

Ball Bearing Installation Instructions Set Screw, Skwezloc®

⚠ WARNING

- Read and follow all instructions carefully.
- Disconnect and lock-out power before installation and maintenance. Working on or near energized equipment can result in severe injury or death.
- Do not operate equipment without guards in place. Exposed equipment can result in severe injury or death.

⚠ CAUTION

- Periodic inspections should be performed. Failure to perform proper maintenance can result in premature product failure and personal injury.

The procedures indicated should be carefully followed. Failure to do so can result in misinstallation which could cause bearing performance problems as well as serious personal injury. Installation, handling or operation of the bearing in excess of ± 2 degrees can cause reduction in bearing performance and may lead to equipment failure.

BEARINGS IN BOLT-ON HOUSINGS (UNITS)

- CHECK AREA-** Clean and organize bearing installation area, keep well lit. Be sure mounting surfaces are clean and flat.
- CHECK SHAFT-** Shaft should be within tolerance range shown in Table #1, clean, and free of nicks and burrs. Mount bearing on unused section of shafting or repair/replace shafting as required.

Table #1

SHAFTING		
Shaft Diameter	Shaft Tolerance	
1/2 - 1 15/16 in. (12 - 49 mm)	+0.0000 / -0.0005 in. (+0.000 / -0.012 mm)	
2 - 3 3/16 in. (50 - 80 mm)	+0.0000 / -0.0010 in. (+0.000 / -0.025 mm)	
3 1/4 - 4 15/16 in. (82 - 125 mm)	+0.0000 / -0.0015 in. (+0.000 / -0.040 mm)	

- INSTALL UNIT-** Slide unit onto shaft. If it is difficult to mount bearing on shaft, use a piece of emery cloth to reduce any high spots on shaft. **Do not hammer on any component of the bearing.**
 - FASTEN UNIT IN PLACE-** Install housing mounting bolts, check and align bearing and tighten mounting bolts to recommended fastener torques. Exercising extreme caution and safety, rotate shaft slowly to center bearing.
- SET SCREW INSERTS**
 - Set screws in a multiple bearing application should be aligned.
 - Torque first set screw to one half recommended torque in Table #2. Torque second set screw to full torque. Torque first set screw to full torque.
 - DOUBLE LOCK SET SCREW INSERTS**
 - Set screws in a multiple bearing application should be aligned.
 - On one end of the inner ring, torque first set screw to one half the recommended torque in Table #2. Torque second set screw to full torque. Torque first set screw to full torque.
 - Repeat step 5b on opposite end of inner ring.

Table #2

SET SCREW TIGHTENING				
SCREW SIZE	HEX. SIZE	TORQUE		
		(in.-lbs.)	(ft.-lbs.)	(N-m)
1/4-28	1/8	65 - 85	-	7 - 10
5/16-24	5/32	125 - 165	-	15 - 18
3/8-24	3/16	230 - 300	-	25 - 34
7/16-20	7/32	350 - 450	30 - 40	40 - 55
1/2-20	1/4	500 - 650	40 - 55	55 - 75
5/8-18	5/16	1100 - 1400	90 - 120	120 - 165

5.3 SKWEZLOC INSERTS

- Be sure that the Skwezloc collar is fitted square and snug against the shoulder on the inner ring.
- Torque the Skwezloc collar cap screw to torque recommended in Table #3.

Table #3

SKWEZLOC CONCENTRIC LOCKING COLLAR CAP SCREW TORQUE		
SCREW SIZE	TORX SIZE	INCH-POUNDS
# 8-32	T-25	70
# 10-24	T-27	100
1/4-20	T-30	240
5/16-18	T-45	495

- MONITOR INSTALLED BEARING-** After bearing has been run for several minutes, and again after several hours, check bearing for excessive noise or vibration. Shutdown machine and check housing temp: typical applications operate at 100°F - 150°F (38°C - 66°C). Tighten all locking devices after 500 hours or 3 months, whichever comes first.

Cylindrical OD Inserts and Inserts in Cylindrical OD Housings

INSTALL INSERT- be sure housing bore is clean and free of debris. Press bearing into housing by applying force to face of outer ring. **Do not hammer on any component of the bearing or apply force to inner ring.** Proceed with Step #1- 6 above. For recommended housing bore tolerance, consult Sealmaster® catalog or phone Sealmaster Application Engineering.

Spherical O.D. and (AR) Expansion Inserts

Important: Replacement Sealmaster bearing inserts are intended for use in Sealmaster housings. Housings should be thoroughly inspected for damage such as cracks, excessive wear or galling of the spherical seat, obstruction of grease port, etc. prior to installation.

INSTALL INSERT- housing bearing seat should be wiped clean. Check grease port and clean free of debris. Wet housing bearing seat with oil or grease. Secure housing in a vise.

For Spherical OD:

- Place bearing insert into housing load slot, positioning the insert outer race dimple and lube hole in line with the casting lube port.
- Using a bar slipped into the insert bore as a lever, swing insert into place within the casting. Insert should have a snug fit in housing bore. **Do not hammer.** (Note: If insert can be made to swivel by hand in the housing bore, fit is too loose - replace entire unit. If heavy force is required, fit is too tight - replace entire unit).
- Ensure alignment of housing grease port hole and bearing dimple and lube hole.
- Place locking pin into lube port and thread lubrication fitting into threaded lube port hole. Grease fitting adjustment is critical (overtightening or undertightening can result in poor bearing performance), snug fit with wrench, then loosen 1/4 turn. Proceed with steps 1-6 above.

For Expansion Type:

- Slide bearing into housing. **Do not hammer.**
- Ensure alignment of housing grease port hole, brass ring lube hole and bearing dimple.
- Place locking pin into housing grease port hole, brass ring lube hole and bearing dimple. Thread lubrication fitting into threaded housing grease port hole. Grease fitting adjustment is critical (overtightening or undertightening can result in poor bearing performance), snug fitting with wrench, then loosen 1/4 turn. Axial positioning is critical.
- Position bearing insert to maximize axial expansion. Proceed with steps 1-6 above.

SEALMASTER GOLD LUBRICATION:

All Sealmaster Gold Ball bearings are delivered with a high quality lithium complex grease with an EP additive. The bearing is ready for use with no initial lubrication required. The grease consists of a lithium complex thickener, mineral oil, and NLGI grade 2 consistency. Compatibility of grease is critical; therefore consult with Application Engineering and your grease supplier to insure greases are compatible. For best performance it is recommended to relubricate with lithium complex thickened grease with a comparable NLGI consistency and base oil properties.

Relubricatable Sealmaster bearings are supplied with grease fittings or zerks for ease of lubrication with hand or automatic grease guns. Always wipe the fitting and grease nozzle clean.

CAUTION: If possible, it is recommended to lubricate the bearing while rotating, until grease purge is seen from the seals. If this is not an option due to safety reasons, follow the alternate lubrication procedure below.

Re-Lubrication Procedure:

Stop rotating equipment. Add one half of the recommended amount shown in Table 4. Start the bearing and run for a few minutes. Stop the bearing and add the second half of the recommended amount. A temperature rise after lubrication, sometimes 30°F (17°C), is normal. Bearing should operate at temperatures less than 200°F (94°C) and should not exceed 250° (121°C) for intermittent operation. For lubrication guidelines, see Table 5 and 6.

Note: Tables 5 and 6 are general recommendations. Experience and testing may be required for specific applications.

Note: Grease charges in Table 4 are based on the use of lithium complex thickened grease with a NLGI grade 2 consistency.

Note: The Maximum Operational Speed listed in Table 5 and 6 are based on the use of a single lock setscrew insert with felt seals. For maximum operational speeds of the other locking mechanisms and seals, refer to catalog for speed rating or consult Application Engineering.

LO and XLO Relubrication Frequency

LO and XLO bearings are designed for applications which require the bearing to operate with less torque or drag than a standard bearing.

Note: Addition of lubricant to the bearing will increase bearing drag.

If relubrication is necessary:

1. Add a very small amount of lubricant
2. Check bearing rotational torque (be sure that the bearing still rotates freely enough for the application.)

Grease Fitting Caps:

Sealmaster ball bearings now incorporate a unique, color-coding system to help identify the type of grease in the bearings. Each relubricatable Sealmaster bearing features a colored fitting cap to help indicate the type of grease used in the individual bearings. Below is a list of the colored fitting caps and the type of grease they represent.

- Yellow: Lithium complex, NLGI #2, ISO 100-220 oil viscosity
- Red: High temperature lithium complex, NLGI #2, ISO 220 synthetic oil viscosity
- White: H1 food grade calcium sulfonate, NLGI #2, ISO 100 oil viscosity
- Black: Non-standard grease
- No cap: Non-standard high temperature grease

Sealmaster bearings with the RM suffix are reduced maintenance bearings (ex. NP-16 RM). Sealmaster reduced maintenance bearings are designed to operate with the standard factory fill of grease and are designed not to be relubricated.

Sealmaster Ball Lube Table 4 / Grease Charge for Relubrication

Series	Bore Diameter		Grease Charge (Mass - Ounces)	Bore Diameter	Grease Charge (Mass - Ounces)
	Gold - Performance			Material Handling Bearing	
	Standard Duty	Medium Duty			
2-012	1/2 - 3/4	-	0.03	-	-
2-015	13/16 - 1	-	0.04	1	0.03
2-13	1 1/16 - 1 1/4R	15/16 - 1	0.09	1 1/16 - 1 1/4R	0.06
2-17	1 1/4 - 1 7/16	1 3/16	0.13	1 1/4 - 1 7/16	0.09
2-19	1 1/2 - 1 9/16	1 7/16	0.18	1 1/2 - 1 9/16	0.14
2-111	1 5/8 - 1 3/4	1 1/2	0.20	1 5/8 - 1 3/4	0.16
2-115	1 13/16 - 2R	1 11/16 - 1 3/4	0.22	1 13/16 - 2R	0.18
2-23	2 - 2 3/16	1 15/16	0.30	2 - 2 3/16	0.25
2-27	2 1/4 - 2 7/16	2 3/16	0.38	-	-
2-211	2 1/2 - 2 11/16	2 7/16 - 2 1/2	0.53	-	-
2-215	2 13/16 - 2 15/16	2 11/16	0.62	-	-
2-33	3 - 3 3/16	2 15/16	0.88	-	-
2-37	3 1/4 - 3 7/16	3 3/16	1.11	-	-
2-38	3 1/2	3 7/16	1.37	-	-
2-43	3 15/16 - 4 3/16	3 15/16 - 4	2.50	-	-
2-47	5	4 7/16 - 4 15/16	3.91	-	-

Sealmaster Relubrication Frequency

Sealmaster Ball Lube Table 5

Environment	Temperature (°F)	Speed (% Catalog Max)	Frequency
Dirty	-20 to 220	0 - 100%	Daily to 1 Week
Clean	-20 to 125	0 - 25%	4 to 10 Months
		26 - 50%	1 to 4 Months
		51 - 75%	1 Week to 1 Month
		76 - 100%	Daily to 1 Week
	125 to 175	0 - 25%	2 to 6 Weeks
		26 - 50%	1 Week to 1 Month
		51 - 75%	Daily to 1 Week
		76 - 100%	
	175 to 220	0 - 100%	

Sealmaster High Temperature Suffix Modified Bearing Relubrication Frequency

Sealmaster Ball Lube Table 6

Environment	Temperature (°F)	Speed (% Catalog Max)	HT / HTC / HTA Suffix (1)	HI Suffix (2)
Dirty	-20 to 400	0 - 100%	Daily to 1 Week	Daily to 1 Week
Clean	200 to 300	0 - 25%	1 to 3 Months	6 to 12 Months
		26 - 50%	2 to 6 Weeks	2 to 6 Months
		51 - 75%	Daily to 1 Week	2 Weeks to 2 Months
		76 - 100%	Daily to 1 Week	Daily to 1 Week
	300 to 400	0 - 25%	2 Weeks to 1 Month	3 to 6 Months
		26 - 50%	1 to 2 Weeks	1 to 3 Months
		51 - 75%	Daily to 1 Week	1 Week to 1 Month
		76 - 100%	Daily to 1 Week	Daily to 1 Week

(1) Use high temperature lithium complex grease, NLGI#2 and synthetic hydrocarbon oil with ISO 220 viscosity

(2) Use Krytox GPL-226, no substitutions

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