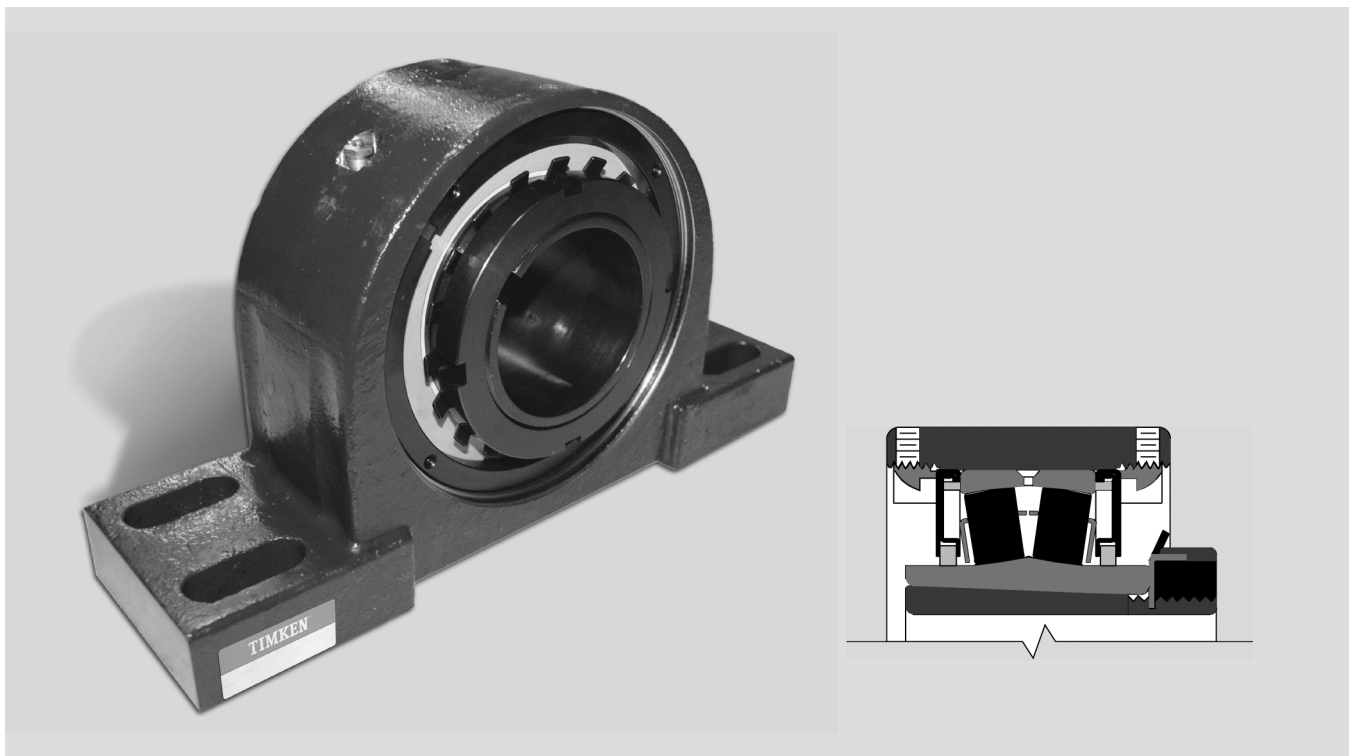


Installation Guide

Timken® Spherical Roller Bearing Solid-Block Housed Unit



TA/DV Series

INSTALLATION GUIDE

TA/DV SERIES, SPHERICAL ROLLER BEARING SOLID-BLOCK HOUSED UNIT

Choose one of the three following methods for installing your housed units depending on your situation. Timken recommends the axial drive-up method for most applications. If your application is not as critical, the more simple Tang Counting Method is fine.

AXIAL DRIVE-UP METHOD:

1. Clean all components of any debris and apply a thin oil film to all mating surfaces to ensure proper seating.
2. If using an open-end cover, slide the open-end cover/seal combination into position on the shaft.
3. Slide the adapter sleeve into position on the shaft, then put the housed unit into place on the adapter sleeve.
4. Loosely install the housed unit mounting bolts. Check the housed unit alignment (fig. 1). 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. Washers should be properly sized to bold diameter and should not be an SAE grade, which is smaller.
5. Put the lockwasher on and thread the locknut onto the adapter sleeve, leaving approximately $\frac{1}{4}$ in. between the lockwasher and the inner ring of bearing.
6. Use a large screwdriver or pry bar to lever the sleeve into position until there is no relative movement between the shaft, the adapter sleeve and the bearing's inner ring.
7. Rotate the locknut until hand tight.
8. Tighten the locknut while using a dial indicator to measure the axial movement of the tapered adapter sleeve relative to the bearing's inner ring (see table 1).
9. Bend a tang on the lockwasher into a slot on the locknut to prevent the locknut from loosening.
 - Tighten the housed unit mounting bolts.
10. 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 $\frac{1}{8}$ in. - $\frac{1}{4}$ 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.

TANG COUNTING METHOD:

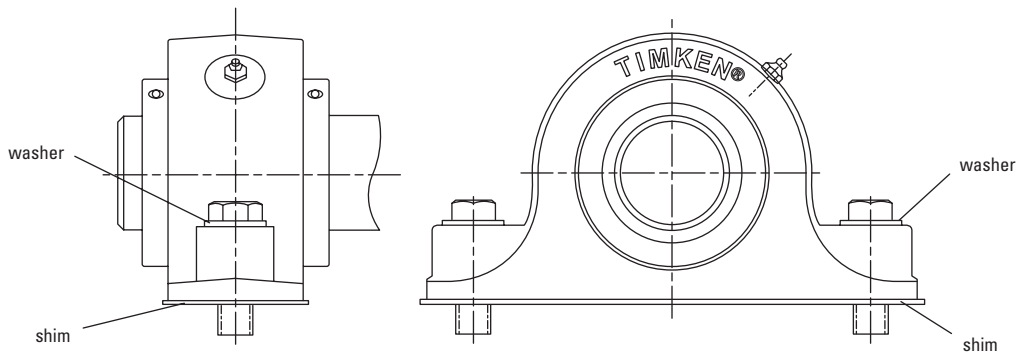
1. Clean all components of any debris and apply a thin oil film to all mating surfaces to ensure proper seating.
2. If using an open-end cover, slide open-end cover/seal combination into position on the shaft.
3. Slide the adapter sleeve into correct position on the shaft, then put the housed unit into place on the adapter sleeve.
4. Loosely install the housed unit mounting bolts. Check the housed unit alignment (fig. 1). 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. Washers should be properly sized to bold diameter and should not be an SAE grade, which is smaller.
5. Put the lockwasher on and thread the locknut onto the adapter sleeve, leaving approximately $\frac{1}{4}$ in. between the lockwasher and the inner ring of the bearing.
6. Use a large screw driver or pry bar to lever the sleeve into position until there is no relative movement between the shaft, the adapter sleeve and the bearing's inner ring.
7. Rotate the locknut until hand tight.
8. Note which tang is in line with one slot on the locknut.
9. Tighten locknut until the slot on the locknut passes the number of tangs shown on table 2.
10. Bend a tang on the lockwasher into a slot on the locknut to prevent the locknut from loosening.
 - Tighten the housed unit mounting bolts.
11. 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 $\frac{1}{8}$ in. - $\frac{1}{4}$ 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.

**TABLE 1. AXIAL MOVEMENT OF TAPERED ADAPTER SLEEVE
RELATIVE TO INNER RING**

Shaft Size		Bearing Number	Minimum Axial Movement	Maximum Axial Movement
in.	mm		in.	in.
1 ¹¹ / ₁₆ 1 ³ / ₄	40	22209	0.015	0.018
1 ¹⁵ / ₁₆ 2	50	22211	0.018	0.022
2 ³ / ₁₆ 2 ¹ / ₄	55	22212	0.018	0.022
2 ¹ / ₄ 2 ⁷ / ₁₆	60	22213	0.018	0.022
2 ⁷ / ₁₆ 2 ¹ / ₂	65	22215	0.022	0.030
2 ⁷ / ₁₆ 2 ³ / ₄	70	22216	0.022	0.030
2 ¹⁵ / ₁₆ 3	75	22217	0.027	0.038
3 ³ / ₁₆ 3 ¹ / ₄	80	22218	0.027	0.038
3 ¹ / ₄ 3 ⁷ / ₁₆	85	22219	0.027	0.038
3 ⁷ / ₁₆ 3 ¹ / ₂	90	22220	0.027	0.038
3 ¹⁵ / ₁₆ 4	100	22222	0.030	0.042
4 ³ / ₁₆ 4 ¹ / ₄	110	22224	0.030	0.042
4 ⁷ / ₁₆ 4 ¹ / ₂	115	22226	0.035	0.050

TABLE 2. NUMBER OF TANGS TO LOCKING

Shaft Size		Bearing Number	Number of Tangs
in.	mm		in.
1 ¹¹ / ₁₆ 1 ³ / ₄	40	22209	3-4
1 ¹⁵ / ₁₆ 2	50	22211	4-5
2 ³ / ₁₆ 2 ¹ / ₄	55	22212	4-5
2 ¹ / ₄ 2 ⁷ / ₁₆	60	22213	4-5
2 ⁷ / ₁₆ 2 ¹ / ₂	65	22215	5-6
2 ⁷ / ₁₆ 2 ³ / ₄	70	22216	5-6
2 ¹⁵ / ₁₆ 3	75	22217	8-9
3 ³ / ₁₆ 3 ¹ / ₄	80	22218	8-9
3 ¹ / ₄ 3 ⁷ / ₁₆	85	22219	8-9
3 ⁷ / ₁₆ 3 ¹ / ₂	90	22220	8-9
3 ¹⁵ / ₁₆ 4	100	22222	10-11
4 ³ / ₁₆ 4 ¹ / ₄	110	22224	10-11
4 ⁷ / ₁₆ 4 ¹ / ₂	115	22226	10-11



Use washers and full shims.

Fig. 1.

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.

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 ¹¹ / ₁₆ 1 ³ / ₄	40 45	22209	0.7	0.2	2000	1000	1200	600	800	400	320	160	160	80	80	40
1 ¹⁵ / ₁₆ 2	50	22211	1.0	0.3	1200	600	800	400	440	220	160	80	100	50	60	30
2 ³ / ₁₆ 2 ¹ / ₄	60	22213	1.4	0.4	1120	560	720	360	360	180	120	60	80	40	40	20
2 ⁷ / ₁₆ 2 ¹ / ₂	65	22215	2.7	0.7	1040	520	680	340	340	170	100	50	60	30		
2 ¹⁵ / ₁₆ 3	75	22217	3.4	0.9	1000	500	640	320	320	160	100	50	60	30		
3 ⁷ / ₁₆ 3 ¹ / ₂	90	22220	6.5	1.6	840	420	520	260	240	120	60	30				
3 ¹⁵ / ₁₆ 4	110	22222	7.4	1.9	680	340	440	220	200	100	60	30				
4 ⁷ / ₁₆ 4 ¹ / ₂	115	22226	12	3.0	600	300	360	180	160	80	40	20				

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.

NOTE

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

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.

HOW TO CONVERT A TA/DV 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 A TA/DV 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.

TIMKEN

Where You Turn

Bearings • Steel •
Power Transmission Systems •
Precision Components •
Gears • Seals • Lubrication •
Industrial Services •
Remanufacture and Repair

www.timken.com



5M 01-12: Order No. 10501