8. The correct internal clearance has now been obtained and the lock washer tang can be peened into the slot of the lock nut, thereby locking the assembly.

The more common procedure used for determining the proper fit of spherical roller bearings on tapered seat is to measure the reduction of internal clearance of the bearing, upon mounting, through the use of feeler gauges or shim stock. This procedure can be utilized with the non-sealed SPHERE-ROL® bearing, if desired. The customer must initially measure and verify the clearance existing in the unmounted bearing, then press the bearing on the tapered seat until the specified amount of clearance has been removed, checking with the feeler gauges. The chart at left gives the required diametral clearance reductions which should be used when the feeler gauging procedure is utilized.

NYLAPLATE® seals

The NYLAPLATE® seals have very low running friction and seals can be compounded from a variety of materials, where required, to resist different types of contaminants and to meet different application temperature conditions.

Nylaplate sealed SPHERE-ROL® bearings are identified by adding the suffix "S" to the bearing number for single sealed bearings and "SS" for double NYLAPLATE® seals. For tapered bore bearings, using the single seal, add suffix "S" to indicate the seal on the small bore side, and "SL" to indicate the seal in the large bore side.

Sealed SPHERE-ROL® bearings containing standard NYLAPLATE® seals from McGill should not be operated at temperatures exceeding 300°F. When higher operating temperatures are encountered, special seal materials can be provided. (Specify "TS," "TSS" or "TSL".)

Sealed SPHERE-ROL® bearings should not be subjected to operating misalignments greater than ±2° for best seal performance. During mounting and handling, the bearing should not be misaligned more than ±3°, to insure that seals do not become displaced. Sealed bearings contain snap rings mounted in the outer ring to limit the allowable bearing misalignment, so that the seals cannot be displaced from the bearing.

LAMBDA® seals

The LAMBDA® sealing arrangement is an optional seal configuration available in the SPHERE-ROL® bearing from McGill, for applications where contamination conditions are particularly severe. These would be applications where substantial amounts of moisture are present (such as direct splash of water) or where bearings operate submerged in dirt and/or dust. The sealing features of the standard NYLAPLATE® seal, used for many years in the SPHERE-ROL® bearing, are combined with the lip-wiping sealing function of an added contact seal, to form the LAMBDA® sealing arrangement. (Specify "YS", "YSS", or "YSL".)

LAMBDA® sealed SPHERE-ROL® bearings should not be operated at misalignment angles in excess of ±1° and for best seal efficiency, operating misalignment angles should not exceed ±½°. The LAMBDA® seal should not be operated at temperatures exceeding 300°F. Please consult the McGill Engineering Department when higher temperatures must be considered.

Expansion-type SPHERE-ROL® bearings

A special version of the SPHERE-ROL® bearing can be provided for applications requiring the bearing to accommodate expansion (float) internally. This "expansion-type" SPHERE-ROL® bearing is specified and identified by adding the suffix letter "E" immediately following the diametral clearance specification. (For instance, SB-22319-C3E.)

Most applications incorporating two bearings on a common shaft require that one of those bearings be "fixed" and that the other be free to "float," either in the housing seat.

bore or on the shaft seat. This float allowance, or expansion allowance, is required to compensate for variations in thermal expansion, or for linear dimension errors resulting from fabrication. In many cases, ordinary non-separable ball or roller bearings are used for expansion but they are unsatisfactory because of housing or shaft seat diameter tolerances, the application of heavy loads or misalignment.

Self-aligning bearings are preferred and the expansion-type SPHERE-ROL® roller bearing is the only internally self-aligning bearing having the capability of accommodating expansion or float allowance internally.

This expansion-type SPHERE-ROL® bearing is dimensionally interchangeable, size for size, with "standard" spherical roller bearings; but, because of changes in internal geometry, it does provide substantial axial play of one race ring relative to the other. The expansion allowance in this type SPHERE-ROL® bearing is normally as much as the end play or expansion allowance that would be found in a non-locating cylindrical roller bearing.

The "E" type SPHERE-ROL® bearing is available with the same sealing advantages, diametral clearance values, tapered bore and outer ring relubrication features as standard bearings shown on pages 94 to 97. The basic dynamic rating of "E" type SPHERE-ROL® bearings is 10% less than standard SPHERE-ROL® bearings. Maximum seal misalignment is limited due to increased axial play in bearing.

The expansion-type SPHERE-ROL® bearing will not operate satisfactorily if subjected to thrust loading. Therefore, the expansion-type SPHERE-ROL® bearing must not be used in "fixed" ("held") positions—it is for use only in "expansion" ("float") positions. It is recommended that the end-wise restraint of both race rings of the expansion-type bearing be provided, so that the expansion allowance intended to be available is not lost by error in installation.

Diametral clearance

SPHERE-ROL® bearings are available in five internal diametral clearance ranges identified as C1, C2, Standard, C3 and C4. The C1 and C2 internal diametral clearances are progressively less than the Standard, while C3 and C4 are progressively looser than Standard.

Similarly, five internal clearance ranges are available for tapered bore SPHERE-ROL® bearings. Each of these ranges is somewhat looser than the corresponding cylindrical bore bearing internal diametral clearance range, because of the need to accommodate a somewhat tighter fit with the tapered bore mounting arrangement.

The following two charts give the internal diametral clearance ranges normally available with SPHERE-ROL® bearings from McGill.

Stock bearings having standard diametral clearance will not be identified by special marking; however, the C1, C2, C3 and C4 clearances will be identified on the bearing inner ring face, following the basic bearing number.

Radial clearance (inches) for "SB" Bearings with straight bores

BASIC BORE DIAMETER MM		RADIAL CLEARANCE IN INCHES							
		C2		STANDARD		C3		C4	
OVER	INCL.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
14	24	.0004	.0008	.0008	.0014	.0014	.0018	.0018	.0024
24	30	.0006	.0010	.0010	.0016	.0016	.0022	.0022	.0028
30	40	.0006	.0012	.0012	.0018	.0018	.0024	.0024	.0032
40	50	.0008	.0014	.0014	.0022	.0022	.0030	.0030	.0039
50	65	.0010	.0017	.0017	.0026	.0026	.0036	.0036	.0047
65	80	.0012	.0020	.0020	.0032	.0032	.0044	.0044	.0057
80	100	.0014	.0025	.0025	.0039	.0039	.0053	.0053	.0071
100	120	.0017	.0031	.0031	.0048	.0048	.0064	.0064	.0083
120	140	.0020	.0038	.0038	.0057	.0057	.0075	.0075	.0095
140	160	.0024	.0043	.0043	.0065	.0065	.0087	.0087	.0110

Radial clearance (inches) for "SB" Bearings with tapered ("K" type) bore

BASIC BORE DIAMETER MM		RADIAL CLEARANCE IN INCHES							
		C2		STANDARD		C3		C4	
OVER	INCL.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
14	24	.0006	.0010	.0010	.0014	.0014	.0018	.0018	.0024
24	30	.0008	.0012	.0012	.0017	.0017	.0022	.0022	.0030
30	40	.0008	.0014	.0014	.0020	.0020	.0026	.0026	.0034
40	50	.0012	.0018	.0018	.0024	.0024	.0032	.0032	.0041
50	65	.0014	.0022	.0022	.0030	.0030	.0039	.0039	.0049
65	80	.0018	.0028	.0028	.0037	.0037	.0049	.0049	.0061
80	100	.0020	.0032	.0032	.0044	.0044	.0057	.0057	.0075
100	120	.0025	.0039	.0039	.0053	.0053	.0069	.0069	.0089
120	140	.0030	.0047	.0047	.0063	.0063	.0081	.0081	.0102
140	160	.0034	.0051	.0051	.0071	.0071	.0091	.0091	.0118

Bearing mounting

Bearings should be mounted squarely when press fitted, either in housings or on shafts, and installation pressure should be applied to the press fitted member only, or should be evenly distributed over both members. When heavier shaft fits are encountered, it is sometimes advisable to heat the assembled bearing in order to prevent scoring of the shaft. Heat should not be applied directly to the bearing, but should be conducted to the bearing by some fluid medium. It is recommended that such heating be accomplished in mineral oil and that the temperature of the oil should not exceed 250°F. Sealed SPHERE-ROL® bearings should not be mounted by this method as the grease with which the bearings are prelubricated may be affected.

Shaft surfaces on which the bearing is to be mounted must be clean and free from nicks and burrs. Ground shaft finishes are normally suggested for applications involving SPHERE-ROL® bearings; however, in some cases, a ground finish is not practical. In these situations, a machined finish may be acceptable; consult the McGill Engineering Department for recommendations.

When stationary outer rings are required to float (move axially in the housing bore to compensate for expansion), a housing bore surface finish of 65 micro inches Ra maximum is recommended.

Shaft and housing seat diameters

The tolerances, specified in the following charts for shaft and housing bearing seat fits, may be followed for specific application conditions that are encountered, as indicated. For special applications not covered by the following, the McGill Engineering Department should be consulted for additional assistance.

The proper shaft and housing seat tolerances are designated by a letter and number. For shafts, a lower case letter is used, and for housings, a capital letter, both indicating the location of the tolerance range in relation to the nominal bearing dimension. The numbers indicate the grade of accuracy.

The recommended shaft and housing fits depend upon the operating conditions, as indicated in the charts. In the right-hand column, the symbols for the recommended shaft and housing fits are given. The corresponding numerical dimension values are given on page 92 for the shaft fits, and on page 93 for the housing fits.

Housing seat fits

HOUSING CONSTRUCTION	OPERATING CONDITIONS			FIT SYMBOL*	REMARKS
Housing not split radially	Housing rotating relative to load direction	Heavy loads on bearing in thin wall housing		P7	The outer ring is not axially displaceable
		Normal and heavy loads		N7	
		Light loads		M7	
	The direction of the load indeterminate	Heavy shock loads			
		Heavy and normal loads axial displacement of outer ring not required		K7	The outer ring, as a rule, is not axially displaceable
Housing split or not split radially		Normal and light loads axial displacement of outer ring desirable		J7	The outer ring, as a rule, is axially displaceable
	Housing stationary relative to load direction	Shock loads, temporary complete unloading			
		All loads	Housing not split radially	H7	The outer ring is easily displaced axially.
			Housing split radially	H8	
		Heat supplied through the shaft		G7	

* For cast iron or steel housing. For housings of light metal, tolerances are generally selected that give slightly tighter fits than those shown.

Shaft seat fits

OPERATING CONDITION		NOMINAL SHAFT DIA. MM	NOMINAL SHAFT DIA. INCH	FIT SYMBOL
Stationary inner ring relative to load direction All loads	Inner ring easily displaced	All diameters	All diameters	g6
	Inner ring not easily displaced	All diameters	All diameters	h6
Inner ring rotating relative to load direction, or load direction indeterminate	Radial load ≤ .08 BDR*	≤ 40 Over 40 to 100 Over 100 to 200	≤ 1.57 Over 1.57 to 3.94 Over 3.94 to 7.88	j6 k6 m6
	Radial load > .08 BDR* ≤ .18 BDR*	≤ 40 Over 40 to 65 Over 65 to 100 Over 100 to 140 Over 140 to 280	≤ 1.57 Over 1.57 to 2.56 Over 2.56 to 3.94 Over 3.94 to 5.52 Over 5.52 to 11.10	k5 m5 m6 n6 p6
	Radial load > .18 BDR*	≤ 40 Over 40 to 65 Over 65 to 100 Over 100 to 140 Over 140 to 200 Over 200 to 500	≤ 1.57 Over 1.57 to 2.56 Over 2.56 to 3.94 Over 3.94 to 5.52 Over 5.52 to 7.88 Over 7.88 to 19.69	m5 m6 n6 p6 r6 r7 Brgs. with greater than normal dia. clearance

* BDR — Bearing Basic Dynamic Rating

Bearing shaft fits and tolerances

Table 1

FIT, INNER RING TO SHAFT			PUSH FIT			PUSH FIT TO WRINGING FIT			WRINGING FIT			DRIVE FIT						LIGHT FORCE FIT		
BEARING BORE DIAMETER			g6			h6			h5			j5			j6			k5		
MM	INCHES		SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT
	MAX.	MIN.	MAX.	MIN.		MAX.	MIN.		MAX.	MIN.		MAX.	MIN.		MAX.	MIN.		MAX.	MIN.	
15	.5906	.5903	.5903	.5899	.0004L	.5906	.5902	.0001L	.5906	.5903	.0000	.5908	.5905	.0002T	.5909	.5905	.0003T	.5910	.5907	.0004T
17	.6693	.6690	.6690	.6686		.6693	.6689		.6693	.6690		.6695	.6692		.6696	.6692		.6697	.6694	
20	.7874	.7870	.7871	.7866	.0004L	.7874	.7869	.0001L	.7874	.7870	.0000	.7876	.7872	.0002T	.7877	.7872	.0003T	.7879	.7875	.0005T
25	.9843	.9839	.9840	.9835		.9843	.9838		.9843	.9839		.9845	.9841		.9846	.9841		.9848	.9844	
30	1.1811	1.1807	1.1808	1.1803		1.1811	1.1806		1.1811	1.1807		1.1813	1.1809		1.1814	1.1809		1.1816	1.1812	
35	1.3780	1.3775	1.3776	1.3770	.0005L	1.3780	1.3774	.0001L	1.3780	1.3776	.0000	1.3782	1.3778	.0003T	1.3784	1.3778	.0004T	1.3785	1.3781	.0006T
40	1.5748	1.5743	1.5744	1.5738		1.5748	1.5742		1.5748	1.5744		1.5750	1.5746		1.5752	1.5746		1.5753	1.5749	
45	1.7717	1.7712	1.7713	1.7707		1.7717	1.7711		1.7717	1.7713		1.7719	1.7715		1.7721	1.7715		1.7722	1.7718	
50	1.9685	1.9680	1.9681	1.9675		1.9685	1.9679		1.9685	1.9681		1.9687	1.9683		1.9689	1.9683		1.9690	1.9686	
55	2.1654	2.1648	2.1650	2.1643	.0005L	2.1654	2.1647	.0001L	2.1654	2.1649	.0000	2.1656	2.1651	.0003T	2.1658	2.1651	.0004T	2.1660	2.1655	.0007T
60	2.3622	2.3616	2.3618	2.3611		2.3622	2.3615		2.3622	2.3617		2.3624	2.3619		2.3626	2.3619		2.3628	2.3623	
65	2.5591	2.5585	2.5587	2.5580		2.5591	2.5584		2.5591	2.5586		2.5593	2.5588		2.5595	2.5588		2.5597	2.5592	
70	2.7559	2.7553	2.7555	2.7548		2.7559	2.7552		2.7559	2.7554		2.7561	2.7556		2.7563	2.7556		2.7565	2.7560	
75	2.9528	2.9522	2.9524	2.9517		2.9528	2.9521		2.9528	2.9523		2.9530	2.9525		2.9532	2.9525		2.9534	2.9529	
80	3.1496	3.1490	3.1492	3.1485		3.1496	3.1489		3.1496	3.1491		3.1498	3.1493		3.1500	3.1493		3.1502	3.1497	
85	3.3465	3.3457	3.3460	3.3451	.0006L	3.3465	3.3456	.0001-LL	3.3465	3.3459	.0001T	3.3467	3.3461	.0003T	3.3470	3.3461	.0005T	3.3472	3.3466	.0008T
90	3.5433	3.5425	3.5428	3.5419		3.5433	3.5424		3.5433	3.5427		3.5435	3.5429		3.5438	3.5429		3.5440	3.5434	
95	3.7402	3.7394	3.7397	3.7388		3.7402	3.7393		3.7402	3.7396		3.7404	3.7398		3.7407	3.7398		3.7409	3.7403	
100	3.9370	3.9362	3.9365	3.9356		3.9370	3.9361		3.9370	3.9364		3.9372	3.9366		3.9375	3.9366		3.9377	3.9371	
105	4.1339	4.1331	4.1334	4.1325		4.1339	4.1330		4.1339	4.1333		4.1341	4.1335		4.1344	4.1335		4.1346	4.1340	
110	4.3307	4.3299	4.3302	4.3293		4.3307	4.3298		4.3307	4.3301		4.3309	4.3303		4.3312	4.3303		4.3314	4.3308	
115	4.5276	4.5268	4.5271	4.5262		4.5276	4.5267		4.5276	4.5270		4.5278	4.5272		4.5281	4.5272		4.5283	4.5277	
120	4.7244	4.7236	4.7239	4.7230		4.7244	4.7235		4.7244	4.7238		4.7246	4.7240		4.7249	4.7240		4.7251	4.7245	
125	4.9213	4.9203	4.9207	4.9197	.0006L	4.9213	4.9203	.0000	-	-	-	4.9216	4.9209	.0005T	4.9219	4.9209	.0006T	4.9221	4.2914	.0010T
130	5.1181	5.1171	5.1175	5.1165		5.1181	5.1171					5.1184	5.1177		5.1187	5.1177		5.1189	5.1182	
140	5.5118	5.5108	5.5112	5.5102		5.5118	5.5108					5.5121	5.5114		5.5124	5.5114		5.5126	5.5119	
150	5.9055	5.9045	5.9049	5.9039		5.9055	5.9045					5.9058	5.9051		5.9061	5.9051		5.9063	5.9056	

Table 2

FIT, INNER RING TO SHAFT	LIGHT FORCE FIT			FORCE FIT						HEAVY FORCE FIT											
BEARING BORE DIAMETER	k6			m5			m6			n6			p6			r6			r7		
MM	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT	SHAFT DIA. IN.		MEAN FIT
	MAX.	MIN.		MAX.	MIN.		MAX.	MIN.		MAX.	MIN.		MAX.	MIN.		MAX.	MIN.		MAX.	MIN.	
15	-	-	-	.5912	.5909	.0006T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17				.6699	.6696																
20	.7880	.7875	.0006T	.7881	.7877	.0007T	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	.9849	.9844		.9850	.9846																
30	1.1817	1.1812		1.1818	1.1814																
35	1.3787	1.3781	.0007T	1.3788	1.3784	.0009T	1.3790	1.3784	.0010T	1.3793	1.3787	.0013T	-	-	-	-	-	-	-	-	-
40	1.5755	1.5749		1.5756	1.5752		1.5758	1.5752		1.5761	1.5755										
45	1.7724	1.7718		1.7725	1.7721		1.7727	1.7721		1.7730	1.7724										
50	1.9692	1.9686		1.9693	1.9689		1.9695	1.9689		1.9698	1.9692										
55	2.1662	2.1655	.0008T	2.1664	2.1659	.0011T	2.1666	2.1659	.0012T	2.1669	2.1662	.0015T	2.1675	2.1668	.0021T	-	-	-	-	-	-
60	2.3630	2.3623		2.3632	2.3627		2.3634	2.3627		2.3637	2.3630		2.3643	2.3636							
65	2.5599	2.5592		2.5601	2.5596		2.5603	2.5596		2.5606	2.5599		2.5612	2.5605							
70	2.7567	2.7560		2.7569	2.7564		2.7571	2.7564		2.7574	2.7567		2.7580	2.7573							
75	2.9536	2.9529		2.9538	2.9533		2.9540	2.9533		2.9543	2.9536		2.9549	2.9542							
80	3.1504	3.1497		3.1506	3.1501		3.1508	3.1501		3.1511	3.1504		3.1517	3.1510							
85	3.3475	3.3466	.0010T	3.3476	3.3470	.0012T	3.3479	3.3470	.0014T	3.3484	3.3475	.0019T	3.3490	3.3481	.0025T	3.3494	3.3485	.0029T	-	-	-
90	3.5443	3.5434		3.5444	3.5438		3.5447	3.5438		3.5452	3.5443		3.5458	3.5449		3.5462	3.5453				
95	3.7412	3.7403		3.7413	3.7407		3.7416	3.7407		3.7421	3.7412		3.7427	3.7418		3.7431	3.7422				
100	3.9380	3.9371		3.9381	3.9375		3.9384	3.9375		3.9389	3.9380		3.9395	3.9386		3.9399	3.9390				
105	4.1349	4.1340		4.1350	4.1344		4.1353	4.1344		4.1358	4.1349		4.1364	4.1355		4.1368	4.1359				
110	4.3317	4.3308		4.3318	4.3312		4.3321	4.3312		4.3326	4.3317		4.3332	4.3323		4.3336	4.3327				
115	4.5286	4.5277		4.5287	4.5281		4.5290	4.5281		4.5295	4.5286		4.5301	4.5292		4.5305	4.5296				
120	4.7254	4.7245		4.7255	4.7249		4.7258	4.7249		4.7263	4.7254		4.7269	4.7260		4.7273	4.7264				
125	4.9224	4.9214	.0011T	4.9226	4.9219	.0015T	4.9229	4.9219	.0016T	4.9235	4.9225	.0022T	4.9241	4.9231	.0028T	4.9248	4.9238	.0035T	-	-	-
130	5.1192	5.1182		5.1194	5.1187		5.1197	5.1187		5.1203	5.1193		5.1209	5.1199		5.1216	5.1206				
140	5.5129	5.5119		5.5131	5.5124		5.5134	5.5124		5.5140	5.5130		5.5146	5.5136		5.5153	5.5143				
150	5.9066	5.9056		5.9068	5.9061		5.9071	5.9061		5.9077	5.9067		5.9083	5.9083		5.9090	5.9080				

Bearing housing fits and tolerances

Table 3

FIT HSG. — OUTER RING	CLOSE RUNNING FIT					SLIDE FIT						PUSH FIT						WRINGING FIT		
BEARING OUTSIDE DIA.	G7					H8			H7			J7			J6			K6		
MM	INCHES		HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT
	MIN.	MAX.	MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.	
35	1.3775	1.3780	1.3784	1.3794		1.3780	1.3796		1.3780	1.3790		1.3776	1.3786		1.3778	1.3784		1.3775	1.3781	
37	1.4562	1.4567	1.4571	1.4581		1.4567	1.4583		1.4567	1.4577		1.4563	1.4573		1.4565	1.4571		1.4562	1.4568	
40	1.5743	1.5748	1.5752	1.5762	.0012L	1.5748	1.5764	.0011L	1.5748	1.5758	.0008L	1.5744	1.5754	.0004L	1.5746	1.5752	.0004L	1.5743	1.5749	.0000L
42	1.6530	1.6535	1.6539	1.6549		1.6535	1.6551		1.6535	1.6545		1.6531	1.6541		1.6533	1.6539		1.6530	1.6536	
47	1.8499	1.8504	1.8508	1.8518		1.8504	1.8520		1.8504	1.8514		1.8500	1.8510		1.8502	1.8508		1.8499	1.8505	
52	2.0467	2.0472	2.0476	2.0488		2.0472	2.0490		2.0472	2.0484		2.0468	2.0480		2.0470	2.0477		2.0466	2.0473	
62	2.4404	2.4409	2.4413	2.4425		2.4409	2.4427		2.4409	2.4421		2.4405	2.4417		2.4407	2.4414		2.4403	2.4410	
68	2.6767	2.6772	2.6776	2.6788	.0013L	2.6772	2.6790	.0012L	2.6772	2.6784	.0009L	2.6768	2.6780	.0005L	2.6770	2.6777	.0004L	2.6766	2.6773	.0000L
72	2.8341	2.8346	2.8350	2.8362		2.8346	2.8364		2.8346	2.8358		2.8342	2.8354		2.8344	2.8351		2.8340	2.8347	
75	2.9523	2.9528	2.9532	2.9544		2.9528	2.9546		2.9528	2.9540		2.9524	2.9536		2.9526	2.9533		2.9522	2.9529	
80	3.1491	3.1496	3.1500	3.1512		3.1496	3.1514		3.1496	3.1508		3.1492	3.1504		3.1494	3.1501		3.1490	3.1497	
85	3.3459	3.3465	3.3470	3.3484		3.3465	3.3487		3.3465	3.3479		3.3460	3.3474		3.3463	3.3472		3.3458	3.3467	
90	3.5427	3.5433	3.5438	3.5452		3.5433	3.5455		3.5433	3.5447		3.5428	3.5442		3.5431	3.5440		3.5426	3.5435	
95	3.7396	3.7402	3.7407	3.7421		3.7402	3.7424		3.7402	3.7416		3.7397	3.7411		3.7400	3.7409		3.7395	3.7404	
100	3.9364	3.9370	3.9375	3.9389	.0015L	3.9370	3.9392	.0014L	3.9370	3.9384	.0010L	3.9365	3.9379	.0005L	3.9368	3.9377	.0005L	3.9363	3.9372	.0001L
110	4.3301	4.3307	4.3312	4.3326		4.3307	4.3329		4.3307	4.3321		4.3302	4.3316		4.3305	4.3314		4.3300	4.3309	
115	4.5270	4.5276	4.5281	4.5295		4.5276	4.5298		4.5276	4.5290		4.5271	4.5285		4.5274	4.5283		4.5269	4.5278	
120	4.7238	4.7244	4.7249	4.7263		4.7244	4.7266		4.7244	4.7258		4.7239	4.7253		4.7242	4.7251		4.7237	4.7246	
125	4.9205	4.9213	4.9219	4.9235		4.9213	4.9238		4.9213	4.9229		4.9207	4.9223		4.9210	4.9220		4.9205	4.9215	
130	5.1173	5.1181	5.1187	5.1203		5.1181	5.1206		5.1181	5.1197		5.1175	5.1191		5.1178	5.1188		5.1173	5.1183	
140	5.5110	5.5118	5.5124	5.5140	.0018L	5.5118	5.5143	.0017L	5.5118	5.5134	.0012L	5.5112	5.5128	.0006L	5.5115	5.5125	.0006L	5.5110	5.5120	.0001L
145	5.7079	5.7087	5.7093	5.7109		5.7087	5.7112		5.7087	5.7103		5.7081	5.7097		5.7084	5.7094		5.7079	5.7089	
150	5.9047	5.9055	5.9061	5.9077		5.9055	5.9080		5.9055	5.9071		5.9049	5.9065		5.9052	5.9062		5.9047	5.9057	
160	6.2982	6.2992	6.2998	6.3014		6.2992	6.3017		6.2992	6.3008		6.2986	6.3002		6.2989	6.2999		6.2984	6.2994	
170	6.6919	6.6929	6.6935	6.6951	.0019L	6.6929	6.6954	.0018L	6.6929	6.6945	.0013L	6.6923	6.6939	.0007L	6.6926	6.6936	.0007L	6.6921	6.6931	.0002L
180	7.0856	7.0866	7.0872	7.0888		7.0866	7.0891		7.0866	7.0882		7.0860	7.0876		7.0863	7.0873		7.0858	7.0868	
190	7.4791	7.4803	7.4809	7.4827		7.4803	7.4831		7.4803	7.4821		7.4796	7.4814		7.4800	7.4812		7.4793	7.4805	
200	7.8728	7.8740	7.8746	7.8764		7.8740	7.8768		7.8740	7.8758		7.8733	7.8751		7.8737	7.8749		7.8730	7.8742	
210	8.2665	8.2677	8.2683	8.2701		8.2677	8.2705		8.2677	8.2695		8.2670	8.2688		8.2674	8.2686		8.2667	8.2679	
215	8.4634	8.4646	8.4652	8.4670		8.4646	8.4674		8.4646	8.4664		8.4639	8.4657		8.4643	8.4655		8.4636	8.4648	
220	8.6602	8.6614	8.6620	8.6638	.0021L	8.6614	8.6642	.0020L	8.6614	8.6632	.0015L	8.6607	8.6625	.0008L	8.6611	8.6623	.0009L	8.6604	8.6616	.0002L
225	8.8571	8.8583	8.8589	8.8607		8.8583	8.8611		8.8583	8.8601		8.8576	8.8594		8.8580	8.8592		8.8573	8.8585	
230	9.0539	9.0551	9.0557	9.0575		9.0551	9.0579		9.0551	9.0569		9.0544	9.0562		9.0548	9.0560		9.0541	9.0553	
240	9.4476	9.4488	9.4494	9.4512		9.4488	9.4516		9.4488	9.4506		9.4481	9.4499		9.4485	9.4497		9.4478	9.4490	
250	9.8413	9.8425	9.8431	9.8449		9.8425	9.8453		9.8425	9.8443		9.8418	9.8436		9.8422	9.8434		9.8415	9.8427	
260	10.2348	10.2362	10.2369	10.2389	.0024L	10.2362	10.2392	.0022L	10.2362	10.2382	.0017L	10.2355	10.2375	.0010L	10.2359	10.2371	.0010L	10.2352	10.2364	.0003L
270	10.6285	10.6299	10.6306	10.6326		10.6299	10.6329		10.6299	10.6319		10.6292	10.6312		10.6296	10.6308		10.6289	10.6301	

Table 4

FIT,HSG. TO OUTER RING	WRINGING FIT			DRIVE FIT						HEAVY DRIVE FIT						LIGHT FORCE FIT					
BEARING OUTSIDE DIA.	K7			M6			M7			N6			N7			P6			P7		
MM	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT	HOUSING BORE IN.		MEAN FIT
	MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.	
35	1.3773	1.3783		1.3772	1.3778		1.3770	1.3780		1.3769	1.3775		1.3767	1.3777		1.3766	1.3772		1.3764	1.3774	
37	1.4560	1.4570		1.4559	1.4565		1.4557	1.4567		1.4556	1.4562		1.4554	1.4564		1.4553	1.4559		1.4551	1.4561	
40	1.5741	1.5751	.0001L	1.5740	1.5746	.0003T	1.5738	1.5748	.0003T	1.5737	1.5743	.0006T	1.5735	1.5745	.0006T	1.5734	1.5740	.0009T	1.5732	1.5742	.0009T
42	1.6528	1.6538		1.6527	1.6533		1.6525	1.6535		1.6524	1.6530		1.6522	1.6532		1.6521	1.6527		1.6519	1.6529	
47	1.8497	1.8507		1.8496	1.8502		1.8494	1.8504		1.8493	1.8499		1.8491	1.8501		1.8490	1.8496		1.8488	1.8498	
52	2.0464	2.0476		2.0462	2.0469		2.0460	2.0472		2.0459	2.0466		2.0457	2.0469		2.0453	2.0460		2.0451	2.0463	
62	2.4401	2.4413		2.4399	2.4406		2.4397	2.4409		2.4396	2.4403		2.4394	2.4406		2.4390	2.4397		2.4388	2.4400	
68	2.6764	2.6776	.0000	2.6762	2.6769	.0004T	2.6760	2.6772	.0003T	2.6759	2.6766	.0007T	2.6757	2.6769	.0007T	2.6753	2.6760	.0013T	2.6751	2.6763	.0013T
72	2.8338	2.8350		2.8336	2.8343		2.8334	2.8346		2.8333	2.8340		2.8331	2.8343		2.8327	2.8334		2.8325	2.8337	
75	2.9520	2.9532		2.9518	2.9525		2.9516	2.9528		2.9515	2.9522		2.9513	2.9525		2.9509	2.9516		2.9507	2.9519	
80	3.1488	3.1500		3.1486	3.1493		3.1484	3.1496		3.1483	3.1490		3.1481	3.1493		3.1477	3.1484		3.1475	3.1487	
85	3.3455	3.3469		3.3453	3.3462		3.3451	3.3465		3.3449	3.3458		3.3447	3.3461		3.3443	3.3452		3.3440	3.3454	
90	3.5423	3.5437		3.5421	3.5430		3.5419	3.5433		3.5417	3.5426		3.5415	3.5429		3.5411	3.5420		3.5408	3.5422	
95	3.7392	3.7406		3.7390	3.7399		3.7388	3.7402		3.7386	3.7395		3.7384	3.7398		3.7380	3.7389		3.7377	3.7391	
100	3.9360	3.9374	.0000	3.9358	3.9367	.0004T	3.9356	3.9370	.0004T	3.9354	3.9363	.0009T	3.9352	3.9366	.0008T	3.9348	3.9357	.0015T	3.9345	3.9359	.0015T
110	4.3297	4.3311		4.3295	4.3304		4.3293	4.3307		4.3291	4.3300		4.3289	4.3303		4.3285	4.3294		4.3282	4.3296	
115	4.5266	4.5280		4.5264	4.5273		4.5262	4.5276		4.5260	4.5269		4.5258	4.5272		4.5254	4.5263		4.5251	4.5265	
120	4.7234	4.7248		4.7232	4.7241		4.7230	4.7244		4.7228	4.7237		4.7226	4.7240		4.7222	4.7231		4.7219	4.7233	
125	4.9202	4.9218		4.9200	4.9210		4.9197	4.9213		4.9194	4.9204		4.9191	4.9207		4.9188	4.9198		4.9185	4.9201	
130	5.1170	5.1186		5.1168	5.1178		5.1165	5.1181		5.1162	5.1172		5.1159	5.1175		5.1156	5.1166		5.1153	5.1169	
140	5.5107	5.5123	.0001L	5.5105	5.5115	.0004T	5.5102	5.5118	.0004T	5.5099	5.5109	.0010T	5.5096	5.5112	.0010T	5.5093	5.5103	.0016T	5.5090	5.5106	.0016T
145	5.7076	5.7092		5.7074	5.7084		5.7071	5.7087		5.7068	5.7078		5.7065	5.7081		5.7062	5.7072		5.7059	5.7075	
150	5.9044	5.9060		5.9042	5.9052		5.9039	5.9055		5.9036	5.9046		5.9033	5.9049		5.9030	5.9040		5.9027	5.9043	
160	6.2981	6.2997		6.2979	6.2989		6.2976	6.2992		6.2973	6.2983		6.2970	6.2986		6.2967	6.2977		6.2964	6.2980	
170	6.6918	6.6934	.0002L	6.6916	6.6926	.0003T	6.6913	6.6929	.0003T	6.6910	6.6920	.0009T	6.6907	6.6923	.0009T	6.6904	6.6914	.0015T	6.6901	6.6917	.0015T
180	7.0855	7.0871		7.0853	7.0863		7.0850	7.0866		7.0847	7.0857		7.0844	7.0860		7.0841	7.0851		7.0838	7.0854	
190	7.4790	7.4808		7.4788	7.4800		7.4785	7.4803		7.4781	7.4793		7.4777	7.4795		7.4775	7.4787		7.4771	7.4789	
200	7.8727	7.8745		7.8725	7.8737		7.8722	7.8740		7.8718	7.8730		7.8714	7.8732		7.8712	7.8724		7.8708	7.8726	
210	8.2664	8.2682		8.2662	8.2674		8.2659	8.2677		8.2655	8.2667		8.2651	8.2669		8.2649	8.2661		8.2645	8.2663	
215	8.4633	8.4651		8.4631	8.4643		8.4628	8.4646		8.4624	8.4636		8.4620	8.4638		8.4618	8.4630		8.4614	8.4632	
220	8.6601	8.6619	.0002L	8.6599	8.6611	.0003T	8.6596	8.6614	.0003T	8.6592	8.6604	.0010T	8.6588	8.6606	.0011T	8.6586	8.6598	.0016T	8.6582	8.6600	.0017T
225	8.8570	8.8588		8.8568	8.8580		8.8565	8.8583		8.8561	8.8573		8.8557	8.8575		8.8555	8.8567		8.8551	8.8569	
230	9.0538	9.0556		9.0536	9.0548		9.0533	9.0551		9.0529	9.0541		9.0525	9.0543		9.0523	9.0535		9.0519	9.0537	
240	9.4475	9.4493		9.4473	9.4485		9.4470	9.4488		9.4466	9.4478		9.4462	9.4480		9.4460	9.4472		9.4456	9.4474	
250	9.8412	9.8430		9.8410	9.8422		9.8407	9.8425		9.8403	9.8415		9.8399	9.8417		9.8397	9.8409		9.8393	9.8411	
260	10.2348	10.2368	.0003L	10.2346	10.2358	.0003T	10.2342	10.2362	.0003T	10.2339	10.2351	.0010T	10.2334	10.2354	.0011T	10.2331	10.2343	.0018T	10.2328	10.2348	.0017T
270	10.6285	10.6305		10.6283	10.6295		10.6279	10.6299		10.6276	10.6288		10.6271	10.6291		10.6268	10.6280		10.6265	10.6285	