M3000 EVEN-LOK™ APPLICATION GUIDE

At Moline, our goal is to provide you with the most reliable products, helpful service, and expert support. We work to make our instruction sheets clear and easy to understand. But if you have further questions, please feel free to call 800.242.4633 or e-mail support@molinebearing.com. We are here to help.

MOUNTING INSTRUCTIONS

PLEASE NOTE: BEFORE MOUNTING, MAKE SURE THERE IS SUFFICIENT CLEARANCE TO ACCESS DISMOUNTING SET SCREWS ON BACK OF UNIT (YELLOW PLASTIC PROTECTION PLUGS).

- Do not remove plastic end cap or plastic protection plugs inserted in the set screw holes until you are ready to install bearing onto shaft.
- Do not disassemble bearing prior to installation.
- Do not tighten any mounting screws prior to installation.
- Use only the supplied Even-lok™ wrench for tightening set screws on bearing. After storage or idle period, add a little fresh grease before running.

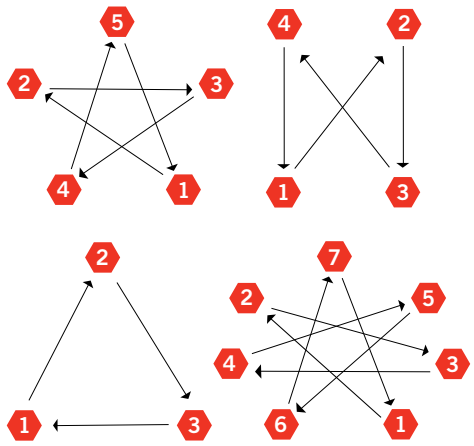
For optimum bearing performance, it is important to start the mounting process with a shaft that is free of burrs and dirt. Please review your shaft and file down burrs and wipe clean the lubricate shaft with light oil. Check shaft diameter and review recommended shaft tolerances below:

SHAFT DIAMETER	TOLERANCE
1 7/16″–1 15/16″	+.000″ to -.003″
2″– 4″	+.000″ to -.004″

1. Clean the base of the bearing and support surface on which it rests. Be sure the supporting surface is flat. If the bearing elevation must be adjusted by shims, the shims MUST extend the full length and width of the support surface.
2. Slide the bearing, with the mounting side facing outward, on the shaft where the unit is to be secured. Leave 1 ½″ minimum housing spacing to allow for insertion of an Allen wrench in the dismounting side set screws. Bolt the housing securely to the support. Note: The mounting side of the bearing is the side which does not have the yellow plastic protection plugs inserted in the set screw holes.
3. The non-expansion bearing must be centered in the housing to allow for axial shaft expansion. Move the bearing axially in the housing in both directions as far as it will go and determine the centered position. It will be necessary to relieve the bearing load while moving the assembly.
4. Snug the mounting screws located in the mounting side collar to finger tightness holding the short leg of the supplied Even-lok™ wrench. Tighten the mounting screws a total of ½ turn by alternately tightening in two increments (¼ turn and ¼ turn). Please refer to the following diagram for proper tightening pattern for each bearing size:

M3000 TIGHTENING PATTERNS

5. Tighten each set screw until the long end of the Even-lok™ wrench bows ½″ under finger pressure. Caution: Do not use auxiliary equipment such as a hammer or pipe in tightening the screws.



DISMOUNTING INSTRUCTIONS

1. Retighten the mounting side set screws until the long end of the Even-Lok™ wrench bows ½″ under finger pressure only.
2. Loosen the mounting side set screws 1-2 full turns.
3. Using a screw driver or other suitable tool, remove and discard the 2 plastic protection plugs.
4. Alternately tighten the dismounting screws in ¼ turn increments until the bearing is released from the shaft. You should hear a distinctive “pop” indicating release.
5. Loosen the dismounting set screws, unbolt the housing from the support structure and remove the complete assembled unit from the shaft.

Note: If the bearing unit will not slip off the shaft during removal, do not continue to further tighten the dismount set screws. This may tend to reverse tighten the bearing to the shaft. In the unlikely event that reverse tightening occurs, loosen the dismounting screws and retighten the screws on the mounting collar side following instructions. Repeat the dismounting procedure Steps 2 through 5.

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. 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.

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

Because the thermometer reading will be approximately 10ºF. 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 M3000 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.

TECHNICAL SUPPORT

Call 800.242.4633, or e-mail at support@molinebearing.com

IMPORTANT NOTICE: Because of the possible dangers to person(s) or property from accidents that may result from the use of products, it is important that correct procedures be followed: Products must be used in accordance with the engineering information specified in the catalog. Proper installation and maintenance operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to ensure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Moline nor are the responsibility of Moline.

M3000 Even-Lok™ Thrust Factors and Seal Speed

SHAFT SIZE	E	LIGHT THRUST IF FA/FR≤E		HEAVY THRUST IF FA/FR≥E		DYNAMIC CAPACITY C*		STANDARD SEAL RPM	MAXIMUM SLIP FIT RADIAL LOAD FR**
		X	Y	X	Y	LBS.	NEWTONS		
1 7/16 - 1 1/2	.28	1.0	2.4	.67	3.6	16500	73600	2800	2000
1 11/16 - 1 3/4	.26	1.0	2.6	.67	3.9	17300	77100	2650	2100
1 15/16 - 2	.24	1.0	2.8	.67	4.2	19000	84500	2400	2300
2 3/16	.23	1.0	2.9	.67	4.3	22400	99500	2150	2700
2 7/16 - 2 1/2	.24	1.0	2.8	.67	4.2	33300	148000	1800	4000
2 11/16 - 3	.22	1.0	3.1	.67	4.6	34600	158000	1600	4200
3 3/16 - 3 1/2	.23	1.0	2.9	.67	4.3	56900	253000	1300	6800
3 11/16 - 4	.24	1.0	2.8	.67	4.2	69900	311000	1200	8400

* 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.

M3000 EVEN-LOK™ 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
1 7/16 1 1/2	5000	7300	5930	4810	3660	2970	2780	2630	2490	2260
	10000	5930	4810	3910	2970	2410	2260	21 40	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	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	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	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	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	-----
2 11/16 2 3/4 2 15/16 3	5000	15600	12600	10300	7800	6340	5930	5610	-----	-----
	10000	12600	10300	8340	6340	5150	4810	4560	-----	-----
	20000	10300	8340	6780	5150	4180	3910	3700	-----	-----
	50000	7800	6340	5150	3910	3180	2970	2810	-----	-----
	100000	6340	5150	4180	3180	2580	2410	2280	-----	-----
3 3/16 3 7/16 3 1/2	5000	25250	20510	16660	12660	10280	9730	-----	-----	-----
	10000	20510	16660	13530	10280	8350	7910	-----	-----	-----
	20000	16660	13530	10990	8350	6780	6420	-----	-----	-----
	50000	12660	10280	8350	6340	5150	4880	-----	-----	-----
	100000	10280	8350	6780	5150	4180	3960	-----	-----	-----
3 11/16 3 15/16 4	5000	31020	25200	20470	15550	12630	11960	-----	-----	-----
	10000	25200	20470	16620	12630	10260	9710	-----	-----	-----
	20000	20470	16620	13500	10260	8330	7890	-----	-----	-----
	50000	15550	12630	10260	7790	6330	5990	-----	-----	-----
	100000	12630	10260	8330	6330	5140	4870	-----	-----	-----