

**M2000  
SPHERICAL  
ROLLER  
BEARINGS**

**Moline M2000 Mounted Spherical Roller Bearings are suitable for a wide variety of applications. They work exceptionally 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, 4-Bolt 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-aligning feature provides for speedy mounting with a minimum of field adjustment required. The housings are ruggedly designed and made in the USA of Class 30 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 are not shaft ready. No time or expense is required for cleaning housings or initial lubrication. Therefore, overall cost is less in many instances. Operating expense over time is also generally less.

Our 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 that 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 balanced Labyrinth seal for high-speed applications.

Moline M2000 bearings are available in expansion (red metal tag) and non-expansion (yellow metal tag) styles. The expansion units have the capacity to move up to .100". The bearings are available in shaft sizes from 1<sup>3</sup>/<sub>16</sub>" up to 5" and 40 to 130mm.

All Moline housings come with a standard paint finish. Custom Colors, Powder Coating, Stainless Steel Powder coating, Nickel plating, Epoxy and Teflon coatings will be quoted on request.

Moline M2000 mounted bearings are carried in Moline warehouses and distributor stocks throughout the United States and in Canada.

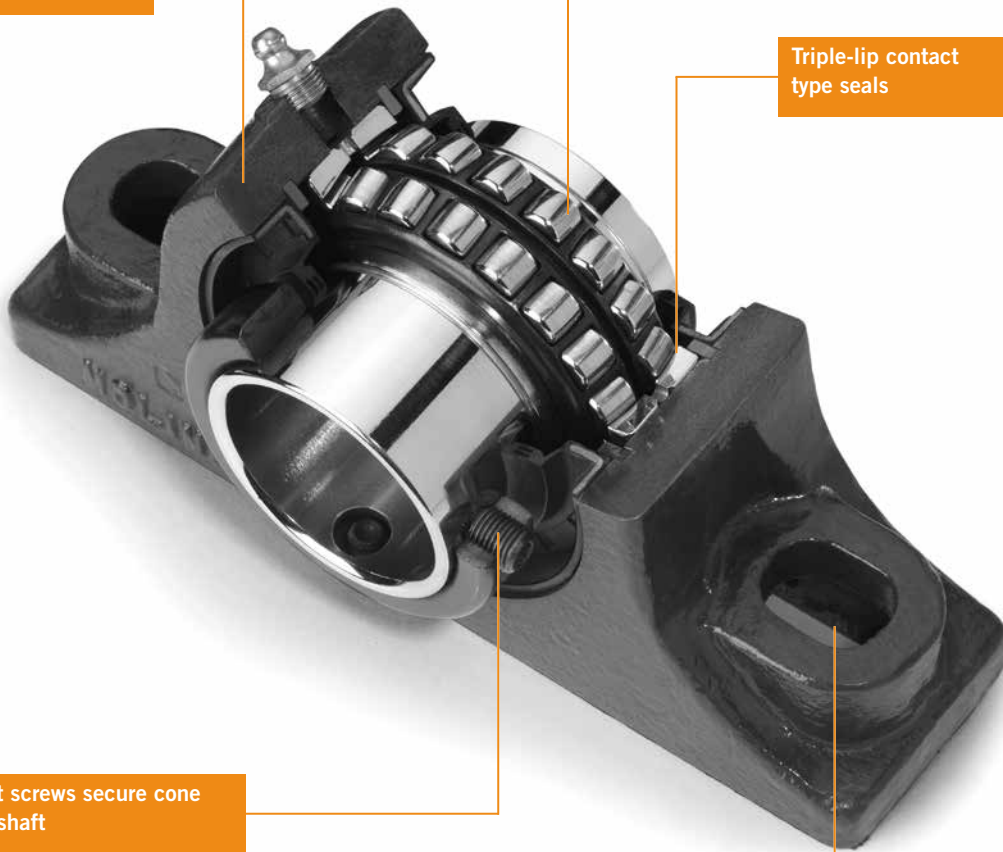
Solid cast iron housing  
with center support  
Made in the USA

Large diameter rollers for  
optimum capacity

Triple-lip contact  
type seals

Set screws secure cone  
to shaft

Elongated bolt holes  
permit adjustment and  
increased mounting  
options



# FEATURES OF MOLINE M2000 SPHERICAL ROLLER BEARINGS

## WITH SKF® OR TIMKEN™ ROLLER BEARINGS

- Available in shaft sizes from 1 $\frac{3}{16}$  to 5"; and 40 to 130mm
- +/- 1 $\frac{1}{2}$ ° misalignment capacity
- Available in Expansion (red tag) and Non-Expansion (yellow tag) 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 250°, high temperature grease is available up to 350°, please call the factory for more information
- Housings available in the standard painted finish. Powder coating in RAL or custom colors, Stainless Steel Powder coating, 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
- Housings are made in the USA of Class 30 cast iron
- Piloted Flange housings are machined with back-out holes
- 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
- Made in the United States

Standard "Triple Lip" Seal



Spring Loaded Garter Seal for use in extreme wet and dirt conditions

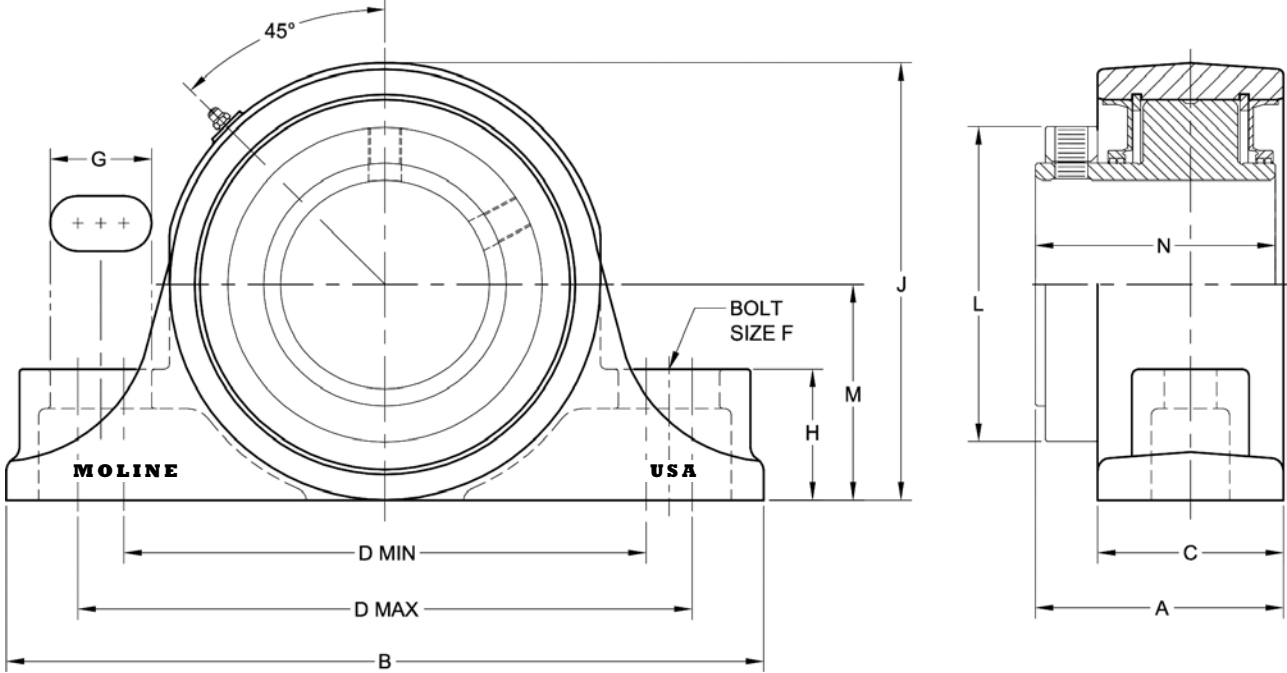


Balanced Metal Labyrinth Seal for high speed applications





# M2000 2-BOLT PILLOW BLOCK



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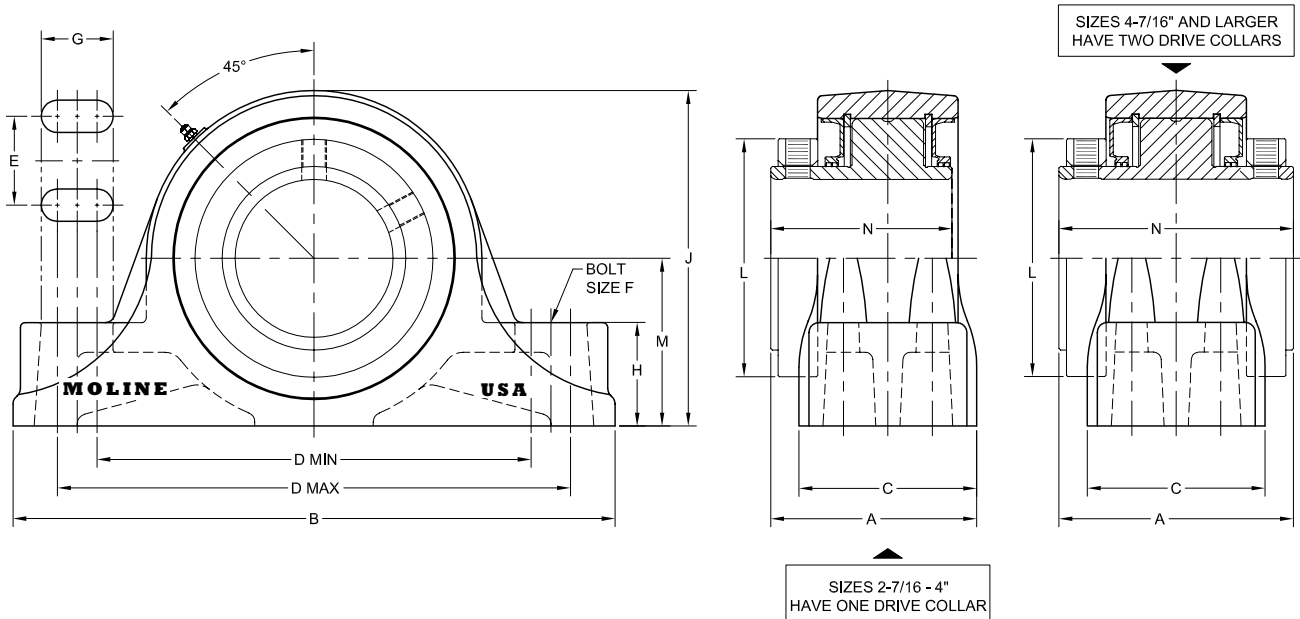


CAD drawings available upon request at no additional charge.

# M2000 4-BOLT PILLOW BLOCK

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SHAFT SIZE	MOLINE PART #		DIMENSIONS (INCHES)					
	EXP	NON-EXP	A	B	C	MIN D	CENTER TO CENTER D	MAX D
2 <sup>7</sup> / <sub>16</sub>	19141207	19241207	3 <sup>3</sup> / <sub>4</sub>	9 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub>	6 <sup>7</sup> / <sub>8</sub>	7 <sup>1</sup> / <sub>4</sub>	7 <sup>5</sup> / <sub>8</sub>
2 <sup>1</sup> / <sub>2</sub>	19141208	19241208						
60mm	19141060	19241060						
65mm	19141065	19241065						
2 <sup>11</sup> / <sub>16</sub>	19141211	19241211	4 <sup>1</sup> / <sub>4</sub>	10 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	7 <sup>7</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>8</sub>
2 <sup>3</sup> / <sub>4</sub>	19141212	19241212						
2 <sup>15</sup> / <sub>16</sub>	19141215	19241215						
3	19141300	19241300						
70mm	19141070	19241070						
75mm	19141075	19241075						
3 <sup>3</sup> / <sub>16</sub>	19141303	19241303	4 <sup>9</sup> / <sub>16</sub>	13	3 <sup>7</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>4</sub>	10	10 <sup>3</sup> / <sub>4</sub>
3 <sup>7</sup> / <sub>16</sub>	19141307	19241307						
3 <sup>1</sup> / <sub>2</sub>	19141308	19241308						
80mm	19141080	19241080						
85mm	19141085	19241085						
90mm	19141090	19241090						





# M2000 4-BOLT PILLOW BLOCK

SHAFT SIZE	DIMENSIONS (INCHES)								WEIGHT LBS.
	E	F	G	H	J	L	M	N	
2 <sup>7</sup> / <sub>16</sub> 2 <sup>1</sup> / <sub>2</sub> 60mm 65mm	1 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub>	5 <sup>11</sup> / <sub>16</sub>	4	2 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>8</sub>	17
2 <sup>11</sup> / <sub>16</sub> 2 <sup>3</sup> / <sub>4</sub> 2 <sup>15</sup> / <sub>16</sub> 3 70mm 75mm	1 <sup>7</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>4</sub>	6 <sup>7</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>	3 <sup>5</sup> / <sub>8</sub>	26
3 <sup>3</sup> / <sub>16</sub> 3 <sup>7</sup> / <sub>16</sub> 3 <sup>1</sup> / <sub>2</sub> 80mm 85mm 90mm	2	3 <sup>3</sup> / <sub>4</sub>	1 <sup>9</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>4</sub>	7 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>32</sub>	38

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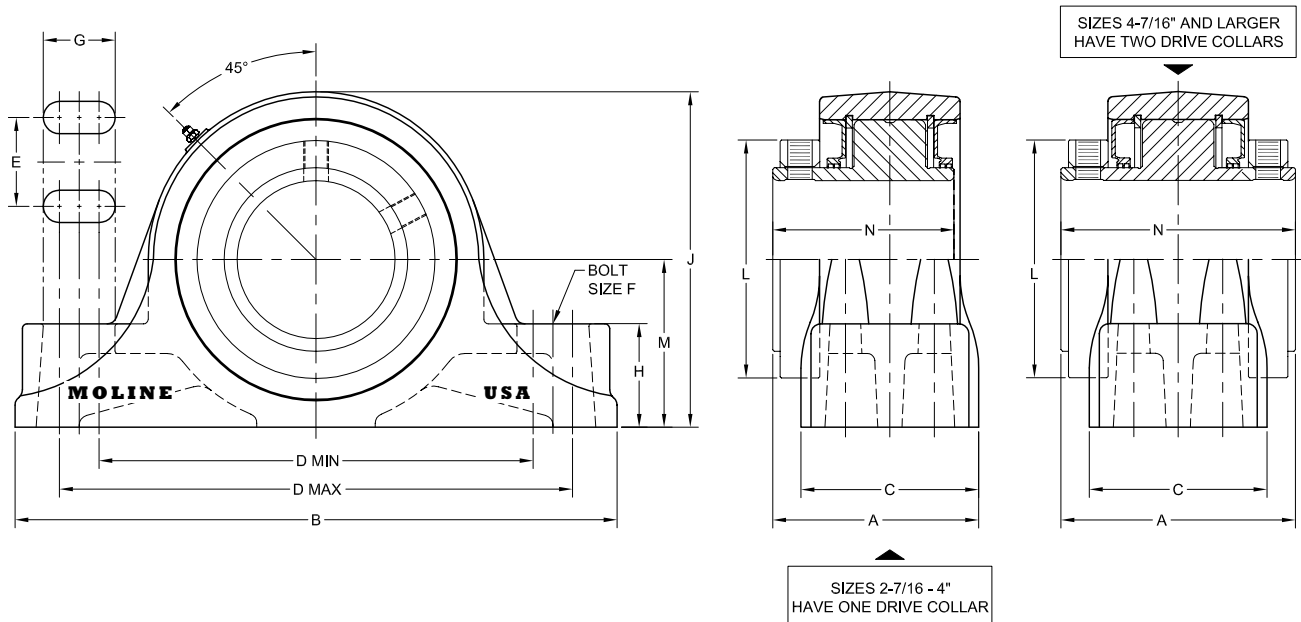
Note: Sizes 2<sup>7</sup>/<sub>16</sub>"– 4" have one drive collar. For sizes 4<sup>7</sup>/<sub>16</sub>" and larger have 2 drive collars.

CAD drawings available upon request at no additional charge.

# M2000 4-BOLT PILLOW BLOCK CONTINUED

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SHAFT SIZE	MOLINE PART #		DIMENSIONS (INCHES)					
	EXP	NON-EXP	A	B	C	MIN D	CENTER TO CENTER D	MAX D
3 1 <sup>1</sup> / <sub>16</sub>	19141311	19241311	5 1/4	15 1/4	4 1/2	11	12	13
3 1 <sup>5</sup> / <sub>16</sub>	19141315	19241315						
4	19141400	19241400						
100mm	19141100	19241100						
4 7 <sup>1</sup> / <sub>16</sub>	19141407	19241407	6 1/4	16 1/2	4 3/4	13	13 1/2	14
4 1/2	19141408	19241408						
110mm	19141110	19241110						
115mm	19141115	19241115						
4 1 <sup>5</sup> / <sub>16</sub>	19141415	19241415	7 7/16	18 5/8	5 3/8	15	15 1/2	16
5	19141500	19241500						
125mm	19141125	19241125						
130mm	19141130	19241130						



# M2000 4-BOLT PILLOW BLOCK

SHAFT SIZE	DIMENSIONS (INCHES)								WEIGHT LBS.
	E	F	G	H	J	L	M	N	
$3 \frac{11}{16}$ $3 \frac{15}{16}$ 4 100mm	2 $\frac{1}{4}$	$\frac{3}{4}$	1 $\frac{13}{16}$	2 $\frac{5}{8}$	8 $\frac{1}{2}$	6	4 $\frac{1}{4}$	4 $\frac{19}{32}$	50
$4 \frac{7}{16}$ 4 $\frac{1}{2}$ 110mm 115mm	2 $\frac{1}{2}$	$\frac{3}{4}$	1 $\frac{5}{16}$	2 $\frac{3}{4}$	9 $\frac{1}{2}$	6 $\frac{1}{8}$	4 $\frac{3}{4}$	6 $\frac{1}{4}$	72
$4 \frac{15}{16}$ 5 125mm 130mm	2 $\frac{3}{4}$	$\frac{7}{8}$	1 $\frac{1}{2}$	3	11 $\frac{1}{8}$	6 $\frac{7}{8}$	5 $\frac{1}{2}$	7 $\frac{7}{16}$	107

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Note: Sizes  $2 \frac{7}{16}$ " - 4" have one drive collar. For sizes  $4 \frac{7}{16}$ " and larger have 2 drive collars.

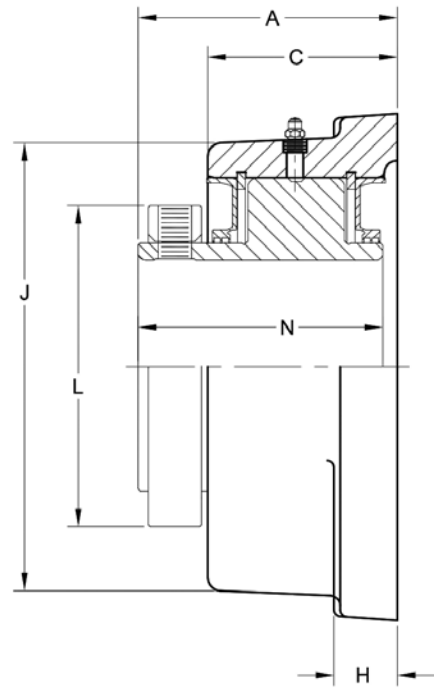
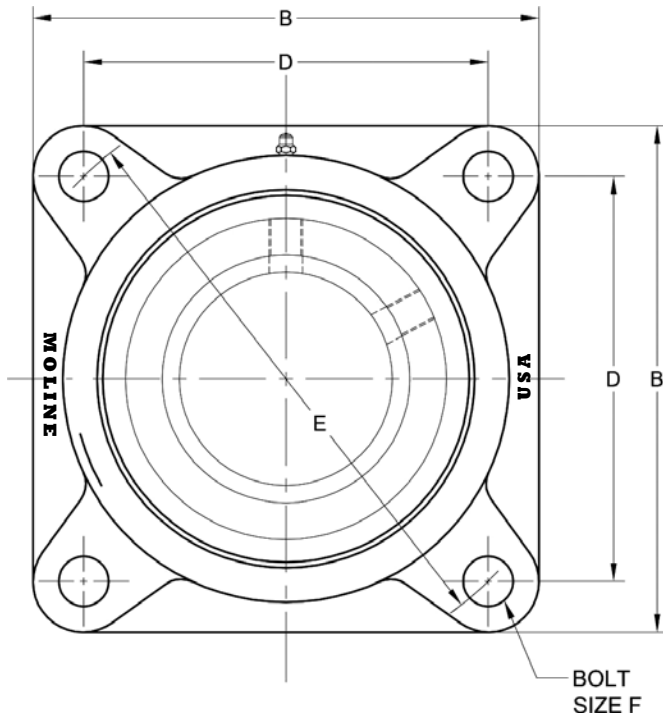
CAD drawings available upon request at no additional charge.

# M2000 4-BOLT FLANGE

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SHAFT SIZE	MOLINE PART #		DIMENSIONS (INCHES)										WEIGHT LBS.
	EXP	NON-EXP	A	B	C	D	E	F	H	J	L	N	
1 3/16 1 1/4 1 7/16 1 1/2	19111103 19111104 19111107 19111108	19211103 19211104 19211107 19211108	2 15/16	4 5/8	2 1/4	3 17/32	5	1/2	3/4	3 7/8	2 1/2	2 3/4	7
1 11/16 1 3/4 40mm 45mm	19111111 19111112 19111040 19111045	19211111 19211112 19211040 19211045	3 1/16	5	2 1/4	3 57/64	5 1/2	1/2	3/4	4 1/4	2 5/8	2 7/8	10
1 15/16 2 50mm	19111115 19111200 19111050	19211115 19211200 19211050	3 1/32	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 2 1/4 55mm	19111203 19111204 19111055	19211203 19211204 19211055	3 9/32	5 7/8	2 7/16	4 1/2	6 3/8	5/8	3/4	5	3 1/4	3 1/8	12.5
2 7/16 2 1/2 60mm 65mm	19111207 19111208 19111060 19111065	19211207 19211208 19211060 19211065	3 9/16	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 70mm 75mm	19111211 19111212 19111215 19111300 19111070 19111075	19211211 19211212 19211215 19211300 19211070 19211075	3 15/16	7 1/4	2 7/8	5 9/16	7 7/8	3/4	1	6 5/8	4 3/8	3 5/8	25
3 3/16 3 7/16 3 1/2 80mm 85mm 90mm	19111303 19111307 19111308 19111080 19111085 19111090	19211303 19211307 19211308 19211080 19211085 19211090	4 11/32	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 100mm	19111311 19111315 19111400 19111100	19211311 19211315 19211400 19211100	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

# M2000 4-BOLT FLANGE



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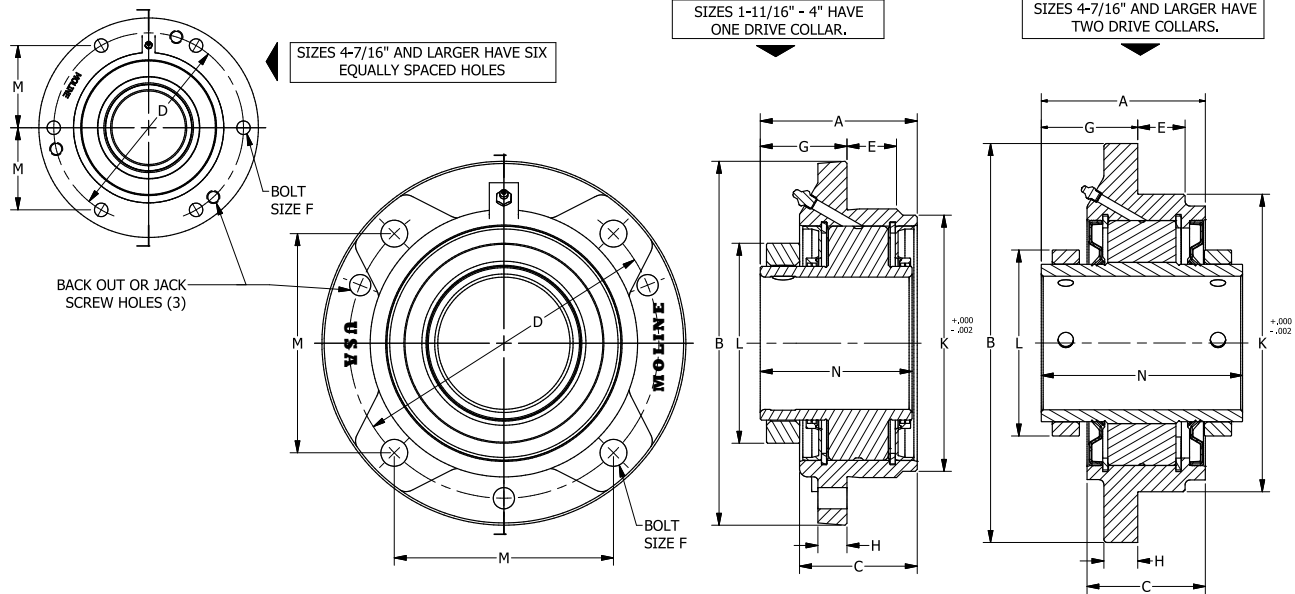


CAD drawings available upon request at no additional charge.

# M2000 PILOTED FLANGE CARTRIDGE

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SHAFT SIZE	MOLINE PART #		DIMENSIONS (INCHES)												WEIGHT LBS.		
	EXP	NON-EXP	A	B	C	D	E	F	G	H	K	L	M	N			
1 3/16	19131103	19231103															
1 1/4	19131104	19231104	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 1/2	3 3/32	2 3/4			7
1 7/16	19131107	19231107															
1 1/2	19131108	19231108															
1 11/16	19131111	19231111															
1 3/4	19131112	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	3 5/8	2 7/8			8.5
40mm	19131040	19231040															
45mm	19131045	19231045															
1 15/16	19131115	19231115															
2	19131200	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	3 51/64	2 7/8			10.5
50mm	19131050	19231050															
2 3/16	19131203	19231203															
2 1/4	19131204	19231204	3 1/4	7 1/8	2 7/16	6	1	1/2	1 25/32	1/2	5	3 1/4	4 1/4	3 1/8			14.5
55mm	19131055	19231055															
2 7/16	19131207	19231207															
2 1/2	19131208	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	4 19/32	3 3/8			16
60mm	19131060	19231060															
65mm	19131065	19231065															



# M2000 PILOTED FLANGE CARTRIDGE

SHAFT SIZE	MOLINE PART #		DIMENSIONS (INCHES)												WEIGHT LBS.
	EXP	NON-EXP	A	B	C	D	E	F	G	H	K	L	M	N	
2 1/16	19131211	19231211	3 13/16	8 3/4	2 13/16	7 1/2	1 1/4	5/8	2	3/4	6 3/8	4 3/8	5 19/64	3 5/8	22
2 3/4	19131212	19231212													
2 15/16	19131215	19231215													
3	19131300	19231300													
70mm	19131070	19231070													
75mm	19131075	19231075													
3 3/16	19131303	19231303	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	6 3/32	4 1/32	33
3 7/16	19131307	19231307													
3 1/2	19131308	19231308													
80mm	19131080	19231080													
85mm	19131085	19231085													
90mm	19131090	19231090													
3 1/16	19131311	19231311	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	6 5/8	4 19/32	45
3 15/16	19131315	19231315													
4	19131400	19231400													
100mm	19131100	19231100													
4 7/16	19131407	19231407	5 5/32	13 1/2	4	11 3/4	1 1/2	3/4	3 3/16	1	10 1/4	6 1/8	5 3/32	6 1/8	72
4 1/2	19131408	19231408													
110mm	19131110	19231110													
115mm	19131115M	19231115M													
4 15/16	19131415	19231415	6 1/16	14 3/4	5 3/4	12 3/4	1 3/4	7/8	3 9/16	1 1/4	11	6 7/8	5 17/32	7 7/16	99
5	19131500	19231500													
125mm	19131125	19231125													
130mm	19131130	19231130													

M2000 SPHERICALS



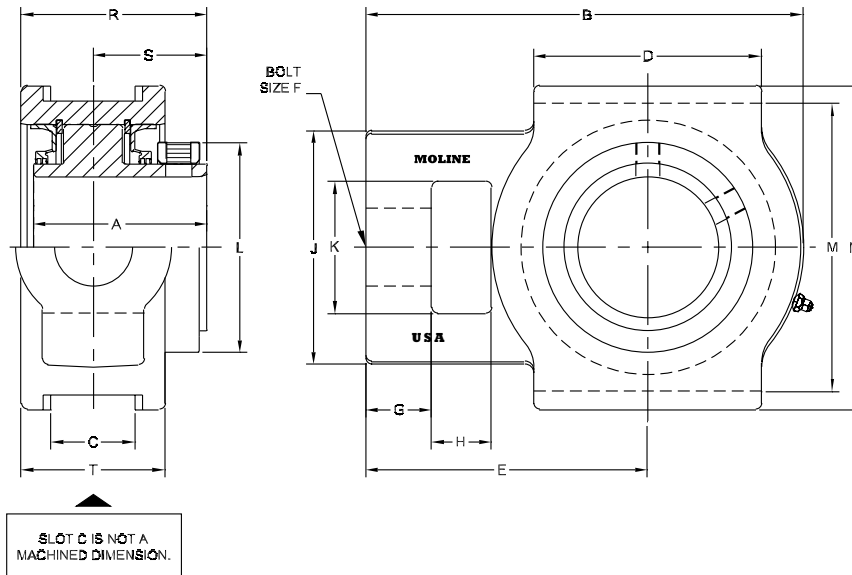
Note: Sizes 2 7/16"– 4" have one drive collar. For sizes 4 7/16" and larger have 2 drive collars.

CAD drawings available upon request at no additional charge.

# M2000 WIDE SLOT TAKE-UP

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SHAFT SIZE	MOLINE PART #		DIMENSIONS (INCHES)							
	EXP.	NON-EXP	A	B	C	D	E	F	G	H
1 15/16	19151115	19251115								
2	19151200	19251200	2 7/8	6 5/16	1 1/16	3 3/4	3 15/16	1	1 5/16	3/4
50mm	19151050	19251050								
2 3/16	19151203	19251203								
2 1/4	19151204	19251204	3 1/8	7 1/8	1 3/16	3 3/4	4 5/8	1 1/8	1	1
55mm	19151055	19251055								
2 7/16	19151207	19251207								
2 1/2	19151208	19251208	3 3/8	7 13/16	1 1/32	4 1/2	5 1/16	1 1/2	1 1/16	1 1/4
60mm	19151060	19251060								
65mm	19151065	19251065								
2 11/16	19151211	19251211								
2 3/4	19151212	19251212	3 5/8	9 1/8	1 25/32	4 3/4	5 7/8	1 1/2	1 3/8	1 1/4
2 15/16	19151215	19251215								
3	19151300	19251300								
70mm	19151070	19251070								
75mm	19151075	19251075								
3 3/16	19151303	19251303								
3 7/16	19151307	19251307	4 1/32	10 1/4	1 25/32	6	6 3/8	1 3/4	1 1/16	1 5/8
3 1/2	19151308	19251308								
80mm	19151080	19251080								
85mm	19151085	19251085								
90mm	19151090	19251090								





# M2000 WIDE SLOT TAKE-UP

SHAFT SIZE	DIMENSIONS (INCHES)								WEIGHT LBS.
	J	K	L	M	N	R	S	T	
1 15/16 2 50mm	3 5/16	1 15/16	2 7/8	4	4 3/4	3 1/16	1 7/8	2 7/16	10
2 3/16 2 1/4 55mm	3 7/8	2 1/4	3 1/4	4 1/2	5 1/4	3 1/4	2	2 9/16	12
2 7/16 2 1/2 60mm 65mm	4 1/4	2 1/2	4	5 1/8	6	3 1/2	2 1/8	2 3/4	16
2 11/16 2 3/4 2 15/16 3 70mm 75mm	4 7/8	2 3/4	4 3/8	5 15/16	6 3/4	3 7/8	2 3/8	3	22
3 3/16 3 7/16 3 1/2 80mm 85mm 90mm	4 7/8	2 7/8	5 1/8	6 13/16	7 13/16	4 1/2	2 19/32	3 13/16	38

M2000 SPHERICALS



CAD drawings available upon request at no additional charge.

# M2000 APPLICATION GUIDE

## 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 <sup>3</sup> / <sub>16</sub> – 1 <sup>1</sup> / <sub>2</sub>	Plus .0000" to minus .0005"
1 <sup>5</sup> / <sub>8</sub> – 4 40mm - 100mm	Plus .0000" to minus .0010"
4 <sup>7</sup> / <sub>16</sub> – 5 110mm - 130mm	Plus .0000" to minus .0015"

SHAFT SIZE		SET SCREW SIZE	TORQUE IN - LBS
IN	MM		
1 <sup>3</sup> / <sub>16</sub> – 2 <sup>1</sup> / <sub>4</sub>	40 – 55	<sup>3</sup> / <sub>8</sub> – 24	290
2 <sup>7</sup> / <sub>16</sub> – 3 <sup>1</sup> / <sub>2</sub>	60 – 90	<sup>1</sup> / <sub>2</sub> – 20	620
3 <sup>15</sup> / <sub>16</sub> – 5	100 – 130	<sup>5</sup> / <sub>8</sub> – 18	1325

## 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.
4. Determine final shaft position and hand tighten screws in the locking collar(s) of non-expansion bearing firmly onto the shaft, while the other bearings remain free. If possible, rotate the shaft slowly under load to properly center the rolling elements with respect to the raceways. Tighten set screws alternately in small increments to the torque value specified in Table above. To ensure full locking of the inner race to the shaft, after 24 hours of operation the setscrews should be retightened to the original torque value.

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. Same as Non-Expansion Bearing.
2. Same as Non-Expansion Bearing.
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<sup>1</sup>/<sub>2</sub>°

# M2000 APPLICATION GUIDE

## 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.

Abnormal bearing temperatures may indicate insufficient lubrication. Normal temperature may range from “cool to the touch” up to the point of “too hot to touch for more than a few seconds,” depending on the bearing size and speed, and surrounding conditions. Unusually high temperature accompanied by excessive leakage of grease indicates too much grease. High temperature with no grease showing at the seals, particularly if the bearing seems noisy, usually indicates too little grease. Normal temperature and a slight showing of grease at the seals indicate proper lubrication.

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.

## Lubrication Guide

Read preceding paragraphs before establishing lubrication schedule.

HOURS RUN PER DAY	SUGGESTED LUBRICATION PERIOD IN WEEKS							
	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

## M2000 APPLICATION GUIDE CONTINUED

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.

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

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 page 65 for maximum

FR= Radial Load

X= Radial Load Factor

(page 65)

Y= Thrust Load Factor

(page 65)

To find the X and Y values, first calculate FA/FR. Then use the M2000 Thrust Factors and Seal Speeds table on the following page 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 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.

The shaft tolerances noted on page 62 are sufficient for normal applications. As noted in Table 1, extremely heavy radial loads may require a light to snug press fit onto the shaft.

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.

# M2000 APPLICATION GUIDE

## M2000 Thrust Factors and Seal Speeds

SHAFT SIZE	E	LIGHT THRUST IF FA/FR≤E		HEAVY THRUST IF FA/FR≥E		DYNAMIC CAPACITY C*		SEAL SPEED LIMITS			MAXIMUM SLIP FIT RADIAL LOAD FR**
		X	Y	X	Y	LBS.	NEWTONS	STANDARD TRIPLE LIP RPM	LABYRINTH RPM	GARTER SPRING RPM	
1 3/16 – 1 1/2	.28	1.0	2.4	.67	3.6	16500	73600	2800	5300	1700	2000
1 11/16 – 1 3/4 40mm 45mm	.26	1.0	2.6	.67	3.9	17300	77100	2650	4700	1600	2100
1 15/16 – 2 50mm	.24	1.0	2.8	.67	4.2	19000	84500	2400	4250	1450	2300
2 3/16 – 2 1/4 55mm	.23	1.0	2.9	.67	4.3	22400	99500	2150	3800	1300	2700
2 7/16 – 2 1/2 60mm 65mm	.24	1.0	2.8	.67	4.2	33300	148000	1800	3250	1100	4000
2 11/16 – 3 70mm 75mm	.22	1.0	3.1	.67	4.6	34600	158000	1600	2800	950	4200
3 3/16 – 3 1/2 80mm 85mm 90mm	.23	1.0	2.9	.67	4.3	56900	253000	1300	2200	800	6800
3 11/16 – 4 100mm	.24	1.0	2.8	.67	4.2	69900	311000	1200	2000	700	8400
4 7/16 – 4 1/2 110mm 115mm	.25	1.0	2.7	.67	4.1	91700	408000	1150	-----	-----	11000
4 15/16 – 5 125mm 130mm	.26	1.0	2.6	.67	3.9	123000	546000	900	-----	-----	14800

\* 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.

For applications that exceed the load ratings above, please contact the factory for assistance.

# M2000 RADIAL LOAD RATINGS

M2000  
SPHERICALS

NOMINAL SHAFT DIAMETER (IN)	L10 HRS LIFE	RADIAL LOAD RATINGS AT VARIOUS REVOLUTIONS PER MINUTE								
		50	100	200	500	1000	1200	1500	1800	2500
1 7/16 1 1/2	5000	7300	5930	4810	3660	2970	2780	2630	2490	2260
	10000	5930	4810	3910	2970	2410	2260	2140	2020	1830
	20000	4810	3910	3180	2410	1960	1830	1740	1640	1490
	50000	3660	2970	2410	1830	1490	1390	1320	1250	1130
	100000	2970	2410	1960	1490	1210	1130	1070	1010	919
1 11/16 1 3/4 40mm 45mm	5000	7660	6220	5050	3840	3120	2910	2760	2610	2370
	10000	6220	5050	4100	3120	2530	2370	2240	2120	1920
	20000	5050	4100	3330	2530	2060	1920	1820	1720	1560
	50000	3840	3120	2530	1920	1560	1460	1380	1310	1190
	100000	3120	2530	2060	1560	1270	1190	1120	1060	964
1 15/16 2 50mm	5000	7960	6470	5250	3990	3240	3030	2870	2720	-----
	10000	6470	5250	4270	3240	2630	2460	2330	2210	-----
	20000	5250	4270	3470	2630	2140	2000	1890	1790	-----
	50000	3990	3240	2630	2000	1620	1520	1440	1360	-----
	100000	3240	2630	2140	1620	1320	1230	1170	1110	-----
2 3/16 2 1/4 55mm	5000	9850	8000	6500	4940	4010	3750	3550	3360	-----
	10000	8000	6500	5280	4010	3260	3050	2880	2730	-----
	20000	6500	5280	4290	3260	2650	2470	2340	2220	-----
	50000	4940	4010	3260	2470	2010	1880	1780	1680	-----
	100000	4010	3260	2650	2010	1630	1530	1450	1370	-----
2 7/16 2 1/2 60mm 65mm	5000	14300	11600	9430	7160	5820	5440	5150	4880	-----
	10000	11600	9430	7660	5820	4730	4420	4180	3960	-----
	20000	9430	7660	6220	4730	3840	3590	3400	3220	-----
	50000	7160	5820	4730	3590	2920	2730	2580	2440	-----
	100000	5820	4730	3840	2920	2370	2210	2100	1990	-----

Note: Refer to page 65 for seal speed limits.

For applications that exceed the load ratings above, please contact the factory for assistance.

# M2000 RADIAL LOAD RATINGS

NOMINAL SHAFT DIAMETER (IN)	L10 HRS LIFE	RADIAL LOAD RATINGS AT VARIOUS REVOLUTIONS PER MINUTE								
		50	100	200	500	1000	1200	1500	1800	2500
2 <sup>1</sup> / <sub>16</sub>	5000	15600	12600	10300	7800	6340	5930	5610	----	----
2 <sup>3</sup> / <sub>4</sub>	10000	12600	10300	8340	6340	5150	4810	4560	----	----
2 <sup>15</sup> / <sub>16</sub>	20000	10300	8340	6780	5150	4180	3910	3700	----	----
3	50000	7800	6340	5150	3910	3180	2970	2810	----	----
70mm	100000	6340	5150	4180	3180	2580	2410	2280	----	----
75mm										
3 <sup>3</sup> / <sub>16</sub>	5000	25250	20510	16660	12660	10280	9730	-----	-----	-----
3 <sup>7</sup> / <sub>16</sub>	10000	20510	16660	13530	10280	8350	7910	-----	-----	-----
3 <sup>1</sup> / <sub>2</sub>	20000	16660	13530	10990	8350	6780	6420	-----	-----	-----
80mm	50000	12660	10280	8350	6340	5150	4880	-----	-----	-----
85mm	100000	10280	8350	6780	5150	4180	3960	-----	-----	-----
90mm										
3 <sup>11</sup> / <sub>16</sub>	5000	31020	25200	20470	15550	12630	11960	-----	-----	-----
3 <sup>15</sup> / <sub>16</sub>	10000	25200	20470	16620	12630	10260	9710	-----	-----	-----
4	20000	20470	16620	13500	10260	8330	7890	-----	-----	-----
100mm	50000	15550	12630	10260	7790	6330	5990	-----	-----	-----
	100000	12630	10260	8330	6330	5140	4870	-----	-----	-----
4 <sup>7</sup> / <sub>16</sub>	5000	40700	33050	26850	20400	16570	-----	-----	-----	-----
4 <sup>1</sup> / <sub>2</sub>	10000	33050	26850	21810	16570	13460	-----	-----	-----	-----
110mm	20000	26850	21810	17710	13460	10930	-----	-----	-----	-----
115mm	50000	20400	16570	13460	10220	8300	-----	-----	-----	-----
	100000	16570	13460	10930	8300	6740	-----	-----	-----	-----
4 <sup>15</sup> / <sub>16</sub>	5000	54590	44340	36010	27360	22220	-----	-----	-----	-----
5	10000	44340	36010	29250	22220	18050	-----	-----	-----	-----
125mm	20000	36010	29250	23760	18050	14660	-----	-----	-----	-----
130mm	50000	27360	22220	18050	13710	11140	-----	-----	-----	-----
	100000	22220	18050	14660	11140	9050	-----	-----	-----	-----

Note: Refer to page 65 for seal speed limits.

For applications that exceed the load ratings above, please contact the factory for assistance.

# M2000 SERIES INTERCHANGE

MOLINE	SKF	DODGE	LINK-BELT	REX	SEALMASTER	BROWNING**	TIMKEN/ QM
2-Bolt Pillow Block (Pages 50-51)							
19121 (Expansion)	SYR	P2BS2000RE	PEB22400H	ZA2000	USRB5000E	SPB1000E	QAPL
19221 (Non-Expansion)	SYR-H	P2BS2000R	PB22400H	ZAS2000	USRB5000	SPB1000NE	
4-Bolt Pillow Block (Pages 52-55)							
19141 (Expansion)	----	P4BS2000RE	PEB22400FH	ZA2000F	USRBF5000E	SPB1000FE	QAPF
19241 (Non-Expansion)	----	P4BS2000R	PB22400FH	ZAS2000F	USRBF5000	SPB1000FNE	
4-Bolt Flange (Pages 56-57)							
19111 (Expansion)	FYR	F4BS2000RE*	FEB22400H		USFB5000	SFB1000E	QAFL
19211 (Non-Expansion)	FYR-H	F4BS2000R*	FB22400H	ZB2000*	USFB5000	SFB1000NE	
Piloted Flange (Pages 58-59)							
19131 (Expansion)	FYRP	FCS2000RE			USFC5000E	SFC1000E	QACW
19231 (Non-Expansion)	FYRP-H	FCS2000R	FCB22400H	ZBR2000	USFC5000	SFC1000NE	
Wide Slot Take-Up (Pages 60-61)							
19151 (Expansion)	TBR	WSTUS2000RE			USTU5000E	STU1000E	QATU
19251 (Non-Expansion)	TBR-H	WSTUS2000R	TB22400H	ZT2000	USTU5000	STU1000NE	

\* Manufacture square and round 4-bolt flange

\*\* Legacy item, has been discontinued.

Note: This is a general dimensional interchange.

For exact dimensions and comparison information on inserts and seals, please contact the factory.

For Nomenclature see pages 226–227