TIMKEN

Tapered bore spherical roller bearings are mounted on tapered shafts (Fig. 1) or on cylindrical shafts with tapered sleeves. The sleeves are either adapter or withdrawal configurations (Fig. 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 (Fig. 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 guage blades between the outer ring and top most rollers (Fig. 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.

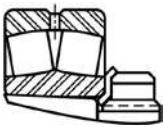

Fig. 1. Mounting with tapered shaft

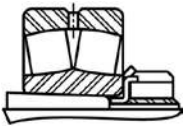

Fig. 2. Mounting with adapter sleeve

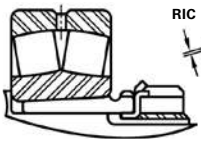

Fig. 3. Mounting with withdrawal sleeve

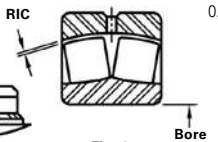

Fig. 4. Radial internal clearance

Example:

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

A. Using feeler guage measure unmounted RIC. From chart it should be 0.12 mm - 0.160 mm".

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 0.065 mm - 0.090 mm" RIC is removed. 0.890 mm - 1.270 mm"axial displacement required.

D. Final measured RIC should not be less than 0.075 mm".

Fig. 5.

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets high-performance mechanical components, including bearings, gears, belts, chain and related mechanical power transmission products and services.

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Nominal Bearing Bore		Normal		C3		C4		Recommended Reduction of RIC		1:12 Taper[1]		1:30 Taper[1]		Normal	C3	C4
		Radial Internal Clearance Prior to Mounting								Axial Displacement Tapered Shaft Installation				Minimum Permissible RIC After Installation		
Over	Incl	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min			
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
30	**40**	0.050	0.035	0.065	0.050	0.085	0.065	0.025	0.020	0.380	0.300	-	-	0.015	0.025	0.040
40	**50**	0.060	0.045	0.080	0.060	0.100	0.080	0.030	0.025	0.460	0.380	-	-	0.020	0.030	0.050
50	**65**	0.075	0.055	0.095	0.075	0.120	0.095	0.040	0.030	0.560	0.460	-	-	0.025	0.040	0.060
65	**80**	0.095	0.070	0.120	0.095	0.150	0.120	0.050	0.040	0.760	0.560	-	-	0.025	0.045	0.075
80	**100**	0.110	0.080	0.140	0.100	0.180	0.140	0.065	0.045	0.970	0.680	-	-	0.035	0.050	0.075
100	**120**	0.135	0.100	0.170	0.135	0.220	0.170	0.070	0.050	1.070	0.760	2.540	1.900	0.050	0.060	0.100
120	**140**	0.160	0.120	0.200	0.160	0.260	0.200	0.090	0.065	1.270	0.890	3.050	2.290	0.055	0.075	0.115
140	**160**	0.180	0.130	0.230	0.180	0.300	0.230	0.100	0.075	1.520	1.140	3.430	2.670	0.055	0.075	0.125
160	**180**	0.200	0.140	0.260	0.200	0.340	0.260	0.115	0.075	1.650	1.140	4.060	2.670	0.060	0.090	0.150
180	**200**	0.220	0.160	0.290	0.220	0.370	0.290	0.125	0.090	1.900	1.400	4.450	3.050	0.070	0.100	0.165
200	**225**	0.250	0.180	0.320	0.250	0.410	0.320	0.140	0.100	2.030	1.520	4.830	3.560	0.075	0.115	0.180
225	**250**	0.270	0.200	0.350	0.270	0.450	0.350	0.150	0.115	2.290	1.780	5.330	4.060	0.090	0.115	0.200
250	**280**	0.300	0.220	0.390	0.300	0.490	0.390	0.165	0.115	2.540	1.780	5.840	4.060	0.100	0.140	0.230
280	**315**	0.330	0.240	0.430	0.330	0.540	0.430	0.180	0.125	2.670	1.900	6.220	4.450	0.100	0.150	0.250
315	**355**	0.360	0.270	0.470	0.360	0.590	0.470	0.190	0.140	2.790	2.030	6.600	4.830	0.115	0.165	0.280
355	**400**	0.400	0.300	0.520	0.400	0.650	0.520	0.200	0.150	3.050	2.290	7.110	5.330	0.130	0.190	0.330
400	**450**	0.440	0.330	0.570	0.440	0.720	0.570	0.215	0.165	3.300	2.540	7.620	5.840	0.150	0.230	0.360
450	**500**	0.490	0.370	0.630	0.490	0.790	0.630	0.230	0.180	3.430	2.670	8.000	6.220	0.165	0.270	0.410
500	**560**	0.540	0.410	0.680	0.540	0.870	0.680	0.250	0.200	3.810	3.050	8.890	7.110	0.180	0.290	0.440
560	**630**	0.600	0.460	0.760	0.600	0.980	0.760	0.280	0.230	4.190	3.430	9.780	8.000	0.200	0.320	0.510
630	**710**	0.670	0.510	0.850	0.670	1.090	0.850	0.300	0.250	4.570	3.810	10.670	8.890	0.200	0.370	0.550
710	**800**	0.750	0.570	0.960	0.750	1.220	0.960	0.350	0.280	5.330	4.190	12.450	9.780	0.230	0.390	0.610
800	**900**	0.840	0.640	1.070	0.840	1.370	1.070	0.380	0.300	5.720	4.570	13.330	10.670	0.250	0.460	0.690
900	**1000**	0.930	0.710	1.190	0.930	1.520	1.190	0.430	0.350	6.480	5.334	15.110	12.450	0.280	0.490	0.750
1000	**1120**	1.030	0.770	1.300	1.030	1.670	1.300	0.480	0.400	7.240	6.100	16.890	14.220	0.280	0.550	0.810
1120	**1250**	1.120	0.830	1.420	1.120	1.830	1.420	0.500	0.430	7.620	6.480	17.780	15.110	0.330	0.610	0.910

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]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.