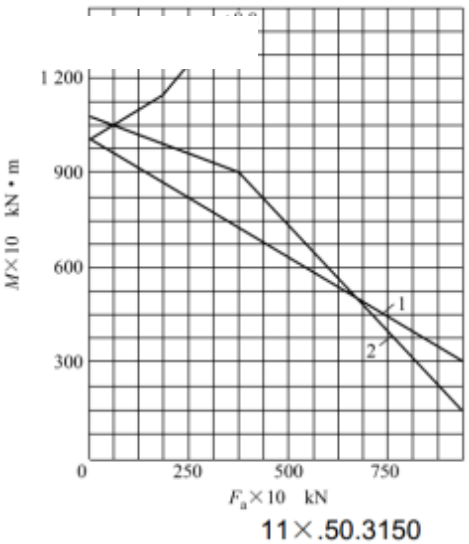
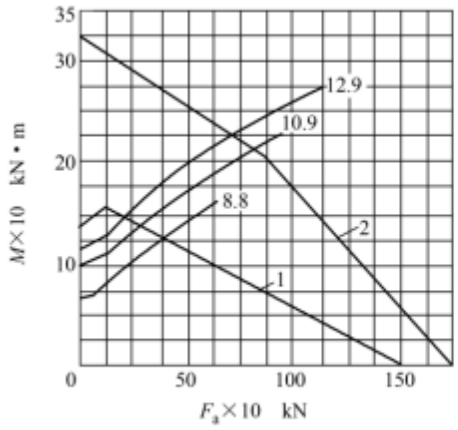


图 B.84 11×.40.2800



11×.50.3150

4.5.4 Load bearing Curve_Double Row Ball Series Design Standard JB/T 2300



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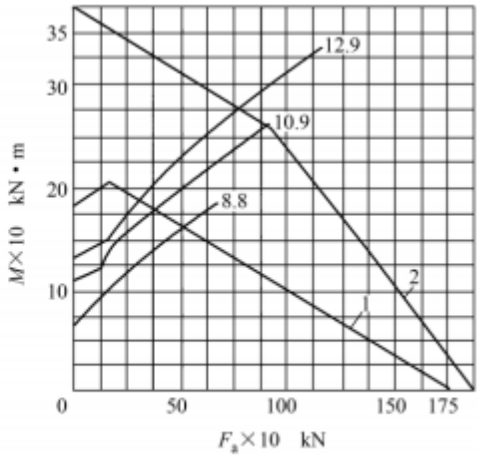

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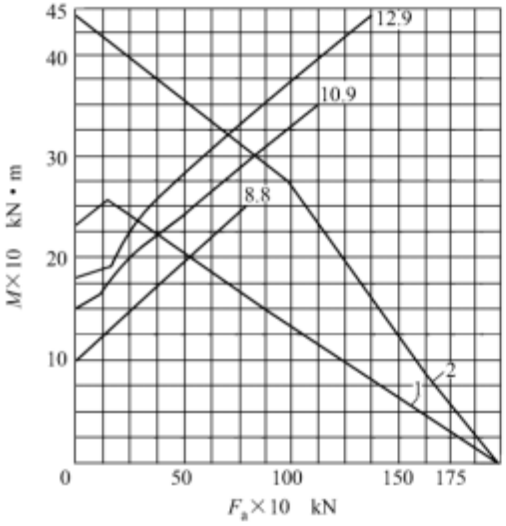

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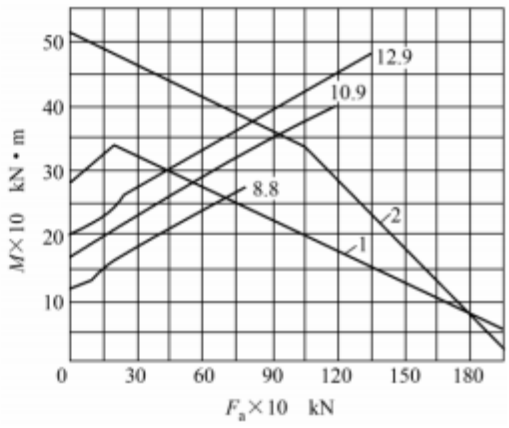

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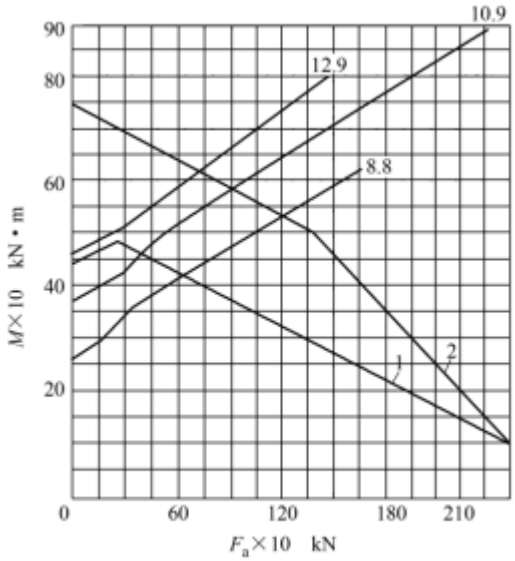

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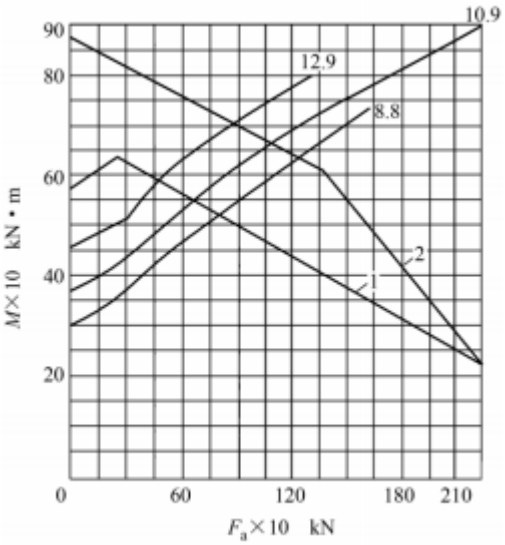

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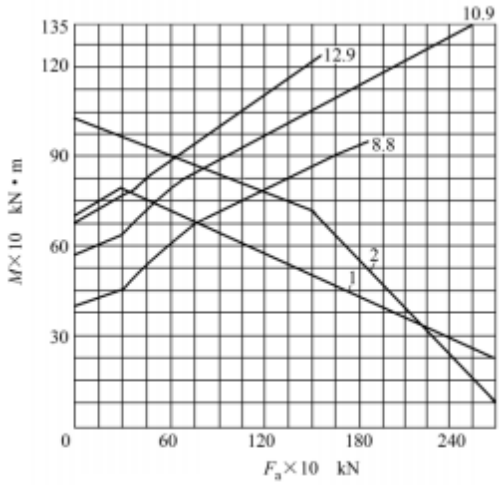
4.5.4 Load bearing Curve_Double Row Ball Series Design Standard JB/T 2300



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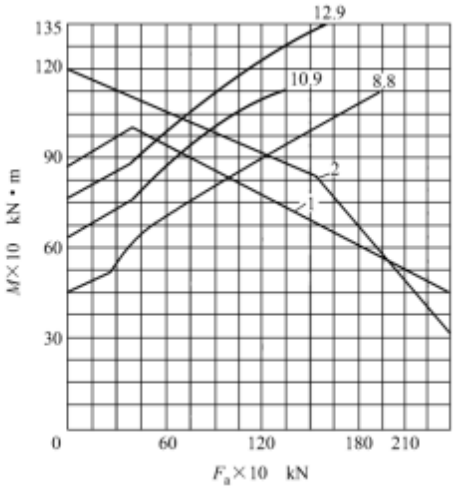

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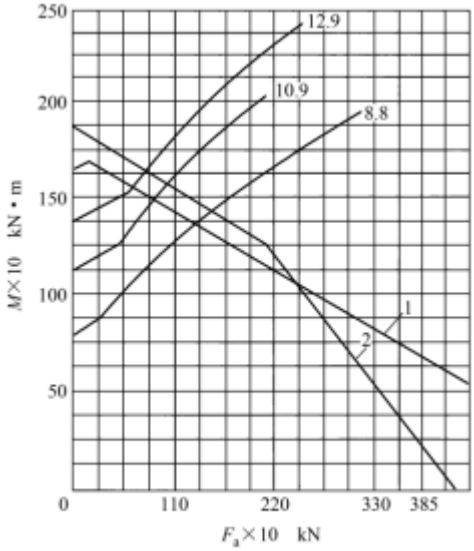

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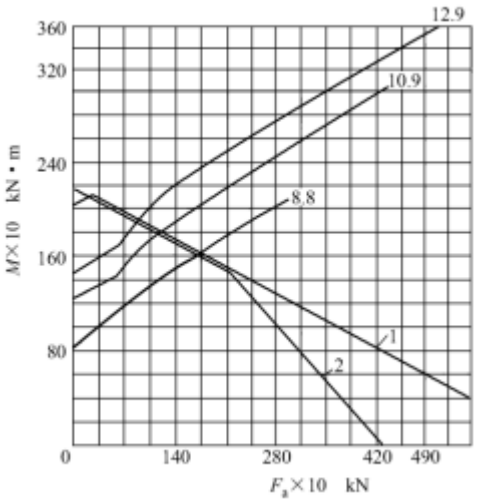
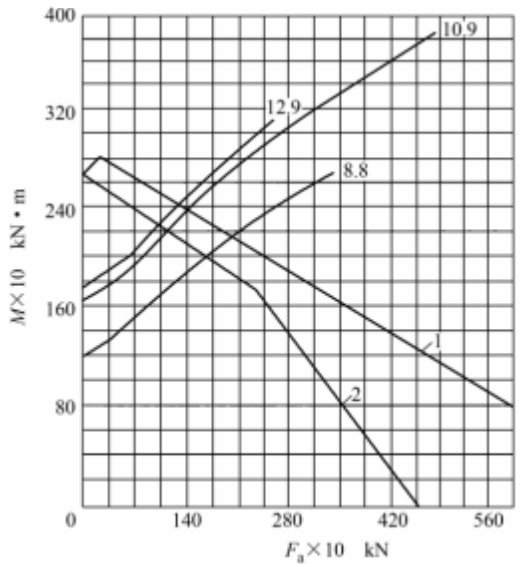
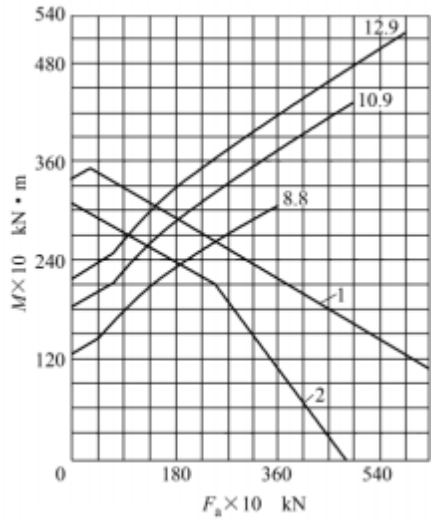


02×.40.1400

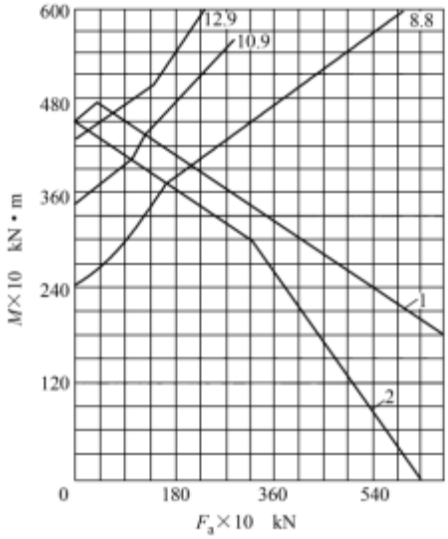


02×.40.1600



02×.40.1800

4.5.4 Load bearing Curve Double Row Ball Series Design Standard JB/T 2300



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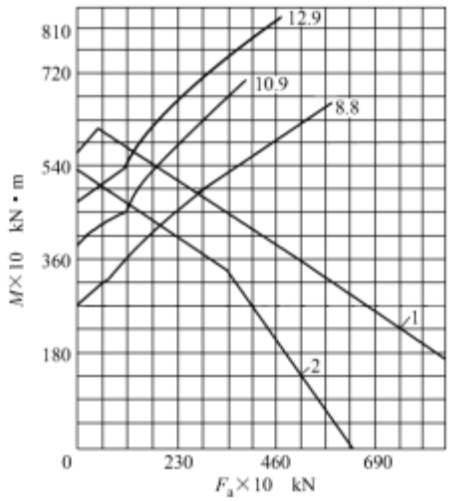

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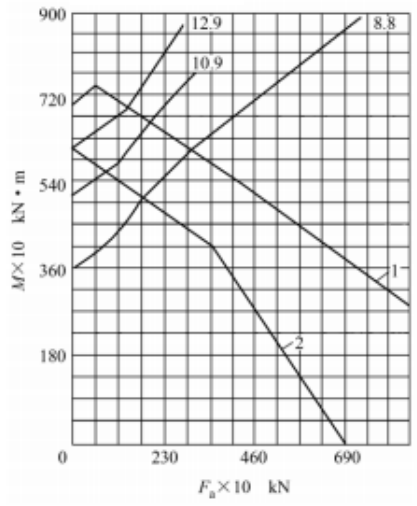


图 B.63 02×.50.2500

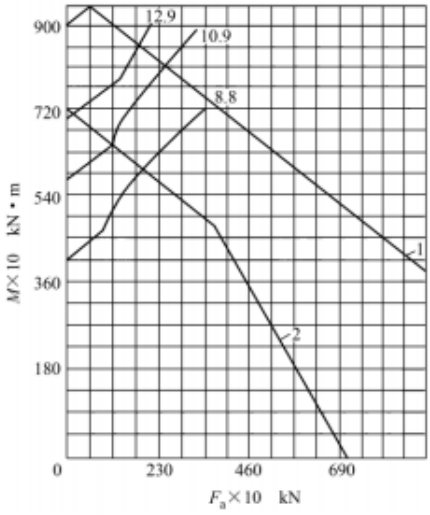
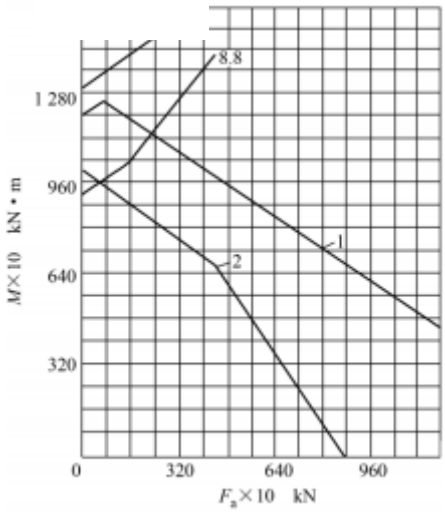


图 B.64 02×.50.2800



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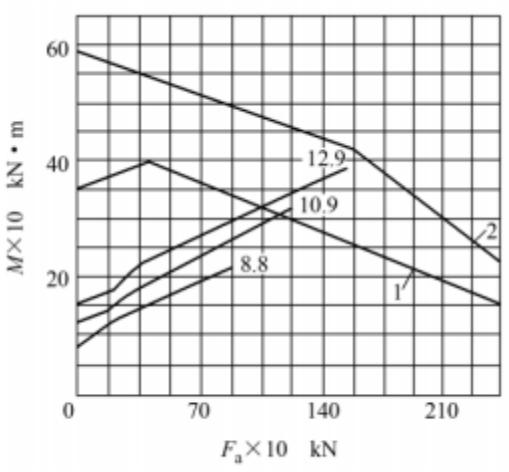
4.5.5 Load bearing Curve_Tri-Row Roller Series Design Standard JB/T 2300



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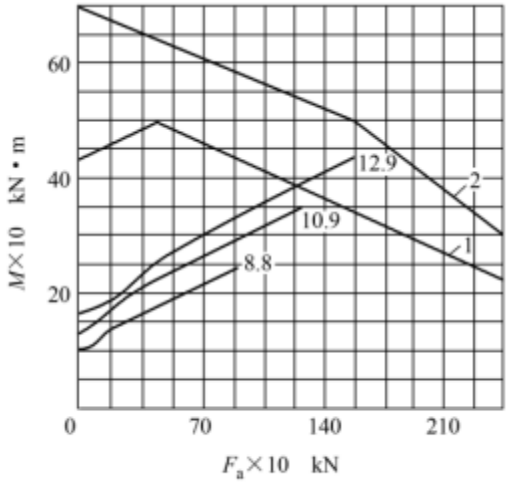

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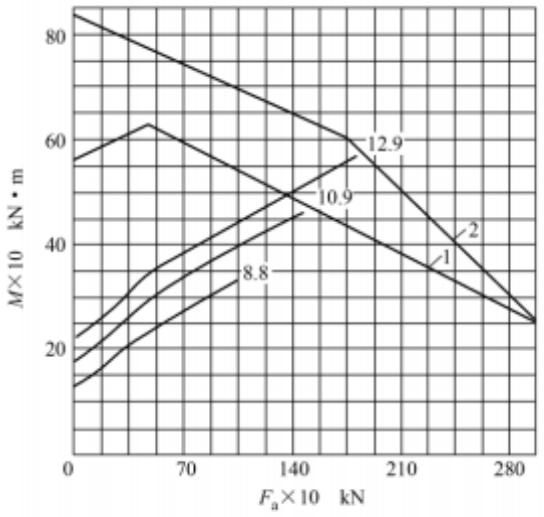

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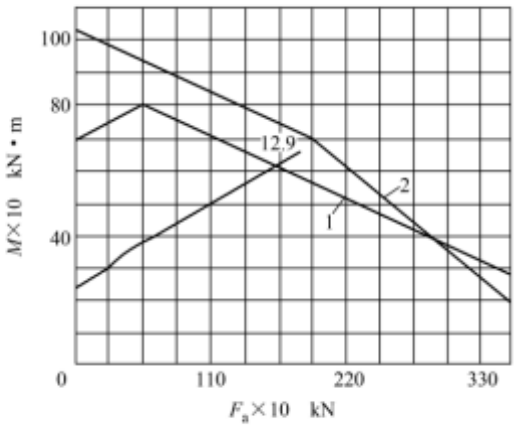

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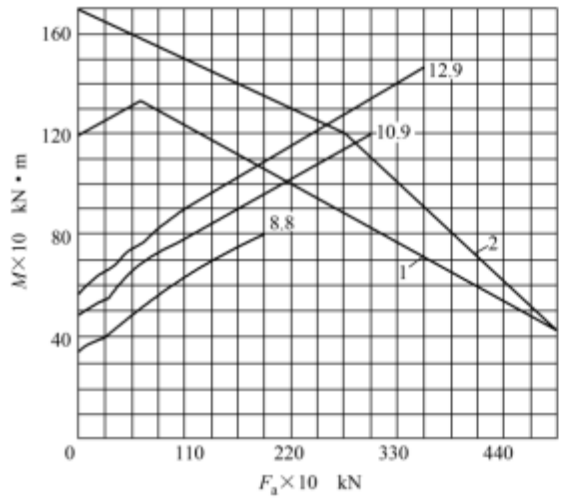

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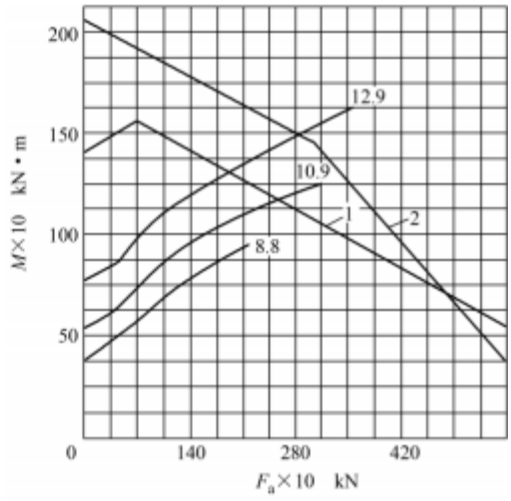

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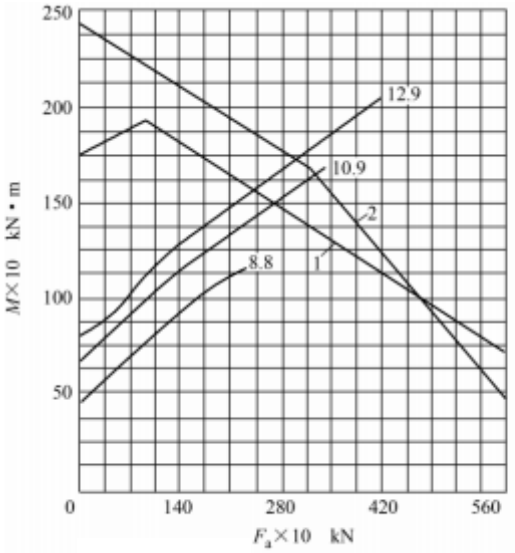
4.5.5 Load bearing Curve_Tri-Row Roller Series Design Standard JB/T 2300



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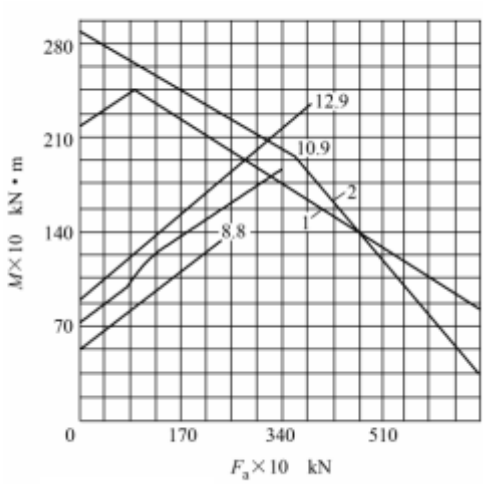

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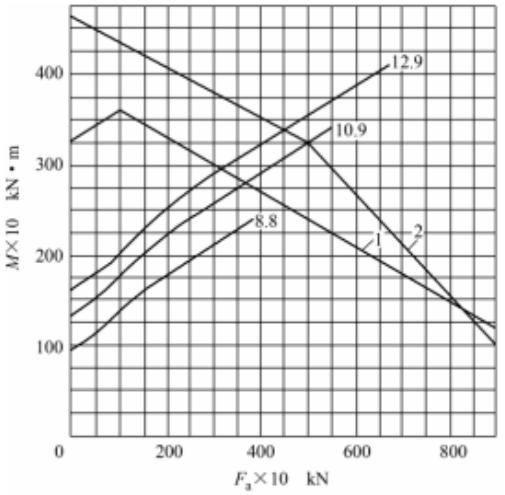


图 B.97 13×.40.1250

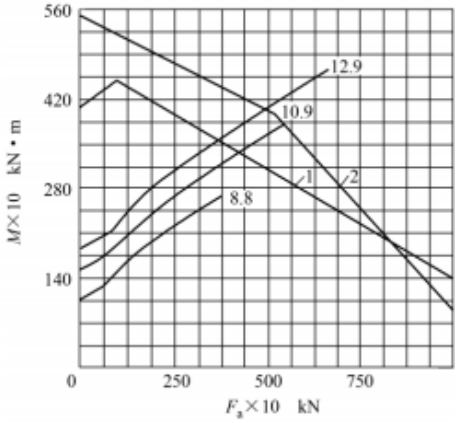
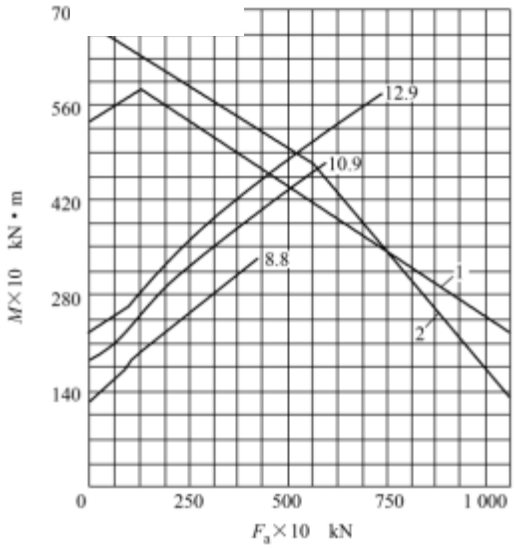


图 B.98 13×.40.1400



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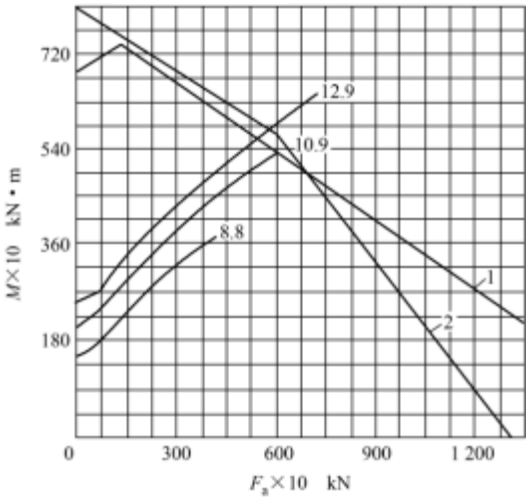
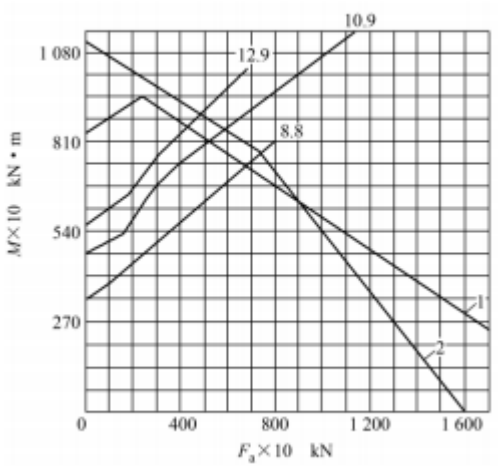


13×.40.1800

4.5.5 Load bearing Curve_Tri-Row Roller Series Design Standard JB/T 2300



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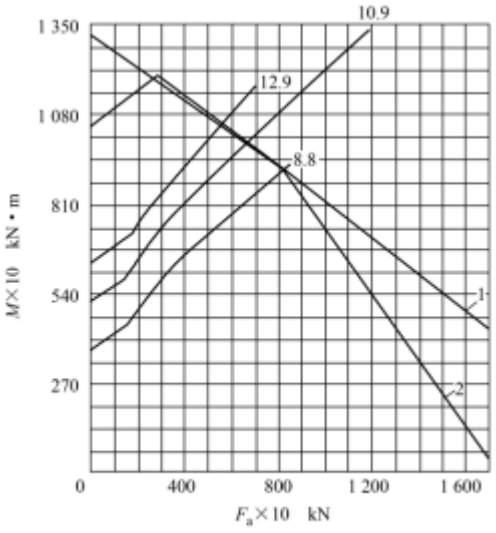

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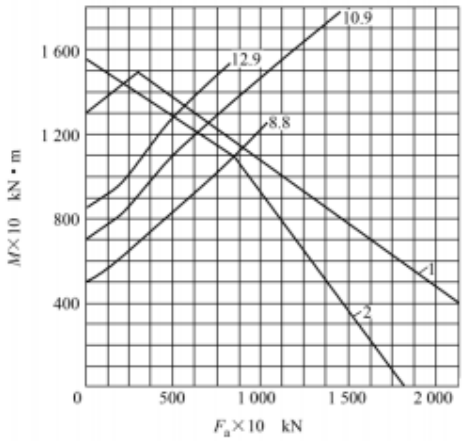


图 B.103 13×.45.2500

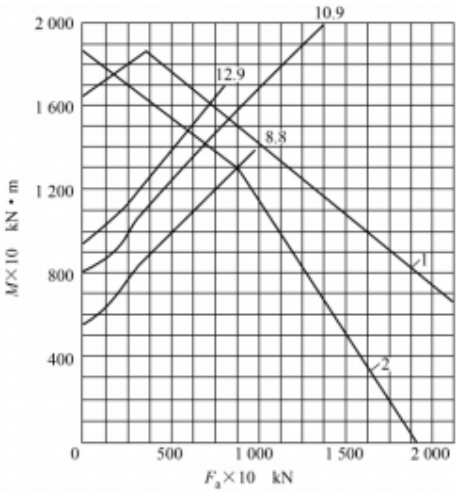
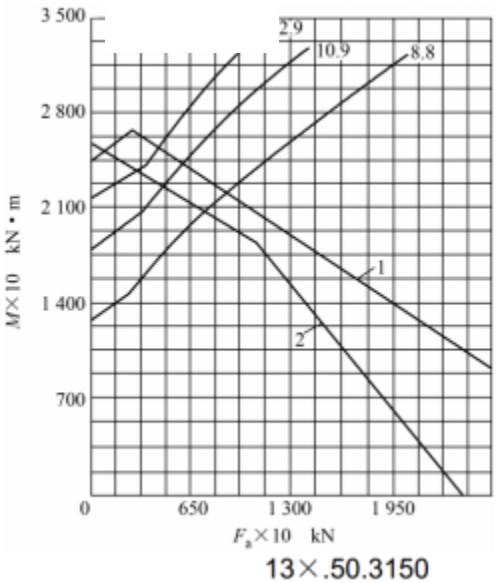
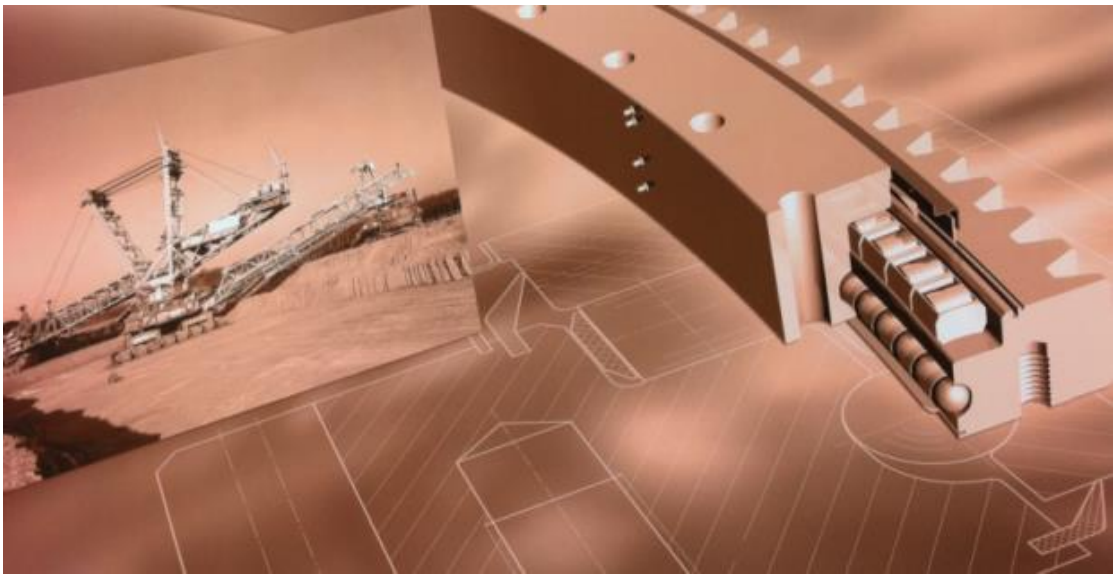


图 B.104 13×.45.2800



13×.50.3150

5 Appendices



5.1 Acceptance Documents

5.2 Slewing Bearing Type Selection Technical Parameter Table

5.3 Quality Warranty Commitment—After-sale Service

5.1 Acceptance Documents

Now you have got the slewing bearing manufactured by us. We hereby extend our congratulations to you for the correct choice you have made.

This slewing bearing is a high-tech product through accurate parameter selection. It accords with the ISO 9000 Standard in terms of both design and manufacture and it is supplied according to the information provided in the Slewing Bearing Type Selection Technical Parameter Table. This product serves for fault-free work, if the working conditions accord with what recommended by us.

If you are the designer, installer or seller, it is your responsibility to check: whether yours or your user's working conditions completely accord with what specified in the Slewing Bearing Type Selection Technical Parameter Table, and whether installation requirements and maintenance conditions are strictly followed.

We recommend that you read this sample "3 Installation & Maintenance" fully and carefully first, so that you can get full understanding of your responsibility. Please send this text to the user, if necessary.

To facilitate your work, we have enclosed herewith the check list, which, although not all-embracing, includes necessary checks to be made under all circumstances. In addition, you are also supposed to know our warranty conditions and restrictions in this regard.

Slewing bearing selection

When selecting a slewing bearing, you should consider:

•Rated load……..……□

•Overload due to:

- Wind…….……...□
- Snow…….……...□
- Working conditions…….……..…□

•Dynamic load……...…….….□

•Peak load……...…□

•Commissioning overload……...……..…□

Confirmation of load includes:

•Raceway……...…..□

•Gear……□

•Bolt……□

•Maximum speed of use……..…...□

Upon receipt

Confirm that the slewing bearing received is of the type that you have ordered

Storage conditions

• During storage,

Whether external protective measure is taken for the product……..…□

• If storage period exceeds 18 months,

Whether slewing bearing is re-lubricated before installation ……..…□

Before installation

Confirm that the product is not impacted and no change in any of its properties (unrecoverable deformation) is caused

•Seal ring is correctly positioned……..…….□

•Seal ring is not damaged (broken) …..…….□

• Whether your carrying equipment is suitable for the product

- Precision……..…..□
- Dimensions……..……..□
- Weight……..….□

In installation

Check

•Flatness of supporting base……□

•Structure size……..□

•Oil nipple location..……□

• Relative location of maximum load zone and slewing bearing's quenching soft belt……..□

In assembly

Check

•Grade of bolt and nut..……□

•Number of bolts..……□

•Specified tightening moment..……□

•Whether to obtain tightening moment with properly lubricated screw thread..……□

•Open fan or spring washer not in use…..…□

•Tempered flat washer may be used, if necessary……...□

Installation of driving pinion (with gear engagement)

Check

•Match between pinion and slewing bearing gear……...□

•No danger of interference danger……□

•Keep minimum backlash.……□

• Determine value of the following points:

- Maximum eccentricity of external gear……..…….…□
- Maximum eccentricity of internal gear……..……□

•Center distance between slewing bearing and pinion can't be changed ……□

•Pinion is uniform in the contact area of gear ring tooth fa……□

Before installation

Be sure

•Maximum speed of slewing bearing no greater than calculated value……□

•No obstacle which may prevent slewing bearing from running…….□

• No article which may damage sealing element…….□

•Slewing bearing and its driving pinion will not cause any danger

- To any material ……....□
- To any person.……..□

•Protection location compliant with relevant standard……□

Check

•Slewing bearing's axial clearance under maximum check load, and record the result…….□

•No abnormal noise or clamping stagnation in revolution…….□

After installation

Be sure

•Operation of device will not be affected by deformation……..□

•Service life will not be shortened due to deformation……..□

In working

Be sure that the user is familiar with the lubrication rules, particularly:

•Grease type ……□

•Lubrication cycle……□

•Re-lubricating method……□

Familiar with lubrication rules in respect of:

- Raceway ……□
- Gear……□

•Will monitor the use condition of seal ring….□

•Know Cycles of the following work is known:

- Bolt tightness check……□
- Bolt replacement.……□

•Know maximum axial clearance of product before disassembly……□

•Or know allowable maximum axial clearance in design…….□

For your reference: **Product installation & operation manual is available by our business department on demand.**

5.2 Slewing Bearing Type Selection Technical Parameter Table

C&H Slewing Bearing Type Selection Technical Data Sheet				
company ： Name： Tel：			Department： E- mail： Fax：	
Application occasion(main machine type,name):	Rotation axis： H ☐ V ☐		Bracket mounting way： Seat-type installation Suspension installation	
Gear type： Ex .☐ Any ☐ Int. ☐ No☐ Appendix B ☐	Application properties： only locationing☐ interval rotation☐ continuous rotation☐		RPM (revolutions per minute)： Normal : Max:	
Load Data				
Load Status load position	A Max working load	B Max test load ie 25% overload	C Catastrophic load (Power off)	Unit
Axial load parallel to rotation axis				KN
Radial load normal to rotation axis (no gear engagement)				KN
Moment from Axial load				KNm
Moment from Radial load				KNm
Total Moment				KNm
（KNm）Drive torque what bearing support ： Normal： Max：			Number of drive pinion： Postion： space degree	

Requirements for slewing bearing type and boundary dimension：

slewing bearing model number (if list possible)：

slewing bearing series： 01* ☐； 02* ☐； 11* ☐； 13* ☐； other ☐

Boundary dimension：

outer diameter: mm or no limit ☐； inner diameter: mm or no limit ☐；

assembling hight: mm or no limit☐

As to the load and life of the continuous rotating slewing bearing, please fill in Form A Pay respect to filled Form A ☐

other requirements：

Slewing bearing accuracy class：G3☐ G4☐ other

basis material test report： no☐ V2.2☐ V3.1☐ other

Lubrication：Centralization Lub☐ Manual operation☐ bolt type： ream bolt☐ no ream bolt☐

test or approve： no☐ CCS☐ DNV☐ BV☐ GL☐ other

ambient temperature：-30℃~+40℃☐ other

air quality：fair☐ dirty☐ salinity high☐ High humidity☐ other

match up measurement and precision：no ☐ other

special working condition and other specification：

Please fill in the form to recommend and provide you with the right and economic slewing bearing 。

Please contact us for any requests.

Tel：0086-21-58356710： Fax ： E-mail: jason@chenghuibearing.com

Signature： Date：

C&H lewing Bearing Type Selection Technical Data Sheet **Appendix A**					
working condition	Axial Load（10^4N）	Radial Load（10^4N）	Overturning Movement（10^4Nm)	Rotate Speed（rpm）	Work Time（%）
1）					
2）					
3）					
4）					
5）					
6）					
7）					
8）					
9）					
10）					
Max 10 load combination					100%
Continous Duty Work Condition（L_{10}） life: rpm- Average Rotate Speed, Minimum hrs					
intermittent operation work Condition life needed：in the angle +/- degree， Minimum rotation					

C&H Slewing Bearing Type Selection Technical Data Sheet **Appendix B**		
external gear ☐; internal gear ☐; involute gear ☐;		
Gear Parameter		
	Pinion	Large Gear
Module m		
Number of teeth z		
Pressure angle α		
helix angle β		
Displacement coefficient x		
Addendum coefficient ha*		
Radial Clearance c*		
Tooth width b		
Accuracy class		
Gear Centre distance adjust	adjustable☐; unadjustable ☐	
provide the pinion drawing if possible, please		
other requests:		
Signature: Date:		

Note: ① Recommended precision of gear on engineering machinery: 11FH (GB10095)

Please fill out this table fully so that we can provide with you an accurate, economical and practical slewing bearing type selection proposal as soon as possible.

For any questions or requests, please contact our design and development department by:

Tel: +86-18616206301 Fax：+86-21-58356720 E-mail: jason@chenghuibearing.com

Signature: Date:

You can ask for electronic document of *Slewing Bearing Type Selection Technical Parameter Table* from our technical department. The electronic data U-disk provided by us to you includes this document and instructions for filling out the table.

5.3 Quanlity Warranty Commitment — After-sale Service

Warranties

The slewing bearing produced by the Company provides warranty over normal operation within normal use range compliant with the following provisions:

• Use condition of a standard product shall accord with the application conditions and with the technical specifications in this sample and the installation & operation instructions.

• Use condition of all products shall accord with the conditions set out by the customer in the completed *Slewing Bearing Type Selection Technical Parameter Table.*

Warranty period

• Warranty for this product shall be effective for one year after installation or for a maximum of 18 months after delivery. This warranty period shall only be limited to the estimated service life of the product, as relevant calculation or the service life set out in other documents of the Company.

Exceptions to warranty

Warranty for any slewing bearing product shall become invalid under any of the following circumstances:

①Failure to fill out, reply and send back the *Slewing Bearing Type Selection Technical Parameter Table* of the Company

The slewing bearing is a high-tech product that can meet special requirements. Provision of a suitable product fully depends on the Company's accurate understanding of the customer's working conditions and expected use condition.

The *Slewing Bearing Type Selection Technical Parameter Table* is table containing numerous technical data and characteristic requirements. This table should be filled out systematically before ordering by customer.

Provision of a product just as needed by a customer depends on the customer's accurate and sufficient answer to the *Slewing Bearing Type Selection Technical Parameter Table*. Therefore, if the customer answers the *Slewing Bearing Type Selection Technical Parameter Table* incorrectly, the Company may refuse to assume the responsibility of warranty.

②Not following the Company's recommendations

Handling, use, installation and maintenance are not in compliance with the recommendations set out in the installation & operation manual for the product sold, particularly:

Carriage

• Handling equipment unfit for quality and weight requirements of the product

• Product use not in compliance with the technical specifications and product application conditions

Installation

•Bearing structure size is incorrect. The size is less than the specified minimum requirements and the flatness is too big.

•The location of slewing bearing's quenching soft belt does not avoid the main load area.

Fastening

•Pre-tightening force of bolts and nuts is not in compliance with our recommendations and requirements

•Any slot, fan-shaped, spring or tempered washer of any unknown designation whatever are used

Lubrication

•Lubricating grease model and re-lubrication cycle are not as recommended by us

Storage

• Failure to update external protective material after storage for 6 months

• Failure to re-lubricate the slewing bearing after storage for 18 months

③ Modify, dismantle or repair the product without prior consent of the Company

④Damage caused by overuse

⑤Damage caused by normal wear of material

Increase of clearance under effect of load within limit of serviceability is normal wear

No warranty is provided for quick-wear parts such as seal ring. Strictly speaking, we provide no warranty for dysfunction caused directly or indirectly by customer's negligence.

Performance of warranty

To obtain warranty for normal operation of the slewing bearing product, you are supposed to complete the following matters:

•The customer shall file the letter of fault declaration before the specified deadline (warranty period).

•The Company's findings on the fault.

•Review technical specifications of corresponding product, the Company's recommendations and other conditions for use and warranty.

Don't return the product without prior consent of the Company.

Warranty

If the declared fault has been investigated and inspected, the Company will:

•Repair the slewing bearing and replace damaged parts as necessary

•Replace the slewing bearing free of charge

• Refund the payment for the purchased slewing bearing

In summary, the Company shall have the right to choose the most suitable solution for any problem found.

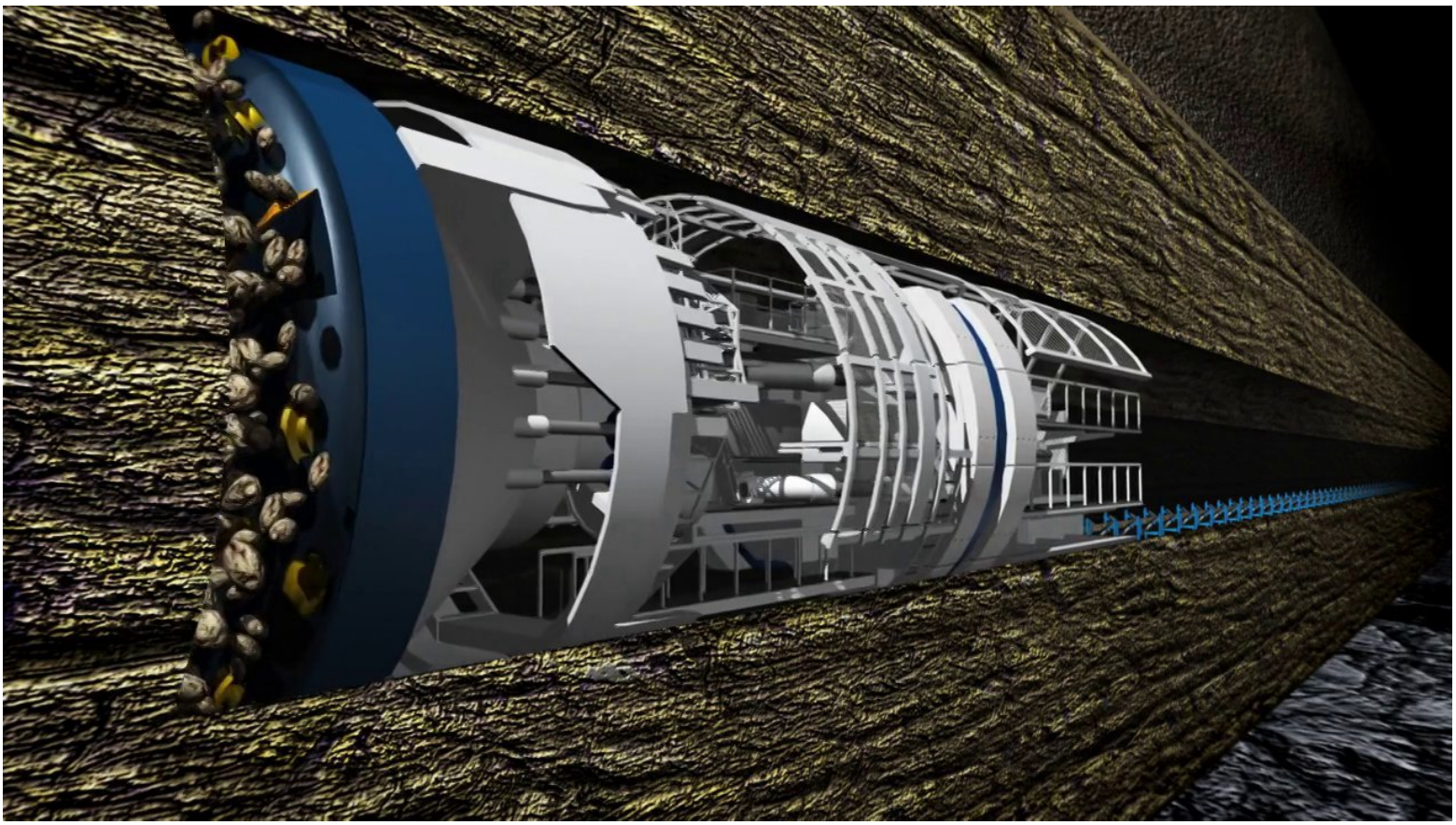
The Company has strict restrictions on warranty over repair, replacement or return of product, so it will make no compensation for any consequence related to any fault: shutdown of machine, other material damage, profit loss…….

If any fault of the slewing bearing is caused by negligence of the customer, particularly due to non-compliance of the Company's recommendations, cost and expenses for investigation on the damage parts including all travel expenses for transport and technical service personnel to the site of use.

Attention

All data and materials included in the present sample are already calculated and checked. We assume no responsibility for any error or omission herein and we reserve the right to improve or rectify any of the experiments, formulas and graphs technically without prior notice.

All previous versions shall become invalid as of the date on which this sample is released.



Shanghai Chenghui Bearign Co.Ltd.

Shanghai Chenghui Beairng Co.Ltd
Address: 289 Zheqiao Road, Pudong, Shandhai, China 201206
Tel: +86 21 58356710 Fax:+86 21 58356720
E-mail: jason@chenghuibearing.com
Website: www.chenghuibearing.com