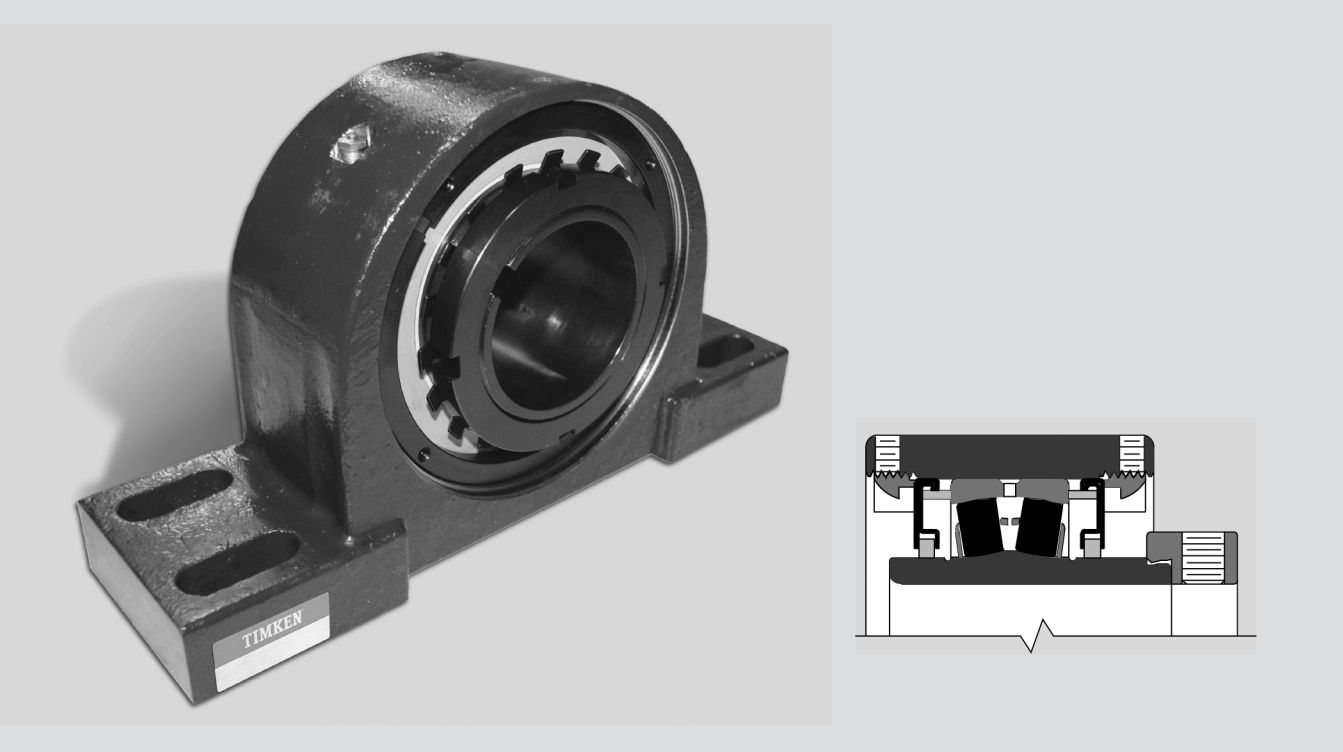
TIMKEN

Where You Turn

Installation Guide

Timken® Spherical Roller Bearing Solid-Block Housed Unit



EC Series

INSTALLATION GUIDE
EC SERIES, SPHERICAL ROLLER BEARING SOLID-BLOCK HOUSED UNIT

INSTALLATION

Please complete the following steps to install Timken EC series spherical roller bearing solid-block housed units.

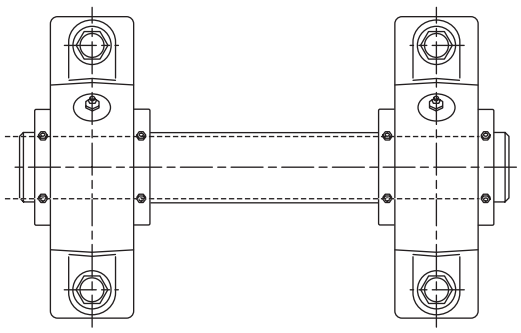
1. Ensure that the shaft is clean, free from nicks and burrs, straight and of proper diameter. See table 1 for recommended shaft tolerances. The housed unit should not be mounted on a worn section of the shaft. Use of shafts with hardness greater than Rc 45 will reduce the effectiveness of locking devices.
2. If using an open-end cover, slide the open-end cover/seal combination into position on shaft.
3. Apply a thin oil film to shaft and bearing bore.
4. Slide the housed unit into position on shaft.
5. Install the housed unit mounting bolts. Check the housed unit alignment. Verify mounting surfaces are in the same flat plane to help make sure good alignment is achieved. If shimming is required to minimize misalignment, use full shims across entire housing base where possible (fig. 2). The bolts then need to be alternately torqued securely to their mounting supports.

TABLE 1. RECOMMENDED SHAFT TOLERANCES.

Shaft Size		Bearing Number	Tolerance
in.	**mm**		in.
1 7/16 1 ½	–	22208	+0.000/0.001
1 11/16 1 ¾	**40** **45**	22209	+0.000/0.0015
1 15/16 2	**50**	22210	+0.000/0.0015
2 3/16 2 ¼	**55**	22211	+0.000/0.0015
2 7/16 2 ½	**60** **65**	22213	+0.000/0.0015
2 11/16 2 ¾ 2 15/16 3	**70** **75**	22215	+0.000/0.002
3 3/16 3 ¼ 3 7/16 3 ½	**80** **85** **90**	22218	+0.000/0.003
3 11/16 3 15/16 4	**100**	22220	+0.000/0.003
4 7/16 4 ½	**110** **115**	22222	+0.000/0.005
4 15/16 5	**125** **130**	22226	+0.000/0.005
5 7/16 5 ½ 5 15/16 6	**140** **150**	23230	+0.000/0.005
6 7/16 6 ½ 6 15/16 7	**170** **180**	23234	+0.000/0.005

6. Rotate the eccentric locking collar until it is hand tight (the direction of rotation does not matter).
7. Lock the eccentric locking collar firmly in place using a spanner wrench or hammer and drift.

   When using a hammer and drift, one or two firm, but not too hard, blows will be sufficient due to the shallow eccentric ramp EC Series housed units. Make sure you drive the collar in the same direction in which you hand tightened it so as to turn it to a tighter position on the bearing's inner ring.
8. Tighten the eccentric locking collar set screws alternately as per table 2. Set screws in multiple units should be aligned to each other (fig. 1).
9. If using covers:
   - Make sure the mating surface of cover and retaining nut are clean and dry.
   - If using a urethane cover, slightly roughen the mating surface of the cover.
   - Place a ⅛ in. - ¼ in. bead of polyurethane adhesive sealant on the mating surface of the cover.
   - Align cover mounting holes with the mounting holes on the retaining housing nut (make sure that the grease fitting on the cover is accessible when doing so).
   - Apply and tighten cover mounting hardware.

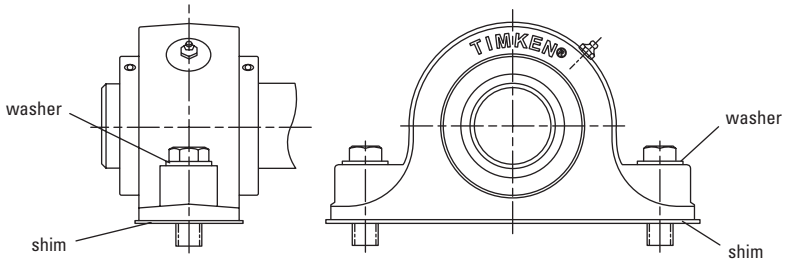


Line up set screws in multiple units.

Fig. 1.

TABLE 2. SET SCREW TORQUE VALUES.

Shaft Size		Bearing Number	Set Screw Size	Torque
in.	**mm**		in.	in. lbs.
1 7/16 1 ½	–	22208	⅜ - 24TPI	290
1 11/16 1 ¾	**40** **45**	22209	⅜ - 24TPI	290
1 15/16 2	**50**	22210	⅜ - 24TPI	290
2 3/16 2 ¼	**55**	22211	⅜ - 24TPI	290
2 7/16 2 ½	**60** **65**	22213	7/16 - 20TPI	430
2 11/16 2 ¾ 2 15/16 3	**70** **75**	22215	7/16 - 20TPI	430
3 3/16 3 ¼ 3 7/16 3 ½	**80** **85** **90**	22218	7/16 - 20TPI	430
3 11/16 3 15/16 4	**100**	22220	9/16 - 18TPI	620
4 7/16 4 ½	**110** **115**	22222	⅝ - 18TPI	1325
4 15/16 5	**125** **130**	22226	⅝ - 18TPI	1325
5 7/16 5 ½ 5 15/16 6	**140** **150**	23230	⅝ - 18TPI	1325
6 7/16 6 ½ 6 15/16 7	**170** **180**	23234	⅝ - 18TPI	1325



Use washers and full shims.

Fig. 2.

LUBRICATION

This information is to aid in the proper lubrication of Timken spherical roller bearing solid-block housed units for the majority of the applications.

Housed units have been factory prelubricated with an NLGI No. 2 lithium-complex extreme-pressure synthetic grease that combines the benefits of wide operating temperatures and broad compatibility with varied materials. This grease offers excellent thermal stability through temperatures ranging from -40° to 177° C (-40° to 350° F). Housed units should be relubricated with this grease or one that is compatible and made for roller bearings. It is vital that the greases used are compatible. Please consult with your Timken engineer for the grease specifications if the use of a grease other than the grease mentioned above is needed.

Normal service is considered as operation in a clean, dry environment at temperatures between -34° C to +82° C (-30° F and +180° F). If service is beyond normal conditions due to speed, temperature or exposure to moisture, dirt or corrosive chemicals, periodic relubrication may be advisable. For extreme conditions or conditions in which special chemicals are used, your Timken engineer should be consulted.

After extended storage or periods when the housed unit is not in operation, fresh grease should be added.

It's important to have the right amount of lubrication because it affects the housed unit bearing operating temperature as well. An inadequate amount of grease could lead to higher temperature operation due to inadequate lubrication film thickness. Excessive grease will lead to higher operating temperatures, due to grease churning which can cause bearing overheating. It is best to observe the bearing and its temperature and adjust the lubrication as needed. If necessary, use the purge valve or seals that purge to reduce the amount of grease.

NOTE

The average manual grease gun will produce approximately one (1) ounce of grease per 33 strokes. Please check with the manufacturer of your grease delivery system for specific information.

RELUBRICATION

Adequate lubrication is an essential element to the housed unit bearing life. Table 3 can be used as a suggested initial point of reference. Relubrication frequency and quantity intervals are best developed through experience for each application, based on types of service, which may differ from the suggestions in the table.

When the housed unit is not in operation for an extended period of time, grease should be added to prevent corrosion.

Table 3 shows general lubrication suggested starting points only. Please read the entire installation instructions prior to using these tables. Applications should be regularly reviewed and lubrication amounts and intervals modified as needed to assure best results.

Every reasonable effort has been made to ensure the accuracy of the information contained in this writing, but no liability is accepted for errors, omissions or any other reason.

NOTE

Proper maintenance and handling practices are critical. Failure to follow installation instructions and to maintain proper lubrication can result in equipment failure.

TABLE 3. RE-LUBRICATION INTERVALS

Shaft Size		Bearing Number	Initial Weight	Relubrication Weight	Relubrication Interval (Hours of Service Based On RPM and Temperature)											
					100 RPM		250 RPM		500 RPM		1000 RPM		2000 RPM		3000 RPM	
in.	mm		oz.	oz.	<160° F	>160° F	<160° F	>160° F	<160° F	>160° F	<160° F	>160° F	<160° F	>160° F	<160° F	>160° F
1 7/16 1 ½	–	22208	0.5	0.1	2200	1000	1400	700	1000	500	240	120	120	60	40	20
1 11/16 1 ¾	**40** **45**	22209	0.7	0.2	2000	1000	1200	600	800	400	320	160	160	80	80	40
1 15/16 2	**50**	22210	0.8	0.2	1600	800	1000	500	640	320	240	120	120	60	60	30
2 3/16 2 ¼	**55**	22211	1.0	0.3	1200	600	800	400	440	220	160	80	100	50	60	30
2 7/16 2 ½	**60** **65**	22213	1.4	0.4	1120	560	720	360	360	180	120	60	80	40	40	20
2 11/16 2 ¾ 2 15/16 3	**70** **75**	22215	2.7	0.7	1040	520	680	340	340	170	100	50	60	30		
3 3/16 3 ¼ 3 7/16 3 ½	**80** **85** **90**	22218	3.7	0.9	960	480	600	300	300	150	80	40	40	20		
3 11/16 3 15/16 4	**100**	22220	6.5	1.6	840	420	520	260	240	120	60	30	20	16		
4 7/16 4 ½	**110** **115**	22222	7.4	1.9	680	340	440	220	200	100	60	30	20	16		
4 15/16 5	**125** **130**	22226	10.6	2.7	560	280	360	180	160	80						
5 7/16 5 ½ 5 15/16 6	**140** **150**	23230	20.8	5.2	480	240	320	160	120	68						
6 7/16 6 ½ 6 15/16 7	**170** **180**	23234	30.0	8.5	400	160	240	160	110	60						

HOW TO CONVERT AN EC SERIES SOLID-BLOCK HOUSED UNIT FROM FIXED TO EXPANSION (FLOATING)

Flange Cartridge and Flange Block

1. Make a reference mark on the housing and retaining nut.
2. Loosen the Teflon-tipped set screw that locks the retaining nut in place.
3. Loosen the retaining nut by tapping it with a hammer and punch, rotating the retaining nut counterclockwise one complete revolution.
4. Tighten the Teflon-tipped set screw.

NOTE

When converting a solid-block housed unit bearing from fixed to expansion, it is imperative that the unit that is going to be converted is correctly oriented. Since the insert in a housed unit flange housed unit is held against either a shoulder or snap ring opposite the housing retaining nut, a flange bearing that has been converted to expansion can only float in the direction of the retaining nut. Based on this, the retaining nut must be on the side of the housing opposite the fixed bearing.

Pillow Block

1. Decide the amount and direction of expansion that's needed. If uni-directional expansion is required, follow directions outlined in the previous column for flange housed units on the nut that is on the side you want the expansion.
2. If multi-directional expansion is required, follow the directions outlined in the previous section for both nuts on flange housed units.

HOW TO CONVERT AN EC SERIES SOLID-BLOCK HOUSED UNIT FROM EXPANSION (FLOATING) TO FIXED

Flange Cartridge and Flange Block

1. Loosen the Teflon-tipped set screw that locks the retaining nut in place.
2. Tighten the retaining nut by tapping it with a hammer and punch, rotating the retaining nut clockwise until it's tight. It is not possible to over-tighten the retaining nut.
3. Tighten the Teflon-tipped set screw.

Pillow Block

1. Follow the directions above for flange housed units on both nuts on either side of the housing.

NOTE

When converting a solid-block housed unit from expansion to fixed on a mounted bearing, the locking collar set screws must be released to allow the insert to move both in the housing and on the shaft.

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