

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 application guides clear and easy to understand. But if you have further questions, please contact us.

800.242.4633

LUBRICATION - VARIOUS OPERATIONS

Normal Operation

Your Moline bearing has been greased at the factory and is ready to install and run. When establishing a re-lubrication schedule, note that a small amount of grease at frequent intervals is preferable to a large amount of grease at infrequent intervals. Table 2 below is a general guide for Lubrication. It should be noted that certain conditions may require a change of lubricating periods as dictated by experience.

High Speed Operation

At higher operating speeds, 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 fitting and run for 10 minutes. This will allow excess grease to escape. Then wipe off excess grease and replace grease fitting.

Operating Temperatures

Normal temperature may range from “cool or warm to the touch” up to a point of “too hot to touch for more than a few seconds,” depending on the bearing size, speed and surrounding conditions. Abnormal bearing temperature may indicate faulty lubrication practices. 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 is noisy, usually indicates too little grease. Normal temperature and a slight showing of grease at the seals indicate proper lubrication.

Special Operating Conditions

Refer acid, chemical, extreme or other special operating conditions to the factory.

LUBRICATION INSTRUCTIONS

Moline bearings have been lubricated at the factory with No. 2 consistency lithium base grease that is suitable for normal operating applications. Many ordinary cup greases will disintegrate at speeds far below those at which Moline bearings will operate successfully if proper grease is used. Relubricate with lithium base grease or a grease that is compatible with original lubricant and suitable for roller bearing service. It should be noted that when re-lubricating, adding a small amount of grease on a frequent basis is preferable to a large amount of grease infrequently. In unusual cases consult the factory or a reputable grease supplier.

Storage or Special Shutdown

If equipment will be idle for some time, before shutting down, add grease to the bearing, rotating the sleeve to distribute grease. If possible, cover the bearing to protect from dust and other contaminants. This will ensure protection of the bearing, particularly when exposed to severe environmental conditions. After lengthy storage or idle period, add fresh grease before starting.

TABLE 2 - LUBRICATION CHART

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

Read Operations and Lubrication sections above before establishing lubrication schedule.



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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.



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. Bolt the housing securely to the support. Note: The mounting side of the bearing is the side with the circle of set screws.
3. The 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:

- Do not remove plastic end cap or plastic protection plugs inserted in the set screw holes (on some older style inserts) 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 then 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"

After choosing the best bearing, make sure you specify the optimal grease for the application.

We use premium Timken™ All Purpose lithium grease to assemble our bearings.

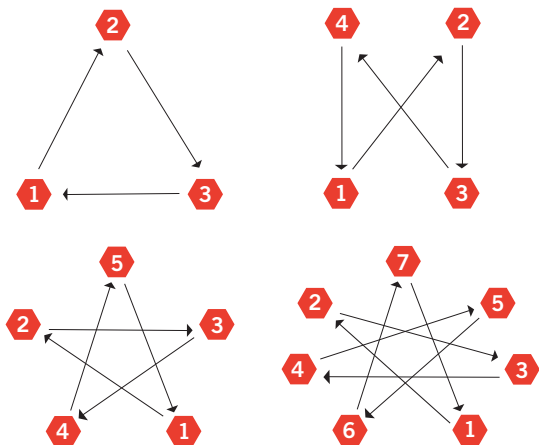
Moline Bearing has access to many of the differing Lubricants on the market today. If you have special or specific performance requirements from the lubricant used for your application, please contact us with the details and we will be glad to accommodate your request.



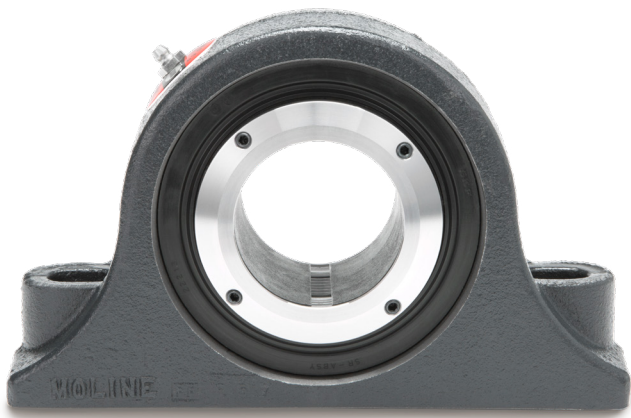
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M3000 TIGHTENING PATTERNS

5. Tighten each set screw until the long end of the Even-lok™ wrench bows ½" under finger pressure or torque to 5.5 lb.ft.
Caution: Do not use power driven or auxiliary equipment such as a hammer or pipe in tightening the screws.



6. Check for misalignment.
 7. Secure the mounting bolts to the support structure tightly.
 8. **Within the first 24 hours of operation, recheck the mounting side screws to the correct torque specifications in step 5 above.**



DISMOUNTING INSTRUCTIONS

1. Clean the bearing and shaft extension of any burrs or rust.
2. It is recommended to lift and support the bearing assembly and shaft extension before dismounting.
3. Loosen the set screws in the mounting collar by a few turns. The pre-loaded wave springs inside the locking mechanism will assist to release the bearing sleeve. The bearing should release from the shaft. If not, tap gently with a rubber hammer on the back-up ring located on the opposite side of the bearing, to release the sleeve.
4. Remove the bearing mounting bolts.
5. Slide the bearing unit off the shaft.

SELECTING THE CORRECT SPHERICAL

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. See page 123.

Select a bearing from the M3000 load-rating chart on page 124 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. See page 124.

For further L10 calculations needed to select and verify the correct Spherical for your application, please refer to the text description on page 80 in conjunction with the M3000 Charts on the following page 123 and 124.



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M3000 Even-Lok™ Thrust Factors and Seal Speed

SHAFT SIZE	e	LIGHT THRUST IF FA/FR ≤ E		HEAVY THRUST IF FA/FR ≥ E		LOAD RATING		SEAL SPEED LIMITS	
		X	Y	X	Y	DYNAMIC C LBS.	STATIC C ₀ LBS.	CONTACT DOUBLE LIP RPM	LABYRINTH RPM
1 7/16 – 1 1/2	.28	1.0	2.4	.67	3.6	22900	22000	3800	5900
1 11/16 – 1 3/4	.26	1.0	2.6	.67	3.9	20200	19800	3500	5400
1 15/16 – 2	.24	1.0	2.8	.67	4.2	21700	22500	3300	4900
2 3/16	.24	1.0	2.8	.67	4.2	30100	30800	3100	4500
2 7/16 – 2 1/2	.24	1.0	2.8	.67	4.2	43400	41100	2700	3800
2 11/16 – 3	.22	1.0	3.0	.67	4.6	47700	54000	2500	3300
3 7/16 – 3 1/2	.23	1.0	2.8	.67	4.2	65200	76400	2100	2800
3 15/16 – 4	.24	1.0	2.8	.67	4.2	81000	93300	2000	2500

* 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.

