

# Mounting Timken® Tapered Bore Spherical Roller Bearings

Tapered bore spherical roller bearings are mounted on tapered shafts (Figure 1) or on cylindrical shafts with tapered sleeves. The sleeves are either adapter or withdrawal configurations. (Figures 2 and 3)

Correct shaft mounting is dependent on the axial movement of the bearing up the tapered seat. This axial movement produces an interference fit which removes bearing radial internal clearance (RIC). RIC measurement before and during mounting is the preferred method to determine adequacy of shaft fit. (Figure 4) Recommended RIC reductions are supplied in the table on the reverse side.

To measure the unmounted RIC, place the bearing in an upright position and center the inner and outer rings. Oscillate the inner

ring several times to properly seat the rollers. Insert feeler gauge blades between the outer ring and top most rollers. (Figure 5) Be sure to cover the full roller length. The unmounted RIC is the thickest blade that will slide through. Both bearing rows should be checked in this manner.

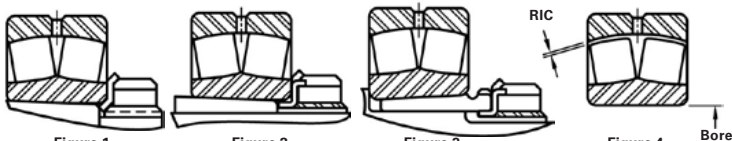
During mounting, the RIC should be measured at the unloaded rollers. This may be at the top or bottom of the bearing depending on orientation. The rollers must be seated during the process. Axial movement should continue until the recommended RIC reduction is obtained.

The mounted RIC should not be less than the minimum permissible value from the table. Timken hydraulic nuts are recommended for mounting larger spherical roller bearings.

## Example:

Bearing 22328K C3 (140 mm bore, taper 1:12) is being mounted on tapered shaft.

- A. Using feeler gauge measure unmounted RIC. From chart it should be 0.0063 - 0.0079".
- B. Move bearing on shaft until line-to-line contact exists with bearing bore.
- C. Using locknut or hydraulic nut, force bearing up the tapered seat until 0.0025 - 0.0035" RIC is removed. 0.035 - 0.050" axial displacement required.
- D. Final measured RIC should not be less than 0.0030".



**Figure 1**  
Mounting with tapered shaft

**Figure 2**  
Mounting with adapter sleeve

**Figure 3**  
Mounting with withdrawal sleeve

**Figure 4**  
Radial internal clearance



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Nominal bearing bore (mm)		Radial Internal Clearance prior to mounting (Inch)						Recommended reduction of RIC (Inch)		Axial displacement tapered shaft installation (Inch)				Minimum permissible RIC after installation		
		Normal		C3		C4				1:12 Taper**		1:30 Taper**		Normal	C3	C4
over	incl	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max			
30	40	.0014	.0020	.0020	.0026	.0026	.0033	.0008	.0010	.012	.015	-	-	.0006	.0010	.0016
40	50	.0018	.0024	.0024	.0031	.0031	.0039	.0010	.0012	.015	.018	-	-	.0008	.0012	.0020
50	65	.0022	.0030	.0030	.0037	.0037	.0047	.0012	.0015	.018	.022	-	-	.0010	.0015	.0025
65	80	.0028	.0037	.0037	.0047	.0047	.0059	.0015	.0020	.022	.030	-	-	.0010	.0017	.0030
80	100	.0030	.0043	.0043	.0055	.0055	.0071	.0018	.0025	.027	.038	-	-	.0014	.0020	.0030
100	120	.0039	.0053	.0053	.0067	.0067	.0087	.0020	.0028	.030	.042	.075	.100	.0020	.0025	.0040
120	140	.0047	.0063	.0063	.0079	.0079	.0102	.0025	.0035	.035	.050	.090	.120	.0022	.0030	.0045
140	160	.0051	.0071	.0071	.0091	.0091	.0118	.0030	.0040	.045	.060	.105	.135	.0022	.0030	.0050
160	180	.0055	.0079	.0079	.0102	.0102	.0134	.0030	.0045	.045	.065	.105	.160	.0024	.0035	.0060
180	200	.0063	.0087	.0087	.0114	.0114	.0146	.0035	.0050	.055	.075	.120	.175	.0028	.0040	.0065
200	225	.0071	.0098	.0098	.0126	.0126	.0161	.0040	.0055	.060	.080	.140	.190	.0030	.0045	.0070
225	250	.0079	.0106	.0106	.0138	.0138	.0177	.0045	.0060	.070	.090	.160	.210	.0035	.0045	.0080
250	280	.0087	.0118	.0118	.0154	.0154	.0193	.0045	.0065	.070	.100	.160	.230	.0040	.0055	.0090
280	315	.0094	.0130	.0130	.0169	.0169	.0213	.0050	.0070	.075	.105	.175	.245	.0040	.0060	.0100
315	355	.0106	.0142	.0142	.0185	.0185	.0232	.0055	.0075	.080	.110	.190	.260	.0045	.0065	.0110
355	400	.0118	.0157	.0157	.0205	.0205	.0256	.0060	.0080	.090	.120	.210	.280	.0050	.0075	.0130
400	450	.0130	.0173	.0173	.0224	.0224	.0283	.0065	.0085	.100	.130	.230	.300	.0060	.0090	.0140
450	500	.0146	.0193	.0193	.0248	.0248	.0311	.0070	.0090	.105	.135	.245	.315	.0065	.0105	.0160
500	560	.0161	.0213	.0213	.0268	.0268	.0343	.0080	.0100	.120	.150	.280	.350	.0070	.0115	.0175
560	630	.0181	.0236	.0236	.0299	.0299	.0386	.0090	.0110	.135	.165	.315	.385	.0080	.0125	.0200
630	710	.0201	.0264	.0264	.0335	.0335	.0429	.0100	.0120	.150	.180	.350	.420	.0080	.0145	.0215
710	800	.0224	.0295	.0295	.0378	.0378	.0480	.0110	.0140	.165	.210	.385	.490	.0090	.0155	.0240
800	900	.0252	.0331	.0331	.0421	.0421	.0539	.0120	.0150	.180	.225	.420	.525	.0100	.0180	.0270
900	1000	.0280	.0366	.0366	.0469	.0469	.0598	.0140	.0170	.210	.255	.490	.595	.0110	.0195	.0300
1000	1120	.0303	.0406	.0406	.0512	.0512	.0657	.0160	.0190	.240	.285	.560	.665	.0110	.0215	.0320
1120	1250	.0327	.0441	.0441	.0559	.0559	.0720	.0170	.0200	.255	.300	.595	.700	.0130	.0240	.0360

**NOTES:** \*Axial displacement values apply to solid steel shafts or to hollow steel shafts with bore diameter less than half the shaft diameter. For shaft materials other than steel or for thin-wall shafts, please contact a Timken sales representative. \*\*1:12 Taper used for 222, 223, 230, 231, 232, 233, 239 series. 1:30 Taper used for 240, 241, 242 series. For sleeve mounting, multiply axial displacement values by 1.1 for 1:12 taper or by 1.05 for 1:30 taper. Questions on tapered shaft data, contact a Timken sales representative.