

Moline M2000 mounted bearings are suitable for a wide variety of applications. They work especially well in situations where a high capacity align-able bearing is required. They are available in a wide range of shaft sizes and a variety of popular mounts.

> Moline M2000 Pillow Blocks, Flange Bearings, Piloted Flange Bearings and Wide Slot Take-up Bearings are ready to slip onto the shaft when received, because they are completely assembled, adjusted, sealed

and pre-lubricated at the factory. The self-align-

ing feature provides for speedy mounting with a minimum of field adjustment required. The housings are ruggedly designed in cast iron. There is no danger of bearing failure resulting from dirt or dust entering the bearing before or during installation. Such contamination is very difficult to prevent in bearings that not shaft ready. No time or expense is required for cleaning housings, or initial lubrication. Therefore, overall installed cost is less in many instances. Operating expense over time is also generally less.



The M2000 bearings are interchangeable with other collar mounted spherical roller bearings in single piece housings, and are equipped with bearings that have excellent load characteristics.

Standard on all Moline M2000 bearings is a specially designed triple lip contact seal, which prohibits entry of contaminants, retains lubrication and is self-purging. In addition, these bearings are also available with a spring loaded Garter seal for extreme conditions and a labyrinth seal for high-speed applications.

Moline M2000 bearings are available in expansion and non-expansion styles. The expansion units have the capacity to move up to .100". The bearings are available in shaft sizes from 1-3/16" up to 4".

The M2000 housings come with a standard paint finish. Other coatings such as Nickel Plating, Epoxy and Teflon are also available. Special machining is also available.

Moline M2000 Mounted bearings are carried in Moline warehouses and distributor stocks all over the United States.





Features of Moline M2000 Mounted Bearings With SKF® Roller Bearings

- Available in shaft sizes from 1-3/16" to 4"
- +/-1-1/2° misalignment capacity
- Available in Expansion (red label) and Non-Expansion (yellow label) styles
- Expansion Units have .100" Capacity
- Single Piece Outer Race
- 3 Lube Holes and Groove in Outer Race
- Precision Ground Contours
- Will Accommodate Moderate Thrust Loads
- Permits Angular Misalignment Without Loss of Capacity
- Long Rollers Allow for Greater Contact
- Standard grease operating temperature is up to 240°, High temperature grease is available up to 350°, please call the factory for more information
- Housings available in the standard painted finish. Nickel Plating, Epoxy and Teflon coatings available on request
- Custom machining and design is available upon request, please call the factory for more information
- Rotating Center Guide Ring for Least Possible Friction
- Accurately Machined Housing
- Comes With a Triple Lip Contact Seal Standard, Also available with Labyrinth Seals for High Speed Applications and with Spring Loaded Garter Seals for Dirty and Wet applications

NON-EXPANSION

EXPANSION

• Made in the United States

M2000 SPHERICAL ROLLER BEARINGS











Shaft	Moline	Part #				Dim	nensio	ns are i	n inche	5				Wgt.
Size	Exp	Non-Exp	A	В	C	D	F	G	н	J	L	м	N	Lbs.
1-3/16 1-1/4	19121103 19121104	19221103 19221104	2-13/16	6-3/8	2-3/16	4-3/4	3/8	3/4	1-1/16	3-3/4	2-3/8	1-3/4	2-3/4	6.5
1-7/16 1-1/2	19121107 19121108	19221107 19221108	2-13/16	6-7/8	2-3/16	5	1/2	15/16	1-3/16	3-7/8	2-3/8	1-7/8	2-3/4	6.9
1-11/16 1-3/4	19121111 19121112	19221111 19221112	3	7-3/8	2-3/16	5-1/2	1/2	15/16	1-5/16	4-1/4	2-5/8	2-1/8	2-7/8	8.1
1-15/16 2	19121115 19121200	19221115 19221200	3	8-3/8	2-3/16	6-1/4	5/8	1	1-3/8	4-9/16	2-7/8	2-1/4	2-7/8	9.1
2-3/16	19121203	19221203	3-1/4	8-7/8	2-1/2	6-3/4	5/8	1	1-5/8	5	3-1/4	2-1/2	3-1/8	11.8
2-7/16 2-1/2	19121207 19121208	19221207 19221208	3-1/2	9-1/4	2-3/4	7-1/8	5/8	1	1-3/4	5-11/16	4	2-3/4	3-3/8	16.2
2-11/16 2-3/4 2-15/16 3	19121211 19121212 19121215 19121300	19221211 19221212 19221215 19221300	3-13/16	10-1/2	2-13/16	8-1/8	3/4	1-1/8	2-1/4	6-7/16	4-1/2	3-1/4	3-5/8	22.1
3-3/16 3-7/16 3-1/2	19121303 19121307 19121308	19221303 19221307 19221308	4-1/4	13	3-1/4	10	7/8	1-7/16	2-1/4	7-1/2	5-1/8	3-3/4	4-1/32	31.6
3-11/16 3-15/16 4	19121311 19121315 19121400	19221311 19221315 19221400	4-3/4	14-1/2	3-9/16	10-7/8	1	1-15/16	2-1/2	8-3/8	6	4-1/8	4-19/32	45

Refer to the Moline List Price Book for pricing.









Shaft	Moline	Part #	Dimensions are in inches												Wgt.
Size	Exp	Non-Exp	A	В	С	D	E	F	G	н	J	L	м	N	Lbs.
2-7/16 2-1/2	19141207 19141208	19241207 19241208	3-3/4	9-1/4	3-1/4	7-1/4	1-3/4	1/2	15/16	1-3/4	5-11/16	4	2-3/4	3-3/8	17
2-11/16 2-3/4 2-15/16 3	19141211 19141212 19141215 19141300	19241211 19241212 19241215 19241300	4-1/4	10-1/2	3-3/4	8-1/8	1-7/8	5/8	15/16	2-1/4	6-7/16	4-1/2	3-1/4	3-5/8	26
3-3/16 3-7/16 3-1/2	19141303 19141307 19141308	19241303 19241307 19241308	4-9/16	13	3-7/8	10	2	3/4	1-9/16	2-1/4	7-1/2	5-1/8	3-3/4	4-1/32	38
3-11/16 3-15/16 4	19141311 19141315 19141400	19241311 19241315 19241400	5-1/4	15-1/4	4-1/2	12	2-1/4	3/4	1-13/16	2-5/8	8-1/2	6	4-1/4	4-19/32	50

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Call 630-584-4600 or 800-242-4633 Fax 630-584-1999 www.molinebearing.com sales@molinebearing.com Moline Bearing Company P.O. Box 509 St. Charles, IL 60174









Shaft	Moline	Part #	Dimensions are in inches											
Size	Ехр	Non-Exp	A	В	C	D	E	F	н	J	L	N	Lbs.	
1-7/16 1-1/2	19111107 19111108	19211107 19211108	2-15/16	4-5/8	2-1/4	3-17/32	5	1/2	3/4	3-7/8	2-3/8	2-3/4	7	
1-11/16 1-3/4	19111111 19111112	19211111 19211112	3	5	2-1/4	3-7/8	5-1/2	1/2	3/4	4-1/4	2-5/8	2-7/8	10	
1-15/16 2	19111115 19111200	19211115 19211200	3	5-1/4	2-1/4	4-1/16	5-3/4	1/2	3/4	4-1/2	2-7/8	2-7/8	10.5	
2-3/16	19111203	19211203	3-1/4	5-7/8	2-7/16	4-17/32	6-3/8	5/8	3/4	5	3-1/4	3-1/8	12.5	
2-7/16 2-1/2	19111207 19111208	19211207 19211208	3-1/2	6-1/8	2-3/4	4-25/32	6-3/4	5/8	1	5-3/4	4	3-3/8	16.5	
2-11/16 2-3/4 2-15/16 3	19111211 19111212 19111215 19111300	19211211 19211212 19211215 19211300	3-15/16	7-1/4	2-7/8	5-9/16	7-7/8	3/4	1	6-5/8	4-1/2	3-5/8	25	
3-3/16 3-7/16 3-1/2	19111303 19111307 19111308	19211303 19211307 19211308	4-5/16	8-3/8	3-1/4	6-23/32	9-1/2	3/4	1-1/8	7-5/8	5-1/8	4-1/32	35	
3-11/16 3-15/16 4	19111311 19111315 19111400	19211311 19211315 19211400	4-7/8	9-1/2	3-9/16	7-19/32	10-3/4	7/8	1-3/16	8-3/8	6	4-19/32	48	

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Shaft	Moline	Part #	Dimensions are in inches											
Size	Ехр	Non-Exp	A	В	C	D	E	F	G	н	к	L	N	Lbs.
1-7/16 1-1/2	19131107 19131108	19231107 19231108	2-13/16	5-1/4	2-1/16	4-3/8	1-9/32	3/8	1-9/16	1/2	3-5/8	2-3/8	2-3/4	7
1-11/16 1-3/4	19131111 19131112	19231111 19231112	3	6-1/8	2-3/16	5-1/8	7/8	7/16	1-9/16	1/2	4-1/4	2-5/8	2-7/8	8.5
1-15/16 2	19131115 19131200	19231115 19231200	3	6-3/8	2-3/16	5-3/8	7/8	7/16	1-1/2	1/2	4-1/2	2-7/8	2-7/8	10.5
2-3/16	19131203	19231203	3-1/4	7-1/8	2-7/16	6	1	1/2	1-3/4	1/2	5	3-1/4	2-7/8	14.5
2-7/16 2-1/2	19131207 19131208	19231207 19231208	3-1/2	7-5/8	2-11/16	6-1/2	1	1/2	1-7/8	5/8	5-1/2	4	3-3/8	16
2-11/16 2-3/4 2-15/16 3	19131211 19131212 19131215 19131300	19231211 19231212 19231215 19231300	3-13/16	8-3/4	2-13/16	7-1/2	1-1/4	5/8	2	3/4	6-3/8	4-1/2	3-3/8	22
3-3/16 3-7/16 3-1/2	19131303 19131307 19131308	19231303 19231307 19231308	4-1/4	10-1/4	3-1/4	8-5/8	1-1/4	3/4	2-1/2	15/16	7-3/8	5-1/8	4-1/32	33
3-11/16 3-15/16 4	19131311 19131315 19131400	19231311 19231315 19231400	4-3/4	10-7/8	3-9/16	9-3/8	1-1/2	3/4	2-5/8	1-1/16	8-1/8	6	4-19/32	45

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NON-EXP

Shaft Size	Moline	Part #					_	_				17				-	Wqt.
	Exp.	Non-Exp	A			U			6		J						Lbs.
1-15/16 2	19151115 19151200	19251115 19251200	3-1/2	6-5/16	11/16	3-3/4	3-15/16	1	15/16	3/4	3-5/16	1-15/16	3-7/16	4	4-3/4	2-7/16	12
2-3/16	19151203	19251203	3-3/4	7-1/8	13/16	3-3/4	4-5/8	1-1/8	1	1	3-7/8	2-1/4	3-3/4	4-1/2	5-1/4	2-9/16	16
2-7/16 2-1/2	19151207 19151208	19251207 19251208	4	7-13/16	1-1/32	4-1/2	5-1/16	1-1/2	1-1/16	1-1/4	4-1/4	2-1/2	4-1/16	5-1/8	6	2-3/4	21
2-11/16 2-3/4 2-15/16 3	19151211 19151212 19151215 19151200	19251211 19251212 19251215 19251300	4-1/2	9-1/8	1-25/32	4-3/4	5-7/8	1-1/2	1-3/8	1-1/4	4-7/8	2-3/4	4-23/32	5-15/16	6-3/4	3	30

Furnished in expansion and non-expansion types. Non-expansion units are furnished unless expansion is specified.

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APPLICATION GUIDE FOR M2000 SPHERICALS

MOUNTING INSTRUCTIONS

It is critical to the performance of the bearing that it be mounted properly. Failure to follow proper mounting practice may result in reduced bearing life.

Shaft Diameter	Shaft Tolerances
1-3/16 - 1-1/2	Plus .0000" to minus .0005"
1-5/8 - 4	Plus .0000" to minus .0010"



INSTALLATION INSTRUCTIONS

Non-Expansion Bearing

- 1. Clean shaft and bore of bearing. The shaft should be straight, free of burrs and nicks, and the correct size.
- 2. Lubricate shaft and bearing bore with grease or oil to facilitate assembly. Slip bearing into position. When light press fit is required, press against the end of the inner ring of bearing. Do not strike or exert pressure on the housing or seals.
- 3. Bolt bearing to support, using shims where necessary to align bearing so inner ring does not rub on housing bore. Use full shims which cover across the entire housing base.





5. Check rotation. If there is any strain, irregular rotational torque or vibration, it could be due to incorrect alignment, bent shaft or bent supports. Installation should be rechecked and correction made where necessary.

M2000 Expansion Bearing Applications

In addition to the requirements listed above, the following additional instructions should be followed. Position the expansion bearing in the housing. For normal expansion conditions, the bearing insert should be positioned in the center of the housing. To center the insert in the housing, move the bearing to the extreme position (-.100" on all expansion units) and mark the shaft. Then move the bearing insert in the opposite direction one-half the total expansion to center the bearing in the housing. If the maximum expansion is required, move the bearing insert to the extreme position in the housing to permit full movement in the direction of the expansion. After the expansion bearing has been positioned

in the housing, tighten the set screws securely to the shaft.









Expansion Bearing

1-3. Same as Non-Expansion Bearing.

4. Position expansion bearing in the housing. For normal expansion conditions, the bearing insert should be positioned in the center of the housing. To center bearing insert in housing, move bearing insert to extreme position and mark shaft. Then using bearing maximums total expansion table, move bearing insert in opposite direction one-half the total expansion to center bearing in the housing. If maximum expansion is required, move bearing insert to the extreme position in the housing to permit full movement in direction of expansion. After expansion bearing has been positioned in the housing, tighten the set screws in the locking collar to the recommended torque.



5. Same as Non-Expansion Bearing.

Bearing Maximum Total Expansion

All Expansion Units have - .100" Capacity Misalignment Capacity = $+/-1\frac{1}{2}$ "

LUBRICATION INSTRUCTIONS

This bearing is factory lubricated with No. 2 consistency lithium base grease which is suitable for most applications. However, extra protection is necessary if bearing is subjected to excessive moisture, dust, or corrosive vapor. In these cases, bearing should contain as much grease as speed will permit (a full bearing with consequent slight leakage through the seal is the best protection against contaminant entry). In extremely dirty environments, the bearing should be purged daily to flush out contaminants. For added protection, it is advisable to shroud the bearing from falling material.

High Speed Operation

At higher operating speed, too much grease may cause overheating. In these cases, the amount of lubrication can only be determined by experience. If excess grease in the bearing causes overheating, it will be necessary to remove grease fittings and run for 10 minutes. This will allow excess grease to escape. Then wipe off excess grease and replace grease fittings.

In higher speed applications, a small amount of grease at frequent intervals is preferable to a large amount at long intervals. However, the proper volume and interval of lubrication can best be determined by experience.

The following table is a general guide for normal operating conditions. However, some situations may require a change in lubricating periods as dictated by experience. If the bearing is exposed to unusual operating conditions, consult a reputable grease manufacturer.





Lubrication Guide

Read preceding paragraphs before establishing lubrication schedule.

Hours		S	uggested	Lubricat	ion Perio	d in Wee	ks	
Hours Run Per Day	1 to 250 RPM	251 to 500 RPM	501 to 750 RPM	751 to 1000 RPM	1001 to 1500 RPM	1501 to 2000 RPM	2001 to 2500 RPM	2501 to 3000 RPM
8	12	12	10	7	5	4	3	2
16	12	7	5	4	2	2	2	1
24	12	5	3	2	1	1	1	1



Abnormal bearing temperatures may indicate insufficient lubrication. If the housing is too hot to touch for more than a few seconds, check the temperature by applying a thermometer at the top of the pillow block with the thermometer tip surrounded by putty.

Because the thermometer reading will be approximately 10°F. lower than the actual bearing temperature, add ten degrees to the reading and compare to the temperature rating of your grease. If the bearing temperature reading is consistent and operating within the recommended limits of your grease, the bearing is operating satisfactorily.



If equipment will be idle for some time, before shutting down, add grease to the bearing until grease purges from the seals. This will ensure protection of the bearing, particularly when exposed to severe environmental conditions. After storage or idle period, add fresh grease to the bearing before starting.



Special Operating Conditions

Refer acid, chemical, extreme or other special operating conditions to the Moline Bearing Company.

Moline spherical bearings have the capacity to carry substantial radial loads, thrust loads or a combined radial and thrust load. The maximum load that can be applied is limited by the various components in the system, and the life requirements listed in this catalog. The factory should be consulted on any application that exceeds the recommendations in the catalog.

Select a bearing from the M2000 load-rating chart having a radial load rating at the operating speed equal to or greater than the calculated Equivalent Radial Load for a desired L10 life. This simple method is all that is necessary for most general applications and provides for occasional shock loads.

L10 Hours of Life - Is the life that may be expected from at least 90% of a given group of bearings operated under identical conditions. The average life (L50) will be approximately five times the L10 life.

To determine the L10 hours of life for loads and RPM's not listed, use the following equation.

$$L_{10} = \left(\frac{C}{P}\right)^{10/3} x \frac{16667}{RPM}$$

Where: C= Dynamic Capacity (See Table below) P= Equivalent Radial Load

If the load on a double row spherical bearing is only in a radial direction (no axial load), the Equivalent Radial Load (P) is equal to the actual radial load. In situations where the bearing load consists of radial and thrust loads, the total load must be converted into an Equivalent Radial Load by the equation:

$$P = XF_{R} + YF_{A}$$

Where: FA= Axial (thrust) Load - See table for maximum
FR= Radial Load
X= Radial Load Factor from Table 1: Thrust Factors (page 42)
Y= Thrust Load Factor from Table 1: Thrust Factors (page 42)



To find the X and Y values, first calculate FA/FR. Then use Table 1: Thrust Factors (page 42) to determine the appropriate values for X and Y. Substitute all known values into the Equivalent Radial Load equation.

For longer L10 hours other than 30,000 hours and not shown, multiply the Equivalent Radial Load by one of the following factors: for 20,000 L10 hours life, use a factor of .87; for 40,000 L10 hours of live, use 1.25; and for 80,000 L10 hours of live, use 1.38.

In applications that have heavy shock loads, frequent shock or severe vibrations, add up to 50% to the Equivalent Radial Load to

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obtain a modified Equivalent Radial Load. The amount of load added is relative to the severity of the application. Additional assistance can be obtained by consulting with the factory.



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The magnitude and direction of both the thrust and radial load must be taken into account when selecting the housing. When pillow blocks are used, heavy loads should be directed through the base. If the bearing must be used in a situation where the load pulls the housing away from the mounting base, both the hold down bolts and housing must be of adequate strength. Auxiliary load carrying devices such as shear bars are advisable for side or end loading of pillow blocks and radial loads for flange units.



TABLE 1: THRUST FACTORS

*Comparing Spherical to Tapered Roller Bearings — The dynamic capacity C (Spherical) and C90 (Tapered) are not the same base. To compare basic dynamic capacities, multiply C x .259 and compare to C90. To select and then compare, use the complete procedure for each bearing and then compare.

** If load exceeds maximum allowable slip fit radial load, snug to light press fit of shaft is required.

M2000 SPHERICAL



Nominal Shaft	L10	Radial Load Ratings at Various Revolutions Per Minute											
Diameter (in)	Hrs Life	50	100	200	500	1000	1200	1500	1800	2500			
1-7/16 1-1/2	5000 10000 20000 50000 100000	7300 5930 4810 3660 2970	5930 4810 3910 2970 2410	4810 3910 3180 2410 1960	3660 2970 2410 1830 1490	2970 2410 1960 1490 1210	2780 2260 1830 1390 1130	2630 2140 1740 1320 1070	2490 2020 1640 1250 1010	2260 1830 1490 1130 919			
1-11/16 1-3/4	5000 10000 20000 50000 100000	7660 6220 5050 3840 3120	6220 5050 4100 3120 2530	5050 4100 3330 2530 2060	3840 3120 2530 1920 1560	3120 2530 2060 1560 1270	2910 2370 1920 1460 1190	2760 2240 1820 1380 1120	2610 2120 1720 1310 1060	2370 1920 1560 1190 964			
1-15/16 2	5000 10000 20000 50000 100000	7960 6470 5250 3990 3240	6470 5250 4270 3240 2630	5250 4270 3470 2630 2140	3990 3240 2630 2000 1620	3240 2630 2140 1620 1320	3030 2460 2000 1520 1230	2870 2330 1890 1440 1170	2720 2210 1790 1360 1110				
2-3/16	5000 10000 20000 50000 100000	9850 8000 6500 4940 4010	8000 6500 5280 4010 3260	6500 5280 4290 3260 2650	4940 4010 3260 2470 2010	4010 3260 2650 2010 1630	3750 3050 2470 1880 1530	3550 2880 2340 1780 1450	3360 2730 2220 1680 1370				
2-7/16 2-1/2	5000 10000 20000 50000 100000	14300 11600 9430 7160 5820	11600 9430 7660 5820 4730	9430 7660 6220 4730 3840	7160 5820 4730 3590 2920	5820 4730 3840 2920 2370	5440 4420 3590 2730 2210	5150 4180 3400 2580 2100	4880 3960 3220 2440 1990				
2-11/16 2-3/4 2-15/16 3	5000 10000 20000 50000 100000	15600 12600 10300 7800 6340	12600 10300 8340 6340 5150	10300 8340 6780 5150 4180	7800 6340 5150 3910 3180	6340 5150 4180 3180 2580	5930 4810 3910 2970 2410	5610 4560 3700 2810 2280					
3-3/16 3-7/16 3-1/2	5000 10000 20000 50000 100000	24200 19700 16000 12100 9870	19700 16000 13000 9870 8020	16000 13000 10600 8020 6510	12100 9870 8020 6090 4950	9870 8020 6510 4950 4020	9230 7500 6090 4630 3760						
3-11/16 3-15/16 4	5000 10000 20000 50000 100000	31100 25300 20500 15600 12700	25300 20500 16700 12700 10300	20500 16700 13600 10300 8360	15600 12700 10300 7820 6350	12700 10300 8360 6350 5160	11900 9630 7820 5940 4830						

RADIAL LOAD RATINGS IN POUNDS







TYPE M2000 WITH SKF® SPHERICAL ROLLER BEARINGS

MOLINE	BROWNING	DODGE	LINK-BELT	REX	SKF
2-Bolt Pillow Block	SPB1000	P2BS2000	PB22400H	ZA2000	SYR
4-Bolt Pillow Block	SPB1000F	P4BS2000	PB22400FH	ZA2000F	
4-Bolt Square Flange	SFB1000	F4BS2000	FB22400H	ZB2000	FYR
Piloted Flange Cartridge	SFC1000	FCS2000	FCB22400H	ZBR2000	FYRP
Wide Slot Take-Up	STU1000NE	WSTUS2	TB22400H	ZT2000	TBR

<u>Note</u>: This is a general dimensional interchange. For exact dimensions and comparison information on inserts and seals, please contact the factory.





