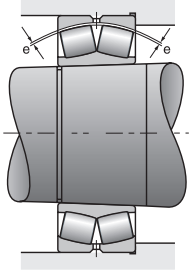
Radial Internal Clearance Reduction

of FAG Spherical Roller Bearings with Tapered Bore (1:12 and 1:30 Taper)

FAG spherical roller bearings with tapered bore are either mounted directly on the tapered shaft (Figure 1) or, if the shaft is cylindrical, on an adapter sleeve (Figure 2) or a withdrawal sleeve (Figure 3). The radial clearance of the bearing must be measured with feeler gauges over both rows of rollers before mounting and it must be recorded.

Pushing the bearing onto the tapered seat expands the inner ring and reduces the radial internal clearance. The reduction in radial internal clearance serves as a measure of the interference fit, or where the radial internal clearance cannot be measured, the distance the bearing is pushed onto the seat can be used as a reference value.



e = Radial internal clearance

During mounting the radial internal clearance or the axial displacement must be checked repeatedly until the proper radial internal clearance is obtained.

The minimum axial displacement applies to bearings whose radial internal clearance is in the lower half of the tolerance range before mounting; the maximum axial displacement applies to bearings of the upper half.

The table on the reverse side lists the values for spherical roller bearings of a bore diameter range between 24 and 2500 mm.

The axial displacement values apply only to solid shafts made of steel and hollow shafts with bore diameters not exceeding half of the shaft outside diameter.

With shafts made from materials other than steel and thin-walled hollow shafts, please contact Schaeffler.

FAG hydraulic nuts and the hydraulic method are recommended to mount large bore spherical roller bearings.

Example: Mounting FAG 22338-BE-XL-K spherical roller bearing with standard CN clearance.
Bore diameter: d = 38 x 5 = 190 mm
Taper: 1:12

Step 1: Measure unmounted radial internal clearance with feeler gauge. It should be .0063 – .0087 inches (see table on reverse).

Step 2: Position bearing on tapered seat until line to line is established.

Step 3: Using either a locknut or a hydraulic nut, push bearing on the tapered seat until .0035 – .0051 inches is removed.

Step 4: The final measured radial internal clearance should not be smaller than .0028 inches.

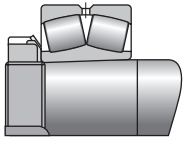


Fig.1: Tapered shaft

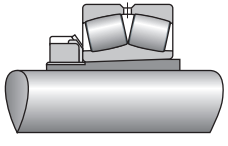


Fig.2: Adapter sleeve

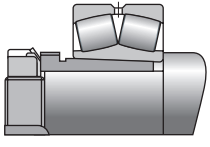


Fig.3: Withdrawal sleeve

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Nominal Bearing Bore (mm) over	incl.	Radial Internal Clearance Before Mounting CN (normal) min	CN (normal) max	C3 min	C3 max	C4 min	C4 max	Reduction in Radial Internal Clearance min	max	Axial Displacement on Solid Steel Shaft Shaft min	Shaft max	Sleeve min	Sleeve max	Shaft min	Shaft max	Sleeve min	Sleeve max	Smallest Radial Internal Clearance After Mounting CN min	C3 min	C4 min
24	30	.0012	.0018	.0018	.0022	.0022	.0029	.0006	.0008	.012	.014	.012	.016					.0006	.0008	.0014
30	40	.0014	.0020	.0020	.0026	.0026	.0034	.0008	.0010	.014	.016	.014	.018					.0006	.0010	.0016
40	50	.0018	.0024	.0024	.0032	.0032	.0039	.0010	.0012	.016	.018	.018	.020					.0008	.0012	.0020
50	65	.0022	.0030	.0030	.0037	.0037	.0047	.0012	.0016	.018	.024	.020	.028					.0010	.0014	.0022
65	80	.0028	.0037	.0037	.0047	.0047	.0059	.0016	.0020	.024	.030	.028	.033					.0010	.0016	.0028
80	100	.0032	.0043	.0043	.0055	.0055	.0071	.0018	.0024	.028	.035	.030	.039					.0014	.0020	.0031
100	120	.0039	.0053	.0053	.0067	.0067	.0087	.0020	.0028	.028	.043	.031	.047	.075	.106	.079	.110	.0020	.0026	.0039
120	140	.0047	.0063	.0063	.0079	.0079	.0102	.0026	.0035	.043	.055	.047	.059	.106	.138	.110	.142	.0022	.0031	.0043
140	160	.0051	.0071	.0071	.0091	.0091	.0118	.0030	.0039	.047	.063	.051	.067	.118	.157	.122	.165	.0022	.0035	.0051
160	180	.0055	.0079	.0079	.0102	.0102	.0134	.0031	.0043	.051	.067	.055	.075	.126	.165	.130	.181	.0024	.0039	.0059
180	200	.0063	.0087	.0087	.0114	.0114	.0146	.0035	.0051	.055	.079	.059	.087	.138	.177	.142	.197	.0028	.0039	.0063
200	225	.0071	.0098	.0098	.0126	.0126	.0161	.0039	.0055	.063	.087	.067	.094	.157	.217	.165	.224	.0031	.0047	.0071
225	250	.0079	.0106	.0106	.0138	.0138	.0177	.0043	.0059	.067	.094	.071	.102	.165	.236	.181	.244	.0035	.0051	.0079
250	280	.0087	.0118	.0118	.0154	.0154	.0193	.0047	.0067	.075	.102	.079	.114	.185	.264	.189	.272	.0039	.0055	.0087
280	315	.0095	.0130	.0130	.0169	.0169	.0213	.0051	.0075	.079	.118	.087	.126	.197	.295	.205	.303	.0043	.0059	.0094
315	355	.0106	.0142	.0142	.0185	.0185	.0232	.0059	.0083	.094	.134	.102	.142	.236	.323	.244	.331	.0047	.0067	.0102
355	400	.0118	.0158	.0158	.0205	.0205	.0256	.0067	.0091	.102	.142	.114	.154	.256	.354	.268	.362	.0051	.0075	.0114
400	450	.0130	.0173	.0173	.0224	.0224	.0284	.0079	.0102	.122	.161	.134	.173	.303	.394	.315	.409	.0051	.0079	.0122
450	500	.0146	.0193	.0193	.0248	.0248	.0311	.0083	.0110	.130	.173	.142	.189	.323	.433	.331	.441	.0063	.0091	.0138
500	560	.0161	.0213	.0213	.0268	.0268	.0343	.0094	.0126	.146	.197	.161	.213	.362	.492	.378	.504	.0067	.0098	.0142
560	630	.0181	.0236	.0236	.0299	.0299	.0386	.0102	.0138	.157	.213	.173	.232	.394	.531	.409	.551	.0079	.0114	.0161
630	710	.0201	.0264	.0264	.0335	.0335	.0429	.0118	.0157	.181	.244	.201	.268	.453	.610	.472	.630	.0083	.0122	.0177
710	800	.0224	.0295	.0295	.0378	.0378	.0480	.0134	.0177	.209	.276	.228	.299	.524	.689	.535	.709	.0091	.0138	.0201
800	900	.0252	.0331	.0331	.0421	.0421	.0539	.0146	.0197	.224	.307	.248	.335	.563	.768	.583	.787	.0106	.0154	.0224
900	1000	.0280	.0366	.0366	.0469	.0469	.0598	.0161	.0217	.248	.335	.276	.370	.622	.827	.646	.866	.0118	.0169	.0252
1000	1120	.0307	.0402	.0402	.0512	.0512	.0650	.0177	.0236	.268	.354	.299	.402	.669	.906	.709	.945	.0126	.0189	.0276
1120	1250	.0339	.0441	.0441	.0559	.0559	.0709	.0193	.0256	.291	.386	.327	.433	.728	.984	.772	1.020	.0134	.0213	.0303
1250	1400	.0370	.0480	.0480	.0610	.0610	.0772	.0217	.0283	.327	.425	.366	.476	.827	1.063	.874	1.114	.0142	.0232	.0331
1400	1600	.0417	.0543	.0543	.0689	.0689	.0866	.0244	.0319	.366	.480	.417	.543	.929	1.213	.972	1.276	.0173	.0260	.0370
1600	1800	.0465	.0606	.0606	.0768	.0768	.0984	.0272	.0366	.409	.551	.461	.622	1.031	1.390	1.087	1.465	.0189	.0287	.0402
1800	2000	.0516	.0673	.0673	.0846	.0846	.1083	.0303	.0409	.457	.614	.516	.697	1.154	1.555	1.213	1.638	.0213	.0319	.0437
2000	2250	.0571	.0748	.0748	.0945	.0945	.1201	.0335	.0453	.500	.677	.571	.768	1.276	1.728	1.339	1.811	.0236	.0374	.0610
2250	2500	.0630	.0827	.0827	.1043	.1043	.1319	.0374	.0504	.563	.756	.638	.846	1.425	1.921	1.496	2.016	.0256	.0453	.0669

For thin-walled hollow shafts contact Schaeffler Engineering
All dimensions in inches except the bearing bore (in mm)

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