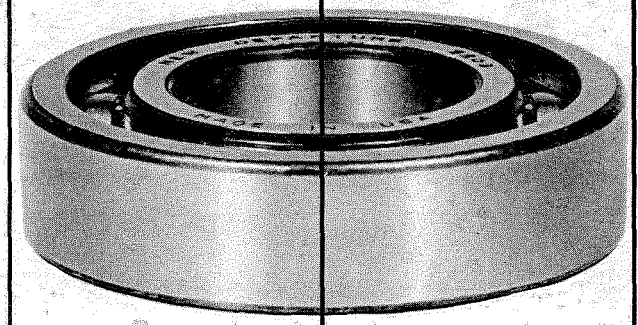
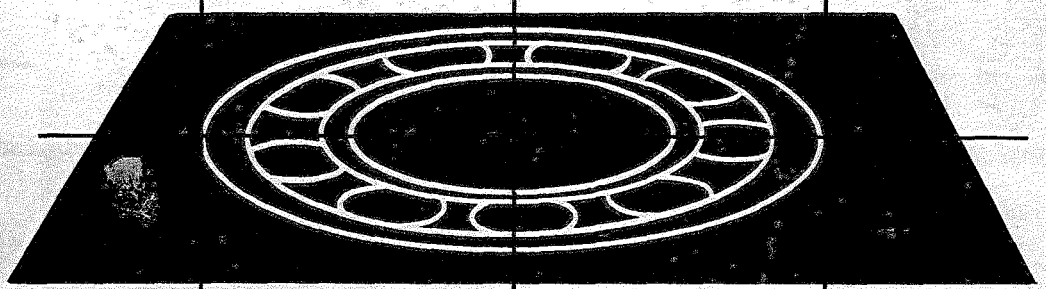
DEPARTURE

ENGINEERING



DIMENSIONAL



CATALOG

keep bearings clean

WHEN HANDLING BEARINGS

DO

1. Remove all outside dirt from housing before exposing bearing.
2. Treat a used bearing as carefully as you would a new one.
3. Work with clean tools in clean surroundings.
4. Handle with clean, dry hands, or better, clean canvas gloves.
5. Use clean solvents and flushing oils.
6. Lay bearings out on clean newspaper.
7. Protect dissassembled bearings from rust and dirt.
8. Use clean rags to wipe bearings.
9. Keep bearings wrapped in oilproof paper when not in use.
10. Clean inside of housing before replacing bearing.

DON'T

1. Don't work in dirty surroundings.
2. Don't use dirty, brittle or chipped tools.
3. Don't use wooden mallets or work on wooden bench tops.
4. Don't handle with dirty, moist hands.
5. Don't use gasolines containing tetraethyl lead, as they may be injurious to health.
6. Don't spin uncleaned bearings.
7. Don't spin bearings with compressed air.
8. Don't use cotton waste or dirty cloths to wipe bearings.
9. Don't expose bearings to rust or dirt.
10. Don't scratch or nick bearing surfaces.

UNITED MOTORS SERVICE
DIVISION OF GENERAL MOTORS CORPORATION
CENTRAL OFFICE—DETROIT

NEW DEPARTURE

Bulletin 2 C-110
Revision A
Page 1
Supersedes All Previous Issues
Bulletins 2 C-109 and 2 C-110

ENGINEERING AND DIMENSIONAL DATA

CONTENTS

Form A259 (With Cover) AA, 12IBD, 12IBDSC, 132, 2FH, 2FD
Bulletin 2C110 (Without Cover) CO: 2 & 12, WDCC, IBDCC, 61, 131, 138, 142, 2X

60M—8-59 Printed in U.S.A.

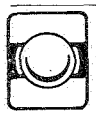
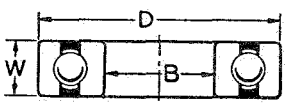
NUMERICAL INDEX

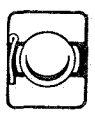
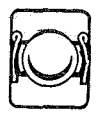
Covers the Series which appear in the TABULATIONS pages 3 to 33 inclusive. For Bearing Numbers which are not within the below series, see SPECIAL COMMERCIAL BEARING SECTION pages 34 to 46 inclusive—which is arranged in cataglog number order.

SINGLE ROW

EXTRA SMALL—SERIES "R" INSTRUMENT BEARINGS

Extra Light "Inch" Type

Bearing Size No.	Bore B		Diam. D		Width W		Bearing Size No.		Single or Double Shield Width W		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
Plain	Fraction	Decimal	Fraction	Decimal	Fraction	Decimal	1 Shield	2 Shields	Fraction	Decimal	
R-2	1/8"	.1250	3/8"	.3750	5/32"	.1562	7R-2	77R-2	5/32"	.1562	25
R-2A	1/8	.1250	1/2	.500	11/64	.1719	7R-2A	77R-2A	11/64	.1719	29
R-3	3/16	.1875	1/2	.500	5/32	.1562	7R-3	77R-3		.1960	45
R-4	1/4	.250	5/8	.6250		.1960	•7R-4	•77R-4		.1960	49
R-4A	1/4	.250	3/4	.750	7/32	.2188	7R-4A	77R-4A	9/32	.2812	84
R-6	3/8	.3750	7/8	.8750	7/32	.2188	•7R-6	•77R-6	9/32	.2812	112
R-8	1/2	.500	1 1/8	1.1250	1/4	.250	•7R-8	•77R-8	5/16	.3125	215
R-10	5/8	.6250	1 3/8	1.3750	9/32	.2812	7R-10	•77R-10	11/32	.3438	245
R-12	3/4	.750	1 5/8	1.6250	5/16	.3125	•7R-12	•77R-12	7/16	.4375	425
R-14	7/8	.8750	1 7/8	1.8750	3/8	.3750	7R-14	•77R-14	1/2	.500	455
R-16	1	1.000	2	2.000	3/8	.3750	7R-16	•77R-16	1/2	.500	455
R-18	1 1/8	1.1250	2 1/8	2.1250	3/8	.3750	7R-18	77R-18	1/2	.500	630
R-20	1 1/4	1.2500	2 1/4	2.2500	3/8	.3750			1/2	.500	665
R-22	1 3/8	1.3750	2 1/2	2.5000	7/16	.4375	7R-22	Z99R-22	9/16	.5625	785
R-24	1 1/2	1.500	2 5/8	2.6250	7/16	.4375			9/16	.5625	835

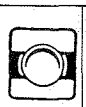
R2-R12 inclusive available with Removable Shields, i.e., RS7R2, RS77R2, etc. See page 30.

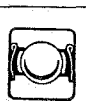
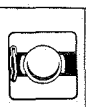
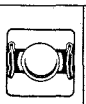
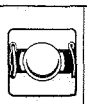
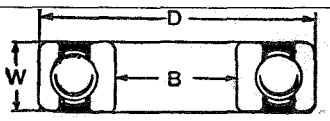
•{Available with Removable Sentri-Seals. See page 21 for picture.
{Sentri Seal Types R10, R12 available with snap ring, and shield combinations.

*For load ratings at other speeds see page 58.

EXTRA SMALL—Type 30 & 9030

Single row for light radial or combined load duty required of bearings below 10mm bore



BEARING SIZE NUMBER						Bore B		Diameter D		Width W		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
Plain	1 Shield	2 Shields	1 Seal	2 Seals	1 Seal 1 Shield	mm	inch	mm	inch	mm	inch	
34	7034	77034	.....	.....	.....	4	.1575	16	.6299	5	.1969	83
35	7035	77035	9035	99035	97035	5	.1969	19	.7480	6	.2362	100
36	7036	77036	9036	99036	97036	6	.2362	19	.7480	6	.2362	100
37	7037	77037	9037	99037	97037	7	.2756	22	.8661	7	.2756	133
38	7038	77038	•9038	•99038	•97038	8	.3150	22	.8661	7	.2756	133
39	7039	77039	9039	99039	97039	9	.3543	26	1.0236	8	.3150	195

35 thru 38 inclusive available with Removable Shields, i.e. RS7035U, RS77035U, etc. See page 30.

•Available with Removable Sentri-Seals. See page 21 for picture.

*For load ratings at other speeds see page 58.

New Departure
DIMENSION DATA

EXTRA LIGHT—Type 3L00 and 9-3L00

Single Row—Non-Loading Groove


3L00


7-3L00


77-3L00


4-3L00


47-3L00


477-3L00


9-3L00

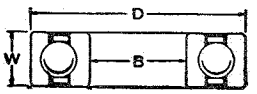

99-3L00


97-3L00


49-3L00


499-3L00


497-3L00



BEARING SIZE NUMBER						Bore B		Diameter D		Width W		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
Plain 1 Seal	**1 Shield** 2 Seals	**2 Shields** 1 Seal 1 Shld	**Sn. Ring** 1 Seal	**Sn. Ring 1 Shield** 2 Seals	**Sn. Ring 2 Shields** 1 Seal 1 Shld	mm	inch	mm	inch	mm	inch	
3L00 9-3L00	**7-3L00** 99-3L00	**77-3L00** 97-3L00				10	.3937	26	1.0236	8	.3150	195
3L01 •9-3L01	**7-3L01** •99-3L01	**77-3L01** •97-3L01				12	.4724	28	1.1024	8	.3150	215
3L02 •9-3L02	**7-3L02** •99-3L02	**77-3L02** •97-3L02	**4-3L02** •49-3L02	**47-3L02** •499-3L02	**477-3L02** •497-3L02	15	.5906	32	1.2598	9	.3543	230
3L03 •9-3L03	**7-3L03** •99-3L03	**77-3L03** •97-3L03	**4-3L03** •49-3L03	**47-3L03** •499-3L03	**477-3L03** •497-3L03	17	.6693	35	1.3780	10	.3937	245
3L04 •9-3L04	**7-3L04** •99-3L04	**77-3L04** •97-3L04	**4-3L04** •49-3L04	**47-3L04** •499-3L04	**477-3L04** •497-3L04	20	.7874	42	1.6535	12	.4724	425
3L05 •9-3L05	**7-3L05** •99-3L05	**77-3L05** •97-3L05	**4-3L05** •49-3L05	**47-3L05** •499-3L05	**477-3L05** •497-3L05	25	.9843	47	1.8504	12	.4724	455
3L06 9-3L06	**7-3L06** 99-3L06	**77-3L06** 97-3L06	**4-3L06** 49-3L06	**47-3L06** 499-3L06	**477-3L06** 497-3L06	30	1.1811	55	2.1654	13	.5118	630
3L07 9-3L07	**7-3L07** •99-3L07	**77-3L07** 97-3L07	**4-3L07** 49-3L07	**47-3L07** 499-3L07	**477-3L07** 497-3L07	35	1.3780	62	2.4409	14	.5512	785
3L08 •9-3L08	**7-3L08** •99-3L08	**77-3L08** 97-3L08	**4-3L08** 49-3L08	**47-3L08** 499-3L08	**477-3L08** 497-3L08	40	1.5748	68	2.6772	15	.5906	835
3L09 •9-3L09	**7-3L09** •99-3L09	**77-3L09** •97-3L09	**4-3L09**	•499-3L09	Z497-3L09	45	1.7717	75	2.9528	16	.6299	1070
3L10 •9-3L10	**7-3L10** •99-3L10	**77-3L10** •97-3L10	**4-3L10** •49-3L10	**47-3L10** •499-3L10	**477-3L10** •497-3L10	50	1.9685	80	3.1496	16	.6299	1130
3L11 •9-3L11	**7-3L11** •99-3L11	**77-3L11** •97-3L11	**4-3L11** •49-3L11	•499-3L11	**477-3L11** •497-3L11	55	2.1654	90	3.5433	18	.7087	1530
3L12 9-3L12	**7-3L12** •99-3L12	**77-3L12** 97-3L12	**4-3L12** 49-3L12	**47-3L12** 499-3L12	**477-3L12**	60	2.3622	95	3.7402	18	.7087	1610
3L13 Z9-3L13	**7-3L13** Z99-3L13	**77-3L13** Z97-3L13	**4-3L13** Z49-3L13	**47-3L13** Z499-3L13	**477-3L13** Z497-3L13	65	2.5591	100	3.9370	18	.7087	1690
3L14 Z9-3L14	**7-3L14** Z99-3L14	**77-3L14** Z97-3L14	**4-3L14** Z49-3L14	**47-3L14** Z499-3L14	**477-3L14** Z497-3L14	70	2.7559	110	4.3307	20	.7874	2140
3L15	**7-3L15**	**77-3L15**	**4-3L15**	**47-3L15**		75	2.9528	115	4.5276	20	.7874	2240
3L16	**7-3L16**	**77-3L16**	**4-3L16**	**47-3L16**	**477-3L16**	80	3.1496	125	4.9213	22	.8661	2640
3L17	**7-3L17**	**77-3L17**	**4-3L17**	**47-3L17**	**477-3L17**	85	3.3465	130	5.1181	22	.8661	2770
3L18	**7-3L18**	**77-3L18**	**4-3L18**	**47-3L18**	**477-3L18**	90	3.5433	140	5.5118	24	.9449	3190
3L19	**7-3L19**					95	3.7402	145	5.7087	24	.9449	3340
3L20	**7-3L20**	**77-3L20**	**4-3L20**	**47-3L20**	**477-3L20**	100	3.9370	150	5.9055	24	.9449	3340
3L21	**7-3L21**	**77-3L21**	**4-3L21**	**47-3L21**		105	4.1339	160	6.2992	26	1.0236	3910
3L22	**7-3L22**	**77-3L22**	**4-3L22**	**47-3L22**	**477-3L22**	110	4.3307	170	6.6929	28	1.1024	4360
3L24	**7-3L24**	**77-3L24**	**4-3L24**	**47-3L24**	**477-3L24**	120	4.7244	180	7.0866	28	1.1024	4560
3L26			**4-3L26**			130	5.1181	200	7.8740	33	1.2992	5430
3L28	**7-3L28**		**4-3L28**	**47-3L28**		140	5.5118	210	8.2677	33	1.2992	5670
3L30						150	5.9055	225	8.8583	35	1.3780	6320
3L36						180	7.0866	280	11.0236	46	1.8110	8660
3L38						190	7.4803	290	11.4173	46	1.8110	9040

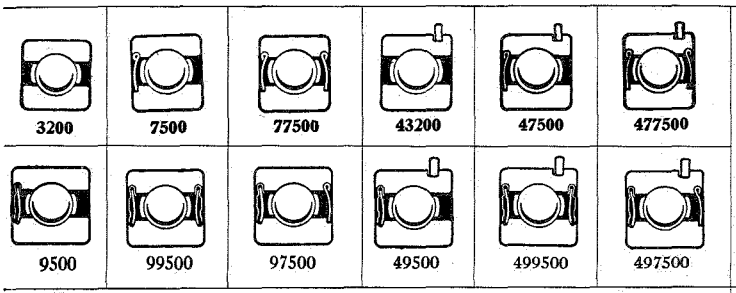
•Available with Removable Sentri Seal. Z prefix. See page 21 for picture.

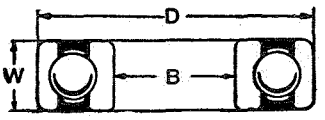
*For load ratings at other speeds see page 58.

SINGLE ROW—LIGHT SERIES—TYPE 3200 & 9500

Non-Loading Groove

Deep uninterrupted race ways. Contains the maximum number and size of balls that can be introduced by eccentric displacement of rings.





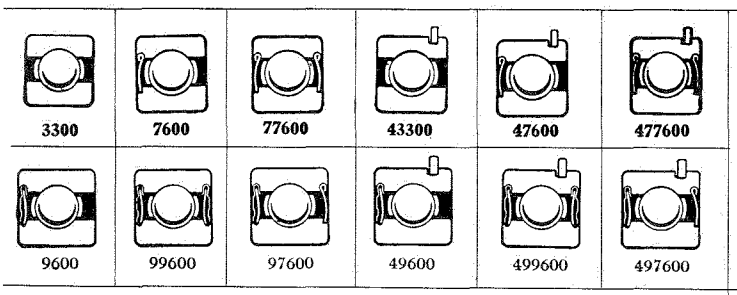
BEARING SIZE NUMBER						Bore B		Diameter D		Width W		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
Plain 1 Seal	**1 Shield** 2 Seals	**2 Shields** 1 Seal 1 Shld	**Sn. Ring** 1 Seal	**Sn. Ring 1 Shield** 2 Seals	**Sn. Ring 2 Shields** 1 Seal 1 Shld	mm	inch	mm	inch	mm	inch	
3200 •9500	**7500** •99500	**77500** •97500	**43200** •49500	**47500** •499500	**477500** •497500	10	.3937	30	1.1811	9	.3543	270
3201 •9501	**7501** •99501	**77501** •97501	**43201** •49501	**47501** •499501	**477501** •497501	12	.4724	32	1.2598	10	.3937	270
3202 •9502	**7502** •99502	**77502** •97502	**43202** •49502	**47502** •499502	**477502** •497502	15	.5906	35	1.3780	11	.4331	290
3203 •9503	**7503** •99503	**77503** •97503	**43203** •49503	**47503** •499503	**477503** •497503	17	.6693	40	1.5748	12	.4724	510
3204 •9504	**7504** •99504	**77504** •97504	**43204** •49504	**47504** •499504	**477504** •497504	20	.7874	47	1.8504	14	.5512	635
3205 •9505	**7505** •99505	**77505** •97505	**43205** •49505	**47505** •499505	**477505** •497505	25	.9843	52	2.0472	15	.5906	690
3206 •9506	**7506** •99506	**77506** •97506	**43206** •49506	**47506** •499506	**477506** •497506	30	1.1811	62	2.4409	16	.6299	1020
3207 •9507	**7507** •99507	**77507** •97507	**43207** •49507	**47507** •499507	**477507** •497507	35	1.3780	72	2.8346	17	.6693	1390
3208 •9508	**7508** •99508	**77508** •97508	**43208** •49508	**47508** •499508	**477508** •497508	40	1.5748	80	3.1496	18	.7087	1590
3209 •9509	**7509** •99509	**77509** •97509	**43209** •49509	**47509** •499509	**477509** •497509	45	1.7717	85	3.3465	19	.7480	1710
3210 •9510	**7510** •99510	**77510** •97510	**43210** •49510	**47510** •499510	**477510** •497510	50	1.9685	90	3.5433	20	.7874	1820
3211 •9511	**7511** •99511	**77511** •97511	**43211** •49511	**47511** •499511	**477511** •497511	55	2.1654	100	3.9370	21	.8268	2250
3212 •9512	**7512** •99512	**77512** •97512	**43212** •49512	**47512** •499512	**477512** •497512	60	2.3622	110	4.3307	22	.8661	2550
3213	**7513**	**77513**	**43213**	**47513**	**477513**	65	2.5591	120	4.7244	23	.9055	2990
3214	**7514**	**77514**	**43214**	**47514**	**477514**	70	2.7559	125	4.9213	24	.9449	3180
3215	**7515**	**77515**	**43215**	**47515**	**477515**	75	2.9528	130	5.1181	25	.9843	3180
3216	**7516**	**77516**	**43216**	**47516**	**477516**	80	3.1496	140	5.5118	26	1.0236	3430
3217	**7517**	**77517**	**43217**	**47517**	**477517**	85	3.3465	150	5.9055	28	1.1024	4190
3218	**7518**	**77518**	**43218**	**47518**	**477518**	90	3.5433	160	6.2992	30	1.1811	4670
3219	**7519**	**77519**	**43219**	**47519**	**477519**	95	3.7402	170	6.6929	32	1.2598	5180
3220	**7520**	**77520**	**43220**	**47520**	**477520**	100	3.9370	180	7.0866	34	1.3386	5710
Q3221						105	4.1339	190	7.4803	35	1.4173	5950
3222	**7522**	**77522**	**43222**	**47522**	**477522**	110	4.3307	200	7.8740	38	1.4961	6510
3224						120	4.7244	215	8.4646	40	1.5748	7040
3226						130	5.1181	230	9.0551	40	1.5748	7630
3228						140	5.5118	250	9.8425	42	1.6535	8840

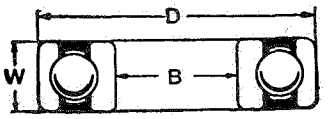
•Available with Removable Sentri Seal. Q prefix. See page 21 for picture.

*For load ratings at other speeds see page 58.

New Departure
DIMENSION DATA

SINGLE ROW—MEDIUM SERIES—3300 & 9600





BEARING SIZE NUMBER						Bore B		Diameter D		Width W		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
Plain 1 Seal	1 Shield 2 Seals	2 Shields 1 Seal 1 Shld	Sn. Ring 1 Seal	Sn. Ring 1 Shield 2 Seals	Sn. Ring 2 Shields 1 Seal 1 Shld	mm	inch	mm	inch	mm	inch	
3300	**7600**	**77600**	**43300**	**47600**	**477600**	10	.3937	35	1.3780	11	.4331	360
3301	**7601**	**77601**	**43301**			12	.4724	37	1.4567	12	.4724	465
3302 Z9602	**7602** Z99602	**77602** Z97602	**43302** Z49602	**47602** Z499602	**477602** Z497602	15	.5906	42	1.6535	13	.5118	580
3303 9603	**7603** 99603	**77603** 97603	**43303**	**47603** 499603	**477603** 497603	17	.6693	47	1.8504	14	.5512	710
3304 •9604	**7604** •99604	**77604** •97604	**43304** •49604	**47604** •499604	**477604** •497604	20	.7874	52	2.0472	15	.5906	1010
3305 •9605	**7605** •99605	**77605** •97605	**43305** •49605	**47605** •499605	**477605** •497605	25	.9843	62	2.4409	17	.6693	1110
3306 •9606	**7606** •99606	**77606** •97606	**43306** •49606	**47606** •499606	**477606** •497606	30	1.1811	72	2.8346	19	.7480	1470
3307 •9607	**7607** •99607	**77607** •97607	**43307** •49607	**47607** •499607	**477607** •497607	35	1.3780	80	3.1496	21	.8268	1820
3308 9608	**7608** 99608	**77608** 97608	**43308** 49608	**47608** 499608	**477608** 497608	40	1.5748	90	3.5433	23	.9055	2200
3309 9609	**7609** 99609	**77609** 97609	**43309** 49609	**47609** 499609	**477609** 497609	45	1.7717	100	3.9370	25	.9843	2570
3310 9610	**7610** 99610	**77610** 97610	**43310** 49610	**47610** 499610	**477610** 497610	50	1.9685	110	4.3307	27	1.0630	3000
3311	**7611**	**77611**	**43311**	**47611**	**477611**	55	2.1654	120	4.7244	29	1.1417	3390
3312	**7612**	**77612**	**43312**	**47612**	**477612**	60	2.3622	130	5.1181	31	1.2205	3780
3313	**7613**	**77613**	**43313**	**47613**	**477613**	65	2.5591	140	5.5118	33	1.2992	4190
3314	**7614**	**77614**	**43314**	**47614**		70	2.7559	150	5.9055	35	1.3780	4620
3315	**7615**	**77615**	**43315**	**47615**	**477615**	75	2.9528	160	6.2992	37	1.4567	4810
3316		**77616**	**43316**			80	3.1496	170	6.6929	39	1.5354	5260
3317	**7617**	**77617**	**43317**	**47617**		85	3.3465	180	7.0866	41	1.6142	5700
3318	**7618**	**77618**				90	3.5433	190	7.4803	43	1.6929	6170
3319			**43319**			95	3.7402	200	7.8740	45	1.7717	7150
3320		**77620**				100	3.9370	215	8.4646	47	1.8504	7610
3322						110	4.3307	240	9.4488	50	1.9685	8680

•Available with Removable Sentri Seal. Z prefix. See page 21 for picture.

SINGLE ROW—HEAVY SERIES—3400

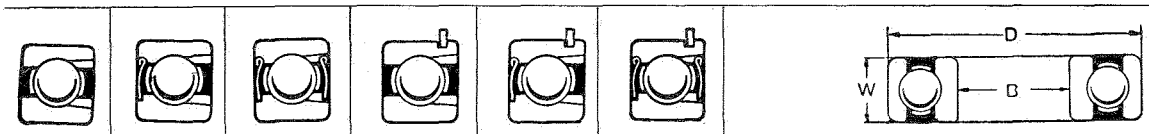
Sealed Bearings with Single Row Width Currently Not Available

3404						20	.7874	72	2.8346	19	.7480	1660
3405	**7705**	**77705**		**47705**		25	.9843	80	3.1496	21	.8268	1970
3406						30	1.1811	90	3.5433	23	.9055	2290
3407						35	1.3780	100	3.9373	25	.9843	2640
3408	**7708**	**77708**		**47708**		40	1.5748	110	4.3307	27	1.0630	2950
3409	**7709**	**77709**	**43409**			45	1.7717	120	4.7244	29	1.1417	3640
3410	**7710**	**77710**	**43410**	**47710**		50	1.9685	130	5.1181	31	1.2205	4030
3411			**43411**			55	2.1654	140	5.5118	33	1.2992	4400
3412			**43412**			60	2.3622	150	5.9055	35	1.3780	4810
3416			**43416**			80	3.1496	200	7.8740	48	1.8898	7480

*For load ratings at other speeds see page 58.

SINGLE ROW—LIGHT SERIES—1200

Contains maximum number and size of balls. Has greatest Radial capacity obtainable in bearing with one row of balls.



BEARING SIZE NUMBER						Bore B		Diameter D		Width W		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
Plain	1 Shield	2 Shields	Sn. Ring	Sn. Ring 1 Shield	Sn. Ring 2 Shields	mm	inch	mm	inch	mm	inch	
1206	7206	77206	41206	47206	477206	30	1.1811	62	2.4409	16	.6299	1230
1207	7207	77207	41207	47207	477207	35	1.3780	72	2.8346	17	.6693	1690
1208	7208	77208	41208	47208	477208	40	1.5748	80	3.1496	18	.7087	2030
1209	7209	77209	41209	47209	477209	45	1.7717	85	3.3465	19	.7480	2140
1210	7210	77210	41210	47210	477210	50	1.9685	90	3.5433	20	.7874	2240
1211	7211	77211	41211	47211	477211	55	2.1654	100	3.9370	21	.8268	2770
1212	•7212	77212	41212	47212	477212	60	2.3622	110	4.3307	22	.8661	3340
1213	7213	77213	41213	47213	477213	65	2.5591	120	4.7244	23	.9055	3910
1214	7214	77214	41214	47214		70	2.7559	125	4.9213	24	.9449	3910
1215	7215	77215	41215	47215	477215	75	2.9528	130	5.1181	25	.9843	4090
1216	7216	77216	41216	47216		80	3.1496	140	5.5118	26	1.0236	4580
1217	7217	77217	41217	47217		85	3.3465	150	5.9055	28	1.1024	5390
1218	7218	77218	41218	47218	477218	90	3.5433	160	6.2992	30	1.1811	5740
1219	7219	77219	41219	47219	477219	95	3.7402	170	6.6929	32	1.2598	6370
1220	7220	77220	41220			100	3.9370	180	7.0866	34	1.3386	7020
1221	7221	77221				105	4.1339	190	7.4803	36	1.4173	7640
1222	7222	77222	41222			110	4.3307	200	7.8740	38	1.4961	8350
1224						120	4.7244	215	8.4646	40	1.5748	9040

•Available as 9212, 1-flush seal.

SINGLE ROW—MEDIUM SERIES—1300

1304	7304	77304	41304	47304	477304	20	.7874	52	2.0472	15	.5906	1200
1305	7305	77305	41305	47305	477305	25	.9843	62	2.4409	17	.6693	1490
1306	7306	77306	41306	47306	477306	30	1.1811	72	2.8346	19	.7480	1820
1307	7307	•77307	41307	47307	477307	35	1.3780	80	3.1496	21	.8268	2250
1308	7308	77308	41308	47308	477308	40	1.5748	90	3.5433	23	.9055	2720
1309	7309	77309	41309	47309	477309	45	1.7717	100	3.9370	25	.9843	3370
1310	7310	77310	41310	47310	477310	50	1.9685	110	4.3307	27	1.0630	3930
1311	7311	77311	41311	47311	477311	55	2.1654	120	4.7244	29	1.1417	4440
1312	7312	77312	41312	47312	477312	60	2.3622	130	5.1181	31	1.2205	4950
1313	7313	77313	41313	47313		65	2.5591	140	5.5118	33	1.2992	5490
1314	7314	77314	41314	47314		70	2.7559	150	5.9055	35	1.3780	6050
1315	7315	77315	41315	47315		75	2.9528	160	6.2992	37	1.4576	6660
1316			41316			80	3.1496	170	6.6929	39	1.5354	7270
1317	7317	77317	41317	47317		85	3.3465	180	7.0866	41	1.6142	7870
1318	7318					90	3.5433	190	7.4803	43	1.6929	8530
1319			41319			95	3.7402	200	7.8740	45	1.7717	9370
1320			41320			100	3.9370	215	8.4646	47	1.8504	9970
1321						105	4.1339	225	8.8583	49	1.9291	10725
1322						110	4.3307	240	9.4488	50	1.9685	11375

•Available as 97307, 1-flush seal.

SINGLE ROW—HEAVY SERIES—1400

See 3400 Series Bearings, foot of page 6, for sizes and types omitted from this series.

1404		*(77400*	*(41400*	*(47400*	*(477400*	20	.7874	72	2.8346	19	.7480	2000
1405	7405	*Series)*	*Series)*	*Series)*	*Series)*	25	.9843	80	3.1496	21	.8268	2380
1406						30	1.1811	90	3.5433	23	.9055	3000
1407						35	1.3780	100	3.9370	25	.9843	3460
1408	7408					40	1.5748	110	4.3307	27	1.0630	3860
1409	7409					45	1.7717	120	4.7244	29	1.1417	4620
1410	7410		41410			50	1.9685	130	5.1181	31	1.2205	5110
1411						55	2.1654	140	5.5118	33	1.2992	5590
1412	7412		41412			60	2.3622	150	5.9055	35	1.3780	6110
1413	7413					65	2.5591	160	6.2992	37	1.4567	6610
1414						70	2.7559	180	7.0866	42	1.6535	7730
1415						75	2.9528	190	7.4803	45	1.7717	8830
V1418						90	3.5433	225	8.8583	54	2.1260	11400

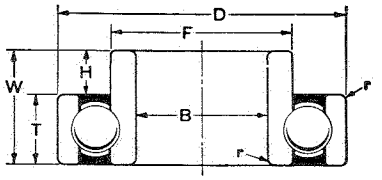
"V" indicates Bronze Separator.

*For load ratings at other speeds see page 58.

New Departure
DIMENSION DATA

SINGLE ROW—WIDE INNER RING—TYPE 4000

Non-Loading Groove—Same as Type 3000 Except Has Wide Inner Ring
Extensively used in commercial electric Motors.



Bearing Size No.	Bore B		Diameter D		WIDTHS				Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
					Inner Ring W		Outer Ring T		
	mm	inch	mm	inch	mm	inch	mm	inch	
4510	50	1.9685	90	3.5433	30.16	1.1875	20	.7874	1820
4604	20	.7874	52	2.0472	22.2	.875	15	.5906	1020
4605	25	.9843	62	2.4409	25.40	1.0000	17	.6693	1120
4606	30	1.1811	72	2.8346	30.16	1.1875	19	.7480	1480
4607	35	1.3780	80	3.1496	34.93	1.3750	21	.8268	1820
4608	40	1.5748	90	3.5433	36.5	1.4375	23	.9055	2200
4609	45	1.7717	100	3.9370	39.69	1.5625	25	.9843	2580
4610	50	1.9685	110	4.3307	44.45	1.7500	27	1.0630	3000
4611	55	2.1654	120	4.7244	49.21	1.9375	29	1.1417	3400
4613	65	2.5591	140	5.5118	58.7	2.3125	33	1.2992	4200
4615	75	2.9528	160	6.2992	68.26	2.6875	37	1.4567	4800

*For load ratings at other speeds see page 58.

DOUBLE ROW

ANGULAR CONTACT

EXTRA LIGHT—SERIES 5L00

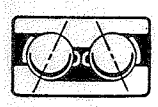
Angular Contact

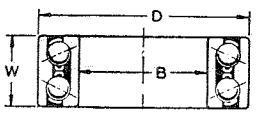
For combined loads from any direction. One-piece inner and outer rings with two rows of balls permanently pre-loaded for greater rigidity.

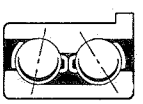
FLANGED—SERIES N5L00A

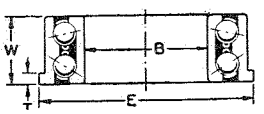
Angular Contact

Available only to precision specifications.
(For Machine Tool Precision Spindles)





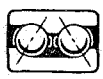
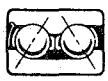
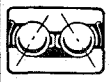
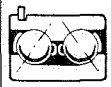
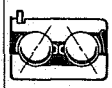


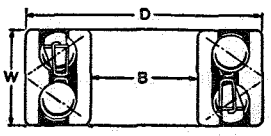


Bearing Size No.	Bore B		Diameter D		Width W		Bearing Size No.	Flange O.D. E		Flange Width T		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
	mm	inch	mm	inch	mm	inch		mm	inch	mm	inch	
5L11	55	2.1654	90	3.5433	30	1.1811	**N5L11A**	95	3.7402	5	.197	2800
5L12	60	2.3622	95	3.7402	32	1.2598	**N5L12A**	99.5	3.9173	4.5	.177	3050
5L14	70	2.7559	110	4.3307	36	1.4173	**N5L14A**	115	4.5276	5	.197	4200
5L16	80	3.1496	125	4.9213	40	1.5748	**N5L16A**	130.5	5.1378	5.5	.216	5200
5L18	90	3.5433	140	5.5118	44	1.7323	**N5L18A**	146	5.7480	6	.236	6200
5L20	100	3.9370	150	5.9055	44	1.7323	**N5L20A**	156	6.1417	6	.236	6600
5L22	110	4.3307	170	6.6929	52	2.0472	**N5L22A**	177	6.9685	7	.276	8500
5L24	120	4.7244	180	7.0866	52	2.0472	**N5L24A**	187	7.3622	7	.276	8800

*For load ratings at other speeds see page 58.

DOUBLE ROW—LIGHT SERIES—5200



Plain	1 Shield	2 Shields	Sn. Ring	Sn. Ring 1 Shield	Sn. Ring 2 Shields	Bore B mm	Bore B inch	Diameter D mm	Diameter D inch	Width W mm	Width W inch	Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
5200	**5500**	**55500**	**45200**	**45500**	**455500**	10	.3937	30	1.1811	14.29	.5625	415
5201	**5501**	**55501**	**45201**	**45501**	**455501**	12	.4724	32	1.2598	15.88	.625	485
5202	**5502**	**55502**	**45202**	**45502**	**455502**	15	.5906	35	1.3780	15.88	.625	530
5203	**5503**	**55503**	**45203**	**45503**	**455503**	17	.6693	40	1.5748	17.46	.6875	705
5204	**5504**	**55504**	**45204**	**45504**	**455504**	20	.7874	47	1.8504	20.64	.8125	980
5205	**5505**	**55505**	**45205**	**45505**	**455505**	25	.9843	52	2.0472	20.64	.8125	1060
5206	**5506**	**55506**	**45206**	**45506**	**455506**	30	1.1811	62	2.4409	23.81	.9375	1650
5207	**5507**	**55507**	**45207**	**45507**	**455507**	35	1.3780	72	2.8346	26.99	1.0625	2100
5208	**5508**	**55508**	**45208**	**45508**	**455508**	40	1.5748	80	3.1496	30.16	1.1875	2880
5209	**5509**	**55509**	**45209**	**45509**	**455509**	45	1.7717	85	3.3465	30.16	1.1875	3020
5210	**5510**	**55510**	**45210**	**45510**	**455510**	50	1.9685	90	3.5433	30.16	1.1875	3150
5211	**5511**	**55511**	**45211**	**45511**	**455511**	55	2.1654	100	3.9370	33.34	1.3125	4000
5212	**5512**	**55512**	**45212**	**45512**	**455512**	60	2.3622	110	4.3307	36.51	1.4375	4450
5213	**5513**	**55513**	**45213**	**45513**	**455513**	65	2.5591	120	4.7244	38.10	1.50	5110
5214	**5514**	**55514**	**45214**	**45514**		70	2.7559	125	4.9213	39.69	1.5625	5600
5215	**5515**	**55515**	**45215**	**45515**	**455515**	75	2.9528	130	5.1181	41.28	1.625	6070
5216	**5516**	**55516**	**45216**	**45516**	**455516**	80	3.1496	140	5.5118	44.45	1.75	6780
5217	**5517**	**55517**	**45217**		**455517**	85	3.3465	150	5.9055	49.21	1.9375	7830
5218	**5518**	**55518**	**45218**		**455518**	90	3.5433	160	6.2992	52.39	2.0625	8730
5219			**45219**			95	3.7402	170	6.6929	55.56	2.1875	9740
5220	**5520**	**55520**	**45220**	**45520**		100	3.9370	180	7.0866	60.33	2.375	10775
5222	**5522**	**55522**	**45222**	**45522**		110	4.3307	200	7.8740	69.85	2.75	11600

For Sentri Seal Double Row Type Check Special Commercial Bearing List. (*995200*)

DOUBLE ROW—MEDIUM SERIES—5300

5300	**5600**	**55600**	**45300**		**455600**	10	.3937	35	1.3780	19.05	.75	605
5301	**5601**	**55601**				12	.4724	37	1.4567	19.05	.75	655
5302	**5602**	**55602**	**45302**			15	.5906	42	1.6535	19.05	.75	910
5303	**5603**	**55603**	**45303**	**45603**	**455603**	17	.6693	47	1.8504	22.23	.875	1140
5304	**5604**	**55604**	**45304**	**45604**	**455604**	20	.7874	52	2.0472	22.23	.875	1210
5305	**5605**	**55605**	**45305**	**45605**	**455605**	25	.9843	62	2.4409	25.40	1.00	1890
5306	**5606**	**55606**	**45306**	**45606**	**455606**	30	1.1811	72	2.8346	30.16	1.1875	2600
5307	**5607**	**55607**	**45307**	**45607**		35	1.3780	80	3.1496	34.93	1.375	3300
5308	**5608**	**55608**	**45308**	**45608**	**455608**	40	1.5748	90	3.5433	36.51	1.4375	3880
5309	**5609**	**55609**	**45309**	**45609**	**455609**	45	1.7717	100	3.9370	39.68	1.5625	4680
5310	**5610**	**55610**	**45310**	**45610**	**455610**	50	1.9685	110	4.3307	44.45	1.75	5600
5311	**5611**	**55611**	**45311**	**45611**		55	2.1654	120	4.7244	49.21	1.9375	6460
5312	**5612**	**55612**	**45312**	**45612**		60	2.3622	130	5.1181	53.98	2.125	7620
5313	**5613**	**55613**	**45313**	**45613**		65	2.5591	140	5.5118	58.74	2.3125	8460
5314			**45314**			70	2.7559	150	5.9055	63.50	2.50	9320
5315			**45315**			75	2.9528	160	6.2992	68.26	2.6875	9720
5316			**45316**			80	3.1946	170	6.6929	68.26	2.6875	10625
5318						90	3.5433	190	7.4803	73.03	2.875	12125

DOUBLE ROW—HEAVY SERIES—5400

5407	(*5700 Series*)	(*55700 Series*)	**45407**	(*45700 Series*)	(*455700 Series*)	35	1.3780	100	3.9370	44.45	1.750	4960

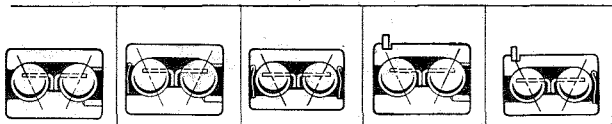
*For load ratings at other speeds see page 58.

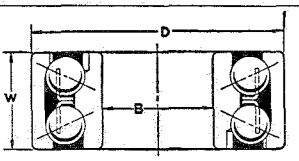
New Departure
DIMENSION DATA

DOUBLE ROW—"W" SERIES—TYPES 5200W & 5300W

With Reverse Angle of Contact—"Externally Diverging Angles of Contact".
Used where slight misalignment occurs due to heat warping housings, etc.—often used with loose internal fit-up.

LIGHT SERIES—5200W





Plain	1 Shield	2 Shields	Snap Ring	Sn. Ring 1 Shield	Bore B mm	Bore B inch	Diameter D mm	Diameter D inch	Width W mm	Width W inch	Radial Load Rating @ 1000 RPM*
5205W	.....	.....	45205W	.....	25	.9843	52	2.0472	20.64	.8125	1280
5206W	5506W	.....	.....	.....	30	1.1811	62	2.4409	23.8	15/16	1660
5207W	5507W	55507W	.....	45507W	35	1.3780	72	2.8346	26.99	1.0625	2500
5208W	.....	.....	45208W	.....	40	1.5748	80	3.1496	30.2	1 3/16	2900
5210W	5510W	55510W	.....	.....	50	1.9685	90	3.5433	30.16	1.1875	3150
5211W	5511W	.....	45211W	.....	55	2.1654	100	3.9370	33.34	1.3125	4000
5212W	.....	.....	45212W	.....	60	2.3622	110	4.3307	36.51	1.4375	4450
5213W	5513W	.....	45213W	.....	65	2.5591	120	4.7244	38.10	1.50	5100
5215W	.....	.....	45215W	.....	75	2.9528	130	5.1181	41.28	1.625	6100
5216W	5516W	.....	.....	.....	80	3.1496	140	5.5118	44.45	1.75	6800
5218W	5518W	.....	45218W	.....	90	3.5433	160	6.2992	52.39	2.0625	8700
5222W	.....	55522W	.....	.....	110	4.3307	200	7.8740	69.85	2.75	12800

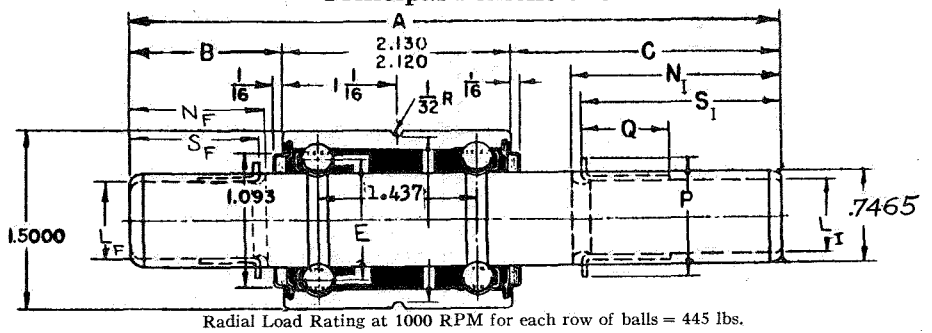
MEDIUM SERIES—5300W

5306W	5606W	55606W	45306W	45606W	30	1.1811	72	2.8346	30.16	1.1875	2800
.....	5607W	.....	45307W	45607W	35	1.3780	80	3.1496	34.93	1.375	3300
.....	.....	.....	45308W	45608W	40	1.5748	90	3.5433	36.51	1.4375	3900
5309W	.....	.....	45309W	45609W	45	1.7717	100	3.9370	39.68	1.5625	4700
5310W	5610W	55610W	45310W	45610W	50	1.9685	110	4.3307	44.45	1.75	5600
5311W	.....	.....	45311W	45611W	55	2.1654	120	4.7244	49.21	1.9375	6500
5312W	5612W	.....	45312W	.....	60	2.3622	130	5.1181	53.98	2.125	7600
5313W	.....	.....	45313W	.....	65	2.5591	140	5.5118	58.74	2.3125	8500

*For load ratings at other speeds see page 58.

FAN AND PUMPSHAFT TYPE—885800

Principal Dimensions



Radial Load Rating at 1000 RPM for each row of balls = 445 lbs.

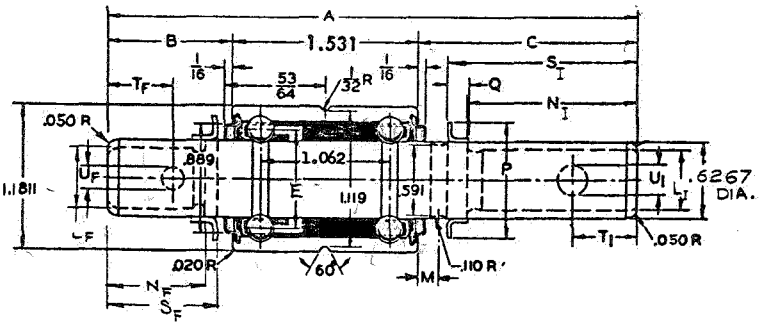
Bearing Number		A	B	C	L_F	L_I	N_F	N_I	P
885800A		4.300	.140	2.035					
885800B	*	4.300	.140	2.035					
885800C	*	4.750	.955	1.670		.6267		1.560	.938
885801		5.870	1.640	2.105	.6267		1.500		
885801B	•	5.870	1.640	2.105	.6267		1.500		
885801E	*	5.870	1.640	2.105	.6267		1.500		
885801S	*	5.870	1.640	2.105	.6267		1.500		.875
885801SA	*	5.870	1.640	2.105	.6267		1.500		.880
885802S	*	5.750	1.750	1.875		.6267		1.750	.875
885803		3.578	.141	1.312					
885804	*	5.250	.953	2.172		.6267		1.938	

Bearing Number		A	B	C	L_F	L_I	N_F	N_I	P
885807	*	6.040	1.800	2.115		.6267		1.990	.880
885807A	*	6.040	1.800	2.115		.6267		1.990	.880
885807B	*	6.040	1.800	2.115		.6267		1.990	.880
885808	*	5.812	1.343	2.344		.6267		2.219	.875
885809		3.875	.875	.875					
885810		5.380	1.445	1.810	.6267	.6267	1.300	1.670	
885811		5.000	1.235	1.640		.6267		1.500	

•Popular for custom designing—soft shaft ends.
*Additional dimensions on request.

FAN AND WATER PUMP—885100 TYPE

Principal Dimensions



Radial Load Rating @ 1000 RPM for each row of balls = 230 lbs.

Bearing Number	A	B	C	L_F	L_I	N_F	N_I	P
885100	4.869	1.250	2.088					
885100A *	4.869	1.250	2.088					
885100S *	4.869	1.250	2.088					.875
885101 *	4.900	1.300	2.069					
885101A *	4.900	1.300	2.069					
885102 *	4.406	1.063	1.812					
885103 *	4.656	.578	2.547					
885103S *	4.656	.578	2.547					.880
885105 *	4.760	1.160	2.069					
885106	4.170	.159	2.480					
885106A *	4.170	.159	2.480					
885107A *	4.310	1.279	1.500					.880
885108 *	4.828	1.578	1.719					
885108B ①	4.828	.780	2.517					.880
885108C	4.828	.780	2.517					
885109	4.172	.813	1.828					
885110	3.844	.750	1.563		.499		1.438	
885111B	4.281	1.078	1.672					.938
885111C *	4.281	1.078	1.672					
885112A *	3.812	.922	1.359					
885113	5.219	1.610	2.078					
885114	3.625	.938	1.156					
885116 *	5.594	1.767	2.296					
885117 *	6.375	2.300	2.544					
885118 *	4.688	1.469	1.688					
885119A *	5.969	.938	3.500					
885120	3.188	.719	.938					
885123 *	3.562	.200	1.831					
885123A *	3.562	.200	1.831					
885123B *	3.562	.200	1.831					
885125S *	6.062	1.343	3.188					.880
885126 *	5.531	1.437	2.563					
885128 ③	3.906	.656	1.719		.500		.562	
885129D *	3.594	.782	1.281		.432		.875	
885130 *	3.921	1.015	1.375	.500	.500	.875	1.281	
885131 *	6.953	2.687	2.735					
885132 *	5.594	1.704	2.359					
885133	4.500	1.249	1.720					
885134S *	5.050	1.249	2.270					.880
885135A	4.700	1.310	1.859					.938
885136A *	6.290	2.299	2.460					.880
885138 *	6.344	1.517	3.296					
885139	3.890	.753	1.606					
885140	4.062	.922	1.609					
885140B	4.062	.922	1.609					.484
885140C *	4.062	.922	1.609					
885141 *	5.031	1.016	2.484					
885141C	5.031	1.016	2.484					
885141D *	5.031	1.016	2.484					
885141H *	5.031	1.016	2.484					
885141J *	5.031	1.016	2.484					
885141CHS*	5.031	1.016	2.484					.938
885144	5.626	1.578	2.516					
885144C *	5.625	1.578	2.516					
885144S *	5.625	1.578	2.516					.938
885144BS *	5.625	1.578	2.516					.938
885144DS *	5.625	1.578	2.516					.880
885144ES *	5.625	1.578	2.516					.880
885144FS *	5.625	1.578	2.516					.880
885144HS *	5.625	1.578	2.516					.938
885144PS	5.625	1.578	2.516					.880

Bearing Number	A	B	C	L_F	L_I	N_F	N_I	P
885145 *	3.906	1.125	1.250					
885145B *	3.906	1.125	1.250					
885146	4.516	.157	2.828					
885146A *	4.516	.157	2.828		.500		.562	
885146B *	4.516	.157	2.828					
885147	4.031	.875	1.625		.499		1.500	
885147A	4.344	1.188	1.625		.499		1.500	
885147C *	3.844	.688	1.625		.499		1.312	.812
885147E *	4.344	1.183	1.630		.499		1.500	
885151	5.031	1.750	1.750					
885151B	5.031	1.750	1.175					
885151C *	5.031	1.750	1.750					
885151D *	5.031	1.750	1.750					
885152 *	4.469	1.079	1.859					
885154	2.891	.157	1.203					
885154A *	2.891	.157	1.203					
885155 *	4.453	1.250	1.672					
885156	4.469	1.079	1.859					
885156B	4.469	1.079	1.859					.875
885156C *	4.469	1.079	1.859					
885156D *	4.469	1.079	1.859					.938
885157	4.469	1.079	1.859	.552		.984		
885157AS *	4.469	1.079	1.859	.552		.984		.875
885158	5.438	1.610	2.297					
885158C *	5.438	1.610	2.297					
885158D ③	5.438	1.610	2.297					
885159 *	4.141	.938	1.672					
885159A	4.141	.938	1.672					
885160 *	4.125	.578	2.016					
885161	5.125	.156	3.438					
885162	4.562	.943	2.088					
885162A *	4.562	.943	2.088					
885163 *	4.281	1.062	1.688		.5035		1.312	
885164 *	4.000	.157	2.312					
885165	3.250	.157	1.562					
885166C	5.031	1.219	2.281	.628	.628			
885166K *	5.031	1.219	2.281	.628	.628			
885167 *	4.390	.934	1.925	.628	.628			
885167U	4.391	.938	1.922	.628	.628			
885167S *	4.391	.938	1.922					.875
885168B *	4.812	1.125	2.156					
885168C	4.812	1.125	2.156					
885168D	4.812	1.125	2.156					
885168E *	4.812	1.165	2.116					
885168F *	4.812	1.125	2.156					
885168K *	4.812	1.125	2.156	.628	.628			
885169	5.073	1.250	2.297					
885169S	5.078	1.250	2.297					.880
885190	4.625	1.334	1.760					
885191 *	5.556	1.962	2.063	.5615		1.500		
885192 *	3.156	.157	1.468					
885193 *	4.125	1.157	1.437					

Popular sizes for custom use (885108B①, 885128②, 885158D③).

①Flat on short end. ½"-13NC-2 L.H. thread on long end.

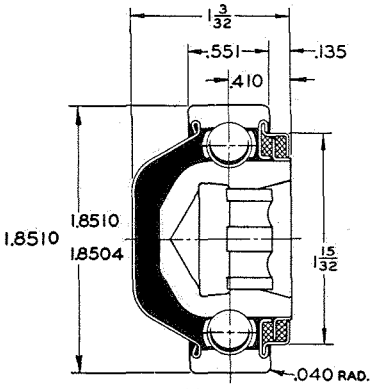
②Flat on short end. ½"-13NC-2 R.H. thread on long end.

③Both ends left soft.

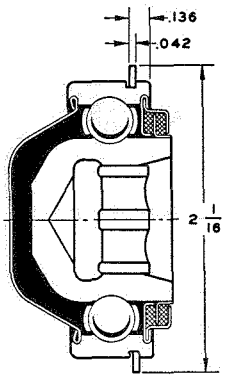
*Addition dimensions supplied on request.

New Departure
DIMENSION DATA

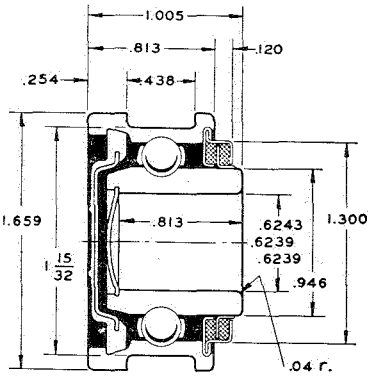
CONVEYOR ROLL BEARINGS



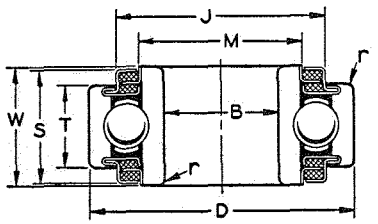
CB-504
INNER RING PARKERIZED



4CB-504



CB-3
RINGS PARKERIZED

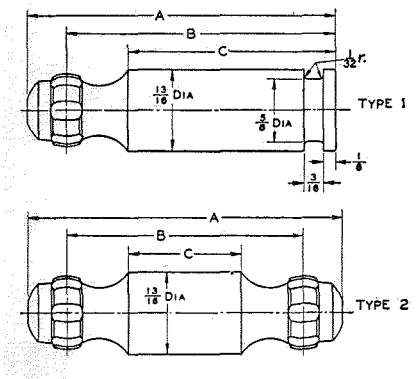


88120—88120-A

Radial Load Rating on these conveyor bearings 755 lbs. @ 500 RPM

Bearing Number	Bore B		Dia. D		Width W		Balls		J	M	S	T	Radius r
	mm	inch	mm	inch	mm	inch	dia.	no.					
88120	20	.7874	47	1.8504	20.8	.820	5/16	8	1 15/32	1.095	.790	.551	.040
88120-A		.700*		1.8510									

*Hexagonal bore, dimension across flats. Parkerized O.D. 1.8502-1.8510.
88120A available as 488120A (snap ring).



STUB SHAFT DIMENSIONS

TYPE 1

Part No.	A	B	C
1-CS-1 3/8①	1 3/8	63/64	3/8
1-CS-1 15/16	1 15/16	1 35/64	15/16
1-CS-2 1/2	2 1/2	2 7/64	1 1/2
1-CS-3	3	2 39/64	2
1-CS-4 1/8	4 1/8	3 47/64	3 1/8
1-CS-4 1/8②	4 1/8	3 47/64	3 1/8

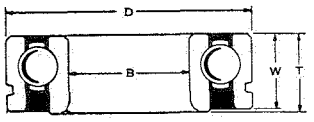
TYPE 2

Part No.	A	B	C
2-CS-2 1/2	2 1/2	1 23/32	1/2
2-CS-2 9/16	2 9/16	1 25/32	9/16
2-CS-2 5/8	2 5/8	1 27/32	5/8
2-CS-3	3	2 7/32	1
2-CS-3 3/32	3 3/32	2 1/16	1 3/32
2-CS-3 9/16	3 9/16	2 25/32	1 9/16
2-CS-4	4	3 7/32	2

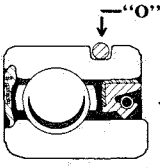
① No 3/16" Groove as pictured.
② Length of notches less than standard.

Sealed Types—Cont'd

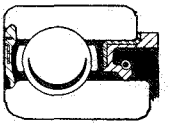
REAR WHEEL BEARINGS "RW" TYPE



Sentri-Seal →



← Garter Spring Seal
Example of one type
Position reversed on some types



Bearing Only	Bearing Complete	Sealing "O" Ring	Sealing Outboard (Wheel) side	Sealing Inboard (differential) side	Bore B mm	Bore B inch	Diameter D mm	Diameter D inch	Width W mm	Width W inch	Width T mm	Width T inch	Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
RW507	RW507D↓	Yes	Garter Spring	None	35	1.3780	72	2.8346		.8858		.8858	1390
RW507B	**RW507E•**	Yes	Sentri Seal	Garter Spring	35	1.3780	72	2.8346		.8858		.925	1390
	RW507F	Yes	Garter Spring	None	35	1.3780	72	2.8346		.8858		.925	1390
	RW507J↓	No	Sentri Seal	Sentri Seal	35	1.3780	72	2.8346		.8449		.925	1390
	RW507R	No	Sentri Seal	Sentri Seal	35	1.3780	72	2.8346		.8449		.8449	1390
RW508	**RW508D**	Yes	Garter Spring	None		1.5312	80	3.1496	21	.8268	25	.9843	1770
RW509	**RW509A•**	Yes	Garter Spring	None		1.6250	83	3.2677		1.0136	26	1.0236	1970
904262	**904278•**	Yes	Garter Spring	None	35	1.3780		3.000		.905		.905	1820
904824	**904868•**	Yes	Sentri Seal	Garter Spring	35	1.3780		3.000		1.000		1.032	1820

•R suffix Indicates Retaining Ring.
*For load ratings at other speeds see page 58.
Note: Light face numbers use part number in bold face type.

Rear Wheel Bearings

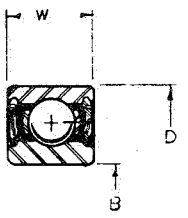
Series 88100, D88500, D88600

Positively sealed on both sides to prevent entrance of dirt or loss of lubricant. Requires no maintenance of any kind.

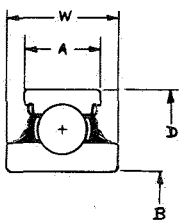
Propeller Shaft Bearings

Series X88100, XD88500, XD88600 and Z99506P

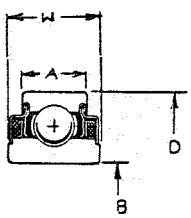
Rear Wheel Bearings with looser felt fitup, processed to operate at the higher speeds required for Propeller Shafts.



Z99500 TYPE



X88107B



88000 TYPE

BEARING PART No.	Bore B mm	Bore B inch	Diameter D mm	Diameter D inch	Width W mm	Width W inch	Width A inch	Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
Z993LL08B	40	1.5748	62	2.4409	15	.5906		510
88107 **‡88107A•**	35	1.3780	72	2.8346	25	.9843	.6693	1390
X88107E, XD88107 **X88107**	35	1.3780	72	2.8346	25	.9843	.6693	1390
X88107 **X88107B**	35	1.3780	72	2.8346	25	.9843	.6693	1390
88108, 88108G **88108E**	38.09	1.4995	80	3.1496	27	1.063	.8268	1770
88128E **88128•**	38.99	1.5312	80	3.1496	27.5	1.083	.8268	1770
88136		1.3120	67	2.6378	24	.9449	.6693	1090
XD88506 **XD88506B**	30	1.1811	62	2.4409	24	.9449	.630	1020
D88508 **XD88508**, **XD88508A†**	40	1.5748	80	3.1496	27	1.0630	.8268	1770
D88509 **XD88509**	45	1.7717	85	3.3465	27	1.0630	.8268	1710
D88510 **XD88510**	50	1.9685	90	3.5433	30	1.1811	.866	1820
XD88606	30	1.1811	72	2.8346	27	1.0630	.748	1470
D88609 **XD88609**	45	1.7717	100	3.9370	35	1.3780	.9843	2570
Z99506P	30	1.1811	62	2.4409	16	.6299		1015

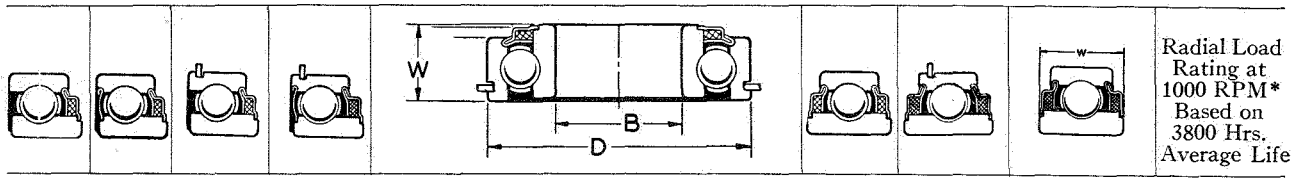
•R suffix Indicates Retaining Ring.
*For load ratings at other speeds see page 58.
‡Chamfered Inner Race Corners, instead of a Radius (Curve).
†Special Curvatures.
NOTE: Light Face Numbers use part number in bold face type.

Sealed Types—Cont'd

For radial or combined loads in either direction. Self-contained seal. Furnished completely lubricated, ready for service. If Snap Ring is desired on same side as seal, indicate with suffix "V," otherwise will be furnished on side opposite to seal as illustrated below.

NOTE: If seal bearing to be replaced is standard Single Row Width, see pages 3 to 6 for 9000, 99000 and 97000 Series.

8000 ND SEAL BEARINGS (Without "WC" Prefix)

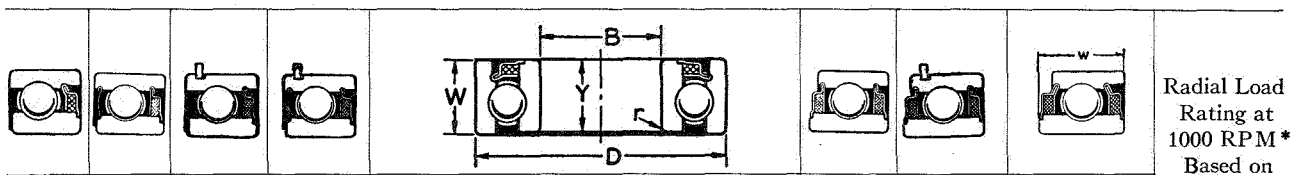


Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life

"WC" PREFIX—WIDE CUP ND SEAL—WC-8000

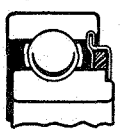
Over-all dimension same as 8000 Series—Outer ring is extended so as to be flush with inner ring on one face.

Available in sizes underlined as "WC,".



BEARING SIZE NUMBER				Bore B		Diameter D		Width W		BEARING SIZE No.		Width W		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
One Seal	Shield & Seal	Sn. Ring 1 Seal	Sn. Ring Sh. & Sl.	mm	inch	mm	inch	mm	inch	Double Seal	Sn. Ring 2 Seals	mm	inch	
8006	**87006**			6	.2362	24	.9449	10.3	.406	**88006**		12.62	.4970	112
8007	**87007**			7	.2756	24	.9449	10.3	.406	**88007**		12.62	.4970	112
8008	**87008**			8	.3150	24	.9449	10.3	.406	**88008**		12.62	.4970	112
8009	**87009**	**48009**	**487009**	9	.3543	30	1.1811	12.699	.500	**88009**	**488009**	16.40	.6457	270
8011	**87011**	**48011**	**487011**	11	.4331	32	1.2598	12.699	.500	**88011**	**488011**	15.40	.6063	270
8013	**87013**	**48013**	**487013**	13	.5118	32	1.2598	12.699	.500	**88013**	**488013**	15.40	.6063	270
8014	**87014**	**48014**	**487014**	14	.5512	35	1.3780	12.699	.500	**88014**	**488014**	14.40	.5669	290
8016	**87016**	**48016**	**487016**	16	.6299	35	1.3780	12.699	.500	**88016**	**488016**	14.40	.5669	290
8026	**87026**	**48026**	**487026**	26	1.0236	52	2.0472	15.87	.625	**88026**	**488026**	16.75	.6594	690
8035	**87035**			5	.1969	19	.748	10.3	.406	**88035**		12.6	.4970	100
8036	**87036**			6	.2362	19	.748	10.3	.406	**88036**		12.6	.4970	100
8037	**87037**			7	.2756	22	.8661	10.3	.406	**88037**		12.6	.4970	133
8038	**87038**			8	.3150	22	.8661	10.3	.406	**88038**		12.6	.4970	133
8039	**87039**			9	.3543	26	1.0236	10.3	.406	**88039**		12.6	.4970	195

C-Prefix



*For load ratings at other speeds see page 58.

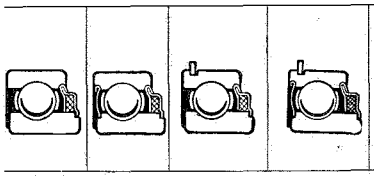
All the above sizes of ND seal bearings are available with metal slingers ("C" prefix), desirable where minimum seal friction is needed.

Sealed Types—Cont'd

For radial or combined loads in either direction. Self-contained seal. Furnished completely lubricated, ready for service. If Snap Ring is desired on same side as seal, indicate with suffix "V," otherwise will be furnished on side opposite to seal as illustrated below.

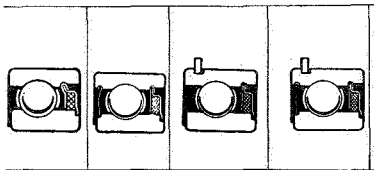
NOTE: If seal bearing to be replaced is standard Single Row Width, see pages 3 to 6 for 9000, 99000 and 97000 Series.

8000 ND Seal Bearings (Without "WC" Prefix)—Cont'd



"WC" Prefix—Wide Cup ND Seal—WC-8000—Cont'd

Over-all dimension same as 8000 Series—Outer ring is extended so as to be flush with inner ring on one face. Available in sizes underlined as "WC".



BEARING SIZE NUMBER				Bore B		Diameter D		Width W		BEARING SIZE No.		Width W		Radial Load Rating at 1000 RPM* Based on 3800 Hrs. Average Life
One Seal	Shield & Seal	Sn. Ring 1 Seal	Sn. Ring Sh. & Sl.	mm	inch	mm	inch	mm	inch	Double Seal	Sn. Ring 2 Seals	mm	inch	
8500	87500	48500	487500	10	.3937	30	1.1811	12.699	.500	88500	488500	16.4	.6457	270
8501	87501	48501	487501	12	.4724	32	1.2598	12.699	.500	88501	488501	15.4	.6063	270
8502	87502	48502	487502	15	.5906	35	1.3780	12.699	.500	88502	488502	14.4	.5669	290
8503	87503	48503	487503	17	.6693	40	1.5748	14.299	.563	88503	488503	16.6	.6536	510
8504	87504	48504	487504	20	.7874	47	1.8504	15.87	.625	88504	488504	17.8	.6988	635
8505	87505	48505	487505	25	.9843	52	2.0472	15.87	.625	88505	488505	16.8	.6594	690
8506	87506	48506	487506	30	1.1811	62	2.4409	19.989	.787	88506†	488506	24	.9449	1020
8507	87507	48507	487507	35	1.3780	72	2.8346	21	.827	88507	488507	25	.9843	1390
8508	87508	48508	487508	40	1.5748	80	3.1496	25	.945	88508†	488508	27	1.063	1590
8509	87509	48509	487509	45	1.7717	85	3.3465	25	.945	88509†	488509	27	1.063	1710
8510	87510	48510	487510	50	1.9685	90	3.5433	26	1.024	88510†	488510	30	1.1811	1820
8511	87511	48511	487511	55	2.1654	100	3.9370	27	1.063	88511	488511	33.3	1.3125	2250
8512	87512	48512	487512	60	2.3622	110	4.3307	29	1.142	88512	488512	33	1.2992	2550
8513	87513	48513	487513	65	2.5591	120	4.7244	31	1.221	88513	488513	36	1.4173	2990
8514	87514			70	2.7559	125	4.9213	31.2	1.299					3180

Above size bores 00 thru 08 of ND seal bearings are available with metal slingers "C" prefix.

Medium Series—8600

8602	87602	48602		15	.5906	42	1.6535	15	.591	88602	488602	17	.6693	580
8603	87603	48603	487603	17	.6693	47	1.8504	16	.630	88603	488603	18	.7087	710
8604	87604	48604	487604	20	.7874	52	2.0472	19	.7480	88604	488604	23	.9055	1010
8605	87605	48605	487605	25	.9843	62	2.4409	21	.827	88605	488605	25	.9843	1110
8606	87606	48606	487606	30	1.1811	72	2.8346	23	.9055	88606†	488606	27	1.0630	1470
8607	87607	48607	487607	35	1.3780	80	3.1496	25	.9843	88607	488607	29	1.1417	1820
8608	87608	48608	487608	40	1.5748	90	3.5433	27	1.0630	88608	488608	31	1.2205	2200
8609	87609	48609	487609	45	1.7717	100	3.9370	30	1.1811	88609†	488609	35	1.3780	2570

Above size bores 04 thru 06 of ND seal bearings are available with metal slingers "C" prefix.

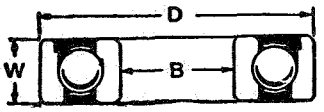
†PROPELLER SHAFT BEARINGS, TYPE XD88000—Outside Dimensions are same as shown above. See page 13.

____Underlined numbers available in "WC" 8000 Series.

*For load ratings at other speeds see page 58.

ANGULAR CONTACT—SINGLE ROW

MAGNETO BEARINGS—Series ND5 to ND20



For radial and light thrust loads. Mounted two bearings opposed. Made separable to speedup assembly of mechanisms in which they are used.

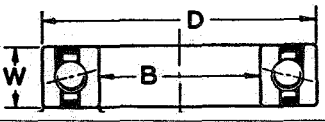
BEARING PART NO.	Bore B		Diameter D		Width W	
	mm	inch	mm	inch	mm	inch
ND5	5	.1969	16	.6299	5	.1969
ND5-4	4	.1575	16	.6299	5	.1969
ND8	8	.3150	24	.9449	7	.2756
ND8-6	6	.2362	24	.9449	7	.2756
ND8-7	7	.2750	24	.9449	7	.2756
ND10	10	.3937	28	1.1024	8	.3150
ND10-9	9	.3543	28	1.1024	8	.3150
ND12	12	.4724	32	1.2598	7	.2756
ND12-11	11	.4331	32	1.2598	7	.2756
ND13	13	.5118	30	1.1811	7	.2756
ND13F†	13	.5118	30	1.1811	7	.2756
ND15	15	.5906	35	1.3780	8	.3150
ND15F†	15	.5906	35	1.3780	8	.3150
ND16	16	.6299	38	1.4961	10	.3937
ND17	17	.6693	44	1.7323	11	.4331
ND17E	17	.6693	44	1.7323	10	.3937
ND17F†	17	.6693	44	1.7323	10	.3937
ND17H	17	.6693	40	1.5748	10	.3937
ND17J	17.4	.6875	34.9	1.3754	11	.4331
ND20	20	.7874	47	1.8504	14	.5512

† Separable cone.

Angular Contact

SINGLE ROW—EXTRA LIGHT SERIES—0L00

Available singly or in matched pairs for Duplex Mounting:—"DB," "DF" or "DT." "DT" type bearings may be used to replace "DB" and "DF" types—but if "DB" or "DF" are ordered as needed, it enables supplier to ship as ordered or substitute "DT," or 2 "U" Prefix "Universal" bearings. "Q" indicates non-metallic, "V" indicates bronze separators.



Flanged Precision Bearings—Type N0L00 Manufactured to A.B.E.C. 5, 7, ND9 precision specifications only.

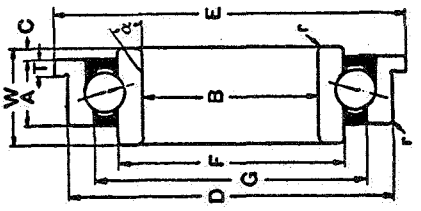
Brg. Size No.	Bore B		Diameter D		Width W		Brg. Size No.	Flange		Radial Rating @	Thrust Rating @
15° Contact Angle	mm	inch	mm	inch	mm	inch	Flanged	O. D. inch	Width inch	1000 RPM*	1000 RPM**
Q0L00	10	.3937	26	1.0236	8	.3150				205	215
Q0L01	12	.4724	28	1.1024	8	.3150				220	230
Q0L02	15	.5906	32	1.2598	9	.3543				255	270
0L03	17	.6693	35	1.3780	10	.3937				270	285
0L04	20	.7874	42	1.6535	12	.4724				470	495
Q0L05	25	.9843	47	1.8504	12	.4724				525	555
Q0L06	30	1.1811	55	2.1654	13	.5118	QN0L06	2.293	.128	715	755
Q0L07	35	1.3780	62	2.4409	14	.5512	QN0L07	2.579	.138	935	985
Q0L08	40	1.5748	68	2.6772	15	.5906	QN0L08	2.815	.148	975	1030
Q0L09	45	1.7717	75	2.9528	16	.6299	QN0L09	3.11	.157	1240	1310
Q0L10	50	1.9685	80	3.1496	16	.6299	QN0L10	3.307	.157	1290	1360
0L11	55	2.1654	90	3.5433	18	.7087	N0L11	3.720	.177	1770	1860
0L12	60	2.3622	95	3.7402	18	.7087	N0L12	3.917	.177	1910	2010
Q0L13	65	2.5591	100	3.9370	18	.7087	QN0L13	4.114	.177	1970	2070
0L14	70	2.7559	110	4.3307	20	.7874	N0L14	4.528	.197	2620	2760
Q0L15	75	2.9528	115	4.5276	20	.7874	QN0L15	4.724	.197	2710	2850
0L16	80	3.1496	125	4.9213	22	.8661	N0L16	5.138	.216	3240	3410
Q0L17	85	3.3465	130	5.1181	22	.8661	QN0L17	5.335	.216	3350	3530
0L18	90	3.5433	140	5.5118	24	.9449	N0L18	5.748	.236	3910	4120
Q0L19	95	3.7402	145	5.7087	24	.9449				4040	4250
0L20	100	3.9370	150	5.9055	24	.9449				4170	4390
Q0L21	105	4.1339	160	6.2992	26	1.0236	QN0L21	6.555	.256	4730	4980
0L22	110	4.3307	170	6.6929	28	1.1024				5340	5620
0L24	120	4.7244	180	7.0866	28	1.1024	N0L24	7.362	.276	5510	5800
Q0L26	130	5.1181	200	7.8740	33	1.2992	QN0L26	8.199	.325	6560	6910
Q0L28	140	5.5118	210	8.2677	33	1.2992				6770	7130
Q0L30	150	5.9055	225	8.8583	35	1.3780				7550	7950

*Radial capacity for two bearings mounted duplex may be taken as 1.7 times rating listed.
**Thrust capacity for two bearings mounted DT may be taken as 1.7 times rating listed.
Thrust capacity for two bearings mounted DB, DF same as a single bearing.
For ratings at speeds not given see page 58.

SINGLE ROW ANGULAR CONTACT—Cont'd

FLANGED PRECISION BEARINGS—TYPE NM0200B

Available in ABEC-5 precision specifications only.



Single Row Angular Contact bearings. Mounted two bearings opposed for combined loads from either direction.

BEARING PART NO.	Bore B		Diameter D		Width W		Flange OD	Flange Width	Radial Rating @ 1000 RPM*	Thrust Rating @ 1000 RPM**
	mm	inch	mm	inch	mm	inch	inch	inch		
NM0205B	25	.9843	52	2.0472	17	.6693	2.1720	.148	645	680
NM0206B	30	1.1811	62	2.4409	19	.7480	2.6378	.157	1190	1250
NM0207B	35	1.3780	72	2.8346	21	.8268	3.0315	.157	1630	1720
NM0210B	50	1.9685	90	3.5433	27	1.0630	3.7402	.197	2160	2270
NM0212B	60	2.3622	110	4.3307	31	1.2205	4.5669	.216	3230	3400
NM0214B	70	2.7559	125	4.9213	35	1.3780	5.1575	.236	3780	3980
NM0216B	80	3.1496	140	5.5118	39	1.5354	5.7677	.256	4430	4660
NM0218B	90	3.5433	160	6.2992	43	1.6929	6.5945	.295	5550	5840
NM0220B	100	3.9370	180	7.0866	47	1.8504	7.4212	.335	6780	7140
NM0224B	120	4.7244	215	8.464	40	2.1654	8.8583	.394	8730	9190

FLANGED PRECISION BEARINGS—TYPE N20200

Available in ABEC 5, 7, ND9 precision specifications only.
Single Row Angular Contact bearings. Mounted two bearings opposed for combined loads from either direction.

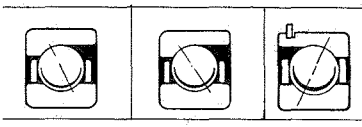
Bearing Size No.	Bore B		Diameter D		Width W		Flange OD	Flange Width	Radial Rating @ 1000 RPM*	Thrust Rating @ 1000 RPM**
Flanged	mm	inch	mm	inch	mm	inch	inch	inch		
N20203	17	.6693	40	1.5748	12	.4724	1.700	.118	440	465
N20204	20	.7874	47	1.8504	14	.5512	1.975	.138	605	635
N20205	25	.9843	52	2.0472	15	.5906	2.172	.148	645	680
N20206	30	1.1811	62	2.4409	16	.6299	2.6378	.157	1190	1250
N20207	35	1.3780	72	2.8316	17	.6693	3.0315	.157	1630	1720
N20208	40	1.5748	80	3.1496	18	.7087	3.3465	.177	1970	2070
N20210	50	1.9685	90	3.5433	20	.7874	3.7402	.197	2160	2270
N20211	55	2.1654	100	3.9370	21	.8268	4.1339	.207	2670	2810
N20212	60	2.3622	110	4.3307	22	.8661	4.5669	.216	3230	3400
N20214	70	2.7559	125	4.9213	24	.9449	5.1575	.236	3780	3980
N20216	80	3.1496	140	5.5118	26	1.0236	5.7677	.256	4430	4660
N20218	90	3.5433	160	6.2992	30	1.1811	6.5945	.295	5550	5840
N20220	100	3.9370	180	7.0866	34	1.3386	7.4212	.335	6780	7140
N20222	110	4.3307	200	7.8740	38	1.4961	8.2480	.374	8070	8500
QN20226	130	5.1181	230	9.0551	40	1.5748	9.4488	.394	9470	9960

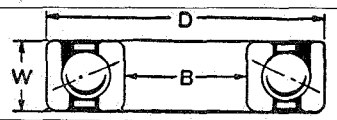
*Radial capacity for two bearings mounted duplex may be taken as 1.7 times rating listed.
**Thrust capacity for two bearings mounted DT may be taken as 1.7 times rating listed.
Thrust capacity for two bearings mounted DB, DF same as a single bearing.
For load ratings at other speeds see page 58.

Angular Contact—Cont'd

SINGLE ROW—LIGHT SERIES—20200 AND 30200

Available singly or in matched pairs for Duplex Mounting:-"DB," "DF" or "DT." "DT" type bearings may be used to replace "DB" and "DF" types—but if "DB" or "DF" are ordered as needed, it enables supplier to ship as ordered or substitute "DT," or 2 "U" Prefix "Universal" bearings. "Q" indicates non-metallic, "V" indicates bronze separators.





Bearing Size No.			Bore B		Diameter D		Width W		Radial Rating @ 1000 RPM*		Thrust Rating @ 1000 RPM**	
15° Contact Angle	35° Contact Angle	Snap Ring	mm	inch	mm	inch	mm	inch	20200 Series	30200 Series	20200 Series	30200 Series
20200			10	.3927	30	1.1811	9	.3543	220		230	
20201			12	.4724	32	1.2598	10	.3937	310		325	
20202			15	.5906	35	1.3780	11	.4331	330		345	
		1 Shield										
†**20203**	**30203#**	**Q720203**	17	.6693	40	1.5748	12	.4724	440	395	465	665
†**20204**	**30204**		20	.7874	47	1.8504	14	.5512	605	735	635	1440
†**20205**	**30205**	**Q420205**	25	.9843	52	2.0472	15	.5906	645	785	680	1540
†**20206**	**Q30206**	**420206**	30	1.1811	62	2.4409	16	.6299	1190	1010	1250	1980
†**20207**	**Q30207**		35	1.3780	72	2.8346	17	.6693	1630	1380	1720	2710
†**20208**	**Q30208**	**420208**	40	1.5748	80	3.1496	18	.7087	1970	1760	2070	3450
20209	**Q30209**	**420209**	45	1.7717	85	3.3465	19	.7480	2060	1850	2170	3630
†**20210**	**Q30210**		50	1.9685	90	3.5433	20	.7874	2160	1950	2270	3820
†**20211**	**Q30211**		55	2.1654	100	3.9370	21	.8268	2670	2390	2810	4690
†**20212**	**Q30212**		60	2.3622	110	4.3307	22	.8661	3230	2840	3400	5570
20213	**Q30213**		65	2.5591	120	4.7244	23	.9055	3780	3300	3980	6470
†**20214**	**Q30214**	**420214**	70	2.7559	125	4.9213	24	.9449	3780	3460	3980	6790
20215	**Q30215**		75	2.9528	130	5.1181	25	.9843	3950	3610	4160	7080
†**20216**	**Q30216**		80	3.1496	140	5.5118	26	1.0236	4430	4160	4660	8160
20217	**Q30217**		85	3.3465	150	5.9055	28	1.1024	5200	4450	5480	8730
†**20218**	**Q30218**		90	3.5433	160	6.2992	30	1.1811	5550	4960	5840	9730
20219	**Q30219**		95	3.7402	170	6.6929	32	1.2598	6150	5490	6480	10775
†**20220**	**Q30220**		100	3.9370	180	7.0866	34	1.3386	6780	6000	7140	11775
20221	**Q30221**		105	4.1339	190	7.4803	36	1.4173	7380	6560	7770	12875
†**20222**	**Q30222**		110	4.3307	200	7.8740	38	1.4961	8070	7100	8500	13925
20224			120	4.7244	215	8.4646	40	1.5748	8730		9190	
†**Q20226**	**Q30226**		130	5.1181	230	9.0551	40	1.5748	9470	8670	9960	17000
Q20228			140	5.5118	250	9.8425	42	1.6535	10950		11525	
Q20230			150	5.9055	270	10.6299	45	1.7717	12150		12800	

†Available with flange see page 17.
#30° Contact angle.

SINGLE ROW—MEDIUM SERIES—H20300 AND 30300

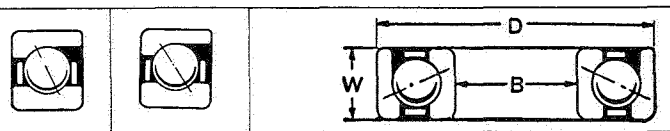
25° Contact Angle	35° Contact Angle	Snap Ring	Bore B		Diameter D		Width W		H20300 Series	30300 Series	H20300 Series	30300 Series
			mm	inch	mm	inch	mm	inch				
H20300			10	.3937	35	1.3780	11	.4331	355		505	
H20301			12	.4724	37	1.4567	12	.4724	385		550	
H20302			15	.5906	42	1.6535	13	.5118	535		765	
H20303		1 Shield	17	.6693	47	1.8504	14	.5512	670		955	
H20304	**Q30304**	**720304**	20	.7874	52	2.0472	15	.5906	1090	895	1560	1760
H20305	**Q30305**		25	.9843	62	2.4409	17	.6693	1360	1220	1940	2390
H20306	**Q30306**		30	1.1811	72	2.8346	19	.7480	1650	1560	2360	3060
H20307	**Q30307**		35	1.3780	80	3.1496	21	.8268	2040	2030	2920	3980
H20308	**Q30308**		40	1.5748	90	3.5433	23	.9055	2460	2410	3520	4730
H20309	**Q30309**	**420309**	45	1.7717	100	3.9370	25	.9843	3060	2810	4370	5510
H20310	**Q30310**	**420310**	50	1.9685	110	4.3307	27	1.0630	3560	3240	5090	6350
H20311	**Q30311**		55	2.1654	120	4.7244	29	1.1417	4030	3830	5760	7510
H20312	**Q30312**		60	2.3622	130	5.1181	31	1.2205	4480	4280	6400	8390
H20313	**Q30313**		65	2.5591	140	5.5118	33	1.2992	4970	4730	7100	9280
H20314	**Q30314**		70	2.7559	150	5.9055	35	1.3780	5480	5170	7830	10150
H20315	**Q30315**		75	2.9528	160	6.2992	37	1.4567	6030	5650	8620	11075
H20316	**Q30316**		80	3.1496	170	6.6929	39	1.5354	6590	6120	9420	12000
H20317	**Q30317**		85	3.3465	180	7.0866	41	1.6142	7140	6630	10200	13000
H20318	**Q30318**		90	3.5433	190	7.4803	43	1.6929	7740	7160	11050	14050
H20319	**Q30319**		95	3.7402	200	7.8740	45	1.7717	8490	7670	12125	15050
H20320	**Q30320**		100	3.8370	215	8.4646	47	1.8504	9040	8780	12925	17225
QH20321	**Q30321**		105	4.1339	225	8.8583	49	1.9291	9710	9320	13875	18275
H20322	**Q30322**		110	4.3307	240	9.4488	50	1.9685	10300	10550	14725	20700
	Q30326		130	5.1181	280	11.0236	58	2.2835		13125		25750

*Radial capacity for two bearings mounted duplex may be taken as 1.7 times rating listed.
**Thrust capacity for two bearings mounted DT may be taken as 1.7 times rating listed.
Thrust capacity for two bearings mounted DB, DF same as single bearing.
For load ratings at other speeds see page 58.

Angular Contact—Cont'd

SINGLE ROW—HEAVY SERIES—20400 AND 30400

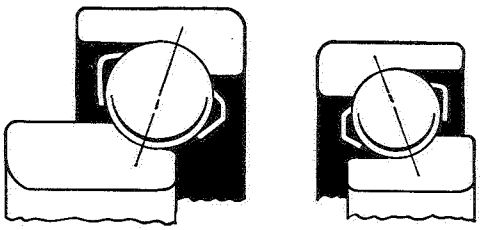
Available singly or in matched pairs for Duplex Mounting:–"DB," "DF" or "DT." "DT" type bearings may be used to replace "DB" and "DF" types—but if "DB" or "DF" are ordered as needed, it enables supplier to ship as ordered or substitute "DT," or 2 "U" Prefix "Universal" bearings.



Bearing Size No.		Bore B		Diameter D		Width W		Radial Rating @ 1000 RPM*	
25° Contact Angle	35° Contact Angle	mm	inch	mm	inch	mm	inch	H20000 Series	30000 Series
QH20404	Q30404	20	.7874	72	2.8346	19	.7480	1820	1640
H20405	Q30405	25	.9843	80	3.1496	21	.8268	2200	2100
QH20406	Q30406	30	1.1811	90	3.5433	23	.9055	2700	2450
H20407	Q30407	35	1.3780	100	3.9370	25	.9843	3150	2850
H20408	Q30408	40	1.5748	110	4.3307	27	1.0630	3500	3400
H20409	Q30409	45	1.7717	120	4.7244	29	1.1417	4150	3800
H20410	Q30410	50	1.9685	130	5.1181	31	1.2205	4650	4200
H20411	Q30411	55	2.1654	140	5.5118	33	1.2992	5050	4600
H20412	Q30412	60	2.3622	150	5.9055	35	1.3780	5550	5000
H20413	Q30413	65	2.5591	160	6.2992	37	1.4567	6000	5900
H20414	Q30414	70	2.7559	180	7.0866	42	1.6535	7000	6800
H20415	Q30415	75	2.9528	190	7.4803	45	1.7717	8000	7800
H20416	Q30416	80	3.1496	200	7.8740	48	1.8898	8600	8300
QH20417		85	3.3465	210	8.2677	52	2.0472	9100	8800
QH20418	Q30418	90	3.5433	225	8.8583	54	2.1260	10100	9900

*Radial capacity for two bearings mounted duplex may be taken as 1.7 times rating listed. For load ratings at other speeds see page 58.

FRONT WHEEL BEARINGS—TYPE 909000



Inner Outer

STANDARD TYPE

Angular contact, separable bearings, particularly adapted to the radial and thrust loads encountered in front wheel service.

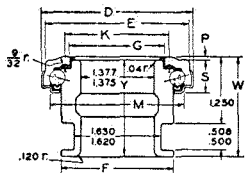
Complete Bearing Part No.	Component Parts		
	Cone Part No.	Cup Part No.	Retainer Part No.
909001††	909501	909601	909701
909002	909502	909602	909702
909003††	909503	909603	909703
909004††	909504	909604	909704
909021	909521	909621	909721
909022††	909522	909622	909722
909023	909523	909623	909723
909024	909524	909624	909724
909025††	909525	909625	909725

Complete Bearing Part No.	Component Parts		
	Cone Part No.	Cup Part No.	Retainer Part No.
909026	909526	909626	909726
909027††	909527	909627	909727
909028††	909528	909628	909728
909032††	909532	909602	909702
909035††	909535	909635	909735
909040	909540	909640	909740
909041	909541	909641	
909042††	909542	909602	909702
909045	909545	909625	909725
909046	909546	909626	909726
909047	909547	909673	909725
909048	909548	909648	909726
909052	909552	909602	909702
909060	909560	909660	909760
909062	909562	909662	909762
909065	909565	909625	909725
909066	909566	909666	909762
909067	909567	909667	909767
909070	909570	909670	909770
909072	909572	909662	909762
909073	909565	909673	909725

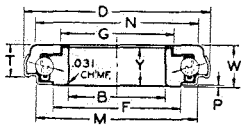
†† Complete bearing not stocked—order component parts shown at right.

CLUTCH THROW-OUT BEARINGS

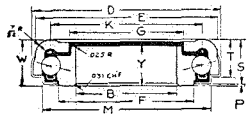
Self-contained, non-separable bearings especially designed for the principal kinds of automotive clutches. Radial capacities of all three types are equal to the thrust ratings.



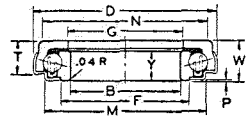
CT22 & 2140122
CT24E*



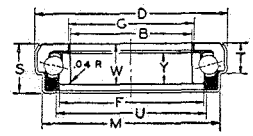
CT24A & CT26



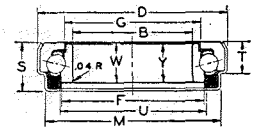
CT24B



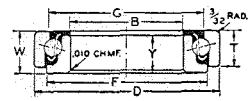
CT30F



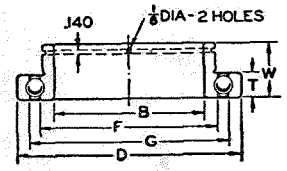
CT36 & CT44



CT32, CT34, 43770D



CT38 & CT40



4L24A-B-E

Bearing Part No.	Bore B		Diameter D	Diameter M	Width W	Width S	Width Y	F	G	N
	mm	inch	inch	inch	inch	inch	inch			
CT22	34.92	1.3750	2.812	2.5	1.87		1.81	—	1.732	—
CT24A	38.10	1.50	2.812	2.5	.625	.495	.594	2.0	1.75	2.5
CT24B	38.10	1.50	2.812	2.5	.687	.558	.594	2.0	1.75	—
CT24C	38.10	1.50	2.812	2.5	.625	.781	.594	2.0	1.75	2.031
CT24E	34.92	1.3750	2.812	2.547	1.270	—	1.140	2.077	1.375	—
CT26	41.29	1.6255	2.594	2.313	.625	.625	.419	1.913	1.012	—
2140122	34.92	1.3750	2.812	2.500	1.609	.605	1.547	2.077	1.732	—
CT30F	47.63	1.875	3.125	2.750	.687	—	.484	2.192	1.915	—
CT32	50.80	2.0000	3.237	3.031	.687	.797	.518	2.388	2.035	2.437
CT34	54.24	2.1355	3.487	3.281	.750	.906	.580	2.638	2.250	2.687

*Dimensions on drawing not applicable.

Bearing Part No.	Bore B		Diameter D	Diameter M	Width W	Width S	Width Y	F	G	N
	mm	inch	inch	inch	inch	inch	inch			
CT36	57.15	2.2500	3.487	3.281	.750	.906	.735	2.638	2.530	2.687
CT44	69.85	2.7500	4.070	3.344	.813	1.000	.793	3.182	3.030	3.203

Brg. Part No.	Bore B		Diameter D		Width W	Width T	Width Y	F	G
	mm	inch	mm	inch	inch	inch	inch		
CT38	60.33	2.3750	98.43	3.875	.875	.750	.781	3.425	3.250
CT40	63.50	2.5000	103.51	4.075	1.0625	.906	.875	3.648	3.437

Bearing Part No.	Bore		Diameter Inch			Width Inch	
	mm	inch	D	F	G	W	T
4L24A	120	4.7244	7.0866	5.597	6.266	1.6562	.748
4L24B	120	4.7244	7.0866	5.597	6.266	1.7187	.748
4L24E	120	4.7244	7.0866	5.597	6.266	1.750	.745

Bearing Part No.	Bore		Diameter Inch			Width Inch	
	mm	inch	D	F	G	W	T
43770D	50.80	2.000	3.237	2.385	2.035	.625	.575

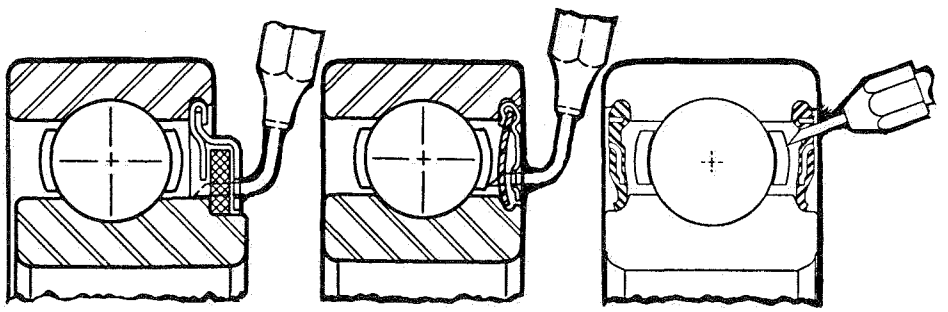
NEW DEPARTURE STEEL BALLS

HIGH CARBON CHROME—GRADE A1

Ball Size	Part Number	Standard Package Quantity
1/16	**1000909582**	200
3/32	**1000909595**	200
1/8	**1000909555**	200
9/64	**1000909637**	200
5/32	**1000909594**	200
3/16	**1000909596**	200
7/32	**1000909611**	100
15/64	**1000909917**	100
1/4	**1000909512**	100
17/64	**1000909922**	100
9/32	**1000909625**	100
5/16	**1000909511**	100
11/32	**1000909671**	50
3/8	**1000909505**	50
13/32	**1000909529**	50
7/16	**1000909532**	50
15/32	**1000909531**	25

Ball Size	Part Number	Standard Package Quantity
1/2	**1000909506**	25
17/32	**1000909655**	25
9/16	**1000909622**	25
19/32	**1000909859**	10
5/8	**1000909554**	10
21/32	**1000909904**	10
11/16	**1000909530**	10
23/32	**1000909597**	10
3/4	**1000909513**	10
25/32	**1000909847**	5
13/16	**1000909591**	5
27/32	**1000909702**	5
7/8	**1000909549**	5
29/32	**1000909964**	5
15/16	**1000909550**	5
31/32	**1000909848**	5
1	**1000909545**	5

SPECIAL NOTE: Steel Balls are supplied in standard package quantities only.



Ease of injection-relubrication. Left to right, Type R-8000 bearings, Type 9000 bearings, and Type Z-99000 bearings. Latter has synthetic seal which closes automatically when needle is withdrawn.

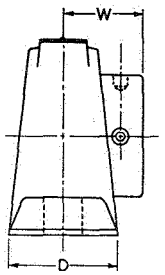
Z99000 "Sentri Seal" seals are also easily removed for relubrication.

INJECTION-RELUBRICATION

In order to make relubrication possible with a minimum of time and expense to the user and without the necessity of exposing bearing interior parts to contamination, New Departure developed the injection-relubrication system.

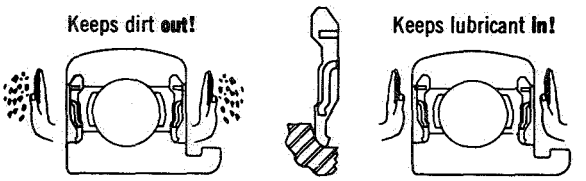
Any high grade turbine quality oil of about 500 to 600 S. U. S. viscosity at 100° F., corrosion and oxidation inhibited, is suitable for injection-relubrication of bearings containing New Departure's general purpose grease.

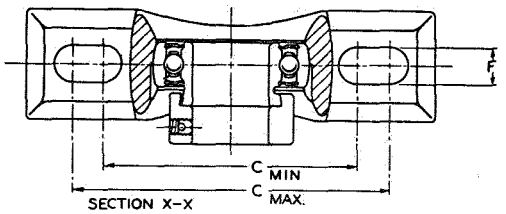
NEW DEPARTURE
BALL BEARING PILLOW BLOCKS

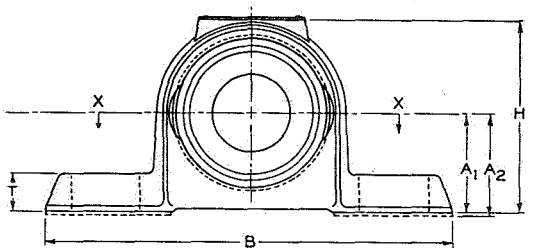


SENTRI-SEAL
—Eliminates lubrication maintenance costs

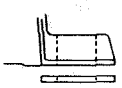
Construction—spring action of molded synthetic rubber with built-in steel rings assures lip contact sealing at all times.







Complete Unit	A_1	†A_2	B	C Min.	C Max.	D	F	H	W	T	Bearing	Rec. Bolt Size	Radial Load Rating @ 1000 RPM*
PAE ½″ PAE 9/16″ PAE 5/8″ PAE 11/16″	1 1/16	1 3/16	5 3/16	3 1/4	4 1/16	1 3/8	7/16	2 5/32	27/32	7/16	Z99AE-008 Z99AE-009 Z99AE-010 Z99AE-011	3/8	510
PAE ¾″	1 1/4	1 5/16	5 3/8	3 3/8	4 3/16	1 1/2	7/16	2 7/16	29/32	7/16	Z99AE-012	3/8	635
PAE 7/8″ PAE 15/16″ PAE 1″	1 5/16	1 7/16	5 1/2	3 11/16	4 5/16	1 5/8	7/16	2 21/32	15/16	1/2	Z99AE-014 Z99AE-015 Z99AE-100	3/8	690
PAE 1 1/16″ PAE 1 1/8″ PAE 1 3/16″	1 9/16	1 11/16	6 1/2	4 1/4	5	1 3/4	9/16	3 3/32	1 1/16	5/8	Z99AE-101 Z99AE-102 Z99AE-103	1/2	1020
PAE 1 1/4″ PAE 1 5/16″ PAE 1 3/8″ PAE 1 7/16″	1 13/16	1 7/8	6 9/16	4 11/16	5 1/4	1 7/8	9/16	3 5/8	1 5/32	5/8	Z99AE-104 Z99AE-105 Z99AE-106 Z99AE-107	1/2	1390
PAE 1 1/2″ PAE 1 9/16″	1 15/16	2	7 1/8	4 15/16	5 13/16	2	9/16	3 7/8	1 1/4	5/8	Z99AE-108 Z99AE-109	1/2	1590
PAE 1 5/8″ PAE 1 11/16″ PAE 1 3/4″	2 1/16	2 1/8	7 1/2	5 1/4	6	2 1/8	9/16	4 1/8	1 9/32	3/4	Z99AE-110 Z99AE-111 Z99AE-112	1/2	1710
PAE 1 13/16″ PAE 1 7/8″ PAE 1 15/16″	2 3/16	2 1/4	8	5 13/16	6 1/2	2 1/4	9/16	4 13/32	1 5/16	3/4	Z99AE-113 Z99AE-114 Z99AE-115	1/2	1820
PAE 2″ PAE 2 1/16″ PAE 2 1/8″ PAE 2 3/16″	2 7/16	2 1/2	9 1/16	6 1/8	7 3/8	2 3/8	11/16	4 7/8	1 7/16	7/8	Z99AE-200 Z99AE-201 Z99AE-202 Z99AE-203	5/8	2250
PAE 2 1/4″ PAE 2 5/16″ PAE 2 3/8″ PAE 2 7/16″	2 11/16	2 3/4	9 5/8	6 15/16	7 15/16	2 1/2	11/16	5 7/16	1 1/2	7/8	Z99AE-204 Z99AE-205 Z99AE-206 Z99AE-207	5/8	2550

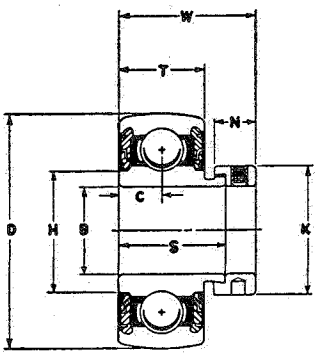


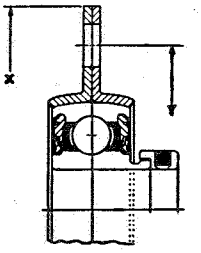
†Mounting pads are furnished with each pillow block for interchangeability and can be used where increased base-to-center height is desired.
*Based on 3800 Hrs. Average Life.
For load ratings at other speeds see page 58.

ADAPTER BEARINGS

TYPE AE (SENTRI-SEAL)

ECCENTRIC LOCKING COLLAR





Available With Flange As Standard Accessory

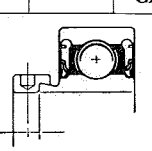
Flanges Must Be Ordered Separately

PRINCIPAL DIMENSIONS

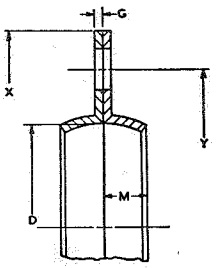
Bearing No.	B Shaft Dia.	D mm	D inch	W	T	C	K	Radial Load Rating* @ 1000 RPM	Stamped Flange No.	Collars Part No.
Z99AE008	1/2	40	1.5748	1 3/32	.4724	.236	1 3/16	510	**FL40**	**E008**
Z99AE009	9/16	40	1.5748	1 3/32	.4724	.236	1 3/16	510	**FL40**	**E009**
Z99AE010	5/8	40	1.5748	1 3/32	.4724	.236	1 3/16	510	**FL40**	**E010**
Z99AE011	11/16	40	1.5748	1 3/32	.4724	.236	1 3/16	510	**FL40**	**E011**
Z99AE012	3/4	47	1.8504	1 3/16	.5512	.276	1 5/16	625	**FL47**	**E012**
Z99AE013	13/16	52	2.0472	1 7/32	.5906	.295	1 1/2	690	**FL52**	**E013**
Z99AE014	7/8	52	2.0472	1 7/32	.5906	.295	1 1/2	690	**FL52**	**E014**
Z99AE015	15/16	52	2.0472	1 7/32	.5906	.295	1 1/2	690	**FL52**	**E015**
Z99AE100	1	52	2.0472	1 7/32	.5906	.295	1 1/2	690	**FL52**	**E100**
Z99AE101	1 1/16	62	2.4409	1 3/8	.6299	.315	1 3/4	1020	**FL62**	**E101**
Z99AE102	1 1/8	62	2.4409	1 3/8	.6299	.315	1 3/4	1020	**FL62**	**E102**
Z99AE103	1 3/16	62	2.4409	1 3/8	.6299	.315	1 3/4	1020	**FL62**	**E103**
Z99AE104B	1 1/4	62	2.4409	1 3/8	.6299	.315	1 3/4	1020	**FL62**	**E104B**
Z99AE104	1 1/4	72	2.8346	1 31/64	.6693	.335	2 3/16	1390	**FL72**	**E104**
Z99AE105	1 5/16	72	2.8346	1 31/64	.6693	.335	2 3/16	1390	**FL72**	**E105**
Z99AE106	1 3/8	72	2.8346	1 31/64	.6693	.335	2 3/16	1390	**FL72**	**E106**
Z99AE107	1 7/16	72	2.8346	1 31/64	.6693	.335	2 3/16	1390	**FL72**	**E107**
Z99AE108	1 1/2	80	3.1496	1 15/32	.7087	.354	2 3/4	1590	**FL80**	**E108**
Z99AE109	1 9/16	80	3.1496	1 15/32	.7087	.354	2 3/8	1590	**FL80**	**E109**
Z99AE110	1 5/8	85	3.3465	1 21/32	.7480	.374	2 1/2	1710	**FL85**	**E110**
Z99AE111	1 11/16	85	3.3465	1 21/32	.7480	.374	2 1/2	1710	**FL85**	**E111**
Z99AE112	1 3/4	85	3.3465	1 21/32	.7480	.374	2 1/2	1710	**FL85**	**E112**
Z99AE113	1 13/16	90	3.5433	1 45/64	.7874	.394	2 3/4	1820	**FL90**	**E113**
Z99AE114	1 7/8	90	3.5433	1 45/64	.7874	.394	2 3/4	1820	**FL90**	**E114**
Z99AE115	1 15/16	90	3.5433	1 45/64	.7874	.394	2 3/4	1820	**FL90**	**E115**
Z99AE200	2	100	3.9370	1 27/32	.8268	.413	3	2250	**FL100**	**E200**
Z99AE201	2 1/16	100	3.9370	1 27/32	.8268	.413	3	2250	**FL100**	**E201**
Z99AE202	2 1/8	100	3.9370	1 27/32	.8268	.413	3	2250	**FL100**	**E202**
Z99AE203	2 3/16	100	3.9370	1 27/32	.8268	.413	3	2250	**FL100**	**E203**
Z99AE204	2 1/4	110	4.3307	1 15/16	.8661	.433	3 5/16	2550		**E204**
Z99AE205	2 5/16	110	4.3307	1 15/16	.8661	.433	3 5/16	2550		**E205**
Z99AE206	2 3/8	110	4.3307	1 15/16	.8661	.433	3 5/16	2550		**CE206**
Z99AE207	2 7/16	110	4.3307	1 15/16	.8661	.433	3 5/16	2550		**CE207**

AE bearings are available with cylindrical O. D. For bearing with cylindrical O. D. suffix **"C"** is added (example **Z99AE100C**)

*For load ratings at other speeds see page 58.



FLANGES

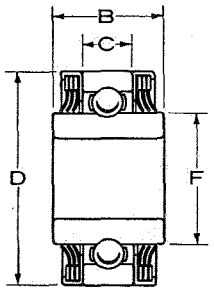


Part No. 2 Req'd. per Bearing	G	X	Y	Mounting Holes No.	Mounting Holes Size	M	Min. Frame Opening	Limiting Radial Load Rating
FL40	.075	3 3/16	2 1/2	3	9/32	9/32	1 7/8	400
FL47	.083	3 9/16	2 13/16	3	11/32	5/16	2 3/16	450
FL52	.083	3 3/4	3	3	11/32	11/32	2 5/8	500
FL62	.104	4 1/16	3 9/16	3	11/32	11/32	2 13/16	750
FL72	.104	4 13/16	3 15/16	3	13/32	3/8	3 3/16	950
FL80	.134	5 13/16	4 11/16	4	17/32	13/32	3 9/16	1150
FL85	.134	5 7/8	4 3/4	4	17/32	7/16	3 13/16	1150
FL90	.149	6 1/8	5	4	17/32	7/16	4	1250
FL100	.149	6 9/16	5 7/16	4	17/32	15/32	4 7/16	1550

See page 24 for FL87.

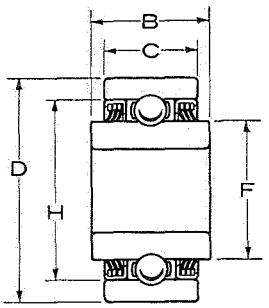
Bearings extensively used on
AGRICULTURAL EQUIPMENT

HEAVY DUTY DISC HARROW BEARINGS
SQUARE OR ROUND BORES
CYLINDRICAL O.D.



TYPE I

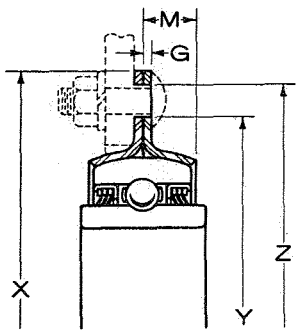
TYPE II



Bearing No.		Type	Shaft Size		O.D. D	Ring Widths ± .005		Radial Load Rating @ 1000 RPM*
Sealed	Open		Nominal	Max.		Inner B	Outer C	
AS4508A	**4508A**	I	1″ Square	1.025	3.150	1.688	.7087	2850
AS4508AD	**4508AD**	II	1″ Square	1.025	3.150	1.438	1.188	2850
AS4508B	**4508B**	I	1⅛″ Square	1.150	3.150	1.688	.7087	2850
AS4508BD	**4508BD**	II	1⅛″ Square	1.150	3.150	1.438	1.118	2850
AS4509AD	**4509AD**	II	1¼″ Square	1.275	3.346	1.438	1.118	3050
AS4511AD	**4511AD**	II	1½″ Square	1.526	4.000	1.750	1.438	4000
AS4508ED	**4508ED**	II	1½″ Round	1.525	3.150	1.438	1.188	2850
.....	**3210-B**	I	1 15/16″ Round	1.9375	3.543	1.938	.7874	3250

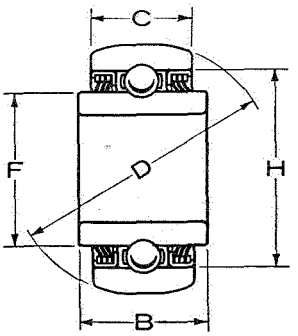
*For load ratings at other speeds see page 58.

SPHERICAL O.D.
SQUARE OR ROUND BORES



Flanges must be ordered separately.

Two pieces make up the flange set.



Bearing No.		Shaft Size		Spherical O.D. D	Width ± .005		F ± .001	H ± .001	Radial Load Rating @ 1000 RPM*	Stamped Flange No.
Sealed	Open	Nominal	Max.		Inner B	Outer C				
AS4508FC	**4508FC**	⅞″ Square	.900	3.438	1.438	1.188	2.058	2.675	2850	**FL87**
AS4508AC	**4508AC**	1″ Square	1.025	3.438	1.438	1.188	2.058	2.675	2850	**FL87**
AS4508BC	**4508BC**	1⅛″ Square	1.150	3.438	1.438	1.188	2.058	2.675	2850	**FL87**
AS4509AC	**4509AC**	1¼″ Square	1.275	3.438	1.438	1.188	2.313	2.873	3050	**FL87**
AS4511AC	**4511AC**	1½″ Square	1.526	4.125	1.750	1.438	2.777	3.409	4000	
AS4508EC	**4508EC**	1½″ Round	1.525	3.438	1.438	1.188	2.058	2.675	2850	**FL87**
AS4509BC	**4509BC**	1¾″ Round	1.770	3.438	1.438	1.188	2.313	2.873	3050	**FL87**

*For load ratings at other speeds see page 58.

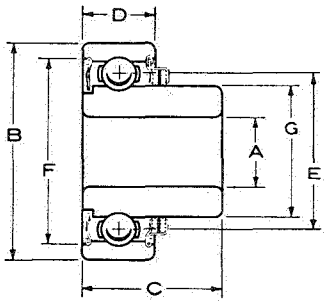
STAMPED FLANGES

Complete line of flanges on page 23.

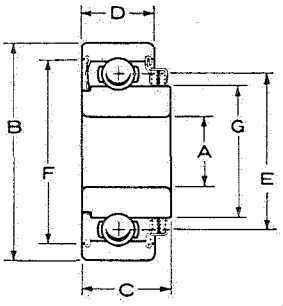
Part No. (1 Half)	G	M	X	Mounting Holes			
				No.	Width	Y	Z
FL-87	.134	.656	5¾	4	.516	4.110	5.266

Bearings extensively used on Agricultural Equipment—Con't

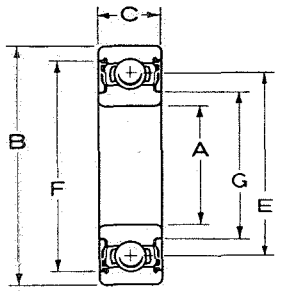
LIGHT DUTY DISC BEARINGS



TYPE I



TYPE II

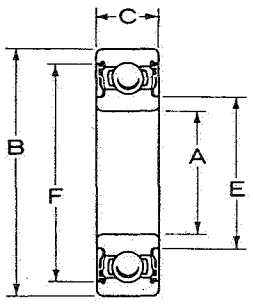


TYPE III

Type	Bearing	Bore A	O.D. B +.0000 −.0005	Inner Ring Width C ±.005	Outer Ring Width D ±.005	Inner Ring Outside Dia. G	Radial Load @ 100 RPM*
I	**87504A16**	.632 .626	1.8504	1.125	.551	1.158	1130
II	**87504U**	.632 .626	1.8504	.686	.551	1.158	1130
III	**Z99502U†**	.506 .500	1.3750	.433	.433	.772	515
III	**Z99503U**	.631 .625	1.5748	.505	.505	.858	905

†Snap ring groove on outer ring O.D.
*For load ratings at other speeds see page 58.

HAY RAKE TINE BAR BEARINGS



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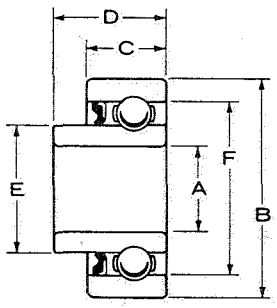

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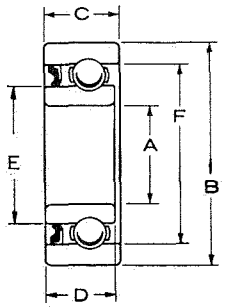


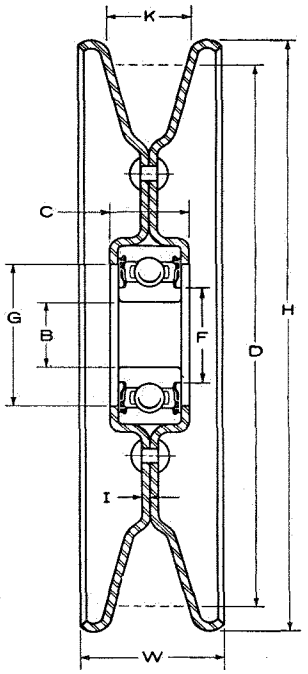
TYPE III

Bearing Number	Type	Bore A	O.D. B +.0000 −.0005	Width O.R. C ±.005	Width I.R. D ±.005	Inner Ring O.D. E	Radial Load @ 100 RPM*
Z99503U	I	.631/.625	1.5748	.505	.505	.858	905
900537	II	.753/.750	2.047	.700	1.053	1.158	1130
900539	III	.753/.750	2.047	.700	.640	1.158	1130

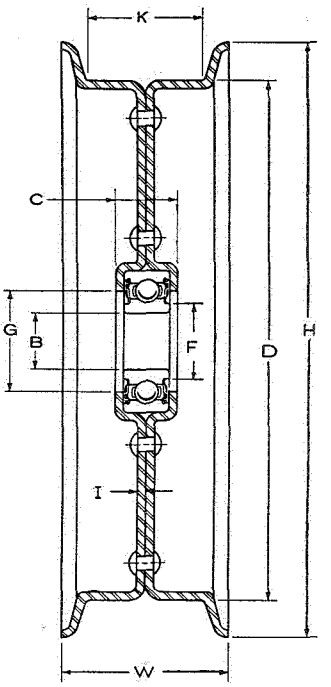
*For load ratings at other speeds see page 58.

Bearings extensively used on Agricultural Equipment—Cont'd

IDLER UNIT ASSEMBLIES



PV SERIES
for "B" Section V-Belts

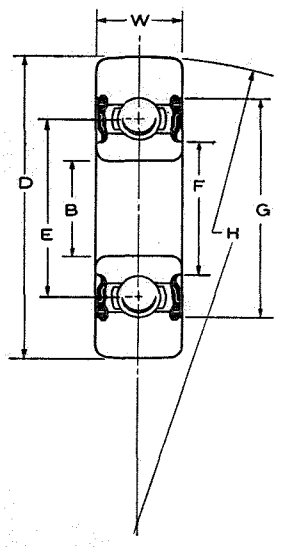


PF SERIES
For Flat Belts or Backside V-Belts

Unit No.	Eff. O.D. D	Sheave O.D. H	Sheave Width W	Mounting Bolt B††	Max. Groove Width K	Radial Load @ 1000 RPM*
PV2-404	4.25	4.875	1.094	½	.737	290
†**PF2-212**	2.75	3.25	1.076	½	.700	290
PF2-400	4.00	4.50	1.375	½	1.062	290
PF2-500	5.00	5.75	1.562	½	1.062	290
PF3-600	6.00	6.75	1.590	⅝	1.062	510
PF3-800	8.00	8.75	1.969	⅝	1.500	510

†Idler unit PF2-12 is hardened to provide long life when used on chain drives.
††Standard machine bolt, hex. head recommended.
*For load ratings at other speeds see page 58.

CAM FOLLOWER BEARINGS



CF SERIES

Bearing Number	Mounting Bolt Dia. B	O.D. D	Width W	Crown Radius H	Radial Load @ 1000 RPM*
CF2-108	½	1.500	.433	3.000	290
CF3-200	⅝	2.000	.505	4.000	465

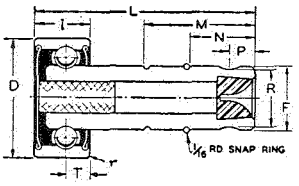
*For load ratings at other speeds see page 58.

Bearings extensively used in
TEXTILE INDUSTRY

(Many Have Other Applications)

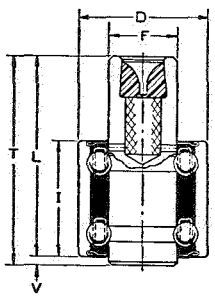
SEAL TYPE—TENSION PULLEY BEARINGS

HORIZONTAL—TYPES TP 15 & 23

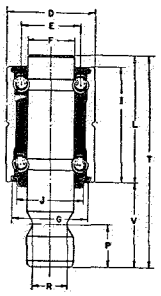


Brg. No.	F	D	R	I	N	P	L	M
TP-15-500	.6267	1.1811	9/16	.551	41/64	1/4	2 11/64	1.250
TP-23-500	.6267	1.1811	9/16	.500	31/32	7/16	1 45/64	
Radial load @ 1000 RPM* 270 lbs.								

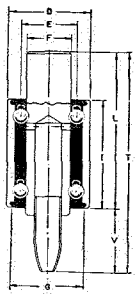
VERTICAL—TYPES TP-17, TP-20 & TP-21



TP-20-500



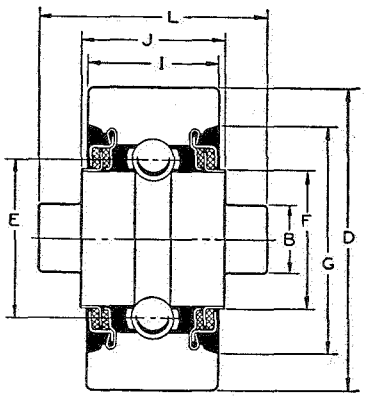
TP-21-500



TP-17-500

BEARING NUMBER	Shaft Diam. F	Bearing O. D. D	Overall Length T	Outer Race Width	Shaft Extn. V	Shaft Extn. fr.O.R.
TP-17-500	.6267	1.1811	3 1/8	1.532	.906	11/16
Radial load @ 1000 RPM 460 lbs.						
TP-20-500	.6267	1.1811	1 53/64	1.062	.078	25/32
TP-21-500	.6267	1.1811	2 13/16	1.530	1 1/8	
Radial load @ 1000 RPM* 460 lbs.						

TREADLE ROLL BEARINGS



PRINCIPAL DIMENSIONS

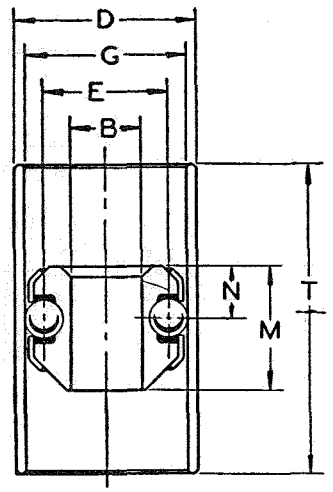
Bearing Number	B	F	D	L	J	I	E	G
TM-11-505	.500	1.055	2.062	1 3/8	25/32	.813	1.202	1.750
TM-13-505	.520	1.055	2.313	2	1 3/32	1.000	1.202	1.750
TM-14-505	.500	1.055	2.313	1 3/8	29/32	.813	1.202	1.750
TM-15-505	.500	1.055	2.313	2 1/8	1 19/32	1.500	1.202	1.750
Radial load @ 1000 RPM* 450 lbs.								

TM-11, 13, 14, is interchangeable respectively with old TM numbers 1, 3, 4, 5.

*For load ratings at other speeds see page 58.

Bearings extensively used in Textile Industry—Cont'd

SPINDLE BEARINGS



PRINCIPAL DIMENSIONS

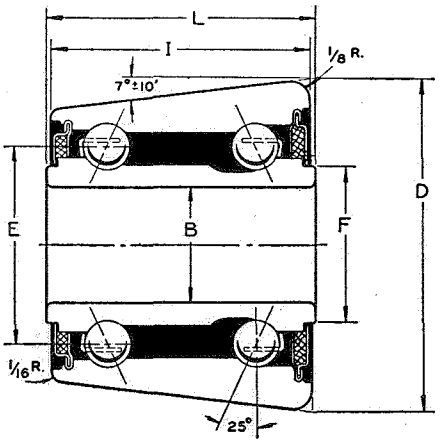
Brg. No.	B	D	E	G	M	N	T
TS-1-500	.3575	.913	.626	.814	.630	.265	1.565
TS-2	.4724	1.1250	.792	1.012	.625	.313	.625

Radial load @ 1000 RPM* 73 lbs. and 108 lbs. respectively.

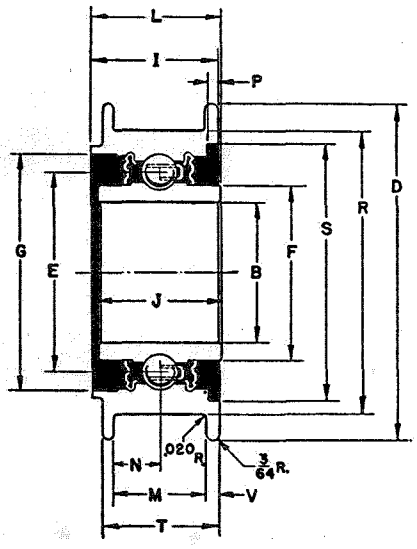
PICK BALL CAM ROLLER

Bearing Number	B	F	D	L	I	E
TC-2-504	.7874	1.056	2.250	1.8125	1.750	1.330

Radial load @ 1000 RPM* 1160 lbs.



TC-2-504



TP-30

SHEAVE BEARING

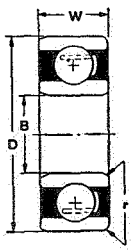
PRINCIPAL DIMENSIONS

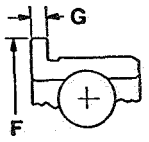
Bearing Number	B	F	D	L	J	I	G
TP-30	1.000	1.245	2.375	.922	.875	.906	1.634
	M	N	P	R	S	V	T
	.654	.328	.080	2.000	1.820	.080	.826

Radial load @ 1000 RPM* 455 lbs.

*For load ratings at other speeds see page 58.

INSTRUMENT BEARINGS





Flange
(Prefix N)

STAINLESS STEEL MINIATURE INCH SERIES

Illustrations not necessarily descriptive of separator type.
Shields are removable "RS" type.
Specify Radial Play Gauging Desired "ZA-ZH" †
Specify "B.E.C.-5".
Lubricant must be specified.

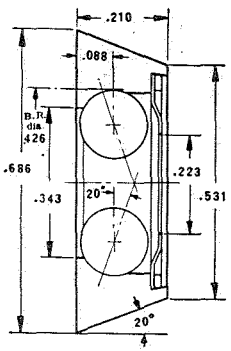
Manufactured to B.E.C.7 except for bore which is B.E.C.5.

Bearing Number	Bore B		Dia. D		Width W	Flange		Bearing Number One Shield	Bearing Number Two Shields	Width W Shielded	Flange Shielded
	Frac.	Dec.	Frac.	Dec.	Dec.	F	G			Dec.	G
M0310 **NM0310**	3/64" 3/64"	.0469 .0469	5/32" 5/32"	.1562 .1562	.0625 .0625	.... .203	.... .013	**7M0310** **7NM0310**	**77M0310** **77NM0310**	.937 .937	.... .031
M0412A **NM0412A**		.0550 .0550	3/16" 3/16"	.1875 .1875	.0781 .0781	.... .234	.... .023	**7M0412A** **7NM0412A**	**77M0412A** **77NM0412A**	.1094 .1094	.... .031
M0516 **NM0516**	5/64" 5/64"	.0781 .0781	1/4" 1/4"	.2500 .2500	.0937 .0937	.... .296	.... .023	**7M0516** **7NM0516**	**77M0516** **77NM0516**	.1406 .1406	.... .031
M0612 **NM0612**	3/32" 3/32"	.937 .937	3/16" 3/16"	.1875 .1875	.0625 .0625	.... .234	.... .018	**7M0612** **7NM0612**	**77M0612** **77NM0612**	.0937 .0937	.... .031
M0620 **NM0620**	3/32" 3/32"	.0937 .0937	5/16" 5/16"	.3125 .3125	.1094 .1094	.... .359	.... .023	**7M0620** **7NM0620**	**77M0620** **77NM0620**	.1406 .1406	.... .031
M0816 **NM0816**	1/8" 1/8"	.1250 .1250	1/4" 1/4"	.2500 .2500	.0937 .0937	.... .296	.... .023	**7M0816** **7NM0816**	**77M0816** **77NM0816**	.1094 .1094	.... .031
M0820 **NM0820**	1/8" 1/8"	.1250 .1250	5/16" 5/16"	.3125 .3125	.1094 .1094	.... .359	.... .023	**7M0820** **7NM0820**	**77M0820** **77NM0820**	.1406 .1406	.... .031
M1020 **NM1020**	5/32" 5/32"	.1562 .1562	5/16" 5/16"	.3125 .3125	.1094 .1094	.... .359	.... .023	**7M1020** **7NM1020**	**77M1020** **77NM1020**	.1250 .1250	.... .036
M1220 **NM1220**	3/16" 3/16"	.1875 .1875	5/16" 5/16"	.3125 .3125	.1094 .1094	.... .359	.... .023	**7M1220** **7NM1220**	**77M1220** **77NM1220**	.1250 .1250	.... .036
M1224 **NM1224**	3/16" 3/16"	.1875 .1875	3/8" 3/8"	.3750 .3750	.1250 .1250	.... .422	.... .023	**7M1224** **7NM1224**	**77M1224** **77NM1224**	.1250 .1250	.... .031
M1624 **NM1624**	1/4" 1/4"	.2500 .2500	3/8" 3/8"	.3750 .3750	.1250 .1250	.... .422	.... .023	**7M1624** **7NM1624**	**77M1624** **77NM1624**	.1250 .1250	.... .036
M1632 **NM1632**	1/4" 1/4"	.2500 .2500	1/2" 1/2"	.5000 .5000	.1250 .1250	.... .547	.... .023	**7M1632** **7NM1632**	**77M1632** **77NM1632**	.1875 .1875	.... .045
M2032 **NM2032**	5/16" 5/16"	.3125 .3125	1/2" 1/2"	.5000 .5000	.1562 .1562	.... .547	.... .031	**7M2032** **7NM2032**	**77M2032** **77NM2032**	.1562 .1562	.... .031

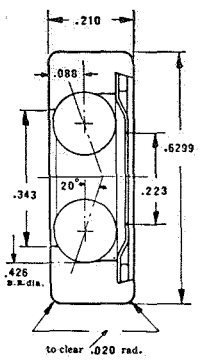
Note: Single shielded flange bearings have shield on flange side.
†See page 48 for radial play gauging ZA, ZB, etc.

Radial lines on the side of the bearing are for identification during manufacture.

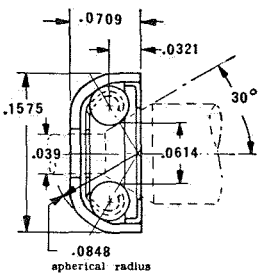
Static Cap.	M0310	M0412A	M0516	M0612	M0620	M0816	M0820	M1020	M1220	M1224	M1624	M1632	M2032
Radial	7.8	17.3	31.6	10.9	46.0	28.8	46.0	37.2	41.7	41.7	47.8	95.4	310.0
Thrust	7.9	20.7	51.6	8.5	63.3	27.2	63.3	36.0	39.7	39.7	43.3	181.0	81.5



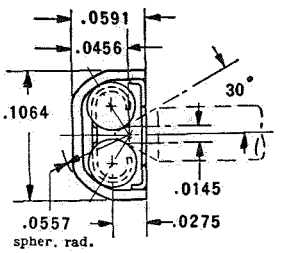
Pivot Bearing 0105A
5 — 5/32" balls
Cup only is 0105



Pivot Bearing 0104A
5 — 5/32" balls
Cup only is 0104

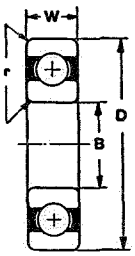


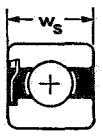
Pivot Bearing PF4
6 — 1 mm. balls



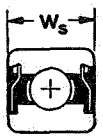
Pivot Bearing C270
3 — 1 mm. balls

INSTRUMENT BEARINGS—Cont'd

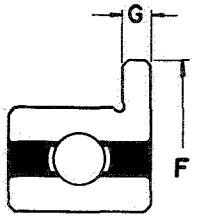




One Shield



Two Shields



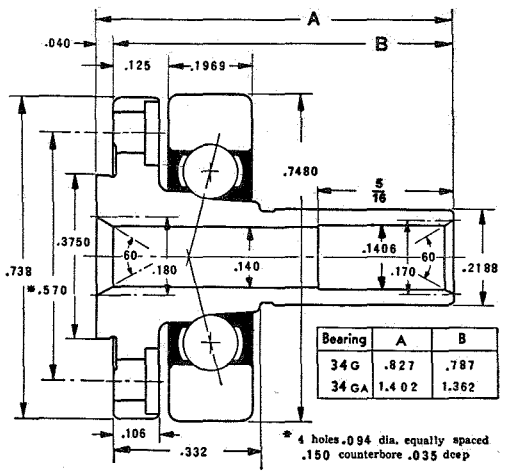
INCH AND METRIC SERIES

Illustrations not necessarily descriptive of separator type.

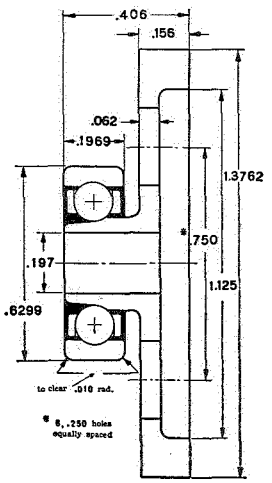
Shields are removable

Bearing	Bore B		Dia. D		Width W	Flange		Bearing Number One Shield	Bearing Number Two Shields	Width Ws Shielded or Flanged	Static Capacity	
	Frac.	Dec.	Frac.	Dec.	Dec.	F	G			Dec.	Radial	Thrust
R2	1/8	.1250	3/8	.3750	.1562	....	....	**RS7R2**	**RS77R2**	.1562	57	75
NR2	1/8	.1250	3/8	.3750	.1562	.440	.030	**RS7NR2**	**RS77NR2**	.1562		
R2A	1/8	.1250	1/2	.5000	.1719	....	....	**RS7R2A**	**RS77R2A**	.1719	57	75
R3D*	3/16	.1875	1/2	.5000	.1562	....	....	**RS7R3D**	**RS77R3D**	.1960	107	190
NR3D*	3/16	.1875	1/2	.5000	.1960	.565	.042	**RS7NR3D**	**RS77NR3D**	.1960		
R4D*	1/4	.2500	5/8	.6250	.1960	....	....	**RS7R4D**	**RS77R4D**	.1960	155	260
NNR4D	1/4	.2500	5/8	.6250	.1960	.690	.042	**RS7NNR4D**	**RS77NNR4D**	.1960		
R4AC*	1/4	.2500	3/4	.7500	.2188	....	....	**RS7R4A**	**RS77R4A**	.2812	238	366
R6DD*	3/8	.3750	7/8	.8750	.2188	....	....	**RS7R6DD**	**RS77R6DD**	.2812	370	552
NR6DD*	3/8	.3750	7/8	.8750	.2188	.969	.062	**RS7NR6DD**	**RS77NR6DD**	.2812		
34D*	4 mm.	.1575	16 mm.	.6299	.1969	....	....	**RS7034D**	**RS77034D**	.1969	155	260
35U*	5 mm.	.1969	19 mm.	.7480	.2362	....	....	**RS7035U**	**RS77035U**	.2362	238	366
36U*	6 mm.	.2362	19 mm.	.7480	.2362	....	....	**RS7036U**	**RS77036U**	.2362	238	366
37U*	7 mm.	.2756	22 mm.	.8661	.2756	....	....	**RS7037U**	**RS77037U**	.2756	370	552
38U*	8 mm.	.3150	22 mm.	.8661	.2756	....	....	**RS7038U**	**RS77038U**	.2756	370	552

Note. Single shielded bearings have shield on flanged side.
*Larger race curvatures than standard provide lower torque characteristics.

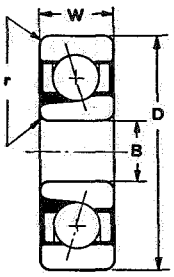


Gimbal Bearings 34G and 34GA
6 — 1/8" balls



Rotor Bearing No. Q34BA
6 — 1/8" balls

INSTRUMENT BEARINGS—Cont'd



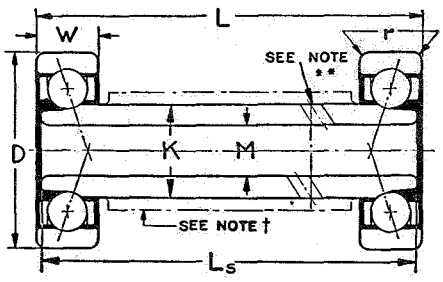
GYRO ROTOR BEARINGS

With one-piece, non-metallic separators for high speed applications. Inner rings are removable.

Bearing Number	O.R. & Ball Assemby	I.R. Number	Bore B		Dia. D		Width W	
			Frac.	Dec.	Frac.	Dec.	Frac.	Dec.
QR1½B**	**QR1½BC**	**R1½B**	3/32	.0937	5/16	.3125	7/64	.1094
QR2B	**QR2BC**	**R2B**	1/8	.1250	3/8	.3750	5/32	.1562
QR3B	**QR3BC**	**R3B**	5/16	.1875	1/2	.5000	5/32	.1562
QR4B	**QR4BC**	**R4B**	1/4	.2500	5/8	.6250		.1960
Q34B	**Q34BC**	**34B**	4 mm.	.1575	16 mm.	.6299	5 mm.	.1969
Q34B5	**Q34BC**	**34B-5**	5 mm.	.1969	16 mm.	.6299	5 mm.	.1969
Q36B	**Q36BC**	**36B**	6 mm.	.2362	19 mm.	.7480	6 mm.	.2362
Q38B	**Q38BC**	**38B**	8 mm.	.3150	22 mm.	.8661	7 mm.	.2756
Q3200B	**Q3200BC**	**3200B**	10 mm.	.3937	30 mm.	1.1811	9 mm.	.3543
	QR3BEC*				1/2	.5000		.1960

*QR3BEC can be matched with either R3BE or R3BEG shafts. Has no I.R.
**Has .144 width separator.

Limiting Static Cap.	QR1½B	QR2B	QR3B	QR4B	Q34B	Q34B-5	Q36B	Q38B	Q3200B
Radial	46	69	152	188	120	120	160	340	475
Thrust	52	44	144	166	185	185	250	580	665



GYRO ROTOR SHAFT ASSEMBLIES

Bearing outer ring and separator-ball assemblies with removable shaft for high speed gyro rotor applications.

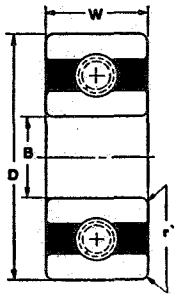
Shaft and Bearing Assembly No.	Outer Ring and Ball Assembly No.	Shaft No.	M	D		W		L	Ls	K†
				Frac.	Dec.	Frac.	Dec.			
QR2BE**	**QR2BC**	**R2BE**	7/64	3/8	.3750	5/32	.1562	1.625	1.625	.2032
QR3BD	**QR3BC**	**R3BD**	.141	1/2	.5000	5/32	.1562	1.688	1.688	.2760
QR3BE	**QR3BEC**	**R3BE**	.103	1/2	.5000		.1960	1.719	1.700	.2509
QR4BD	**QR4BC**	**R4BD**	.250	5/8	.6250		.1960	.947	.827	.4375
Q34BD	**Q34BC**	**34BD**	.1575	16 mm.	.6299	5 mm.	.1969	1.192	1.192	.3003
Q36BD	**Q36BC**	**36BD**	.218	19 mm.	.7480	6 mm.	.2362	2.156	2.156	.3860
Q38BD	**Q38BC**	**38BD**	.297	22 mm.	.8661	7 mm.	.2756	1.560	1.410	.6250
QR3BEG	**QR3BEC**	**R3BEG**		1/2	.5000		.1960	1.861	1.838	.2030

†"K" for **QR4BD** and **Q38BD** is larger than raceway shoulder diameter.
****QR2BE** shaft has two .059 holes at angle of 35°, located 1.172 from end of shaft.

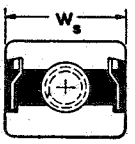
Limiting Static Cap.	QR2BE	QR3BD	QR4BD	Q34BD	Q36BD	Q38BD	QR3BE	QR3BEG
Radial	53	152	150	120	160	335	115	114
Thrust	69	144	200	185	250	560	218	106
Radial Load Cap @ 1000 RPM•	24	44	42	41	50	83	46	47

•For load ratings at other speeds see page 58.

INSTRUMENT BEARINGS—Cont'd

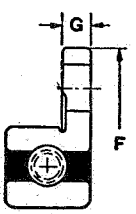


One Shield



Two Shields

Shields are removable.



Flange

GIMBAL, SYNCHRO AND OTHER BEARINGS WITH SPRING SEPARATORS

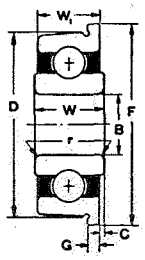
"SR" series bearings are designed for Gimbals and other zero r.p.m. to very slow speed applications.

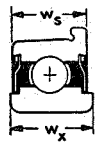
Bearings CSR3D to CS38F are fitted with close wound spring separators for synchros or other applications with speeds generally under 2000 r.p.m.

Bearing Number	Bore B		Dia. D		Width W		Flange		Bearing Number One Shield	Bearing Number Two Shields	Ws Width Shielded
	Frac.	Dec.	Frac.	Dec.	Frac.	Dec.	F	G			
GIMBAL BEARINGS											
SR2	1/8	.1250	3/8	.3750	5/32	.1562	....	....	**RS7SR2**	**RS77SR2**	.1562
SNR2	1/8	.1250	3/8	.3750	5/32	.1562	.440	.030	**RS7SNR2**	**RS77SNR2**	.1562
SR3D	3/16	.1875	1/2	.5000	5/32	.1562	....	....	**RS7SR3D**	**RS77SR3D**	.1960
SNR3D	3/16	.1875	1/2	.5000	....	.1960	.565	.042	**RS7SNR3D**	**RS77SNR3D**	.1960
SR3J	3/16	.1875	1/2	.5000	5/32	.1562	....	....	**RS7SR3J**	**RS77SR3J**	.1562
SNR3J	3/16	.1875	1/2	.5000	5/32	.1562	.875	.052	**RS7SNR3J**	**RS77SNR3J**	.1562
SR4D	1/4	.2500	5/8	.6250	....	.1960	....	....	**RS7SR4D**	**RS77SR4D**	.1960
SNNR4D	1/4	.2500	5/8	.6250	....	.1960	.690	.042	**RS7SNNR4D**	**RS77SNNR4D**	.1960
SR6DD	3/8	.3750	7/8	.8750	7/32	.2188	....	....	**RS7SR6DD**	**RS77SR6DD**	.2812
SNR6DD	3/8	.3750	7/8	.8750	9/32	.2812	.969	.062	**RS7SNR6DD**	**RS77SNR6DD**	.2812
SYNCHRO BEARINGS											
CSR3D	3/16	.1875	1/2	.5000	5/32	.1562	....	....	**RS7CSR3D**	**RS77CSR3D**	.1960
CSNR3D	3/16	.1875	1/2	.5000	....	.1960	.565	.042	**RSCSNR3D**	**RS77CSNR3D**	.1960
CSR4D	1/4	.2500	5/8	.6250	....	.1960	....	....	**RS7CSR4D**	**RS77CSR4D**	.1960
CSNNR4D	1/4	.2500	5/8	.6250	....	.1960	.690	.042	**RS7CSNNR4D**	**RS77CSNNR4D**	.1960
CSR6DD	3/8	.3750	7/8	.8750	7/32	.2188	....	....	**RS7CSR6DD**	**RS77CSR6DD**	.2812
CSNR6DD	3/8	.3750	7/8	.8750	9/32	.2812	.969	.062	**RS7CSNR6DD**	**RS77CSNR6DD**	.2812
CS35F	5 mm.	.1969	19 mm.	.7480	6 mm.	.2362	....	....	**CSRS7035F**	**CSRS77035F**	.2362
CS36F	6 mm.	.2362	19 mm.	.7480	6 mm.	.2362	....	....	**CSRS7036F**	**CSRS77036F**	.2362
CS37F	7 mm.	.2756	22 mm.	.8661	7 mm.	.2756	....	....	**CSRS7037F**	**CSRS77037F**	.2756
CS38F	8 mm.	.3150	22 mm.	.8661	7 mm.	.2756	....	....	**CSRS7038F**	**CSRS77038F**	.2756

Open and Close Wound Limiting Thrust Cap.	SR2	CSR3D	SR3J	CSR4D	CSR6DD	CS35F	CS36F	CS37F	CS38F
	64	148	40	195	474	345	345	440	440

INSTRUMENT BEARINGS—Cont'd





Shielded

BEARINGS WITH FLANGED OUTER RING TAPERED O.D.

Based on inch series, but with protruding inner ring faces and with axial locating flange on outer rings.

Shields are removable.
Can be supplied with one shield on flanged side.

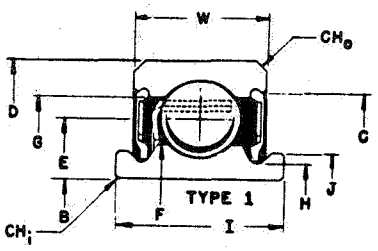
Bearing Number	Bore B		†Dia. D	W Width inner ring	W1 Width outer ring	C	Flange		Bearing Number	Width Shielded	
	Frac.	Dec.					F	G		WS	WX
NR3HA	$\frac{3}{16}$	.1875	.4382	.189	.163	.016	.500	.042	**RS77NR3HA**	.163	.189
	$\frac{3}{16}$	.1875	.5632	.218	.195	.016	.625	.042	***RS77NR3HC**	.195	.218
NR3H	$\frac{3}{16}$	.1875	.5632	.218	.195	.016	.625	.042	**RS77NR3H**	.226	.250
NR4H	$\frac{1}{4}$	.2500	.6257	.250	.226	.016	.687	.042	**RS77NR4H**	.226	.250
NR5H	$\frac{5}{16}$	.3125	.6882	.250	.226	.016	.750	.042	**RS77NR5H**	.226	.250

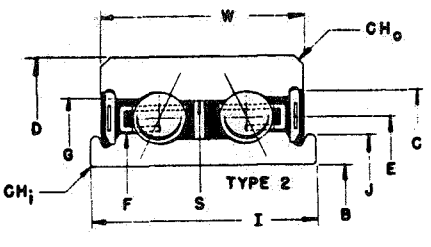
†Outer ring taper is .080 in. per foot on diameter. *Stainless Steel Only.

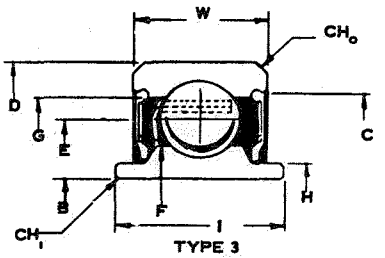
Limiting Static Cap.	NR3H	NR3HA	NR3HC	NR4H	NR5H
Radial	107	71	107	155	230
Thrust	190	91	190	260	195
Radial Load Cap. @ 1000 RPM*	36	26	36	44	53

*For load ratings at other speeds see page 58.

AIRCRAFT PULLEY BEARINGS







Type	Bearing No.	Bore B +.0000 −.0005	Dia. D +.0000 −.0005	Ring Widths +.000 −.005	Ring Widths +.000 −.005	45° Corner Chamfers CHo +.015 −.000	45° Corner Chamfers CHi +.015 −.000	Radial Load Ratings at 1000 RPM*
3	**AP1**	.1900	.7774	.270	.297	.022	.005	100
1	**AP2**	.1900	.6250	.234	.297	.016	.005	100
2	**AP3**	.3125	.9375	.5625	.6250	.022	.005	205
3	**AP4**	.2500	.8750	.375	.4375	.022	.005	133
1	**AP5**	.3125	.8750	.375	.6250	.022	.005	133
3	**AP6**	.2500	.9014	.335	.484	.032	.005	133

*For load ratings at other speeds see page 58.

SPECIAL COMMERCIAL BEARINGS

These specials are only a part of the specials made by New Departure. The list is restricted to those numbers that are most generally available. Standard sizes available with significant prefix and suffix letters are not listed. For the current availability on these and any specials, please check with your supplier.

Basic Bearing Number	Bore		O. D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
88AG7/8	.875	..	....	..	....	....		Stamped and Welded Steel Flange Forms Outer Ring
Q0L00A11	.415	..	1.0236	26	.3150	.3150	**0L00**	Special Bore
***Q3L00A**	.3937	10	1.0236	26	.3150	.3150	**3L00**	With Special Width
***3L00B**	.3937	10	1.0236	26	.3070 to	.3050	**3L00**	
WD3L00D	.3937	10	1.0236	26	.3150	.3150	**3L00**	Phosphor Bronze WD Type Separator. Stabilized for High Temperature Operation
773L00H	.3937	10	1.0236	26	.3150	.3150	**3L00**	Stabilized for High Temperature Operation
WC873L00A	.3937	10	1.0236	26	.453	.453		Interchangeable with Norma Hoffman 6010P
Q0L01B	.4724	12	1.1024	28	.3150	.3150	**0L01**	Precision Spindle Brg., B Type Inner Ring and Non-Metallic Sep.
3L01C	.4724	12	1.1024	28	.3150	.3150	**3L01**	Special Marking
773L01D	.4724	12	1.1024	28	.3150	.3150	**3L01**	Stabilized for High Temperature Operation
Z998L01A	.4724	12	1.1024	28	.5900	.5900	**3L01**	Cartridge Bearing, Stabilized for High Temp. Oper.
RS77R2AA	.1250	..	.3750	..	.1562	.1562	**R2**	Cadium Plated. Instrument Grade
SR77R2BJ	.1250	..	.3750	..	.1562	.1562	**R2**	Stainless Steel Shields Ribbon Type Separator Stabilized
SS77R2BJ	.1250	..	.3750	..	.1562	.1562	**R2**	Stainless Steel Throughout Stabilized and Ribbon Type Sep.
***R2C**	.1250	..	.6250	..	.1719	.1719	**R2A**	.094 Radius Form on O.D.
77R2E	.1250	..	.3750	..	.1562	.1562	**77R2**	Service Use 77R2
SR2F	.1250	..	.3750	..	.1562	.1562	**R2**	Instrument Grade, 9—1MM Dia. Balls
SSRS77R2P	.1250	..	.3750	..	.1562	.1562	**R2**	Stabilized for Operation at 400 Degree F
77R2R	.1250	..	.3870	..	.1562	.1562	**R2A**	
Q0L02B	.5906	15	1.2598	32	.3543	.3543	**0L02**	Precision Spindle Brg., B Type Inner Ring and Non-Metallic Sep.
WD3L02	.5906	15	1.2598	32	.3543	.3543	**3L02**	Cylindrical Pocket Bronze Bonded Steel Sep. Having Bronze Cone Control Saddles
SSWD3L02	.5906	15	1.2598	32	.3543	.3543	**3L02**	SS Rings and Balls, Bronze Sep.
***3L02B**	.5906	15	1.2598	32	.3443 to	.3463		
3L02F	.5906	15	1.2598	32	.3543	.3543	**3L02**	With Cross Corner Control, Special Marking
WC873L02A	.5906	15	1.2598	32	.500	.500		Interchangeable with Norma Hoffman 6015 P
Q773L02	.5906	15	1.2598	32	.3543	.3543	**773L02**	With Special Non-Metallic Sep. to Allow Shielding
993L02Q	.5906	15	1.2598	32	.3543	.3543	**3L02**	Made to Premium Steel Specs.
4EF03	.4490	..	2.018	..	1.670	....		Steering Gear Roller Tooth Outer Race
R3A	.2031	..	.5000	..	.1562	.1562		
R3AA	.1875	..	.5000	..	.1562	.1562	**R3**	Stabilized for High Temperature Operation
R3AB	.1875	..	.5000	..	.1960	.1960	**R3**	Basic R3 with 77R3 Width and Low Cost Tolerances
7R3K	.1875	..	.5000	..	.1960	.1960	**7R3**	Rings and Balls Stabilized for Operation at 375 Degrees F
SSRS7R3DC	.1875	..	.7500	..	1.960	1.960	**R3D**	Instrument Grade
SSRS77NR3D	.1875	..	.5000	..	1.960	1.960	**R3**	Instrument Grade, SS, .565 Flange O.D.
SSRS77SR3DU	.1875	..	.5000	..	1.960	1.960	**R3**	Instrument Grade, with 5—3/32 Balls was SS77SR3DU
0L03A	.6693	17	1.3780	35	.3937	.3937		Rings & Balls Only
Q0L03B	.6693	17	1.3780	35	.3937	.3937	**0L03**	Precision Spindle Brg., B Type Inner Ring and Non-Metallic Sep.

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O.D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
*993LL03A	.6693	17	1.1811	30	.3937	.3937		Ear Type Sep. with 11 5/32 in. Balls
3L03B	.6693	17	1.3780	35	.3837 to .3857			Special Ring & Assembled Width
R4J	.2500	..	.6250	..	.1960	.1960	R4	Stabilized for High Temperature Operation
R4AB	.2500	..	.7500	..	.2188	.2188	R4A	Stabilized for High Temperature Operation
NR4D	.2500	..	.6250	..	.1960	.1960	R4D	.690 Dia. x .042 Wide Flange. Instrument Grade
77R4J	.2500	..	.6250	..	.1960	.1960	R4	Stabilized for High Temperature
R77R4E	.2500	..	.6250	..	.1960	.1960	77R4	.030 Relube Hole in Shield
RS77R4DE	.2500	..	.6250	..	.1960	.1960	R4D	Ribbon Type Sep., Special Thin Stock Instrument Grade
SSRS7R4DDB	.2500	..	.6250	..	.3920	.3920	R4D	Duplex Pair. Instrument Grade
Q0L04A	.7874	20	1.6535	42	.4724	.4724	Q0L04	Type D Corners
Q0L04B	.7874	20	1.6535	42	.4724	.4724	0L04	Precision Spindle Brg., B Type Inner Ring and Non-Metallic Sep.
Q3L04C	.7874	20	1.6535	42	.462	.4724	3L04	
3L04D	.7874	20	1.6535	42	.4624 to .4644		3L04	
3L04E	.7874	20	1.6535	42	.3543	.3543	3L04	9MM Width
3L04H	.7874	20	1.6535	42	.4724	.4724	3L04	With Cross Corner Control, Special Marking
3L04R	.7874	20	1.6535	42	.4724	.4724	3L04	Single Row Bearing 3L04 Stabilized for High Temperature Operation
WD3L04G	.7874	20	1.6535	42	.4724	.4724	3L04	4 PC WD Type Sep., High Temperature Stabilization
773L04R	.7874	20	1.6535	42	.4724	.4724	773L04	Stabilized for 400° F
*RWC883L04A	.7515	..	1.7500	..	1.068	.5512		2 Tapped Holed 90 Degrees Apart in Inner Rings
FT5A	.314	..	.625	..	.231	.231		Brass Sep.
*SSND5D	.1969	5	.6299	16	.1969	.1969	ND5	Brass Sep., SS Rings
Q0L05B	.9843	25	1.8504	47	.4724	.4724	0L05	Precision Spindle Bearing 0L05 Basic Size B Type Inner Ring Non-Metallic Separator
Q0L05CDT	.9843	25	1.8504	47	.4724	.4724	Q0L05	Keyway on Each Face of I.R. and O.R.
SS1L05A	.9843	25	1.8504	47	.4724	.4724	1L05	Full Ball Complement, Stainless Steel Rings and Balls
*3L05B	.9843	25	1.8504	47	.4644 to .4624		3L05	
SSWD3L05J	.9843	25	1.8504	47	.4724	.4724	3L05	Stainless Steel with Special I.R. Controlled Separator Stabilized at 500 Degrees F
R6F	.3750	..	.8750	..	.2188	.2188	R6	Stabilized for High Temperature Operation
R6AC	.3750	..	.8750	..	.2188	.2188	R6	Basic R6 with Low Cost Features
7R6A	.3750	..	.8750	..	.2188	.2188	7R6	Ball Race Location .137 from Shield Side of Bearing
77R6AA	.3750	..	.8750	..	.2812	.2812	77R6	Stabilized for High Temperature Operation
77R6AB	.3750	..	.7500	..	.2812	.2812	77R6	Special O.D. Ball Size and B.C. Diameter
77R6B	.3750	..	.8750	..	.2812	.2812	77R6	Keyway in One Inner Ring Face
RS77SR6E	.3750	..	.8750	..	....	....	R6	Instrument Grade, 16—1/16 Dia. Balls
Q0L06B	1.1811	30	2.1654	55	.5118	.5118	0L06	Single Row Angular Contact Bearing Q0L06 DT Type with Separable Inner Ring Outer Ring Controlled Ball Retainer
Q0L06CDT	1.1811	30	2.1654	55	.5118	.5118	Q0L06	Keyway on Each Face of I.R. and O.R.
V0L06	1.1811	30	2.1654	55	.5118	.5118	0L06	
QN0L06	1.1811	30	2.1654	55	.5118	.5118	Q0L06	With Flange
3L06D	1.1811	30	2.1654	55	.5118	.5118	3L06	Stabilized for High Temperature
3L06E	1.1811	30	2.1654	55	.5118	.5118	3L06	Special Marking
995L06	1.1811	30	2.1654	55	.9062	.9062	5L06	Double Row Bearing
Q0LL07DT	1.3780	35	2.1654	55	.3937	.3937	0LL07	With N.M. Separator, Duplex Pair

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O. D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
3L07H	1.3780	35	2.4409	62	.5512	.5512	**3L07**	Special Bore Corner
93L07F	1.3780	35	2.4419	62	.5522	.5522	**3L07**	Cadmium Plated 93L07 with Special Width O.D. Loose Internal Fitup and Seal
***SSND8D**	.3150	8	.9449	24	.2756	.2756	**ND8**	Brass Sep., Other Parts SS
9R8B	.500	..	1.125	..	.3125	.3125	**R8**	Basic R8 Low Cost Tolerances Plastic Seal
SSRS77R8C	.5000	..	1.125	..	.3125	.3125	**R8**	Removable Shields, Stainless Steel, Stabilized for 400 Degree F Operation
Z99R8D	.5000	..	1.125	..	.3125	.3125	**Z99R8**	Stabilized for High Temperature and Black Hycar Seals
Z993LL08B	1.5748	40	2.4409	62	.5906	.5906	**3LL08**	Special Width, Curvatures and Sentri Seals
3L08F	1.5748	40	2.6772	68	.5906	.5906	**3L08**	Special Marking
***3L11C**	2.1654	55	3.5433	90	.7087	.7087	**3L11**	Ring Width Std. —.008, —.010
F12A	.750	..	1.625	..	.3125	.3125	**R12**	With Special Outer Ring. Full Ball Complement
ND12A	.4724	12	1.2598	32	.2756	.2756	**ND12**	Stabilized for 450 Degree F
***ND13-14**	.5512	14	1.1811	30	.2756	.2756	**ND13**	14MM Bore
***SSR14A**	.8750	..	1.8750	..	.3750	.3750	**R14**	Stainless Steel Open Wound Spring Separator
***7R14RU**	.8750	..	1.8750	..	.5000	.5000	**7R14**	Special Shield Stamping. Use 7R14
***77R14RU**	.8750	..	1.8750	..	.5000	.5000	**77R14**	Special Shield Stamping. Use 77R14
Q0L14ADT	2.7559	70	4.3307	110	.7874	.7874	**Q0L14**	Duplex Angular Contact Bearing. Slots at High Points of Eccentricity. ABEC-7 Only
Q0L14BDT	2.7559	70	4.3307	110	.7874	.7874	**Q0L14**	Duplex Angular Contact Bearing—Slots Ground at High Points of Race Ring Eccentricity. ABEC-7 Only
ND15J	.5906	15	1.3780	35	.313	.315	**ND15**	I.R. Width .313 In. I.R. Has No Shoulder on Non Thrust Side. Folded Type Shield
QH0L15ADT	2.9528	75	4.5276	115	.7874	.7874	**QH0L15**	Duplex Angular Contact Bearing. Slots Ground at High Points of Eccentricity. ABEC-7 Only
R16A	1.000	..	2.000	..	.5625	.5625	**R16**	With .5625 Width, Special Bore and O.D. Tolerances
***7R16RU**	1.000	..	2.000	..	.5000	.5000	**7R16**	Special Shield Stamping. Use 7R16
***77R16RU**	1.000	..	2.000	..	.5000	.5000	**77R16**	Special Shield Stamping. Use 77R16
FT17	1.068 to 1.125		1.969	50	.625	.625		Full Ball Complement
***QH0L17D**	3.3465	85	5.1181	130	.8661	.8661	**0L17**	Duplex Angular Contact Bearing with Face Keyways
Q0L17ADT	3.3465	85	5.1181	130	.8661	.8661	**Q0L17**	Duplex Angular Contact Bearing. Slots Ground at High Point of Eccentricity. ABEC-7 Only
Q0L17BDT	3.3465	85	5.1181	130	.8661	.8661	**0L17**	Keyways .093 Deep by .312 Width Across Both Faces of Outer and Inner Rings
QH0L17ADT	3.3465	85	5.1181	130	.8661	.8661	**QH0L17DT**	High Points of Eccentricity Marked with Slots $\frac{3}{32}$ x $\frac{3}{16}$ on Both Sides of Brg., and on Both Rings. ABEC-7 Only
3L17A	3.3465	85	5.1181	130	.8661	.8661	**3L17**	Stabilized for High Temperature
77R18A	1.125	..	2.125	..	.500	.500		Unlapped Races 3L06 U Type Separator
***0L19A100M**	3.9570	100	5.7087	145	.7087	.7087	**0L19**	3.9570 I.R. Bore, 18 MM Width, Special Finish
3L20A	3.9370	100	5.9055	150	.9449	.7874	**3L20**	Narrow Cup
***Q0L21A**	4.1339	105	6.2992	160	1.0236	1.0236	**0L21**	Angular Contact Bearing with Face Keyways
773L21A	4.1339	105	6.2992	160	1.0236	1.0236	**773L21**	Two Oil Holes in Outer Ring
***7R22RU**	1.3750	..	2.5000	..	.5625	.5625	**7R22**	Special Shield Stamping. Use 7R22
***77R22RU**	1.3750	..	2.5000	..	.5625	.5625	**77R22**	Special Shield Stamping. Use 77R22
Q3L22UA	4.3750	..	6.7987	..	1.000	1.000		
CT24A1							**CT24A**	CT24A with Pressed Sleeve

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O.D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
CT24F							**CT24E**	Special Marking
CT24H							**CT24E**	With CT22 Outer Ring and Shell
Q0L24ADT	4.7244	120	7.0866	180	1.1024	1.1024	**Q0L24**	Duplex Angular Contact Bearing. Slots at High Points of Eccentricity. ABEC-7 only
Q0L24BDT	4.7244	120	7.0866	180	1.1024	1.1024	**Q0L24**	Duplex Angular Contact Bearing—Slots Ground at High Points of Race Ring Eccentricity. ABEC-7 Only
3L24A	4.7244	120	7.0866	180	1.1024	.9055	**3L24**	
***774L24F**	4.7244	120	7.1653	182	1.4961	1.1024	**773L24**	Wide Inner Ring has a Puller Groove
Q0L28A137	5.3761	..	8.4998	..	1.4961	1.4961		
Q0L28CDT	5.5118	140	8.2677	210	1.2992	1.2992		Duplex Angular Contact Bearing. Slots Ground at High Point of Eccentricity. ABEC-7 Only
QH0L28BDT	5.5118	140	8.2677	210	1.2992	1.2992	**QH0L28DT**	High Points of Eccentricity Marked with Slots $\frac{1}{8} \times \frac{1}{4}$ on Both Inner and Outer Rings on Both Sides. ABEC-7 Only
QH0L28CDT	5.5118	140	8.2677	210	1.2992	1.2992	**QH0L28**	Duplex Angular Contact Bearing—Slots Ground at High Points of Race Ring Eccentricity. ABEC-7 Only
QH0L28DDT	5.5118	140	8.2677	210	1.2992	1.2992	**0L28**	25 Degree Angular Contact Type with Keyway Slot on Faces
3L28A	5.5118	140	8.2677	210	1.2992	1.1024	**3L28**	Narrow Cup 1.1024 Wide
Q0L30ADT	5.9055	150	8.8583	225	1.3780	1.3780	**0L30**	15° Angular Contact Type with Keyway Slot on Faces
3L30A	5.9055	150	8.8583	225	1.3780	1.1811	**3L30**	Narrow Cup 1.1811 Wide
FT32A	1.9685 to 2.048		2.625	..	.4375	.4375		Full Ball Complement
***F36**	.2362	6	.7480	19	.2362	.2362	**36**	Open Cup Curvature, M Type Steel Sep.
V36H	.2362	6	.7480	19	.2362	.2362	**F36**	With High Speed Steel Rings & Balls
G36	.2362	6	.8750	..	.2362	.2362	**36**	
3L36A	7.0866	180	11.0236	280	1.8110	1.8110	**3L36**	Special Material
3L36B	7.0866	180	11.0236	280	1.8110	1.8110	**3L36**	DT Mounting
38E	.3150	8	.8661	22	.2756	.2756	**38**	Special Snap Ring Groove
WD38G	.3150	8	.8661	22	.2756	.2756	**WD38**	Rings Stabilized for Operation at 400 Degrees F. WD38 Sep.
39B	.3543	9	1.0236	26	.4134	.3150		
XR76	4.75	..	6.499	.	.875	.875		
H0203	.6693	17	1.5748	40	.4724	.4724	**0203**	60 Degree Contact Angle, Brass Retainer
***205B**							**5205**	Replaced by 5205WL1450A
E206	1.1811	30	2.4409	62	.750	.750		Double Row
***H0206**	1.1811	30	2.4409	62	.6299	.6299	**0206**	60 Degree Contact Angle, Brass Retainer
E207	1.3780	35	2.8346	72	.875	.875		Double Row
E208	1.5748	40	3.1496	80	1.000	1.000		Double Row
***N0224B28B**	5.5118	140	8.4646	215	1.6875	1.500		O.R. $1\frac{1}{2}$ in. Wide I.R. $1\frac{11}{16}$ in. Wide Extended on Flange Side Only. Brg. has 26—$\frac{23}{32}$ in. Balls—Snap Assembled with Non-Metallic Sep. & 15 Degree Contact Angle
CB504A	....	..	1.8510	..	....	....	**CB504**	With Special Land Riding Seals
RW507K	1.3780	35	2.8346	72	.9250	.8858	**RW507E**	With Special Stamping
RW507P	1.3780	35	2.8346	72	.9250	.8858	**RW507E**	Except for Z Seals
RW508E	1.5312	..	3.1496	80	.9843	.8268	**RW508D**	With Special Stamping
RW508F	1.5312	..	3.1496	80	.9843	.8268	**RW508D**	Special Marking
RW509C	1.6250	..	3.2677	83	1.0630	1.0136	**RW509**	One Sentri-Seal
RW509D	1.6250	..	3.2677	83	1.0236	1.0136	**RW509**	RW509A with O Ring and Special Stamping
RW509E	1.6250	..	3.2677	83	1.0236	1.0136	**RW509**	Special Marking
77F541	1.0625	..	1.500	..	.281	.250		Single Row Torque Tube Bearing Double Shields—Full Ball Complement Cadmium Plated
CS542A	1.3125	..	1.7500	..	.280	.250		Torque Tube Type Brg., 7HCC and 7 Aluminum Balls $\frac{1}{8}$ Dia., Spring Separator. Instrument Grade.

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

1213 A- HAS- 60mm Bore + Hvy Chamfer
1212 Bore

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O. D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
77F545	2.0625	..	2.625	..	.281	.250		Single Row Torque Tube Bearing Double Shields—Full Ball Complement Cadmium Plated
916	.500	..	1.5312	..	2.000	1.750		Steering Arm Bearing. Wide Double Row. 2.000 in. Assembled Width. Double Sealed.
924	.7503	..	1.7505	..	.469	.513		Steering Knuckle Bearing. Single Row .609 Assembled Width. Sealed Type
928	.875	..	2.250	..	....	.375		Steering Knuckle Bearing. Single Row. .750 Assembled Width. Overhanging Shield Fastened on O.D.
1100	1.7717	45	4.3307	110	1.0630	1.0630	**1310**	
1101	2.1654	..	4.5276	..	1.0630	1.0630		13—$\frac{23}{32}$ in. Balls, .08 Corners, 16 Per Cent 19 Per Cent Cone Shoulders
1102	1.500	..	3.5433	90	.9055	.9055	**1308**	
1105	1.5748	40	3.1496	80	.8268	.8268	**1208**	.06 Corner Radius
1106	1.3780	35	2.8346	72	.7480	.7480	**1207**	
1107	2.000	..	4.7244	120	1.1417	1.1417	**1311**	
1109	1.5748	40	3.9370	100	.9843	.9843	**1309**	.08 Corner Radius
1217-75	2.9528	75	5.9055	150	1.1024	1.1024	**1217**	
1219-85	3.345	85	6.6929	170	1.2598	1.2598	**1219**	
1222-100	3.9370	100	7.8740	200	1.4961	1.4961	**1222**	
***1304A19**	.750	..	2.0472	52	.5906	.5906	**1304**	
N1311A	2.1648	55	4.7244	120	1.1417	1.1417	**1311**	Flanged Cup, $5\frac{3}{32}$ in. O.D., .265 Width of Flange
***OE1317**	3.3465	85	7.0866	180	1.6142	1.6142	**1317**	51.6 Per Cent Cone Curv. .012-.016 End-play Box Type Sep.
3102	.6248 to .6244		1.3780	..	.4331	.4331	**3202**	
3107	.3126	..	.8661	22	.2756	.2756	**38**	
3109	.375	..	1.0236	26	.3150	.3150	**39**	
***3109C**	1.7717	45	3.1496	80	.7087	.7087		.04 Corner Radius
***3111**	.5000	..	1.2598	..	.375	.365		Outer Ring has .250 in. Radius Form on O.D.
3112H	1.1811	..	1.8750	..	.2187	.2187		16 Per Cent Shoulders
3115	2.375	..	3.750	..	.6875	.6875		XLS2$\frac{3}{8}$
SP3200	.3937	10	1.1811	30	.3543	.3543	**3200**	64 Per Cent Race Curvatures .010 to .015 End Play
WC3200	.3937	10	1.1811	30	.480	.5000	**WC8500**	No Seal
3200F	.3937	10	1.1811	30	.3543	.3543	**3200**	Stabilized for High Temperature
3201A13	.5000	..	1.2598	32	.3937	.3937	**3201**	$\frac{1}{2}$ in. Bore
WD3201E	.4724	12	1.2598	32	.3937	.3937	**WD3201**	Special 53 Per Cent Cup Curvatures
SSWD3201AA	.4724	12	1.2598	32	.3937	.3937	**3201**	With WD Type Separator Stabilized for High Temperature Operation
***3202A16**	.6107 to .6104		1.3780	35	.4331	.4331	**3202**	
3202BB	.6253	..	1.3780	35	.4331	.4331	**3202**	
3202C16	.6253	..	1.3748	..	.4331	.4331	**3202**	
3202H	.6250	..	1.3750	..	.4331	.4331	**3202**	U Type Separator Special Bore O.D. and Tolerances
WD3202P	.5906	15	1.378	35	.4331	.4331		Single Row Bearing Four-Piece WD Type Separator 53 Per Cent Outer Race Curvatures Stabilized for Operation at 350 Degree F
***3203AB**	.6693	17	1.5748	40	.4724	.4724	**3203**	With Special Notch on Outer Ring O.D.
3203AC	.628	..	1.5748	40	.720	.472	**Z99503U**	2 Special Designed Seals, Special Tolerances
3203DG	.6693	17	1.5748	40	.4724	.4724	**3203**	18 Per Cent Cup, 22.5 Per Cent Cone Race Shoulders 53 Per Cent Cup and 51.6 Per Cent Cone Race Curvatures
Q3203H	.6693	17	1.5748	40	.4724	.4724	**3203**	Nonmetallic Sep. Assembled with Tubular Brass Rivets
V3203C	.6693	17	1.5748	40	.4724	.4724	**3203**	Iron Silicon Bronze Inner Ring Controlled Separator

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O.D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
3204E	.7874	20	1.8504	47	.5512	.5512	**3204**	35 Degree Corner Radii on Cone Bore
3204AB	.7874	20	1.8504	47	.5512	.5512	**3204**	Stabilized for High Temperature Operation
3204AJ	.7874	20	1.8504	47	.600	.625	**3204**	Special WC8504 with Land Riding Seal
Q3204H	.7874	20	1.8504	47	.5512	.5512	**3204**	Non-Metallic Separators Assembled with Tubular Brass Rivets
***WD3204P**	.7874	20	1.8504	47	.5512	.5512	**WD3204**	Rings and Balls Stabilized for 400 Degree F Operation
WD3205K	.9843	25	2.0472	52	.5906	.5906	**3205**	Four Piece WD Type Separator. Stabilized for Operation at 400 Degrees F
***QB3206**	1.1811	30	2.4409	62	.6299	.6299	**3206**	Tubular Brass Rivets in Non-Metallic Separator
***3206A25**	1.000	..	2.4409	62	2.0625	.6299	**3206**	
Q3206C	1.1811	30	2.4409	62	.6299	.6299	**3206**	51.6 Per Cent Cup Curvatures
3207D	1.3780	35	2.8346	72	.6613 to .6593		**3207**	.6593 Width, to .6613 with Endplay Taken up Under 15 Lbs. Spec. Stamping on Cone
3207E	1.3726 to 1.3721		2.8346	72	.6693	.6693	**3207**	
3207J	1.3780	35	2.8346	72	.6693	.6693	**3207**	Stabilized for High Temperature
3207R	1.3780	35	2.8346	72	.6613	.6613	**3207**	Special Marking
3207AB	1.3780	35	2.8346	72	.6693	.6693	**3207**	Stabilized, Special Inner Ring Curvatures, Outer Ring Control—I.S.B. Separator
V3207K	1.3780	35	2.8346	72	.6693	.6613	**3207**	I.R. Controlled I.S.B. Sep.
Q3209C	1.7717	45	3.3465	85	.7480	.7480	**Q3209**	.125 Wide x .062 Deep Slot in Face of O.R. Instrument Grade Balls
Q3209F	1.7717	45	3.3465	85	.7480	.7480	**3209**	Single Row Radial Bearing with A 35° Slot, .125 Wide x .188 Deep on Outer Ring Face Inner Ring Controlled Separator—Instrument Balls
3210B	1.9380	..	3.5433	90	1.9375	.7874	**3210**	
V3210E	1.9685	..	3.5433	..	.7874	.7874		Split Inner Ring—Stabilized for High Temperature Operation
***3211-62A**	2.4404	62	3.9370	100	.8268	.8268	**3211**	
Q3213D	2.5591	65	4.7244	120	.9055	.9055	**3213**	Cone Controlled Sep. E.P. .0085 to .0113
V3303B	.6693	17	1.8504	47	.5512	.5512	**3303**	With I.S.B. Separator
V3303C	.6693	17	1.8504	47	.5512	.5512	**3303**	Basic V3303 with Special Flush Face Grind Requirement
QJ3303	.6693	17	1.8504	47	.5512	.5512	**3303**	With I.R. Snap, O.R. Controlled N.M. Separator
3305A25	1.000	..	2.500	..	.750	.750	**3305**	Replaces SKF RMS8 or Norma MS10
3305AA	.9843	25	2.4415 to 2.4409		.6693	.6693	**3305**	
3305U	1.0002	..	2.4409	62	.6693	.6693	**3305**	
3307E	1.3780	35	3.1496	80	.8188 to .8168		**3307**	Special Ring & Assembled Width .8188—.8168
3307F	1.3780	35	3.1496	80	.8188	.8188	**3307**	Special Marking
***3309-8**	1.5748	40	3.9370	100	.9843	.9843	**3309**	1.5748 Bore
3311A	2.1654	55	4.7244	120	1.1417	1.1417	**3311**	Special Bore Corner Radii .125
3318A	3.5277	..	7.4803	190	1.6929	1.6929	**3318**	
Q3403A	.6693	17	2.4410	62	.6693	.6693	**3403**	Screw Assembled Sep. Low Shoulders
3404A	.7874	20	2.8346	72	.7480	.7480	**3404**	.015—.040 Cone Bore Corner Breaks
4508C	1.125 Square		....	..	1.6875	1.3125	**3208**	$3\frac{7}{16}$ in. Spherical O.D.
4510A	1.9685	50	3.5433	90	1.2969	.7874	**3210**	
***5116**	1.1811	30	3.0315	77	1.8125	1.6875		
5129	.4724	12	1.2598	32	.625	.625	**5201**	With Full Ball Complement of 11-.235 Balls Per Row

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O. D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
5201B	.4724	12	1.2598	32	.625	.625	**5201**	Stabilized for High Temperature Operation
5204A	.7874	20	1.8504	47	.8125	.8125	**5204**	Groove in Outer Ring O.D.
***5205C25**	1.0005	..	2.0472	52	2.0625	.708		Has 25 Degree Contact Angle
5206B	1.1811	30	2.431	..	.9375	.9375	**5206**	
***E5211**	1.9685	50	3.9370	100	1.3125	1.3125	**5211**	.040 in. I.R. Corner Radius
***N5216E**	3.1496	80	5.5118	140	1.750	1.750	**5216**	Flange Contact Angle Flange Side 32°, Loading Groove Side 12°. Flange W. .2512, O.D. 5.7677
N5220E	3.9370	100	7.0866	180	2.3750	2.3750	**5220**	.0005 to Plus .0003 Endplay with Flange. Contact Angles are 32 Degrees & 12 Degrees on Flange & L.G. Sides Respectively
5222WA	4.3307	110	7.8740	200	2.7500	2.7500	**5222**	External Diverging Contact Angle Special Material
5308-7	1.3780	35	3.5433	90	1.4375	1.4375	**5308**	
***5310-45W**	1.7717	45	4.3307	110	1.7500	1.7500	**5310W**	
H5310A	1.9685	50	4.3307	110	1.8750	1.7500	**5310**	Cone Projects ⅛ in. on Non-Loading Groove Side
***E5312W**	1.9685	50	5.1181	130	2.1250	2.1250	**5312W**	
***H5609**	1.7717	45	3.9370	100	1.6875	1.6875	**5609**	
***H5610**	1.9685	50	4.3307	110	1.8750	1.8750	**5610**	
***E5612**	1.9685	50	5.1181	130	2.1250	2.1250	**5612**	
***7034C**	.1575	4	.6299	16	.1969	.1969	**7034**	With 60 Per Cent O.R., 56 Per Cent I.R. Curvatures
SS7034M	.1875	..	.6299	16	.1969	.1969	**7034**	With .1875/.1873 Bore. Stainless Steel Throughout
7034U	.1575	4	.6299	16	.1969	.1969	**7034**	7R4 Internal Dimensions
***WC7036G**	.2362	6	.7480	19	.406	.406	**WC87036**	With Seal Omitted
7036P	.2362	6	.7480	19	.2362	.2362	**7036**	7036 With Open Curvatures
***7036K6**	.2500	..	.7480	19	.2362	.2362	**7036**	¼ in. Bore .02 Corner Radii
7037D	.2756	7	.8661	22	.2756	.2756	**7037**	U Type Separator. Ring Width Plus .000 to Minus .002. Designed for Roller Skates
***7038A8**	.3117	..	.8661	22	.2756	.2756	**7038**	
Q7038M	.3150	8	.8661	22	.3150	.3150	**Q7038**	
WC7038A	.3150	8	.8661	22	.406	.406	**WC87038**	Without Seal
***7106**	.7087	18	1.5748	40	.4724	.4724	**7503**	
7107B	.1971	..	.5779	..	.2362	.2362		Special Cup & Cone Curvatures
7108	.5118	13	1.2598	32	.3937	.3937	**7501**	13 MM Bore
7109	.5906	15	1.3780	35	.354	.354	**7502**	U Type Sep. .0025—.0050 Endplay
7109B	.5906	15	1.3780	35	.354	.354	**7109**	Width Tolerance Plus .00—.006, Bore Tolerance Plus .0000—.0006 Unground Ball Races
7109AD	.5906	15	2.0472	52	.354	.440	**7109**	Staked in Adapter Ring
7109A16	.6255	..	1.3780	35	.354	.354	**7502**	Not Lapped .003 to .0045 Endplay
7110	.5000	..	1.2598	32	.3937	.3937	**7501**	
7111	.2500	..	.7480	19	.2362	.2362	**7036**	¼ in. Bore Plus .0001 to —.0001
7119	.4063	..	1.0236	26	.3150	.3150	**7039**	
***7120**	.6248	..	1.3780	35	.4331	.4331	**7502**	.6248 to .6244 Bore
7310A	1.9685	50	4.3307	110	1.0630	1.0630	**7310**	Shield on Loading Groove Side
7310B51	2.0040	..	4.3307	110	1.0630	1.0630	**7310**	2.0040 I.R. Bore
***7317A**	3.3465	85	7.0866	180	1.6142	1.6142	**7317**	With .190 Corner Radius on Open Side of I.R. Bore
***7405A**	.9843	25	3.1496	80	.8268	.8268	**7405**	.025 Cone Radius on Shield Side
7500C	.3937	10	1.1811	30	.3543	.3543	**47500**	Special Tolerances, Unlapped Ball Races
7501C	.4724	12	1.2598	32	.3937	.3937	**7501**	9/32 in. Slot Across Cup Face
7502-16	.6299	16	1.3780	35	.4331	.4331	**7502**	16 MM Bore
***7502A**	.5906	15	1.3780	35	.4331	.4331	**7502**	Special Cone and Cup Shoulders
7502RU	.5906	15	1.3780	35	.4331	.4331	**7502**	Special Shield Stamping. Use 7502
7502B16	.6299	16	1.4961	38	.4331	.4331	**7502**	16 MM Bore, 38 MM O.D.
***7504F**	.7874	20	1.8504	47	.5512	.5512	**7504**	With 53 Per Cent I.R. Ball Race Curvature

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

Not Same as 120 Line—Different

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore Decimal	Bore M/M	O.D. Decimal	O.D. M/M	Width Inner Ring	Width Outer Ring	Basic Size	Description
7504U	.7874	20	1.8504	47	.5512	.4262	**7504**	Outer Ring Width of .4262
7504C22	.8553	..	1.8504	47	.5512	.5512	**7504**	.8553 Bore
7505A32	1.2500	..	2.000	..	.375	.375		.003 to .005 Endplay Under 5½ Lbs.
7508RU	1.5748	40	3.1496	80	.7087	.7087	**7508**	Special Shield Stamping. Use 7508
***7510RU**	1.9685	50	3.5433	90	.7874	.7874	**7510**	Special Shield Stamping. Use 7510
***7512RU**	2.3622	60	4.3307	110	.8661	.8661	**7512**	Special Shield Stamping. Use 7512
8006A	.2362	6	.7480	19	.338	.301	**8006**	9 MM Width Replace Norma GS-96
***8007K**	.2756	7	.9449	24	.386	.315	**8007**	With Anti Rotating Key
R8008B10	.3752	..	.8749	..	.386	.315		Overall Width .406, 56 Per Cent Cup and 54 Per Cent Cone Curvature
WC8008C	.3150	8	.9449	24	.386	.406	**WC8008**	No Seal-Brass Sep.
***WC8008A6**	.250	..	.9449	24	.386	.406	**WC8008**	I.R. Bore .250
RWC8013B	.5118	13	1.2598	32	.480	.500	**RWC8013**	Felt Slinger—Relube Type
R8037R	.2756	7	.8661	22	.588	.406	**37**	Nylon Separator
***8038B**	.3150	8	.8661	22	.386	.315	**8038**	Overall Width .406
8038E	.3150	8	.8661	22	.386	.315	**8038**	Without Seal. Overall Width .406
WC8038E	.3150	8	.8661	22	.386	.406	**WC8038**	Without Seal
R8038R	.3150	8	.8661	22	.588	.406	**38**	Nylon Separator
***8104**	.6299	16	1.3780	35	.480	.500	**WC8016**	With Special Large O.R. O.D. Corner Radii
8115	.6245	..	1.3780	35	.480	.4331	**8502**	Overall Width .500
8118	.3150	8	.9449	24	.386	.315	**8008**	Slinger Seal Non-Metallic Sep. Overall Width .406
***8500A**	.3937	10	1.1417	29	.500	.3543	**8500**	I.R. & O.R. Flush on Non Sealed Side
***8500K**	.3937	10	1.1811	30	.480	.3543	**8500**	Overall Width .500 With Anti-Rotating Key
***E8502**	.6875	..	1.3754	..	.4331	.4331		
***8502D16**	.6107	..	1.3780	35	.480	.4331	**8502**	Overall Width .500
***RWC8503H**	.6693	17	1.5748	40	.538	.563	**WC8503**	Special Race Curvature
8504A19	.7500	..	1.8504	47	.600	.5512	**8504**	Overall Width .625
WC8504B	.7874	20	2.0472	52	.600	.610	**WC8504**	Cone Underhangs Cup .025 on Open Side. Bearing Width .625
C8505R	.9843	25	2.0472	52	.600	.5906	**C8505**	Stabilized for High Temperature
8507D	1.4375	..	2.8346	72	.7874	.6693	**8507**	
***D8507**	1.3780	35	2.8346	72	.7874	.6693	**8507**	Wheel Type Seal
***C8507A33**	1.3130	..	2.8346	72	1.0625	.6693		Crow Seal—Slotted Inner Ring
C8507B33	1.3130	..	2.8346	72	1.0625	.6693	**8507**	Flush on Open Side
WC8512A	2.3622	60	4.3307	110	1.1417	1.1417	**WC8512**	Single Felt Seal, Inner Ring Chrome Plated, with O.D. Chamfer Blended on Seal Side. O.R. has C Bore for Seal
WC8512AB	2.3622	60	4.3307	110	1.1417	1.1417	**WC8512A**	.7283 Ball Race Location
8605K	.9843	26	2.4409	62	.8268	.6693	**8605**	Special Marking. Use 8605
***9026**	1.0236	26	2.0472	52	.5906	.5906	**9505**	
9501U	.4724	12	1.2598	32	.3937	.3937	**9501**	U Type Separator, Removable Plastic Seal
Z9504B	.7505	..	1.7805	..	.610	.610		
9507ACDF	1.3780	35	2.8346	72	.6693	.6693	**9507**	Single Row Radial Bearing Duplex Pair Mounted "DF" Single 9000 Type Seal
NM16320	.3125	..	.5000	..	.1875	.1250	**M1632**	Shielded Width I.R., Unshielded O.R. Instrument Grade
Q20202C	.5906	15	1.3780	35	.4331	.4331	**20202**	8 Ball Sep.
20202E	.5906	15	1.3780	35	.354	.354	**20202**	With 3202 Ribbon Type Sep. with 9-.210 in. Balls. .354 in. Bearing Width. Offset Ball Race with 15 Degree Contact Angle. Snap on Race Breakout on I.R. O.R. Recessed on Side Opposite I.R. Race Breakout
Q20203C	.6693	..	1.5748	..	.4724	.4724		"D" Type Bore and O.D. Corners. Special Race Finish and Box Marking
20204C	.7874	20	1.8504	47	.5512	.5512	**20204**	Special Width of Pair 1.1024-1.0984

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

43108-C-38 = 43108 W/1.4860 Bore

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O. D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
V20212ADT	2.3622	60	4.3307	110	.8661	.8661	**20212**	Stabilized for High Temperature
Q20213ADT	2.5591	65	4.7244	120	.9055	.9055	**20213**	Special Marking. Special Tolerances Non-Metallic Sep.
***20215A**	2.9628	..	5.1181	130	.9843	.9843	**20215**	25 Degree Contact Angle
***E20216**	3.1496	80	5.5118	140	1.5354	1.0236	**20216**	Inner Ring, Extending 3.5 MM on Thrust Side of Cone, with Key Slot, and 9.5 MM on Other Side
***20219A**	3.7502	..	6.6929	170	1.2598	1.2598	**20219**	25 Degree Contact Angle
***H-20222A**	4.3307	110	7.8740	200	1.4961	1.4961	**20222**	25 Degree Contact Angle, Key Notch in Inner Ring
VH20304B	.7874	20	2.0472	52	.5906	.5906	**20304**	Stabilized for Operation at High Temp. Iron Silicon Bronze Separator
***E20305**	.9843	25	2.4409	62	.6693	.6693	**20305**	Special Limits, O.R. Controlled Sep.
***F20306**	1.1811	30	2.8346	72	.7480	.7480	**20306**	Special Limits, O.R. Controlled Sep.
***F20315**	2.9528	75	6.2992	160	1.4567	1.4567	**20315**	No Angle of Contact, S.R. Endplay
30204A	.7874	20	1.8504	47	.5512	.5512	**30204**	Special Outer Ring O.D. Corners and Outer and Inner Ring Face Flushness Required on Non-Thrust Side
30205A	.9843	25	2.0472	52	.5906	.5906	**30205**	Special Corner Radii & Special Stamping
***E30207**	1.3780	35	2.8345	72	.6693	.6693	**30207**	Full Type 15—$\frac{7}{16}$ in. Balls
E30209A	1.7717	45	3.3465	85	.763	.757	**E30209**	Balls Retained by Snap Ring
E30210A	1.9685	50	3.5433	90	.802	.796	**E30210**	Balls Retained by Snap Ring
***E30213**	2.5591	65	4.7244	120	.9055	.9055	**30213**	Full Type With 16—$\frac{11}{16}$ in. Balls
E30213A	2.5591	65	4.7244	120	.9055	.9055	**E30213**	Balls Retained by Snap Ring
***41100**	1.7717	45	4.3307	110	1.0630	1.0630	**1100**	With Snap Ring
42108	.9843	25	2.0472	52	.5886	.664	**43205**	20 Per Cent Cone, 16 Per Cent Cup Shoulders, 51.6 Per Cent Curvatures, .664 Inches Width Overhung on Snap Ring Side
42305	.9843	25	2.4409	62	.6693	.6693	**77605**	1/16 in. Hole in Cone
42306	1.1811	30	2.9528	75	.7480	.7480	**77606**	75 MM Crowned O.D.
43203DG	.6693	17	1.5748	40	.4724	.4724	**43203**	Deep Groove
43207C	1.3780	35	2.8346	72	.6693	.6693	**43207**	Special Snap Ring 3 1/64 in.
43210D	1.9685	50	3.5433	90	.7874	.7874	**43210**	Sides of Snap Ring Groove Ground, Endplay Snap Ring in Groove .004 Max.
Q43221	4.1339	105	7.4803	190	1.4173	1.4173	**43221**	Non-Metallic Inner Ring Controlled Separator
43304A	.7874	20	2.0472	52	.5906	.5906	**43304**	Elliptical Cone Race
43305C	.9843	25	2.4409	62	.6693	.6693	**43305**	Special Snap Ring Shipped in Box with Bearing
43308H	1.5748	40	3.5433	90	.9055	.9055	**3308**	With Special Bore Corner
***43309A41**	1.625	..	3.9370	100	.9843	.9843	**43309**	.0065-.009 Endplay
45214WA	2.7559	70	4.9213	125	1.5625	1.5625	**45214**	15 Degree Contact on One Row, 35 Degree Contact on the Other
45214WB	2.7559	70	4.9213	125	1.5625	1.5625	**45214W**	With 35° and 15° Contact Angles with One Steel and One Bronze Separator
***47106**	1.5748	40	2.8346	72	.6299	.6299		40 x 72 x 16 MM Nonloading Groove, Grooved for Special Snap Ring
***47106C**	1.5748	40	2.8346	72	.6299	.6299	**47106**	Special Snap Ring 3.023 Dia. .065 Width .125 Distance Snap Ring to Face
47109BV	.5906	15	1.3780	35	.354	.354	**7109B**	With Snap Ring on Shield Side. Replaces Size 47109V
47508-7	1.3780	35	3.1496	80	.7087	.7087	**47508**	
47508C38	1.4860	..	3.1496	80	.7087	.7087	**47508**	
47509A45	1.7717	45	3.3465	85	.678	.7480	**47509**	Cone .678 Wide, Special Snap Ring 3$\frac{7}{16}$ in.
***47510-2**	1.9685	50	3.5433	90	.7874	.7874	**47510**	Special Snap Ring 3-47/64 in. Dia., .105 in. Wide, and .125 in. Distance Snap Ring to Brg. Face
47510B	1.9685	50	3.5433	90	.7874	.7874	**47510**	Special Snap Ring
***48505B25**	.9964	..	2.0150	..	.600	.5906	**48505**	
49502H	.6250	..	1.3750	..	.4331	.4331	**9502**	Molded Nylon Seals. Snap Ring Groove—7109 U Type Sep.

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O.D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
49502J	.5625	..	1.3750	..	.4331	.4331	**9502**	Molded Nylon Seal—Snap Ring Groove —7109 U Type Sep.
55508B	1.5748	..	4.062	..	1.1875	1.750	**55508**	Max O.D. 4.062 with Special Contour
***55606F**	1.1811	30	2.8346	72	1.1875	1.1875	**55606**	Full Type—No Sep.
***55608F**	1.5748	40	3.5433	90	1.4375	1.4375	**55608**	Full Type—No Sep.
***55610F**	1.968	50	4.3307	110	1.750	1.750	**55610**	Full Type—No Sep.
77034J	.1575	4	.6299	16	.1969	.1969	**77034**	57.3 Per Cent Race Curvature
***77034K**	.1575	4	.6299	16	.1969	.1969	**77034**	With .015, .005 Bore Corner Breakouts
RS77034-5	.1969	5	.6299	16	.1969	.1969	**34**	RJD Shields and L Type Separator
***77035A**	.1969	5	.7480	16	.2362	.2362	**77035**	Full Type 10-9/64 Balls Max. Snap
77036P	.2362	6	.7480	16	.2362	.2362	**77036**	With 57 Per Cent Race Curvatures
***RWC77036G**	.2362	6	.7480	19	.406	.406	**WC87036**	Seal Replaced by Special A Piece 56 Per Cent Cup and 54 Cone Race Curvatures
77037G	.2756	7	.8661	22	.2756	.2756	**77037**	Special Inner and Outer Ring Curvatures of 57.3 Per Cent
77038J	.3150	8	.8661	22	.2756	.2756	**77038**	57.3 Per Cent Race Curvature
77038Q	.3127	..	.8661	22	.2756	.2756	**7038**	
77038AA	.3150	8	.8661	22	.2756	.2756	**38**	Stabilized for High Temperature
***G77038A**	.3150	8	.8661	22	.3150	.3150		30 Degree Double Contact B. Race. 18 Per Cent Shoulders I.R. has 30 Degree Double Contact B Race and 22½ Per Cent Shoulders Brg. has U Type Sep. with 7-5/32 in Balls. Std. 7038 Shields
Q77038M	.3150	8	.8661	22	.3150	.3150	**Q77038**	Special 8 MM Width to Allow Shielding with Non-Metallic Sep.
***77039A**	.3543	9	1.0236	26	.3150	.3150	**77039**	Full Type 11-3/16 in. Balls Max. Snap
***G77039A**	.375	..	1.0236	26	.3543	.3543	**77039**	2 Point Contact Race Curvature
SS77039D	.3543	9	1.0236	26	.3150	.3150	**77039**	SS77039 Stabilized for High Temperature Operation
***77039-10**	.3937	10	1.0236	26	.3150	.3150	**77039**	10 MM Bore
77107	.1575	4	.6299	16	.2362	.2362	**77034**	Two Point Contact Cone Curvature. Cup and Shields Stainless Steel
77108	.5118	13	1.2598	32	.3937	.3937	**77501**	13 MM Bore
77110	.5000	..	1.2598	32	.3937	.3937	**77501**	With .5000 Bore
77111	.2500	..	.7480	19	.2362	.2362	**77036**	¼ in. Bore
***77115A**	.5000	..	1.9375	..	.500	.433	**77502**	Grooved Pulley 3/16 in. Radius in O.D.
***77121**	.3125	..	1.375	..	.500	.433		½ in. Wide Sash Pulley with Grooved O.R. .433 in. Wide. Bore Corners Grooved
***77123**	.6693	17	1.8504	47	.5512	.5512	**77504**	.6693 Bore
77500E	.3937	10	1.2380	..	.3543	.3323	**77500**	With Special Crowned O.D.
SS77500J	.3937	10	1.1811	30	.3543	.3543	**3200**	SS77500 Stabilized for High Temperature Operation
77501H	.4724	12	1.2598	32	.3937	.3937	**77501**	Stabilized for High Temperature Operation
77502Q	.5906	15	1.625	..	.4331	.4331	**77502**	Crowned O.D.
77502RU	.5906	15	1.3780	35	.4331	.4331	**77502**	Special Shield Stamping. Use 77502
***77502SO**	.5906	15	1.3780	35	.4331	.4331	**77502**	With Spherical O.D.
77502-16	.6299	16	1.3780	35	.4331	.4331	**77502**	16 MM Bore
77503F	.6702	..	1.5742	..	.4724	.4724	**3203**	With .6702 Bore, 1.5742 O.D.
77503A17	.6884 to .6880		1.5748	40	.4724	.4724	**77503**	.6884 x .6880 Bore Y Grade
77504AD	.7498	..	1.8504	47	.5512	.5512	**77504**	With .7498 Bore (SKF 465996-2Z)
***77505B25**	.9964	..	2.0000	..	.5906	.5906	**77505**	With .9964 Bore and 2.000 in O.D.
77505C25	.9964	..	2.0150	..	.5906	.5906	**77505**	.9964 Bore and 2.0150 O.D.
77506F	1.1811	30	2.4409	62	.6299	.6299	**77506**	Special Shield Stamping. Use 77506

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O.D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
*77507A38	1.5000	..	2.8346	72	.6693	.6693	77507	With 1.5000 in. Bore
77512D	2.3622	60	4.3307	110	.8661	.8661	77512	Stabilized for High Temperature
*77512RU	2.3622	60	4.3307	110	.8661	.8661	77512	Special Shield Stamping. Use 77512
77515A	2.9528	75	5.1181	130	.9843	.9843	77515	Stabilized for High Temperature
77517B	3.3465	85	5.9055	150	1.1024	1.1024	77517	Stabilized for High Temperature
77605H	.9843	25	2.4409	62	.6693	.6693	77605	Stabilized for High Temperature
*77606A16	.6263	..	2.8346	72	1.1875	1.000		O.R. & I.R. Flush on One Side. I.R. Bore has Large Ctr. Sunk Chamfer
77608F	1.5748	40	3.5433	90	.9055	.9055	77608	Stabilized for High Temperature
77611B	2.1654	55	4.7244	120	1.1417	1.1417	77611	Stabilized for High Temperature
77614A	2.7559	70	5.9055	150	1.3780	1.3780	77614	Stabilized for High Temperature
*84208	1.5748	40	3.1496	80	1.1875	.8268		
*84213	2.5591	65	4.7244	120	1.500	1.0236	4213	
WC87008B	.3150	8	.9449	24	.406	.406	WC87008	I.R. Extended on Shielded Side so I.R. and O.R. are Flush. I.R. not Notched on Seal Side. Seal B PC. Altered
WC87037-6	.2360	6	.8661	22	.406	.406	WC87037	6 MM Bore
*C87039C10	.4063	..	1.0236	26	.445	.3543	C87039	.4063 Bore
87115	.6245	..	1.3780	35	.500	.4331	87502	.6245 Bore
WC87115	.6245	..	1.3780	35	.500	.500	WC87502	.6245 Bore
*87306	1.1811	30	2.8346	72	.9055	.7480		N.D. Seal Shield Brg. Loading Groove Type
87504A16	.629	..	1.8504	47	1.125	.5512	87504	Special Seal and Close Curvatures
*87504A19	.750	..	1.8504	47	.600	.5512	87504	¾ in. Bore
87504G2	.7874	20	1.8504	47	.600	.5512	87504	Two Garlock Seals
*C87504A21	.8125	..	1.8504	47	.600	.5512	C87504	13/16 in. Bore
C87504AK	.7874	20	1.8504	47	.625	.5512	C87504	Stabilized for High Temperature Operation
WC87504G2	.7874	20	1.8504	47	.600	.6250	WC87504	2 Garlock Seals
87505B25	.9964	..	2.0150	..	.600	.5906	87505	.9964 Bore and 2.0150 O.D.
*87507C	1.3780	35	2.8376	..	.7874	.6693	87507	With 2.8376 in. O.D.
*88008B-5	.1875	..	.9449	24	.4970	.3150	88008	With .1875 in. Bore
C88016B	.6299	16	1.3780	35	.5669	.4331	C88016	Stabilized for High Temperature
*88036A6	.2500	..	.7480	19	.497	.315	8036	With .250 Bore
QR88037H	.2756	7	.8661	22	.588	.406	88037	Wide Inner and Outer Rings Non-Metallic Separator
*CWC88038A8	.3128	..	.8661	22	.497	.406	88038	With .3128 Bore
QR88038H	.3150	8	.8661	22	.588	.406	88038	Wide Inner & Outer Rings Non-Metallic Separator
88100	.6263	..	1.3780	35	.8125	.4331	88502	With .8125 I.R. Width I.R. Extends Both Sides of O.R., .6263 Bore, Notch Diametrically Thru I.R. Face on Longer Side
88106	.817	..	2.0472	52	1.625	.5906	88505	88505 O.R. with 51 Per Cent BR Curv. with ⅜ in. Tapped Hole in I.R. Extension .817 in. Bore
88107C	1.3780	35	2.8346	72	.9843	.6693	88107A	Single Row Bearing with Special Land Riding Seals
88121	1.3765	..	2.8346	72	.9843	.6693	88507	With 1.3765 in. Bore
88123	1.000	..	2.0472	52	.6594	.5906	88505	With 1.000 in. Bore
*88124	1.750	..	3.5433	90	1.1811	.8661	88510	1¾ in. Bore
*88125	.5000	..	1.2598	32	.6063	.3937	88013	With .5000 in. Bore
88500K	.3937	10	1.1811	30	.6457	.3543	88500	Anti Rotating Key on Seal
CWC88500A	.3937	10	1.1811	30	.6457	.6457	CWC88500	With .6457 O.R. Width O.R. & I.R. Flush on Both Sides
C88501AB	.4724	12	1.2598	32	.6063	.3937	C88501	Stabilized for High Temperature Operation
88501A11	.4379	..	1.2598	22	.6063	.3937	88011	.4379 Bore
*C88502A16SR	.6250	..	....	..	.5669	.4331	C88502	With .6250 Bore. Spherical O.D. Fitted with Self Aligning Outer Ring Having 1.5748 O.D.
WC88502B	.5906	15	1.3780	35	.625	.625	WC88502	⅝ in. Width—Replaces Norma XB-72

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O. D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
*WC88502K	.5906	15	1.3780	35	.5669	.500	WC88502	Seal B PC. on the Flush Side Made with a Key Passing Thru a PC. into Slot in O.R. Face
88503C	.6693	17	1.5748	40	.6536	.4724	88503	U Type Sep.—Unlapped Raceways
88506A30	1.1875	..	2.4409	62	.9449	.6299	88506	Special Bore 1.1875
XD88506A	1.1811	30	2.4409	62	.9449	.6299	88506	Propeller Shaft Fit Up Type Seal. 50.6 Per Cent O.R. and I.R. Ball Race Curvature
XD88506C29	1.125	..	2.4409	62	.9449	.6299	XD88506	1.125 Bore
*YXD88506B	1.1811	30	2.4409	62	.9449	.6299	88506	Tin Plated Brass Sep. Prop. Shaft Seal
XD88509D	1.7717	45	3.3465	85	1.0630	.8268	XD88509	Special Marking
*88510-8	1.5748	40	3.5433	90	1.1811	.8661	88510	With 40 MM Bore
*88512-55	2.1654	55	4.3307	110	1.2992	.9843	88512	55 MM Bore
Z97502-16	.6299	16	1.3780	35	.4331	.4331	3202	Z97502 Bearing with 16MM Bore
Z97503J	.6693	17	1.5748	40	.4724	.4724	3203	Special Internal Curvatures
Z97503P	.6693	17	1.5748	40	.4724	.4724	3203	Special Bore Corners
97505C25	.9964	..	2.0150	..	.5906	.5906	97505	Shield and Seal, 9000 Type
ZWC99009A	.3543	9	1.1811	30	.6457	.500	WC88009	Two Z Seals with Flat Inserts
*S99034	.1575	4	.6299	16	.1969	.1969	99034	With Felt Nylon Seals. Close Wound Stainless Steel Spring Type Sep. with 5⅛ in. Balls
99500E	.4365	..	1.1811	30	.3543	.3543	99500	Special Bore .4365
SSZ99500QZH	.3937	10	1.1811	30	.3543	.3543	3200	Basic 3200 Stabilized with Double Sentri Seal Stainless Steel Throughout
99502H	.6250	..	1.3750	..	.4331	.4331	99502	Width 7109 U Type Separator—Zytel Seals—Special Tolerances
99502J	.5625	..	1.3780	..	.4331	.4331	99502	7109 U Type Separator, Special Tolerances —Zytel Seals
99502AF	.5906	15	1.3780	35	.4331	.4331	3202	Zytel Seals, U Type Separator
99502-16	.6299	16	1.3780	35	.4331	.4331	99502	With 16MM .6299 Bore
*99502F16	.6250	..	1.3780	35	.4331	.4331	99502	.6250 Bore
Z99502R	.5906	15	1.3780	35	.5669	.4331	88502	With Hycar PA21 Z Seals
Z99502-16	.6299	16	1.3780	35	.4331	.4331	3202	Z99502 with 16MM Bore
Z99502AC	.6250	..	1.3780	35	.4331	.4331	3202	With .6250 Bore, Z Seals, U Type Separators Special Tolerances
Z99503B	.6693	17	1.5748	40	.6875	.6875	Z99503	Single Row Double Seal Brg. with Double Row Width. Hycar PA21 Z Seals
Z99503J	.6693	17	1.5748	40	.4724	.4724	Z99503	Deep Grooves and 51 Per Cent/50.6 Per Cent Curvature. 2-Z Type Seals-Hycar
Z99503U	.628	..	1.5748	40	.505	.505	Z99503	U Type Separator, 18 Per Cent Shoulders
Z99504AB	.7874	20	1.8504	47	.5512	.5512	3204	Stabilized for High Temp. Operation Hycar Seals
Z99504R	.7874	20	1.8504	47	.6988	.5512	88504	With Hycar PA21 Z Seals
99505Q	.9843	25	2.0472	52	.5906	.5906	99505	With Stabilized Rings for Minus 94 Degrees F to Plus 265 Degrees F Operation
99505C25	.9964	..	2.0150	..	.5906	.5906	99505	Double Sealed, 9000 Type, .9964 Bore x 2.0150 O.D. x .5906 Wide
Z99505R	.9843	25	2.0472	52	.5906	.5906	Z99505	Stabilized for High Temperature, Hycar Seals
99506A	1.1811	30	2.4409	62	.6299	.6299	99506	With Stabilized Rings for Minus 94 Degrees F to Plus 265 Degrees F Operation
Z99506J	1.1811	30	2.4409	62	.6299	.6299	Z99506	Stabilized for High Temperature
Z99506P	1.1811	30	2.4409	62	.6299	.6299	3206	Z99506 with Special Seal
Z99507H	1.3780	35	3.1720	..	.6693	.454	Z99507	Low Carbon O.R. with Special Humped Contour for Chain Idler Sprocket
99605F	.9843	25	2.4409	62	.6693	.6693	99605	Stabilized for Operation Between Minus 70 Degrees & 130 Degrees C. Standard 99605 Seals
Z99605J	.9843	25	3.000	..	.6693	1.000	99605	Thick Section O.R. with Special Corner Radii

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

SPECIAL COMMERCIAL BEARINGS—Continued

Basic Bearing Number	Bore		O.D.		Width		Basic Size	Description
	Decimal	M/M	Decimal	M/M	Inner Ring	Outer Ring		
Z99607B	1.3780	35	4.000	..	.8268	1.1875	**Z99607**	Special Outer Ring Width and O.D.
99608E	1.5748	40	4.055	..	.906	.570	**99608**	3.530 O.D. with Humped Section on O.R. to 4.055 O.D. and .570 Width
Z99805	.9843	25	2.0472	52	.8125	.8125	**Z99505**	With Double Row Width. Cartridge Brg.
Z99805A	.9843	25	2.0472	52	.8125	.8125	**3205**	Cartridge Bearing Z99805 Stabilized for High Temperature Operation
420209	1.7717	45	3.3465	85	.7480	.7480	**20209**	Snap Ring
H420209B	1.7717	45	3.3465	85	.9843	.7480	**20209**	Snap Ring & Wide Cone 25 Degrees Contact Angle
H420310B	1.9685	50	4.3307	110	1.2205	1.0630	**H420310**	Wide Cone 1.2205 in.
***473107**	.3126	..	.8661	22	.2756	.2756	**47038**	With .3126 Bore
487505B25	.9964	..	2.015	..	.600	.5906	**87505B25**	.9964 Bore x 2.015 O.D. .625 Width & Snap Rings
QF720304	.7874	20	2.0472	52	.5906	.5906	**20304**	Shield and Non-Metallic Sep. Single Row Endplay
900502	....	..	2.3722	..	....	....	**954921**	Special D.R. Brg., Non-Loading Groove Type, Compressor Wobble Plate, 2.3722 O.D.
900537	.753	..	2.0472	52	1.053	.700	**3204**	One Buna N Seal on Extended I.R. Side
900539	.753	..	2.0472	52	.700	.700	**3204**	Slinger and Seal
900541	6.0940	..	7.1257	..	.505	.432		
900545	1.875	..	3.487	..	....	....	**CT34A**	Machined Low Carbon I.R., Integral with Sleeve
954995	.4431	..	1.6985	..	1.397	1.126		Triple-Tooth Roller Tooth Bearing, 25 Degree Contact Angle
Z995202A	.5906	15	1.3780	35	.7188	.7188	**5202**	With .7188 Width & Double Removable Sentri-Seals
Z995202B	.6470	..	1.3780	35	.7188	.7188	**Z995202A**	
Z995202F	.6250	..	1.3750	..	1.0937	1.0937	**Z995202**	
Z995204	.7874	20	1.8504	47	.9375	.9375		
Z995204B	.6470	..	1.8504	47	.9375	.9375		
Z995205	.9843	25	2.0472	52	.9375	.9375	**5205**	With Double Sentri Seals
***1166748**	....	..	....	..	....	....		One-way Sprag Clutch-Double Cage Type .330 Sprag—.675 Long
***1171059**	....	..	....	..	....	....		One-way Sprag Clutch-Double Cage Type .330 Sprag .425 Long
***1179222**	....	..	....	..	....	....		Sprag Clutch, Double Cage Type
1182990	....	..	....	..	....	....		One Way Sprag Clutch Double Cage Type .330 Sprag .540 Long
5663818	....	..	....	..	....	....		Flat Thrust Bearing
5666683	....	..	....	..	..	....		O.R.—Ball Nut Type Steering Gear Worm
5666693	....	..	....	..	....	....		Ball & Sep. Assembly—Ball Nut Type Steering Gear Worm
5681978	....	..	....	..	....	....		One Piece Curled Type Separator—D.B. Contact Angle
5683402	....	..	....	..	....	....		Triple Ring Thrust Bearing Unit Assembly Type

*Availability limited to manufactured stock.

CONSULT SUPPLIER FOR AVAILABILITY.

PREFIXES AND SUFFIXES

Unless otherwise indicated, Prefixes and Suffixes are part of the bearing number.

Prefix	Suffix	INDICATES
	A	Immediately following basic bearing number—specialty letter. (Indicates some deviation from standard).
AB		Adapter bearing with wide inner ring, set screw locking type.
AE		Adapter bearing with wide inner ring, eccentric locking collar type.
AG		Agricultural Bearing with two piece flanged outer ring.
AP		Aircraft pulley bearing.
AS		Agricultural seal (usually multiple lip type).
	B	Specialty letter.
C		Steel Slinger-type Seal.
	C	Specialty letter.
CB		Conveyor Roll Bearing.
CF		Cam follower bearing.
CS		Close wound coil spring stainless steel separator.
CT		Clutch Throwout Bearing.
CWC		Steel Slinger Seal, Wide Outer Ring.
D		Rear-Wheel-type seal. (Steel slinger and felt seal.)
	D	Specialty letter.
	DB	Duplex Bearing—Back to Back Mounting } Follows basic number and its prefixes &/or suffixes: Example: QN0207A DB L5 A
	DF	Duplex Bearing—Face to Face Mounting }
	DT	Duplex Bearing—Tandem Mounting }
	E	Specialty letter.
F		With Flush Type Angular Contact Bearing, single row end play. Inch Type, without separator.
FL		Pressed metal flange, used in pairs on a spherical O.D. bearing.
FT		Flat thrust bearings.
	F	Specialty letter.
H		With 0LL00, 0L00 and 20000 Series Angular Contact Bearing—25° Contact Angle.
	H	Specialty letter.
	J	Specialty letter.
	K	Specialty letter.
	L	"Loose" Endplay (except Duplex Bearings)—follows basic bearing number and its suffixes: e.g. 5305 L1A, 5306 L.
	L	Duplex Bearings—Standard Fit-up (light pre-load)—follows "DB," "DF" or "DT": e.g. H20305DT L1A.
LC		Type AE Adapter Bearing Less Collar. Warehouse carries with collar.
	LR	Loose Radial Play.
M		With inch dimension bearings—Miniature stainless steel instrument bearings.
	MR	Minimum radial play.
N		Flanged Outer Race.
	N	With Single Row—Extra Loose End-Play (formerly "EL").
	NR	Radial play—Looser than LR.
ND		Magneto Series (separable).
NF		See individual descriptions of "N" and "F" prefixes.
PAE		Cast iron pillow blocks.
PF		Agricultural idler unit for flat belts.
PV		Agricultural idler unit for V belt.
	P	Specialty letter.
Q		Non-metallic Separator.
R		With Sealed Bearings—Relubrication Feature. Inch type with separator.
	R	Specialty letter. (When not preceded by X, L, M or N.)
RS		Removable Shields.
RW		Rear Wheel.
S		Open Wound Coil Spring Separator of Stainless Steel.
	S	Special Internal fit-up or preload.
SR		Stainless steel separator. If used in a bearing having shields or seals, the sheet metal closures are stainless steel.
SS		Stainless Steel.
T		Combined with another letter (TC, TM, TP, etc.) significes various textile bearing types.
	T	Tight internal fit-up (except Duplex Bearings)—follows basis bearing number and its Suffixes: e.g. 5306T.
	T	Duplex Bearings—Heavy Pre-load—follows basic bearing number and its suffixes: e.g. Q20210DT T5A.
Type		Following suffix DT, DF, DB indicates one piece only of pair.
U		"Universal" single Angular Contact Bearing—ground for Duplex Back-to-Back, Face-to-Face or Tandem mounting. Example: Two U20200 L5 may be used as 20200 DB L5A, 20200 DF L5A or 20200 DTL5A. May also be used singly.
	U	Specialty letter.
V		Cast Bronze Machined Separator.
	V	Snap-ring on opposite side from standard (std. is on loading groove side, opposite shield or seal, as illustrated).
	W	With Double Row—Externally diverging contact angles—Reversed Contact Angle.

Prefixes and Suffixes—Cont'd

Prefix	Suffix	INDICATES
WC		Wide Cup Seal Bearing—Outer Ring extended so as to be flush with Inner Ring on one face.
WD		Two piece, cylindrical pocket, intregal saddle, outer ring controlled, pressed phosphor bronze separator.
X		With 88000 Seal Bearings—Free seal fit-up for Propeller Shaft Bearings.
	X	Standard Endplay & Noise Test (except on Single Angular Contact and Duplex Bearings). Usually omitted, thus 3205 X1A is simply shown as "3205."
	#	Angular Contact Bearings—Single Bearings Only—No preload (Do not use for Duplex Mounting). Omitted when Standard, thus H20305 #1 is simply shown as "H20305."
	X	Duplex Bearings—Medium preload. Follows "DB," "DF," or "DT" e.g. H20305 DT X1A.
	XR	Standard Radial Play.
	Y	Low Speed Noise Test.
Z		Removable molded synthetic rubber seal or shield.
	ZA	.0002 Maximum Radial Play.
	ZB	.0001—.0003 Radial Play.
	ZC	.0002—.0004 Radial Play.
	ZD	.0003—.0005 Radial Play.
	ZE	.0004—.0006 Radial Play.
	ZF	.0005—.0008 Radial Play.
	ZH	.0008—.0011 Radial Play.
1 Digit Figures		Immediately following Basic Bearing No. and End Play Symbol—Degree of Precision
		1—ABEC1 3—ABEC3 5—ABEC5 7—ABEC7, New Departure Perfix. 9—New Departure Ultra Perfix.
4 Digit Figures		Immediately following Basic Bearing No. and End Play Symbol—Special Feature (See Sp. Specs. page 49).
Last Suffix Letter(s)		Type of Grease Packing—Examples: X1 A (A grease), XY1C (C grease), T3 CF (CF grease), DB L5A (A grease) etc. (See pages 50 and 51.)
1 Digit Figure		Following Grease Suffix letters indicates other than standard, volume or method of applying lubricant. (See page 51.)

SPECIAL SPECIFICATIONS

The most frequently used of many four digit specifications immediately following End-Play or Pre-Load Symbol. The first digit at left indicates grade. Thus "1213" indicates ABEC-1. The second digit changes to zero for higher grades. Thus "3013" indicates ABEC-3, and "5013" is ABEC-5. EXAMPLE: 41208 X1241 A indicates standard internal fit-up, without Snap Ring, A Grease.

Spec. No.	Indicates
1210	No shield groove in cone.
1212	Free running felts.
1213	Width of cup and cone +.000 −.002.
1214	End play or radial play symbol etched on bearing.
1217	Double row bearings. Special limits on bearing runouts.
1224	Special cleaning and noise test.
1225	Special noise test.
1227	Single row and single shielded. Matched DB on non-shielded and non-stamped side.
1228	Hand feel test.
1232	Non-stamped cone face lapped.
1241	Ship without snap ring.
1245	High points of eccentricity marked on cup and cone.
1250	Special noise test and no snap ring.
1253	Classified bore and O.D. to nearest .0001.
1254	Classified bore.
1255	Classified O.D.
1266	Air solvent cleaning.
1268	Use on "Z" type bearings PA21 high temperature seal material.
1270	Special noise test.
1273	Etch specification on bearing.
1279	Etch grease code letter on bearing face.
1281	Special tolerances on snap ring groove.
1293	Leave off all seals or shields.
1296	No AFBMA out-of-roundness tolerances on bore diameter.
1318	Special tolerances on Bore and O.D. permissible.
1362	Zinc plate "B" piece of seal—no felt drag.
1376	Special end play, noise test and ship without snap rings.
1446	¼ full "C" grease. Special noise test and end play.
1450	Special tolerance on cup face stick out.
1460	Etch "RT" on bearing.
1468	Cone face stickout beyond seal or shield parts must be no less than .005 with end play taken up.
1522	Reverse sealing material in seal (results in heavier than standard seal drag).

Spec. No.	Indicates
1581	Cone stickout beyond seal parts must be .005 minimum with end play taken up.
1597	Leave off complete seal on bearings.
1681	Cone bore diameter must be within nominal tolerances, cone eccentricitiy .0002 maximum.
1730	Special width and special cone runout tolerance also extra quiet.
1774	Radial play .0002 to .0005 hand feel test.
1796	Mark high points of eccentricity on cone.
1811	Special noise test. Shield on opposite side from standard.
1825	Covers stainless steel bearings shipped dry.
1833	Hand feel test. Omit slinger from seal.
1834	V grease 30% full air solvent cleaning.
1835	Special cone runout. Extra quiet.
1978	"C" ¼ to ⅓ full special noise test.
2100	Obsolete specification. Replaced by "9" after grease letter.
3030	Runout of cup and cone held closer than ABEC 3.
3031	Same as 3030 except that bore and O.D. tolerance only marked on bearing.
3040	Mark bore and O.D. tolerances on bearings and boxes.
3150	Special end play. "L" type separator. Air solvent cleaned. Etch bearings "S3150."
3160	Etch letters "RT" on bearing.
3165	End play letter and specification numeral etched on bearing.
3186	Special noise test PX balls.
3666	Special overall width.
3788	Eccentricity of cone .0002 maximum.
5005	O.D. ABEC5 tolerances before closures, ABEC3 after closures.
5038	Mark bore and O.D. tolerances and cup and cone eccentricities on bearings.
5106	Special noise test. Mark bore and O.D. tolerances and cup and cone eccentricities on bearings.
5358	Classified bore and O.D. torque test.
5366	Torque test on size RS77SR3J only, ship shields and snap wires separately in same vial.

EXAMPLE: 47106 X1241 A is without Snap Ring—it is OK to substitute a standard 47106 if Snap Ring is removed and mechanic told to "Use Old Snap Ring." (Same true of "1250.")

SLUSH OR GREASE CODE

STANDARD LUBRICANTS and CORROSION PREVENTIVES used in each type and size range of New Departure Bearings. These code letters are the last letters in the bearing part number suffix, but, when standard, are omitted from catalogs, price lists, invoices and bearing boxes. Thus "3205" means "3205 X1 **A**," "7505" means X1 **C**," while "7506" means "7506 X1 **A**." Complete part number thru lubricant letter is used when other than standard lubricant is used, e.g., "7505 X1 **A**." A numeral or letter appearing after the lubricant letter indicates some variance from standard. (See bottom of page 51.)

Type of Bearings		Bore Number				Std Slush or Grease All Spec.	Std Grease Volume ± 5%
		Extra Light	Light	Medium	Heavy		
Single Row Radial (Not including R88000, R87000, RWC88000, and RWC87000) Single Row Ang. Contact (Includes 30 Series Instrument Bearings)	Open	All Sizes				A	
	Single Shield	Under 6	Under 6	Under 5		C	50%
		6 up	6 up	5 up	4 up	A	
	Single Seal	Under 10	Under 8	Under 7	Under 5	C	50%
		10 up	8 up	7 up	5 up	B	50%
	Double Shield Seal & Shield Double Seal	Under 10	Under 8	Under 7	Under 5	C	25%
		10 up	8 up	7 up	5 up	B	25%
Double Row	Same as above						50%
Inch Type (Includes miniature and inch type Instrument Bearings)	Open	All Sizes				A	
	Single Shield	Under 16				C	50%
		16 up				A	
	Double Shield	Under 6				C	40%
		6 up				C	25%
Single Row Radial R88000, R87000, RWC88000, RWC87000	Seal & Shield		Under 8			C	40%
	Double Seal		8			B	40%
Cartridge	Double Seal	Z99800—Z99900—All Sizes				C	50%
Adapter		Z99AB—All Sizes				Z	40%
		Z99AE—All Sizes				Z	40%
		R88A—All Sizes				Z	40%
Magneto	Open	All Sizes				A	
Front Wheel and Parts	Open	All Sizes				A	
Rear Wheel	Double Seal	RW500 Series All Others				Z BC	40% 40%
Propeller Shaft	Double Seal	All Sizes				C	40%
Aircraft Pulley Bearings						E	Full
Clutch Throwout	Open	4L24A, B, C and E				A	
	Single Shield	All Others				C	60%
Fan and Water Pump	Double Seal	All Sizes				Z	45%
Steering Arm	Double Seal	916				Z	75%
	Single Seal	924-924A				Z	100%
Roller Tooth	Open	All Sizes				A	
Textile		TC-2-504 All TM-505 Series TP-15-500, TP-23-500 TP-17-500 TP-20-500, TP-21-500 TP-30 TS-2				C C C A C C C	40% 40% 40% 75% 25% 100%
Conveyor	Seal & Shield	All Sizes				Z	75%
	Double Seal	All Sizes				Z	80%
Flat Thrust Bearings		FT17 and FT32A				C	60%
Agricultural	Double Seal	Cam followers (CF Series) Light Disc (Z99502U, Z99503U, 87504U, & 87504A16) Hay Rake bearings (900537 and 900539)				Z	75%
		Heavy Duty Disc Bearings (AS4500 Series)				Z	90%

See page 51 for description of ND grease and oil code letters.

Armed Forces Specifications Present	N.D. Codes	Preferred N.D. Codes
MIL-L-644B	BW, DN	BW
MIL-L-2104A(1)	FH	FH
MIL-G-3278A	E, BM	E
MIL-L-3545(1)	FC, DC, BC	FC
MIL-L-4343A(1)	CL	CL
MIL-L-6085A(2)	J, W	J
MIL-G-7118A	CJ	CJ
MIL-G-7187(1)	HN	HN
MIL-G-7421A	BX	BX
MIL-L-7711A	T	T
MIL-L-7808C(1)	DA	DA
MIL-L-7870A	U	U
MIL-G-10924A	AX	AX
MIL-C-11796A (Class 3)	CO	CO
MIL-L-15719A	FX	FX
MIL-G-15793(2)	BV	BV
MIL-L-16958A(1)	CN	CN
MIL-L-17353A	CW	CW
MIL-G-18709(1)	B	B

Specifications	
Obsolete	Superseded By
2-106	MIL-G-10924
2-134	MIL-G-3278
14-G-8	MIL-G-15793
14-G-11	MIL-L-3545
14-L-3	MIL-G-18709
14-L-7	MIL-L-3545
14-L-15	MIL-L-16958
14-O-20	MIL-L-6085
AN-C-124	MIL-C-11796
AN-G-5	MIL-L-3545
AN-G-10	MIL-G-7118
AN-G-15	MIL-L-7711
AN-G-25	MIL-G-3278
AN-O-6	MIL-L-7870
AN-O-11	MIL-L-6085
AXS-781	MIL-G-10924
AXS-1169	MIL-G-10924
AXS-1767	MIL-L-644
JAN-L-644	MIL-L-644
MIL-L-7808B	MIL-L-7808
MIL-O-6084	MIL-L-644
MIL-O-6085	MIL-L-6085

STANDARD GREASES AND OILS

Ball bearings rely on lubricants principally to prevent metal to metal contact of components wherever it may occur. Proper separator function depends largely on efficient lubrication. In addition, lubricants conduct heat away from heavily loaded areas, and prevent corrosion of bearing parts. Coupled with efficient seals as in New Departure sealed-for-life bearings, lubricants must be long-lived to assure constant and adequate lubrication to the bearing.

ND Code	Lubricant	Temperature (°F)	Major Characteristics
A	Rust inhibitor	.....	Soft, semi-fluid oxidation inhibited rust preventive for general use.
B BB	Sodium soap-petroleum oil grease Lubricant B in solvent cleaned bearings	— 25° to 250°	Noise reduction at light loads. Good rust prevention under humid conditions.
BC	Sodium soap-petroleum oil grease	— 25° to 300°	Heavy loads. High temperature.
BR	Lithium soap-silicone grease	— 35° to 400°	Light loads. Extra high temperature.
BW	Oil	— 50° to 150°	Low temperature. Contains rust inhibitor.
BX	Lithium soap-diester grease	—100° to 200°	Extra low temperature. Satisfactory with Buna N seals. Not to be used with Neoprene seals or cellophane packing material.
C CC	Sodium soap-petroleum oil grease Lubricant C in solvent cleaned bearings	— 25° to 250°	General purpose. Combines good rust prevention under humid conditions with lubricating qualities covering a wide temperature range.
CO	Rust inhibitor	.....	Soft film, oxidation inhibited rust preventive.
E	Lithium soap-diester grease	— 67° to 250°	Low temperature. Water resistant. Satisfactory with Buna N seals. Not to be used with Neoprene seals or cellophane packing material.
F	Oil	— 50° to 200°	High viscosity. Rust preventive.
J	Diester oil	— 67° to 250°	Instrument oil. Satisfactory with Buna N seals. Not to be used with Neoprene seals or cellophane packing material.
L	Lithium soap-silicone grease	— 90° to 350°	Wide temperature range. Light loads.
V	Sodium soap-petroleum oil grease	— 25° to 300°	High temperature.
Z	Lithium soap-petroleum oil grease	— 25° to 225°	Water resistant.

The following numbers (except 9) or a letter following the lubrication letter or letters indicate the oil or grease lubrication volume for volumes other than standard. Example: 7505X1C3 means ¼ full of C grease.

1. Indicates the low amount of specified oil applied by Oil Mist Spray process.
2. Indicates 1/6 to ⅛ full of grease specified.
3. Indicates ¼ full of grease specified.
4. Indicates 40% full of grease specified.
5. Indicates 50% full of grease specified.
6. Indicates 30% full of grease specified.
8. Indicates 75% full of grease specified.
9. Indicates special washing, rinsing and handling with clean gloves. (Details furnished on request.)

F Indicates 100% full of grease specified.
P Indicates one freely falling drop from #20 oiling needle.

DECIMAL EQUIVALENTS

				Milli-meters	Inches	Milli-meters	Inches	Milli-meters	Inches	Milli-meters	Inches
1-64	.0156	33-64	.5156								
1-32	.0313	17-32	.5313								
3-64	.0469	35-64	.5469	1	0.0394	26	1.0236	51	2.0079	76	2.9921
1-16	.0625	9-16	.5625	2	0.0787	27	1.0630	52	2.0472	77	3.0315
5-64	.0781	37-64	.5781	3	0.1181	28	1.1024	53	2.0866	78	3.0709
3-32	.0938	19-32	.5938								
7-64	.1094	39-64	.6094	4	0.1575	29	1.1417	54	2.1260	79	3.1102
1-8	.125	5-8	.625	5	0.1969	30	1.1811	55	2.1654	80	3.1496
				6	0.2362	31	1.2205	56	2.2047	81	3.1890
9-64	.1406	41-64	.6406								
5-32	.1563	21-32	.6563	7	0.2756	32	1.2598	57	2.2441	82	3.2283
11-64	.1719	43-64	.6719	8	0.3150	33	1.2992	58	2.2835	83	3.2677
3-16	.1875	11-16	.6875	9	0.3543	34	1.3386	59	2.3228	84	3.3071
13-64	.2031	45-64	.7031								
7-32	.2188	23-32	.7188	10	0.3937	35	1.3780	60	2.3622	85	3.3465
15-64	.2344	47-64	.7344	11	0.4331	36	1.4173	61	2.4016	86	3.3858
1-4	.250	3-4	.750	12	0.4724	37	1.4567	62	2.4409	87	3.4252
17-64	.2656	49-64	.7656	13	0.5118	38	1.4961	63	2.4803	88	3.4646
9-32	.2813	25-32	.7813	14	0.5512	39	1.5354	64	2.5197	89	3.5039
19-64	.2969	51-64	.7969	15	0.5906	40	1.5748	65	2.5591	90	3.5433
5-16	.3125	13-16	.8125								
21-64	.3281	53-64	.8281	16	0.6299	41	1.6142	66	2.5984	91	3.5827
11-32	.3438	27-32	.8438	17	0.6693	42	1.6535	67	2.6378	92	3.6220
23-64	.3594	55-64	.8594	18	0.7087	43	1.6929	68	2.6772	93	3.6614
3-8	.375	7-8	.875								
				19	0.7480	44	1.7323	69	2.7165	94	3.7008
25-64	.3906	57-64	.8906	20	0.7874	45	1.7717	70	2.7559	95	3.7402
13-32	.4063	29-32	.9063	21	0.8268	46	1.8110	71	2.7953	96	3.7795
27-64	.4219	59-64	.9219								
7-16	.4375	15-16	.9375	22	0.8661	47	1.8504	72	2.8346	97	3.8189
29-64	.4531	61-64	.9531	23	0.9055	48	1.8898	73	2.8740	98	3.8583
15-32	.4688	31-32	.9688	24	0.9449	49	1.9291	74	2.9134	99	3.8976
31-64	.4844	63-64	.9844								
1-2	.500	1″	1.0000	25	0.9843	50	1.9685	75	2.9528	100	3.9370

NEW DEPARTURE

ENGINEERING DATA INDEX

CONTENTS — Page

BEARING SELECTION

Basis of Bearing Load Ratings

Fatigue in General

Establishment of the load capacity of a mechanical structure often requires determination only of that limiting load beyond which some permanent deformation or rupture of the material will occur.

However, if a load is applied repeatedly so as to cause a rapid alternation of stresses, a gradual deterioration of the material will take place, even though the stress range is well within the elastic limit. This deterioration or loss of molecular strength, called fatigue, does not in any way impair the usefulness or operation of the machine element until after a sufficient repetition of the stress, an actual breaking down of the material structure occurs. This is known as fatigue failure.

It is obvious, therefore, that determination of the load capacity of any mechanical device subject to fatigue must involve consideration not only of the load, but also of the length of service such a device may be expected to deliver before fatigue failure occurs.

Fatigue in Ball Bearings

Ball bearings do not suddenly break down for no apparent reason, nor do they wear out in the sense of loss of dimension and accurate positioning characteristics. In a ball bearing running under load the balls and raceways are subjected to a continuous repetition of stresses. After long and carefree service they may begin to show the effect of that fatigue common to all structural material subject to repeated stresses.

This is normal life. All other causes of failure are premature and can definitely be prevented by correct design, mounting and maintenance practice.

The principal factors affecting the length of time that a bearing will function normally, are, therefore: load, which determines the **magnitude** of stress, and speed, which determines **frequency** of stress repetition.

Various details of design also are important, their handling being correlative to the experience and judgment of the bearing manufacturer in achieving the most desirable balance between capacity, endurance and reliability. For instance, the magnitude of the stress is affected by ball diameter, number of balls and curvature of the raceways while frequency of the stress is affected by number and size of balls and the pitch circle. The thoroughly experienced manufacturer knows that extra ball size or number, if overemphasized, can result in weaknesses which may more than offset any apparent gain to the user.

Under a given load the life of a ball bearing is a certain number of revolutions or a certain number of stress cycles. Therefore, this life may be shortened or lengthened by increasing or decreasing the bearing speed.

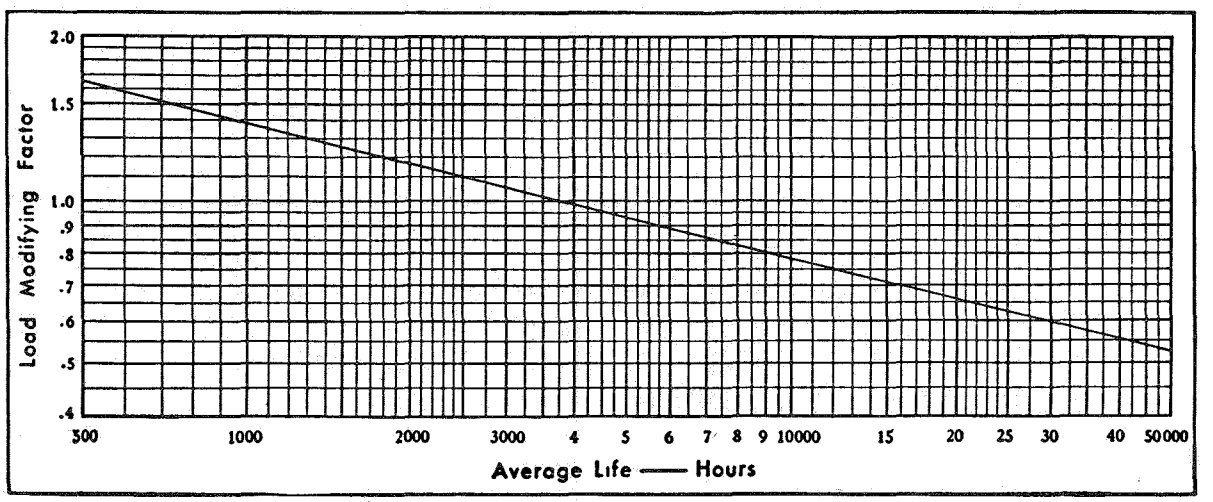
Long series of tests have shown that the fatigue life of a ball bearing varies inversely as the 4th power of the load and inversely as the speed. In other words, if the load is reduced by one-half with the speed unchanged, bearing life will be increased sixteen times. Also, if the load is unchanged but the speed is doubled, the life is reduced one-half.

Thus, it is evident that the load rating of a ball bearing must be stated in terms of load at speeds corresponding to a certain expected life.

Expected Life

No matter how much care is devoted to the selection of materials and their fabrication into a device, a certain variation in the lives of apparently identical individual items subjected to the same service, will inevitably occur.

No steel is more uniform than that used for ball bearings. No other commercial product is so uniformly accurate in dimension, yet this variation in inidividual bearings still occurs. The expected life of a ball bearing must, therefore, be the average life of identical bearings subjected to the same load and speed conditions. Sufficiently large groups of bearings must be considered in order to assure the reliability of this average life. It is clear that the constancy of the average is maintained by the uniformity which the manufacturer achieves in producing bearings of any type or size.



Graph Giving Load Modifying Factors for Desired Average Life in Hours.

BEARING SELECTION—Basis of Bearing Load Ratings—Continued

Uniformity of Life Distribution

Although the fatigue life of apparently identical bearings shows a variation, tests of sufficiently large groups of bearings of any type or size demonstrate a remarkable **uniformity of life distribution.** In other words, regardless of make, type or size, the number of fatigue failures that can be anticipated at any given percentage of the average life, has been shown to conform to a definite and uniform pattern. Thus, though a variation in the **average life** of different makes or sizes of bearings may be experienced, the **distribution** of fatigue failures from which each average is derived, remains characteristic for all groups.

This fact is of decided importance in the determination of a bearing size requirement. Considered alone, it would tend to induce the use of extravagantly large sizes, but an experienced bearing engineer, in arriving at his recommendation balances variation in life against continuity of loading and speed and variably mounting conditions, as dictated by his experience in similar cases.

Load Ratings

In developing a system of bearing ratings, New Departure has considered it most satisfactory to establish one basic load rating corresponding to a given average or expected life. Thus, the ratings tabulated in this and other New Departure catalogs correspond to an average bearing life of 3800 hours at the speeds listed. For a more complete listing of radial and thrust ratings see New Departure Vol. I Engineering Handbook.

If another average life is desired the catalog load ratings must be modified by multiplying with the corresponding factor found at the left in the graph shown on page 54.

Application

Ball bearing application engineering is a highly specialized field, demanding not only a broad and intimate knowledge of the many details involved in bearing design, manufacture and installation, but also of a great many other subjects, directly or indirectly associated.

New Departure load ratings, with the constant life reference point for all bearing types, represent a vast amount of research work and mathematical analysis, with many years of endurance testing of bearings alone, reinforced by a very broad experience with field, as well as laboratory tests of bearings in actual installations.

The results from such involved programs of research are impressive, including as they do, investigation of the many variables, each of which must be considered in relation to others. However, it is realized that the presentation of data of such wide scope in the abbreviated form unavoidable in any book of this nature could be subject to serious misinterpretion through incompleteness.

For such reasons, it is believed that a statement of principles to act as a guide in the preliminary stages of design is more desirable than any attempt to present an extensive technical discussion which could be mistaken as a substitute for the services of a skilled bearing engineer.

Determination of Bearing Size or Expected Average Bearing Life

After the desired type of bearing is selected; i.e., single row, type 3000, double row, type 5000, etc., it is necessary to determine the proper size to give the required life or, if size is dictated by other considerations, to calculate the expected average life.

In most applications, ball bearings are subjected to some combination of thrust and radial loads.

If combined loads exist it becomes necessary to convert them to a radial equivalent.

Use of Combined Load Factors F_C, page 57, makes it possible to convert computed radial and thrust load components to an "equivalent radial load." This "equivalent load" is that radial load which would result in the same average bearing life as the actual loads. Thus this "equivalent" load allows use of the radial load ratings for all cases where bearings are subject to combined radial and thrust loads.

Examples following illustrate typical problems and procedure for solution:

Symbols

- R = Radial load or radial load component
- T = Thrust load or thrust load component
- S = Effective operating speed in RPM (subject 2, page 56)
- R_E = Equivalent radial load
- F_C = Combined load factor (table, page 57)
- F_L = Life modifying factor (graph, page 56)
- F_S = Speed factor (table, page 58)
- R_R = Radial rating at RPM as in catalog or radial rating required at a given speed
- R_T = Thrust rating at RPM as in catalog or thrust rating required at a given speed
- L = Expected average bearing life

Example I

Given: Bearing type = 3000 series
Radial load R = 800 lbs.
Thrust load T = 1000 lbs.
Effective operating speed S = 2000 RPM

Problem. Select proper size to give expected average bearing life, L of 18,000 hours.

Solution: In this case the radial rating required to give the desired life is:

$$R_{R\ (at\ 2000\ RPM)} = R_E \times F_L = R \times F_C \times F_L$$

Since $\frac{T}{R} = \frac{1000}{800} = 1.25$, $F_C = 2.02$ (column A, page 57)

$F_L = 1.475$ (graph, page 56)

Therefore, $R_{R\ (at\ 2000\ RPM)} = 800 \times 2.02 \times 1.475 = 2384$ lbs.

Since ratings are not listed for 2000 RPM it is necessary to convert to a speed for which ratings are given. For convenience, 1000 RPM is normally selected.

$$R_{R\ (at\ 1000\ RPM)} = \frac{R_{R\ (at\ 2000\ RPM)}}{F_S}$$

$F_S = .8409$ (table, page 58)

$$\text{Therefore, } R_{R\ (at\ 1000\ RPM)} = \frac{2384}{.8409} = 2835 \text{ lbs.}$$

The radial load rating tables may now be entered at 1000 RPM and it will be found that the ratings of the 3213 or 3310 bearing (pages 5 and 6) most nearly equal 2835 lbs. Either of these bearings then, should operate at the assumed loads and speeds for an expected average life L of 18,000 hours.

Note: If radial load only exists:

$$R_E = R$$

Example II

Given: Bearing type = 3000 series
Radial load R = 10 lbs.
Thrust load T = 500 lbs.
Effective operating speed S = 1000 RPM

Problem: Select proper size to give expected average life, L of 12,000 hours.

Solution: If $\frac{T}{R}$ is above 10, the radial component may be neglected. Therefore, since $\frac{T}{R} = \frac{500}{10} = 50$, assume a pure thrust load of 500 lbs. only and the load rating required to give 12,000 hours average life is:

$R_T = T \times F_L = 500 \times 1.33 = 666$ lbs., $F_L = 1.33$ (graph, page 56)

— Continued next page

BEARING SELECTION—Basis of Bearing Load Ratings—Continued

Example II—Cont'd.

The radial load tables (radial and thrust capacities for type 3000 being equal) may now be entered at 1000 rpm and it will be found that the radial or thrust ratings of the 3205 or 3303 bearing (pages 5 and 6) most nearly equal 666 lbs. The 3303 bearing, however, should never be loaded by a thrust load of greater than 440 lbs. Since the actual thrust load is 500 lbs. this bearing should not be used. The 3205 bearing is satisfactory and should operate at the assumed loads and speeds for an expected average life L of 12,000 hours.

Example III

Given: Bearing type = number 3204
Radial load R = 200 lbs.
Thrust load T = 50 lbs.
Effective operating speed S = 3500 RPM

Problem: Determine expected average life L under load and speed conditions given.

Solution: $L = 3800 \left(\frac{R_{R\ (3500)}}{R_E}\right)$

R_R in this case is the catalog radial load rating for 3204 size bearing at 3500 RPM. Since ratings are not listed for this speed it is calculated as follows:

$R_{R\ (at\ 3500\ RPM)} = R_{R\ (at\ 1000\ RPM)} \times F_S = 635 \times .7311 = 464$ lbs.

$R_E = R \times F_C$

Since $\frac{T}{R} = \frac{50}{200} = .25$, $F_C = 1.09$ (column A, page 57)

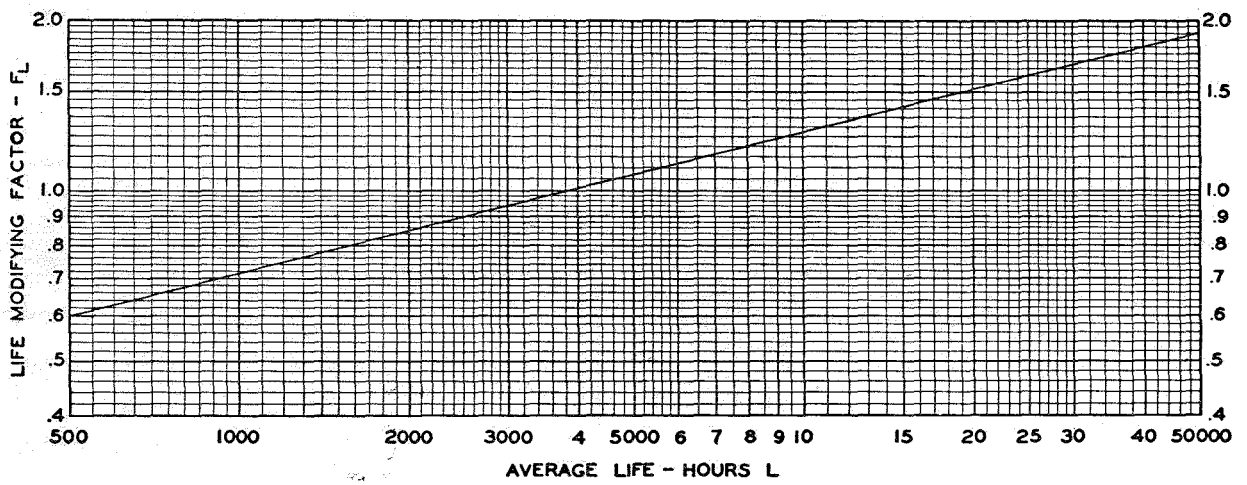
Therefore, $R_E = 200 \times 1.09 = 218$ lbs.

and $L = 3800 \left(\frac{464}{218}\right)^4 = 78{,}000$ hours

Note: If only thrust load exists, or if $\frac{T}{R}$ is above 10,

$$L = 3800 \left(\frac{R_T}{T}\right)^4$$

If only radial load exists $R_E = R$



Graph For Selection of Life Modifying Factors F_L

Radial and Thrust Ratings of Duplex Bearings

The radial load rating of a duplex set of single row angular contact bearings (two single bearings as a pair, DF, DB or DT) at any speed, is 1.7 times the rating of one bearing.

The thrust rating for DF and DB sets is the same as for a single bearing since only one bearing carries all the thrust load in this combination. The thrust rating of a DT set of two bearings is 1.7 times the rating of one bearing. If more than two bearings are mounted in tandem or if DT sets are subjected to combinations of thrust and radial loads below $\frac{T}{R} = 10$, the New Departure Sales Engineer should be consulted.

Determination of Effective Operating Speed—S

When the direction of the load is stationary the effective operating speed S is the inner or outer ring RPM when only one is rotating. In cases where both rotate in the same direction,

S = difference in RPM of inner and outer rings

In cases where both rotate but in opposite directions,

S = sum of RPM of inner and outer rings

No decrease in capacity for outer ring rotating is necessary.

Quiet Running Limiting Loads

Limiting load ratings for bearings when not rotating must be based upon criteria entirely different from those used for rotating bearings.

Limiting radial ratings are defined as those which, if exceeded to any extent on a non-rotating bearing produce very small brinell marks in the races causing the bearing to become noisy when subsequently rotated under lighter loads. Radial loads up to approximately three times the limiting radial ratings may be applied to bearings when not rotating if a subsequent increase in noise level is not objectionable.

Radial loads up to approximately three times the limiting radial ratings may also be applied to rotating bearings without expecting an increase in noise level, provided the bearing makes several complete revolutions under the maximum load. The usual relations between life and load apply if proper lubrication is used to take care of the higher friction torque produced by the heavy loads.

Limiting thrust ratings are defined as those which result in contact ellipse stresses high enough to produce very small brinell marks in the races or to bring the contact ellipse to the edge of the race. In most bearings, the ellipse will reach the edge of the race before stresses become large enough to produce minute brinell marks.

Thrust loads greater than limiting thrust ratings should not be imposed on rotating bearings, but when not rotating, thrust loads in excess of limiting thrust ratings may be sometimes imposed. In instances where thrust loads exceed limiting ratings the New Departure Sales Engineer should be consulted.

Abnormal Conditions

Applications are sometimes found in which abnormal conditions exist. These conditions include vibratory, rotating or oscillatory loads or motions, very high or low operating speeds and temperatures (or a great range of speed or temperatures), excessive humidity or contaminated atmospheres, and cyclic variations of load and speed. Success of any installation depends on serious consideration of these factors. If such conditions exist the New Departure Sales Engineer should be consulted.

BEARING SELECTION—Load Conversion Factors

Combined Load Factors F_C for Conversion to Equivalent Radial Load

Bearing Type	Combined Load Factor F_C
Single Row Radial Bearings, Types 1000 Open or Shielded (Not recommended for pure thrust)	COLUMN A. For $\frac{T}{R}$ values above .6, consult N. D. Sales Eng.
Single Row Radial Bearings, Types 30, 3L00, 3000 Open or Shielded, ND-Seal Brgs., Inch Series Type R, and Rear Wheel Bearings	COLUMN A
One Row Angular Contact Types 0L00 and 20000	COLUMN B
One Row Angular Contact Type H20000	COLUMN C
One Row Angular Contact Type 30000	COLUMN D
Duplex Brgs., Types 0L00 DF and DB, 20000 DF and DB. (Radial Ratings for a Pair of Bearings Must Be Used — See Page 10.)	COLUMN E
Duplex Bearings, Types H20000 DF and DB. (Radial Ratings for a Pair of Bearings Must Be Used), Double Row Bearings, Type 5000 Open or Shielded.	COLUMN F
Duplex Bearings, Type 30000 DF and DB. (Radial Ratings for a Pair of Bearings Must Be Used.) Also 5307WM.	COLUMN G
Duplex Bearings, Type 0L00 DT, 20000 DT, H20000 DT, 30000 DT and Front Wheel Brgs.	Consult New Departure Sales Engineer

$\frac{T}{R}$	A	B	C	D	E	F	G
.05	1.01	1.00	1.00	1.00	1.04	1.03	1.01
.10	1.02	1.00	1.00	1.00	1.09	1.07	1.02
.15	1.04	1.00	1.00	1.00	1.14	1.10	1.04
.20	1.06	1.00	1.00	1.00	1.19	1.14	1.06
.25	1.09	1.00	1.00	1.00	1.24	1.17	1.09
.30	1.12	1.00	1.00	1.00	1.30	1.21	1.12
.35	1.16	1.00	1.00	1.00	1.37	1.25	1.16
.40	1.20	1.01	1.00	1.00	1.44	1.29	1.20
.45	1.24	1.01	1.00	1.00	1.51	1.33	1.24
.50	1.28	1.02	1.01	1.00	1.58	1.37	1.28
.60	1.37	1.02	1.02	1.00	1.73	1.46	1.34
.70	1.46	1.07	1.03	1.01	1.88	1.55	1.42
.80	1.56	1.15	1.05	1.01	2.02	1.64	1.50
.90	1.67	1.22	1.08	1.02	2.16	1.74	1.57
1.00	1.77	1.30	1.13	1.02	2.30	1.83	1.63
1.25	2.02	1.50	1.22	1.06	2.68	2.07	1.82
1.50	2.27	1.70	1.31	1.15	3.03	2.31	2.00
1.75	2.52	1.92	1.48	1.23	3.38	2.56	2.20
2.00	2.77	2.14	1.63	1.32	3.77	2.83	2.38
3.00	3.77	3.05	2.27	1.75	5.39	3.91	3.12
4.00	4.76	3.98	2.93	2.22	7.01	5.03	3.88
5.00	5.77	4.92	3.62	2.70	8.64	6.17	4.68
7.50	8.27	7.29	5.33	3.96	12.70	9.02	6.79
10.00	10.77	9.67	7.07	5.23	16.73	11.90	8.92

Where $\frac{T}{R}$ is above 10, neglect radial load and use pure thrust ratings.

See New Departure Vol. I Handbook.

BEARING SELECTION—Factors for Speeds Not Tabulated

RADIAL OR THRUST RATINGS AT SPEEDS NOT IN LOAD RATING TABLES

To obtain bearing ratings (either radial or thrust) at speeds other than those given in load rating tables:

Select the speed from the table below and multiply load rating at 1000 RPM given in load rating tables by factor F_S for the selected speed. Interpolation may be used with sufficient accuracy.

Thus: $R_{R\ (any\ RPM)} = R_{R\ (1000\ RPM)} \times F_S$

or $R_{T\ (any\ RPM)} = R_{T\ (1000\ RPM)} \times F_S$

For thrust ratings at 1000 RPM not shown in this publication see New Departure Vol. I Handbook.

For speeds below 10 RPM use factor F_S for 10 RPM. For speeds above 10,000 RPM consult New Departure Sales Engineer.

Speed Factors F_S

RPM	F_S	RPM	F_S	RPM	F_S	RPM	F_S	RPM	F_S	RPM	F_S	RPM	F_S
		270	1.387	825	1.049	1725	.8726	3250	.7448	5100	.6654	8700	.5823
10	3.162	280	1.375	850	1.041	1750	.8695	3300	.7419	5200	.6622	8800	.5806
15	2.858	290	1.363	875	1.034	1775	.8664	3350	.7392	5300	.6591	8900	.5790
20	2.659	300	1.351	900	1.027	1800	.8633	3400	.7364	5400	.6560	9000	.5774
25	2.515	310	1.340	925	1.020	1825	.8604	3450	.7337	5500	.6530	9100	.5758
30	2.403	320	1.330	950	1.013	1850	.8575	3500	.7311	5600	.6501	9200	.5742
35	2.312	330	1.320	975	1.006	1875	.8546	3550	.7285	5700	.6472	9300	.5726
40	2.236	340	1.310	1000	1.000	1900	.8518	3600	.7260	5800	.6444	9400	.5711
45	2.171	350	1.300	1025	.9938	1925	.8490	3650	.7235	5900	.6416	9500	.5696
50	2.115	360	1.291	1050	.9878	1950	.8462	3700	.7210	6000	.6389	9600	.5681
55	2.065	370	1.282	1075	.9821	1975	.8436	3750	.7186	6100	.6363	9700	.5666
60	2.021	380	1.274	1100	.9765	2000	.8409	3800	.7162	6200	.6337	9800	.5652
65	1.981	390	1.265	1125	.9710	2050	.8357	3850	.7139	6300	.6312	9900	.5637
70	1.944	400	1.257	1150	.9657	2100	.8307	3900	.7116	6400	.6287	10000	.5624
75	1.911	410	1.250	1175	.9605	2150	.8258	3950	.7093	6500	.6263		
80	1.880	420	1.242	1200	.9554	2200	.8211	4000	.7071	6600	.6239		
85	1.852	430	1.235	1225	.9506	2250	.8165	4050	.7049	6700	.6215		
90	1.826	440	1.228	1250	.9457	2300	.8120	4100	.7027	6800	.6193		
95	1.801	450	1.221	1275	.9411	2350	.8077	4150	.7006	6900	.6170		
100	1.778	460	1.214	1300	.9365	2400	.8034	4200	.6985	7000	.6148		
110	1.736	470	1.208	1325	.9321	2450	.7993	4250	.6965	7100	.6126		
120	1.699	480	1.201	1350	.9277	2500	.7953	4300	.6944	7200	.6105		
130	1.665	490	1.195	1375	.9235	2550	.7914	4350	.6924	7300	.6084		
140	1.635	500	1.189	1400	.9193	2600	.7875	4400	.6905	7400	.6063		
150	1.607	525	1.175	1425	.9153	2650	.7838	4450	.6885	7500	.6043		
160	1.581	550	1.161	1450	.9113	2700	.7801	4500	.6866	7600	.6023		
170	1.557	575	1.149	1475	.9074	2750	.7765	4550	.6847	7700	.6003		
180	1.535	600	1.136	1500	.9036	2800	.7731	4600	.6828	7800	.5984		
190	1.515	625	1.125	1525	.8999	2850	.7696	4650	.6810	7900	.5965		
200	1.495	650	1.114	1550	.8962	2900	.7663	4700	.6792	8000	.5946		
210	1.477	675	1.103	1575	.8926	2950	.7630	4750	.6774	8100	.5928		
220	1.460	700	1.093	1600	.8891	3000	.7598	4800	.6756	8200	.5910		
230	1.444	725	1.084	1625	.8857	3050	.7567	4850	.6738	8300	.5892		
240	1.429	750	1.075	1650	.8823	3100	.7536	4900	.6721	8400	.5874		
250	1.414	775	1.066	1675	.8790	3150	.7506	4950	.6704	8500	.5856		
260	1.400	800	1.057	1700	.8758	3200	.7477	5000	.6687	8600	.5840		

BEARING TOLERANCES

New Departure employs bearing tolerances which are within the limits standardized in the ball bearing industry by the Anti-Friction Bearing Manufacturers Association through their Annular Bearing Engineers Committee (ABEC).

For general usage, bearings built to ABEC-1 standards are adequate. ABEC-3 and ABEC-5 grades are employed where smaller tolerances are required to give desired mounting and running characteristics. ABEC-7 and ABEC-9 grades are available for applications which require extreme accuracy such as certain machine tools and instruments.

The ABEC has established an allowance for bore and outside diameter to provide for out-of-roundness and taper conditions. These allowances apply only to ABEC-1 and ABEC-3 grade bearings and are expressed as $d_{min.}$ and $d_{max.}$ diameters. For a particular bearing,

$$d_m = \frac{d_{min.} + d_{max.}}{2}$$

where d_m is within the bore or O.D. tolerance range shown in the tabulation which follows.

In general, plain Single Row Radial and Angular Contact bearings are available in all the high (ABEC-5, -7 and -9) specification grades. For availability of a high specification on bearings having closures, snap rings, loading grooves, flanges or other specialties, consult your New Departure Sales Engineer. Inch Series bearings are available in the higher specification grades as Instrument bearings (see page 30).

Due to the nearly universal use of inch gauge blocks by American industry, the standard 4-Place Decimal Inch Conversion Table (based upon 1″ = 25.4 mm) is taken as the ruling nominal dimension. All tolerances are measured from this nominal 4-place decimal inch value and are given in decimal inches. The reference metric dimension may differ from the basic nominal inch dimension by as much as .00005″.

TOLERANCES ON INNER RING

Bore Number	Bore Diameter (+.0000″ to value below) A.B.E.C. Specification No.					Max. Radial Runout (Inches) A.B.E.C. Specification No.				
	1	3	5	7	9	1	3	5	7	9
0— 3	−.0003	−.0002	−.0002	−.00015	−.00010	.0004	.0003	.0002	.00010	.00005
4— 6	−.0004	−.0002	−.0002	−.00015	−.00010	.0005	.0003	.0002	.00015	.00010
7—10	−.0005	−.0003	−.0002	−.00020	−.00010	.0006	.0004	.0002	.00015	.00010
11—16	−.0006	−.0004	−.0003	−.00020	−.00015	.0008	.0004	.0002	.00015	.00010
17—24	−.0008	−.0005	−.0003	−.00025	−.00020	.0010	.0005	.0003	.00020	.00010
26—30	−.0010	−.0006	−.0004	−.00030	−.00025	.0012	.0006	.0003	.00030	.00010
32—36	−.0010	−.0006	−.0004	−.00030	−.00025	.0012	.0006	.0003	.00030	.00020
Bearing Number										
34—39	−.0003	−.0002	−.0002			.0003	.0002	.0002		
8006—09	−.0003					.0003				
8011—16	−.0003					.0004				
8026	−.0004					.0005				
R2—R4A	−.0003	−.0002	−.0002			.0003	.0002	.0002		
R2—R10	−.0003	−.0002	−.0002			.0004	.0003	.0002		
R12—R18	−.0004	−.0002	−.0002			.0005	.0003	.0002		
R20—R24	−.0005	−.0003	−.0002			.0006	.0004	.0002		

TOLERANCES ON OUTER RING

Bore Number			Outside Diameter (+.0000″ to value below) A.B.E.C. Specification No.					Max. Radial Runout (Inches) A.B.E.C. Specification No.				
Extra Light	Light	Medium	1	3	5	7	9	1	3	5	7	9
0— 1	0		−.0004	−.0003	−.0002	−.0002	−.00015	.0006	.0004	.0002	.0002	.00010
2— 5	1— 4	0— 3	−.0005	−.0003	−.0002	−.0002	−.00015	.0008	.0004	.0002	.0002	.00010
6—10	5— 8	4— 7	−.0005	−.0004	−.0003	−.0002	−.00015	.0010	.0005	.0003	.0002	.00015
11—15	9—13	8—11	−.0006	−.0004	−.0003	−.0003	−.00020	.0014	.0007	.0004	.0002	.00020
16—20	14—17	12—14	−.0008	−.0005	−.0004	−.0004	−.00020	.0016	.0008	.0004	.0003	.00020
21—24	18—20	15—17	−.0010	−.0006	−.0005	−.0004	−.00025	.0018	.0009	.0005	.0003	.00020
26—32	21—28	18—22	−.0012	−.0007	−.0005	−.0004	−.00030	.0020	.0010	.0005	.0004	.00025
Bearing Number												
34—39			−.0004	−.0003	−.0002			.0006	.0004	.0002		
8006—09			−.0004					.0006				
8011—16			−.0005					.0008				
8026			−.0005					.0010				
R2—R8			−.0004	−.0003	−.0002			.0006	.0004	.0002		
R10—R14			−.0005	−.0003	−.0002			.0008	.0004	.0002		
R16—R24			−.0005	−.0004	−.0003			.0010	.0005	.0003		

WIDTH TOLERANCES

Single Inner and Outer Rings	+.000 to −.005
Rings 10 mm and smaller, ABEC-7 and -9	+.000 to −.001
Double Ring Width on Duplex Bearings (0-16 Bore)	+.000 to −.020
Double Ring Width on Duplex Bearings (17-36 Bore)	+.000 to −.030

BEARING MOUNTING FITS

Explanation of Fits

Shaft and Housing Fits

In the majority of ball bearing applications, the shaft rotates and the housing is stationary. In some instances, however, such as various pulley and wheel mountings, the shaft is the stationary member. The following rule covers the fits to be used for both cases.

In general, ball bearings should be applied with the rotating ring a firm press or interference fit, and stationary ring a close push fit, the degree of tightness or looseness depending upon the service for which the bearings are intended. This rule is founded upon the following essential facts:

1. Under normal load conditions, a press-fitted ring will not slip or turn on or in a rotating shaft or housing, and wear in the latter parts is thereby avoided.

2. A bearing having one ring push-fitted and not clamped can move axially so as to avoid the imposition of excessive thrust loads, such as might be caused by changes in shaft length due to expansion.

3. General machine assembly may be accomplished with greater ease where one of the bearing rings is a push fit.

The above rule is general and cannot apply exactly to all conditions. Thus, for very heavy, vibratory or rotating loads, mounting fits for **both** shaft and housing would be made tighter. Also, for many precision applications the stationary ring would require closer than a push fit, not only to avoid radial looseness and excessive deflection under load, but to reduce or prevent creep, which in time might result in increased looseness of housing fit.

In the case of single row angular contact bearings to be applied opposed under a definite preload, either spaced apart or abutted as in duplex mountings, the fits frequently depart somewhat from the general rule for the following reason:

When these bearings are preloaded, a slight expansion occurs in the outer ring, which results in a tightening of the housing fit. Thus, in the case of medium size bearings, the housing may be finished to give a very snug push fit for assembly, but when the bearings are preloaded (always after assembly) the ultimate fit may be on the order of .0001″ tight. Because of this, adequate rigidity is obtained, yet assembly operations are facilitated.

"Expected" and "Theoretical" Fits

In the tables of bearing mounting fits given in this book, it will be noticed that the "theoretical fits" listed represent the maximum of either tightness or looseness that could be obtained in practice were the bearings, housings and shafts to vary the full limits of their respective tolerances.

Actually, investigation has proved that practically all applications result in fits that are very much more uniform and less extreme than the indicated **possible** in the tables. Where "expected fits" are given, they list, therefore, the results that will normally be obtained in good shop practice. The reason for this uniformity in actual results may best be explained by an example:

For a 7 bore bearing, the standard bore tolerance is + .0000″ −.0005″, giving limits of 1.3780″ −1.3775″. The shaft limits for this size bearing are 1.3784″ −1.3779″; therefore, if bearing and shaft both ran to the extreme limits, it would be possible to obtain fits either .0009″ tight or .0001″ loose.

With modern precision grinding machines, which very nearly eliminate the human element, bearing bores are held uniformly close, in the case of a standard New Departure 7 bore bearing, averaging within 1.3778″ −1.3776.″

In grinding a shaft, the operator normally stops as soon as the diameter comes to or just within the shaft high limit, averaging for the seat to take a 7 bore bearing, 1.3783″ −1.3779″. With these averages uniformly maintained in good practice, the actual fits obtained for A.B.E.C.-1 or New Departure standard specification bearings would be from .0001″ to .0007″ tight.

Tight and Loose Bearings

When a bearing is mounted on a shaft with a press fit, the inner ring expands a certain amount, depending upon the tightness of the fit. As a result, the bearing has less end play or internal looseness after mounting.

For average conditions, New Departure bearings are supplied with sufficient internal looseness so that, using the recommended press fit, the correct bearing operating fit-up will be uniformly obtained.

There are various applications, however, where ball bearings are required to be either tighter or looser than ordinarily supplied. In such cases it is very undesirable to attempt to achieve this difference by mounting the bearing tighter or looser on the shaft. To do so would, in many instances, result in mounting fits which would adversely affect bearing performance. Therefore, in ordering bearings where greater than normal tightness or looseness is indicated, complete details of the application should be stated so that bearings of suitable internal characteristics may be furnished.

SHAFT MOUNTING FITS—For A.B.E.C.—1 Tolerances

ABEC-1

Single Row Radial, Single Row Angular Contact, Double Row and N-D Seal Bearings

(Except Type 30, and ND-Seal bearings not to standard single row widths. See page 69.)

The fits given in this table are satisfactory for nearly all general or average bearing applications. However, for some mounting conditions, certain modifications of these fits may be required.

In general, soft shafts; those not having smoothly ground bearing seats, and those subject to very heavy or vibratory loads, need tighter than average fits. Correct fits for any special conditions will be supplied by the New Departure Sales Engineer.

For explanation of "Expected Fits" listed below, see page 60.

Bearing Bore Numbers	BEARING BORE		SHAFT REVOLVING						SHAFT STATIONARY					
	Diameters		Diameters		Expected Fit		Theoret. Fit		Diameters		Expected Fit		Theoret. Fit	
	Max.	Min.	Max.	Min.	Loose or Tight	Tight	Loose	Tight	Max.	Min.	Max. Loose	Min. Loose	Loose	Tight
0	.3937	.3934	.3939	.3936					.3935	.3932				
1	.4724	.4721	.4726	.4723	.0000L	.0004	.0001	.0005	.4722	.4719	.0004	.0000	.0005	.0001
2	.5906	.5903	.5908	.5905					.5904	.5901				
3	.6693	.6690	.6695	.6692	.0000L	.0004	.0001	.0005	.6691	.6688	.0004	.0000	.0005	.0001
4	.7874	.7870	.7877	.7873	.0000L	.0006	.0001	.0007	.7871	.7867	.0006	.0000	.0007	.0001
5	.9843	.9839	.9846	.9842	.0000L	.0006	.0001	.0007	.9840	.9836	.0006	.0000	.0007	.0001
6	1.1811	1.1807	1.1814	1.1810	.0000L	.0006	.0001	.0007	1.1808	1.1804	.0006	.0000	.0007	.0001
7	1.3780	1.3775	1.3784	1.3779	.0001T	.0007	.0001	.0009	1.3776	1.3771	.0007	.0001	.0009	.0001
8	1.5748	1.5743	1.5752	1.5747	.0001T	.0007	.0001	.0009	1.5744	1.5739	.0007	.0001	.0009	.0001
9	1.7717	1.7712	1.7721	1.7716	.0001T	.0007	.0001	.0009	1.7713	1.7708	.0007	.0001	.0009	.0001
10	1.9685	1.9680	1.9689	1.9684	.0001T	.0007	.0001	.0009	1.9681	1.9676	.0007	.0001	.0009	.0001
11	2.1654	2.1648	2.1659	2.1653	.0001T	.0009	.0001	.0011	2.1649	2.1643	.0009	.0001	.0011	.0001
12	2.3622	2.3616	2.3627	2.3621					2.3617	2.3611				
13	2.5591	2.5585	2.5596	2.5590	.0001T	.0009	.0001	.0011	2.5586	2.5580	.0009	.0001	.0011	.0001
14	2.7559	2.7553	2.7564	2.7558					2.7554	2.7548				
15	2.9528	2.9522	2.9533	2.9527	.0001T	.0009	.0001	.0011	2.9523	2.9517	.0009	.0001	.0011	.0001
16	3.1496	3.1490	3.1501	3.1495	.0001T	.0009	.0001	.0011	3.1491	3.1485	.0009	.0001	.0011	.0001
17	3.3465	3.3457	3.3471	3.3464	.0002T	.0012	.0001	.0014	3.3458	3.3451	.0012	.0002	.0014	.0001
18	3.5433	3.5425	3.5439	3.5432					3.5426	3.5419				
19	3.7402	3.7394	3.7408	3.7401	.0002T	.0012	.0001	.0014	3.7395	3.7388	.0012	.0002	.0014	.0001
20	3.9370	3.9362	3.9376	3.9369					3.9363	3.9356				
21	4.1339	4.1331	4.1345	4.1338					4.1332	4.1325				
22	4.3307	4.3299	4.3313	4.3306	.0002T	.0012	.0001	.0014	4.3300	4.3293	.0012	.0002	.0014	.0001
24	4.7244	4.7236	4.7250	4.7243					4.7237	4.7230				
26	5.1181	5.1171	5.1188	5.1179					5.1173	5.1164				
28	5.5118	5.5108	5.5125	5.5116	.0002T	.0014	.0002	.0017	5.5110	5.5101	.0014	.0002	.0017	.0002
30	5.9055	5.9045	5.9062	5.9053					5.9047	5.9038				
32	6.2992	6.2982	6.2999	6.2990					6.2984	6.2975				
34	6.6929	6.6919	6.6936	6.6927	.0002T	.0014	.0002	.0017	6.6921	6.6912	.0014	.0002	.0017	.0002
36	7.0866	7.0856	7.0873	7.0864					7.0858	7.0849				

ABEC-1

HOUSING MOUNTING FITS—For A.B.E.C.—1 Tolerances

Single Row Radial, Single Row Angular Contact, Double Row and N-D Seal Bearings

(Except Type 30 and ND-Seal bearings not to standard single row widths. See page 69.)

The fits given in this table are satisfactory for nearly all general or average bearing applications. However, for some mounting conditions, certain modification of these fits may be required.

In general, soft metal housings, particularly when revolving, and those subject to heavy or vibratory loads, need tighter than average fits. For best results, housings should have a smooth finish such as produced by grinding or reaming.

In practice the actual fits obtained will be closer than those listed under "Theoretical Fits" below. See page 60.

Bearing Bore Numbers			BEARING OUTER DIAM.		HOUSING STATIONARY				HOUSING REVOLVING			
Series			Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
E.L.	L.	M.	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
0			1.0236	1.0232	1.0240	1.0235			1.0236	1.0231		
1			1.1024	1.1020	1.1028	1.1023	.0001	.0008	1.1024	1.1019	.0005	.0004
	0		1.1811	1.1807	1.1815	1.1810			1.1811	1.1806		
2	1		1.2598	1.2593	1.2603	1.2597			1.2598	1.2592		
3	2	0	1.3780	1.3775	1.3785	1.3779	.0001	.0010	1.3780	1.3774	.0006	.0005
		1	1.4567	1.4562	1.4572	1.4566			1.4567	1.4561		
	3		1.5748	1.5743	1.5753	1.5747			1.5748	1.5742		
4		2	1.6535	1.6530	1.6540	1.6534	.0001	.0010	1.6535	1.6529	.0006	.0005
5	4	3	1.8504	1.8499	1.8509	1.8503			1.8504	1.8498		
	5	4	2.0472	2.0467	2.0477	2.0471			2.0472	2.0466		
6			2.1654	2.1649	2.1659	2.1653	.0001	.0010	2.1654	2.1648	.0006	.0005
7	6	5	2.4409	2.4404	2.4414	2.4408			2.4409	2.4403		
8			2.6772	2.6767	2.6777	2.6771			2.6772	2.6766		
	7	6	2.8346	2.8341	2.8351	2.8345	.0001	.0010	2.8346	2.8340	.0006	.0005
9			2.9528	2.9523	2.9533	2.9527			2.9528	2.9522		
10	8	7	3.1496	3.1491	3.1501	3.1495	.0001	.0010	3.1496	3.1490	.0006	.0005
	9		3.3465	3.3459	3.3472	3.3464	.0001	.0013	3.3466	3.3458	.0007	.0007
11	10	8	3.5433	3.5427	3.5440	3.5432	.0001	.0013	3.5434	3.5426	.0007	.0007
12			3.7402	3.7396	3.7409	3.7401			3.7403	3.7395		
13	11	9	3.9370	3.9364	3.9377	3.9369	.0001	.0013	3.9371	3.9363	.0007	.0007
14	12	10	4.3307	4.3301	4.3314	4.3306			4.3308	4.3300		
15			4.5276	4.5270	4.5283	4.5275	.0001	.0013	4.5277	4.5269	.0007	.0007
	13	11	4.7244	4.7238	4.7251	4.7243	.0001	.0013	4.7245	4.7237	.0007	.0007
16	14		4.9213	4.9205	4.9221	4.9211	.0002	.0016	4.9214	4.9204	.0009	.0009
17	15	12	5.1181	5.1173	5.1189	5.1179			5.1182	5.1172		
18	16	13	5.5118	5.5110	5.5126	5.5116	.0002	.0016	5.5119	5.5109	.0009	.0009
19			5.7087	5.7079	5.7095	5.7085			5.7088	5.7078		
20	17	14	5.9055	5.9047	5.9063	5.9053	.0002	.0016	5.9056	5.9046	.0009	.0009
21	18	15	6.2992	6.2982	6.3002	6.2990	.0002	.0020	6.2993	6.2981	.0011	.0011
22	19	16	6.6929	6.6919	6.6939	6.6927	.0002	.0020	6.6930	6.6918	.0011	.0011
24	20	17	7.0866	7.0856	7.0876	7.0864	.0002	.0020	7.0867	7.0855	.0011	.0011
	21	18	7.4803	7.4791	7.4815	7.4801	.0002	.0024	7.4805	7.4791	.0012	.0014
26	22	19	7.8740	7.8728	7.8752	7.8738	.0002	.0024	7.8742	7.8728	.0012	.0014
28			8.2677	8.2665	8.2689	8.2675			8.2679	8.2665		
	24	20	8.4646	8.4634	8.4658	8.4644	.0002	.0024	8.4648	8.4634	.0012	.0014
30		21	8.8583	8.8571	8.8595	8.8581			8.8585	8.8571		
	26		9.0551	9.0539	9.0563	9.0549			9.0553	9.0539		
32		22	9.4488	9.4476	9.4500	9.4486	.0002	.0024	9.4490	9.4476	.0012	.0014
	28		9.8425	9.8413	9.8437	9.8423			9.8427	9.8413		
34		24	10.2362	10.2348	10.2375	10.2359			10.2364	10.2348		
	30		10.6299	10.6285	10.6312	10.6296	.0003	.0027	10.6301	10.6285	.0014	.0016
36		26	11.0236	11.0222	11.0249	11.0233			11.0238	11.0222		

SHAFT MOUNTING FITS—For A.B.E.C.—3 Tolerances

ABEC-3

Single Row Radial, Single Row Angular Contact, Double Row and N-D Seal Bearings

(Except Type 30 and ND-Seal bearings not to standard single row widths. See page 70.)

The fits given in this table are intended for applications requiring greater accuracy in certain respects than for general use.

Modification for some mounting conditions may be required, such as for very heavy or vibratory loads where somewhat tighter fits are desired.

Correct fits for any special conditions will be supplied by the New Departure Sales Engineer.

Actually, with these limits, closer fits will be obtained than listed under "Theoretical Fits." See page 60.

Bearing Bore Numbers	BEARING BORE		SHAFT REVOLVING				SHAFT STATIONARY			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
0	.3937	.3935	.3939	.3936			.3936	.3933		
1	.4724	.4722	.4726	.4723	.0004	.0001	.4723	.4720	.0001	.0004
2	.5906	.5904	.5908	.5905			.5905	.5902		
3	.6693	.6691	.6695	.6692			.6692	.6689		
4	.7874	.7872	.7876	.7873	.0004	.0001	.7873	.7870	.0001	.0004
5	.9843	.9841	.9845	.9842			.9842	.9839		
6	1.1811	1.1809	1.1813	1.1810	.0004	.0001	1.1810	1.1807	.0001	.0004
7	1.3780	1.3777	1.3783	1.3779	.0006	.0001	1.3778	1.3774	.0001	.0006
8	1.5748	1.5745	1.5751	1.5747	.0006	.0001	1.5746	1.5742	.0001	.0006
9	1.7717	1.7714	1.7720	1.7716	.0006	.0001	1.7715	1.7711	.0001	.0006
10	1.9685	1.9682	1.9688	1.9684	.0006	.0001	1.9683	1.9679	.0001	.0006
11	2.1654	2.1650	2.1657	2.1653	.0007	.0001	2.1651	2.1647	.0001	.0007
12	2.3622	2.3618	2.3625	2.3621			2.3619	2.3615		
13	2.5591	2.5587	2.5594	2.5590	.0007	.0001	2.5588	2.5584	.0001	.0007
14	2.7559	2.7555	2.7562	2.7558			2.7556	2.7552		
15	2.9528	2.9524	2.9531	2.9527	.0007	.0001	2.9525	2.9521	.0001	.0007
16	3.1496	3.1492	3.1499	3.1495	.0007	.0001	3.1493	3.1489	.0001	.0007
17	3.3465	3.3460	3.3469	3.3464	.0009	.0001	3.3461	3.3456	.0001	.0009
18	3.5433	3.5428	3.5437	3.5432			3.5429	3.5424		
19	3.7402	3.7397	3.7406	3.7401	.0009	.0001	3.7398	3.7393	.0001	.0009
20	3.9370	3.9365	3.9374	3.9369			3.9366	3.9361		
21	4.1339	4.1334	4.1343	4.1338			4.1335	4.1330		
22	4.3307	4.3302	4.3311	4.3306	.0009	.0001	4.3303	4.3298	.0001	.0009
24	4.7244	4.7239	4.7248	4.7243			4.7240	4.7235		
26	5.1181	5.1175	5.1185	5.1179			5.1177	5.1171		
28	5.5118	5.5112	5.5122	5.5116	.0010	.0002	5.5114	5.5108	.0002	.0010
30	5.9055	5.9049	5.9059	5.9053			5.9051	5.9045		
32	6.2992	6.2986	6.2996	6.2990			6.2988	6.2982		
34	6.6929	6.6923	6.6933	6.6927	.0010	.0002	6.6925	6.6919	.0002	.0010
36	7.0866	7.0860	7.0870	7.0864			7.0862	7.0856		

ABEC-3

HOUSING MOUNTING FITS—For A.B.E.C.—3 Tolerances

Single Row Radial, Single Row Angular Contact Double Row and N-D Seal Bearings

(Except Type 30 and ND-Seal bearings not to standard single row widths. See page 70.)

The fits given in this table are intended for applications requiring greater accuracy in certain respects than for general use.

Modification for some conditions may be required, such as for soft metal housings, particularly when revolving, or those subject to heavy or vibratory loads, where somewhat tighter fits are necessary. Housings should be smoothly finished as by grinding or reaming.

Actual fits with these limits will be closer than listed under "Theoretical Fits" below. See page 60.

Bearing Bore Numbers			BEARING OUTER DIAM.		HOUSING STATIONARY				HOUSING REVOLVING			
Series			Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
E.L.	L.	M.	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
0			1.0236	1.0233	1.0239	1.0235			1.0236	1.0232		
1			1.1024	1.1021	1.1027	1.1023	.0001	.0006	1.1024	1.1020	.0004	.0003
	0		1.1811	1.1808	1.1814	1.1810			1.1811	1.1807		
2	1		1.2598	1.2595	1.2601	1.2597			1.2598	1.2594		
3	2	0	1.3780	1.3777	1.3783	1.3779	.0001	.0006	1.3780	1.3776	.0004	.0003
		1	1.4567	1.4564	1.4570	1.4566			1.4567	1.4563		
	3		1.5748	1.5745	1.5751	1.5747			1.5748	1.5744		
4		2	1.6535	1.6532	1.6538	1.6534	.0001	.0006	1.6535	1.6531	.0004	.0003
5	4	3	1.8504	1.8501	1.8507	1.8503			1.8504	1.8500		
	5	4	2.0472	2.0468	2.0476	2.0471			2.0472	2.0467		
6			2.1654	2.1650	2.1658	2.1653	.0001	.0008	2.1654	2.1649	.0005	.0004
7	6	5	2.4409	2.4405	2.4413	2.4408			2.4409	2.4404		
8			2.6772	2.6768	2.6776	2.6771			2.6772	2.6767		
	7	6	2.8346	2.8342	2.8350	2.8345	.0001	.0008	2.8346	2.8341	.0005	.0004
9			2.9528	2.9524	2.9532	2.9527			2.9528	2.9523		
10	8	7	3.1496	3.1492	3.1500	3.1495	.0001	.0008	3.1496	3.1491	.0005	.0004
	9		3.3465	3.3461	3.3470	3.3464	.0001	.0009	3.3466	3.3460	.0005	.0005
11	10	8	3.5433	3.5429	3.5438	3.5432	.0001	.0009	3.5434	3.5428	.0005	.0005
12			3.7402	3.7398	3.7407	3.7401			3.7403	3.7397		
13	11	9	3.9370	3.9366	3.9375	3.9369	.0001	.0009	3.9371	3.9365	.0005	.0005
14	12	10	4.3307	4.3303	4.3312	4.3306			4.3308	4.3302		
15			4.5276	4.5272	4.5281	4.5275	.0001	.0009	4.5277	4.5271	.0005	.0005
	13	11	4.7244	4.7240	4.7249	4.7243	.0001	.0009	4.7245	4.7239	.0005	.0005
16	14		4.9213	4.9208	4.9218	4.9211	.0002	.0010	4.9214	4.9207	.0006	.0006
17	15	12	5.1181	5.1176	5.1186	5.1179			5.1182	5.1175		
18	16	13	5.5118	5.5113	5.5123	5.5116	.0002	.0010	5.5119	5.5112	.0006	.0006
19			5.7087	5.7082	5.7092	5.7085			5.7088	5.7081		
20	17	14	5.9055	5.9050	5.9060	5.9053	.0002	.0010	5.9056	5.9048	.0006	.0006
21	18	15	6.2992	6.2986	6.2998	6.2990	.0002	.0012	6.2993	6.2985	.0007	.0007
22	19	16	6.6929	6.6923	6.6935	6.6927	.0002	.0012	6.6930	6.6922	.0007	.0007
24	20	17	7.0866	7.0860	7.0872	7.0864	.0002	.0012	7.0867	7.0859	.0007	.0007
	21	18	7.4803	7.4796	7.4810	7.4801	.0002	.0014	7.4805	7.4796	.0007	.0009
26	22	19	7.8740	7.8733	7.8747	7.8738	.0002	.0014	7.8742	7.8733	.0007	.0009
28			8.2677	8.2670	8.2684	8.2675			8.2679	8.2670		
	24	20	8.4646	8.4639	8.4653	8.4644	.0002	.0014	8.4648	8.4639	.0007	.0009
30		21	8.8583	8.8576	8.8590	8.8581			8.8585	8.8576		
	26		9.0551	9.0544	9.0558	9.0549			9.0553	9.0544		
32		22	9.4488	9.4481	9.4495	9.4486	.0002	.0014	9.4490	9.4481	.0007	.0009
	28		9.8425	9.8418	9.8432	9.8423			9.8427	9.8418		
34		24	10.2362	10.2354	10.2369	10.2359			10.2364	10.2354		
	30		10.6299	10.6291	10.6306	10.6296	.0003	.0015	10.6301	10.6291	.0008	.0010
36		26	11.0236	11.0228	11.0243	11.0233			11.0238	11.0228		

SHAFT MOUNTING FITS—For A.B.E.C.—5 Tolerances

ABEC-5

Single Row Radial, Single Row Angular Contact, and Double Row Bearings

(Except Type 30. See page 71.)

These fits are intended for spindles and other applications requiring considerable rigidity and accuracy.

Obviously these cannot cover all mounting conditions, and where unusual circumstances such as heavy vibratory loads or special preloading, etc., are involved, modified fits should be obtained from the New Departure Sales Engineer.

Actually, with the limits given, closer fits will be obtained than indicated under "Theoretical Fits" in the table. See page 60.

Bearing Bore Numbers	BEARING BORE		SHAFT REVOLVING				SHAFT STATIONARY			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
0	.3937	.3935	.3938	.3936			.3936	.3934		
1	.4724	.4722	.4725	.4723	.0003	.0001	.4723	.4721	.0001	.0003
2	.5906	.5904	.5907	.5905			.5905	.5903		
3	.6693	.6691	.6694	.6692			.6692	.6690		
4	.7874	.7872	.7875	.7873	.0003	.0001	.7873	.7871	.0001	.0003
5	.9843	.9841	.9844	.9842			.9842	.9840		
6	1.1811	1.1809	1.1812	1.1810	.0003	.0001	1.1810	1.1808	.0001	.0003
7	1.3780	1.3778	1.3782	1.3779	.0004	.0001	1.3779	1.3776	.0001	.0004
8	1.5748	1.5746	1.5750	1.5747	.0004	.0001	1.5747	1.5744	.0001	.0004
9	1.7717	1.7715	1.7719	1.7716	.0004	.0001	1.7716	1.7713	.0001	.0004
10	1.9685	1.9683	1.9687	1.9684	.0004	.0001	1.9684	1.9681	.0001	.0004
11	2.1654	2.1651	2.1656	2.1653	.0005	.0001	2.1652	2.1649	.0001	.0005
12	2.3622	2.3619	2.3624	2.3621			2.3620	2.3617		
13	2.5591	2.5588	2.5593	2.5590	.0005	.0001	2.5589	2.5586	.0001	.0005
14	2.7559	2.7556	2.7561	2.7558			2.7557	2.7554		
15	2.9528	2.9525	2.9530	2.9527			2.9526	2.9523		
16	3.1496	3.1493	3.1498	3.1495	.0005	.0001	3.1494	3.1491	.0001	.0005
17	3.3465	3.3462	3.3467	3.3464			3.3463	3.3460		
18	3.5433	3.5430	3.5435	3.5432			3.5431	3.5428		
19	3.7402	3.7399	3.7404	3.7401	.0005	.0001	3.7400	3.7397	.0001	.0005
20	3.9370	3.9367	3.9372	3.9369			3.9368	3.9365		
21	4.1339	4.1336	4.1341	4.1338			4.1337	4.1334		
22	4.3307	4.3304	4.3309	4.3306	.0005	.0001	4.3305	4.3302	.0001	.0005
24	4.7244	4.7241	4.7246	4.7243			4.7242	4.7239		
26	5.1181	5.1177	5.1183	5.1179			5.1179	5.1175		
28	5.5118	5.5114	5.5120	5.5116	.0006	.0002	5.5116	5.5112	.0002	.0006
30	5.9055	5.9051	5.9057	5.9053			5.9053	5.9049		
32	6.2992	6.2988	6.2994	6.2990			6.2990	6.2986		
34	6.6929	6.6925	6.6931	6.6927	.0006	.0002	6.6927	6.6923	.0002	.0006
36	7.0866	7.0862	7.0868	7.0864			7.0864	7.0860		

ABEC-5 HOUSING MOUNTING FITS—For A.B.E.C.—5 Tolerances

Single Row Radial, Single Row Angular Contact and Double Row Bearings

(Except Type 30. See page 71.)

The fits in this table are for applications requiring considerable rigidity and accuracy and housing bores should be smoothly finished, as by grinding or reaming. Where conditions exist which require variation in the fits, such as the use of soft metal housings, heavy or vibratory loads, or special preloading, recommendations may be obtained from the New Departure Sales Engineer.

The actual fits obtained with the limits given will average closer than those listed under "Theoretical Fits" below. See page 60.

Bearing Bore Numbers			BEARING OUTER DIAM.		HOUSING STATIONARY				HOUSING REVOLVING			
Series			Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
E.L.	L.	M.	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
0			1.0236	1.0234	1.0239	1.0236			1.0236	1.0233		
1			1.1024	1.1022	1.1027	1.1024	.0000	.0005	1.1024	1.1021	.0003	.0002
	0		1.1811	1.1809	1.1814	1.1811			1.1811	1.1808		
2	1		1.2598	1.2596	1.2601	1.2598			1.2598	1.2595		
3	2	0	1.3780	1.3778	1.3783	1.3780	.0000	.0005	1.3780	1.3777	.0003	.0002
		1	1.4567	1.4565	1.4570	1.4567			1.4567	1.4564		
	3		1.5748	1.5746	1.5751	1.5748			1.5748	1.5745		
4		2	1.6535	1.6533	1.6538	1.6535	.0000	.0005	1.6535	1.6532	.0003	.0002
5	4	3	1.8504	1.8502	1.8507	1.8504			1.8504	1.8501		
	5	4	2.0472	2.0469	2.0475	2.0472			2.0472	2.0469		
6			2.1654	2.1651	2.1657	2.1654	.0000	.0006	2.1654	2.1651	.0003	.0003
7	6	5	2.4409	2.4406	2.4412	2.4409			2.4409	2.4406		
8			2.6772	2.6769	2.6775	2.6772			2.6772	2.6769		
	7	6	2.8346	2.8343	2.8349	2.8346	.0000	.0006	2.8346	2.8343	.0003	.0003
9			2.9528	2.9525	2.9531	2.9528			2.9528	2.9525		
10	8	7	3.1496	3.1493	3.1499	3.1496	.0000	.0006	3.1496	3.1493	.0003	.0003
	9		3.3465	3.3462	3.3468	3.3464	.0001	.0006	3.3465	3.3461	.0004	.0003
11	10	8	3.5433	3.5430	3.5436	3.5432	.0001	.0006	3.5433	3.5429	.0004	.0003
12			3.7402	3.7399	3.7405	3.7401			3.7402	3.7398		
13	11	9	3.9370	3.9367	3.9373	3.9369	.0001	.0006	3.9370	3.9366	.0004	.0003
14	12	10	4.3307	4.3304	4.3310	4.3306			4.3307	4.3303		
15			4.5276	4.5273	4.5279	4.5275	.0001	.0006	4.5276	4.5272	.0004	.0003
	13	11	4.7244	4.7241	4.7247	4.7243	.0001	.0006	4.7244	4.7240	.0004	.0003
16	14		4.9213	4.9209	4.9217	4.9212	.0001	.0008	4.9213	4.9208	.0005	.0004
17	15	12	5.1181	5.1177	5.1185	5.1180			5.1181	5.1176		
18	16	13	5.5118	5.5114	5.5122	5.5117	.0001	.0008	5.5118	5.5113	.0005	.0004
19			5.7087	5.7083	5.7091	5.7086			5.7087	5.7082		
20	17	14	5.9055	5.9051	5.9059	5.9054	.0001	.0008	5.9055	5.9050	.0005	.0004
21	18	15	6.2992	6.2987	6.2997	6.2991	.0001	.0010	6.2992	6.2986	.0006	.0005
22	19	16	6.6929	6.6924	6.6934	6.6928	.0001	.0010	6.6929	6.6923	.0006	.0005
24	20	17	7.0866	7.0861	7.0871	7.0865			7.0866	7.0860	.0006	.0005
	21	18	7.4803	7.4798	7.4808	7.4802	.0001	.0010	7.4804	7.4797	.0006	.0006
26	22	19	7.8740	7.8735	7.8745	7.8739			7.8741	7.8734	.0006	.0006
28			8.2677	8.2672	8.2682	8.2676			8.2678	8.2671		
	24	20	8.4646	8.4641	8.4651	8.4645	.0001	.0010	8.4647	8.4640	.0006	.0006
30		21	8.8583	8.8578	8.8588	8.8582			8.8584	8.8577		
	26		9.0551	9.0546	9.0556	9.0550			9.0552	9.0545		
32		22	9.4488	9.4483	9.4493	9.4487	.0001	.0010	9.4489	9.4482	.0006	.0006
	28		9.8425	9.8420	9.8430	9.8424			9.8426	9.8419		
34		24	10.2362	10.2357	10.2367	10.2360			10.2364	10.2356		
	30		10.6299	10.6294	10.6304	10.6297	.0002	.0010	10.6301	10.6293	.0006	.0007
36		26	11.0236	11.0231	11.0241	11.0234			11.0238	11.0230		

SHAFT MOUNTING FITS—For A.B.E.C.—7 Tolerances

ABEC-7

Single Row Radial and Single Row Angular Contact Bearings

Fits obtained from this table are for precision spindles and other similar parts requiring exceptional accuracy and rigidity in mounting. Bearing seats on shafts must be very accurately and smoothly finished. Where conditions such as heavy or vibratory loads, or special preloading are to be in effect, correct modifications of these fits may be obtained from the New Departure Sales Engineer.

The fits actually obtained from the limits given will average materially closer than those listed below under "Theoretical Fits." See page 60.

Bearing Bore Numbers	BEARING BORE		SHAFT REVOLVING				SHAFT STATIONARY			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
0	.3937	.39355	.39375	.3936			.39365	.3935		
1	.4724	.47225	.47245	.4723	.0002	.0001	.47235	.4722	.0001	.0002
2	.5906	.59045	.59065	.5905			.59055	.5904		
3	.6693	.66915	.66935	.6692			.66925	.6691		
4	.7874	.78725	.78745	.7873	.0002	.0001	.78735	.7872	.0001	.0002
5	.9843	.98415	.98435	.9842			.98425	.9841		
6	1.1811	1.18095	1.18115	1.1810	.0002	.0001	1.18105	1.1809	.0001	.0002
7	1.3780	1.3778	1.3781	1.3779	.0003	.0001	1.3779	1.3777	.0001	.0003
8	1.5748	1.5746	1.5749	1.5747	.0003	.0001	1.5747	1.5745	.0001	.0003
9	1.7717	1.7715	1.7718	1.7716	.0003	.0001	1.7716	1.7714	.0001	.0003
10	1.9685	1.9683	1.9686	1.9684	.0003	.0001	1.9684	1.9682	.0001	.0003
11	2.1654	2.1652	2.1656	2.1653	.0004	.0001	2.1653	2.1650	.0001	.0004
12	2.3622	2.3620	2.3624	2.3621			2.3621	2.3618		
13	2.5591	2.5589	2.5593	2.5590	.0004	.0001	2.5590	2.5587	.0001	.0004
14	2.7559	2.7557	2.7561	2.7558			2.7558	2.7555		
15	2.9528	2.9526	2.9530	2.9527			2.9527	2.9524		
16	3.1496	3.1494	3.1498	3.1495	.0004	.0001	3.1495	3.1492	.0001	.0004
17	3.3465	3.34625	3.34665	3.3464			3.34635	3.3461		
18	3.5433	3.54305	3.54345	3.5432			3.54315	3.5429		
19	3.7402	3.73995	3.74035	3.7401	.0004	.0001	3.74005	3.7398	.0001	.0004
20	3.9370	3.93675	3.93715	3.9369			3.93685	3.9366		
21	4.1339	4.13365	4.13405	4.1338			4.13375	4.1335		
22	4.3307	4.33045	4.33085	4.3306	.0004	.0001	4.33055	4.3303	.0001	.0004
24	4.7244	4.72415	4.72455	4.7243			4.72425	4.7240		
26	5.1181	5.1178	5.1182	5.1179			5.1180	5.1177		
28	5.5118	5.5115	5.5119	5.5116	.0004	.0002	5.5117	5.5114	.0002	.0004
30	5.9055	5.9052	5.9056	5.9053			5.9054	5.9051		
32	6.2992	6.2989	6.2993	6.2990			6.2991	6.2988		
34	6.6929	6.6926	6.6930	6.6927	.0004	.0002	6.6928	6.6925	.0002	.0004
36	7.0866	7.0863	7.0867	7.0864			7.0865	7.0862		

ABEC-7 HOUSING MOUNTING FITS—For A.B.E.C.—7 Tolerances

Single Row Radial and Single Row Angular Contact Bearings

These housing fits are for precision spindles and other parts requiring exceptional accuracy and rigidity of support. Housing bores must be straight and brought to size by grinding or other methods capable of a quality of finish equal to the bearing bore and O.D.

Where soft housings, vibratory loads, or special preloads require modification of these fits, they may be obtained from the New Departure Sales Engineer.

In practice, fits from the limits listed will average closer than those given under "Theoretical Fits" below. Refer to page 60.

Bearing Bore Numbers			BEARING OUTER DIAM.		HOUSING STATIONARY				HOUSING REVOLVING			
Series			Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
E.L.	L.	M.	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
0			1.0236	1.0234	1.0238	1.0236			1.02355	1.02335		
1			1.1024	1.1022	1.1026	1.1024	.0000	.0004	1.10235	1.10215	.00025	.00015
	0		1.1811	1.1809	1.1813	1.1811			1.18105	1.18085		
2	1		1.2598	1.2596	1.2600	1.2598			1.25975	1.25955		
3	2	0	1.3780	1.3778	1.3782	1.3780	.0000	.0004	1.37795	1.37775	.00025	.00015
		1	1.4567	1.4565	1.4569	1.4567			1.45665	1.45645		
	3		1.5748	1.5746	1.5750	1.5748			1.57475	1.57455		
4		2	1.6535	1.6533	1.6537	1.6535	.0000	.0004	1.65345	1.65325	.00025	.00015
5	4	3	1.8504	1.8502	1.8506	1.8504			1.85035	1.85015		
	5	4	2.0472	2.0470	2.0474	2.0472			2.04715	2.04695		
6			2.1654	2.1652	2.1656	2.1654	.0000	.0004	2.16535	2.16515	.00025	.00015
7	6	5	2.4409	2.4407	2.4411	2.4409			2.44085	2.44065		
8			2.6772	2.6770	2.6774	2.6772			2.67715	2.67695		
	7	6	2.8346	2.8344	2.8348	2.8346	.0000	.0004	2.83455	2.83435	.00025	.00015
9			2.9528	2.9526	2.9530	2.9528			2.95275	2.95255		
10	8	7	3.1496	3.1494	3.1498	3.1496	.0000	.0004	3.14955	3.14935	.00025	.00015
	9		3.3465	3.3462	3.3467	3.3464	.0001	.0005	3.3465	3.3462	.0003	.0003
11	10	8	3.5433	3.5430	3.5435	3.5432			3.5433	3.5430		
12			3.7402	3.7399	3.7404	3.7401			3.7402	3.7399		
13	11	9	3.9370	3.9367	3.9372	3.9369	.0001	.0005	3.9370	3.9367	.0003	.0003
14	12	10	4.3307	4.3304	4.3309	4.3306			4.3307	4.3304		
15			4.5276	4.5273	4.5278	4.5275	.0001	.0005	4.5276	4.5273	.0003	.0003
	13	11	4.7244	4.7241	4.7246	4.7243	.0001	.0005	4.7244	4.7241	.0003	.0003
16	14		4.9213	4.9209	4.9216	4.9212	.0001	.0007	4.9213	4.9209	.0004	.0004
17	15	12	5.1181	5.1177	5.1184	5.1180			5.1181	5.1177		
18	16	13	5.5118	5.5114	5.5121	5.5117	.0001	.0007	5.5118	5.5114	.0004	.0004
19			5.7087	5.7083	5.7090	5.7086			5.7087	5.7083		
20	17	14	5.9055	5.9051	5.9058	5.9054			5.9055	5.9051		
21	18	15	6.2992	6.2988	6.2995	6.2991	.0001	.0007	6.2992	6.2988	.0004	.0004
22	19	16	6.6929	6.6925	6.6932	6.6928			6.6929	6.6925		
24	20	17	7.0866	7.0862	7.0869	7.0865			7.0866	7.0862		
	21	18	7.4803	7.4799	7.4806	7.4802	.0001	.0007	7.4803	7.4799	.0004	.0004
26	22	19	7.8740	7.8736	7.8743	7.8739			7.8740	7.8736		
28			8.2677	8.2673	8.2680	8.2676			8.2677	8.2673		
	24	20	8.4646	8.4642	8.4649	8.4645	.0001	.0007	8.4646	8.4642	.0004	.0004
30		21	8.8583	8.8579	8.8586	8.8582			8.8583	8.8579		
	26		9.0551	9.0547	9.0554	9.0550			9.0551	9.0547		
32		22	9.4488	9.4484	9.4491	9.4487	.0001	.0007	9.4488	9.4484	.0004	.0004
	28		9.8425	9.8421	9.8428	9.8424			9.8425	9.8421		
34		24	10.2362	10.2357	10.2365	10.2360			10.2363	10.2357		
	30		10.6299	10.6294	10.6302	10.6297	.0002	.0008	10.6300	10.6294	.0005	.0006
36		26	11.0236	11.0231	11.0239	11.0234			11.0237	11.0231		

SHAFT MOUNTING FITS—For A.B.E.C.—1 Tolerances

ABEC-1

Single Row Type 30. N-D Seal Bearings not to Standard Single Row Widths

The fits given in this table are satisfactory for nearly all general or average bearing applications. However, for some mounting conditions, certain modifications of these fits may be required.

In general, soft shafts; those not having smoothly ground bearing seats, and those subject to very heavy or vibratory loads, need tighter than average fits. Correct fits for any special conditions will be supplied by the New Departure Sales Engineer.

For explanation of "Expected Fits" listed below, see page 60.

Bearing Numbers	BEARING BORE Diameters		SHAFT REVOLVING Diameters		Expected Fit		Theoret. Fit		SHAFT STATIONARY Diameters		Expected Fit		Theoret. Fit	
	Max.	Min.	Max.	Min.	Loose or Tight	Tight	Loose	Tight	Max.	Min.	Max. Loose	Min. Loose	Loose	Tight
34	.1575	.1572	.1576	.1573					.1574	.1571				
35	.1969	.1966	.1970	.1967	.0001L	.0003	.0002	.0004	.1968	.1965	.0003	.0001T	.0004	.0002
36	.2362	.2359	.2363	.2360					.2361	.2358				
37	.2756	.2753	.2757	.2754					.2755	.2752				
38	.3150	.3147	.3151	.3148	.0001L	.0003	.0002	.0004	.3149	.3146	.0003	.0001T	.0004	.0002
39	.3543	.3540	.3544	.3541					.3542	.3539				
8006	.2362	.2359	.2363	.2360					.2361	.2358				
8007, 8037	.2756	.2753	.2757	.2754	.0001L	.0003	.0002	.0004	.2755	.2752	.0003	.0001T	.0004	.0002
8008, 8038	.3150	.3147	.3151	.3148					.3149	.3146				
8009, 8039	.3543	.3540	.3544	.3541	.0001L	.0003	.0002	.0004	.3542	.3539	.0003	.0001T	.0004	.0002
8011	.4331	.4328	.4333	.4330	.0000L	.0004	.0001	.0005	.4329	.4326	.0004	.0000	.0005	.0001
8013	.5118	.5115	.5120	.5117	.0000L	.0004	.0001	.0005	.5116	.5113	.0004	.0000	.0005	.0001
8014	.5512	.5509	.5514	.5511	.0000L	.0004	.0001	.0005	.5510	.5507	.0004	.0000	.0005	.0001
8016	.6299	.6296	.6301	.6298	.0000L	.0004	.0001	.0005	.6297	.6294	.0004	.0000	.0005	.0001
8026	1.0236	1.0232	1.0239	1.0235	.0000L	.0006	.0001	.0007	1.0233	1.0229	.0006	.0000	.0007	.0001

HOUSING MOUNTING FITS—For A.B.E.C.—1 Tolerances

Single Row Type 30. N-D Seal Bearings not to Standard Single Row Widths

The fits given in this table are satisfactory for nearly all general or average bearing applications. However, for some mounting conditions, certain modification of these fits may be required.

In general, soft metal housings, particularly when revolving, and those subject to heavy or vibratory loads, need tighter than average fits. For best results, housings should have a smooth finish such as produced by grinding or reaming.

Correct fits for any special conditions will be supplied by the New Departure Sales Engineer.

In practice the actual fits obtained will be closer than those listed under "Theoretical Fits" below. See page 60.

Bearing Numbers	BEARING OUTER DIAM. Diameters		HOUSING STATIONARY Diameters		Theoret. Fit		HOUSING REVOLVING Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
34	.6299	.6295	.6303	.6298			.6299	.6294		
35, 36	.7480	.7476	.7484	.7479	.0001	.0008	.7480	.7475	.0005	.0004
37, 38	.8661	.8657	.8665	.8660			.8661	.8656		
39, 8039	1.0236	1.0232	1.0240	1.0235			1.0236	1.0231		
8037, 8038	.8661	.8657	.8665	.8660			.8661	.8656		
8006, 7 & 8	.9449	.9445	.9453	.9448	.0001	.0008	.9449	.9444	.0005	.0004
8009	1.1811	1.1807	1.1815	1.1810			1.1811	1.1806		
8011, 8013	1.2598	1.2593	1.2603	1.2597			1.2598	1.2592		
8014, 8016	1.3780	1.3775	1.3785	1.3779	.0001	.0010	1.3780	1.3774	.0006	.0005
8026	2.0472	2.0467	2.0477	2.0471			2.0472	2.0466		

ABEC-3 SHAFT MOUNTING FITS—For A.B.E.C.—3 Tolerances

Single Row Type 30. N-D Seal Bearings not to Standard Single Row Widths

The fits given in this table are intended for applications requiring greater accuracy in certain respects than for general use.

Modification for some mounting conditions may be required, such as for very heavy or vibratory loads where somewhat tighter fits are desired.

Correct fits for any special conditions will be supplied by the New Departure Sales Engineer.

Actually, with these limits, closer fits will be obtained than listed under "Theoretical Fits." See page 60.

Bearing Numbers	BEARING BORE		SHAFT REVOLVING				SHAFT STATIONARY			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
34	.1575	.1573	.1576	.1573			.1575	.1572		
35	.1969	.1967	.1970	.1967	.0003	.0002	.1969	.1966	.0002	.0003
36	.2362	.2360	.2363	.2360			.2362	.2359		
37	.2756	.2754	.2757	.2754			.2756	.2753		
38	.3150	.3148	.3151	.3148	.0003	.0002	.3150	.3147	.0002	.0003
39	.3543	.3541	.3544	.3541			.3543	.3540		
8006	.2362	.2360	.2363	.2360			.2362	.2359		
8007, 8037	.2756	.2754	.2757	.2754	.0003	.0002	.2756	.2753	.0002	.0003
8008, 8038	.3150	.3148	.3151	.3148			.3150	.3147		
8009, 8039	.3543	.3541	.3544	.3541	.0003	.0002	.3543	.3540	.0002	.0003
8011	.4331	.4329	.4333	.4330	.0004	.0001	.4330	.4327	.0001	.0004
8013	.5118	.5116	.5120	.5117	.0004	.0001	.5117	.5114	.0001	.0004
8014	.5512	.5510	.5514	.5511			.5511	.5508		
8016	.6299	.6297	.6301	.6298	.0004	.0001	.6298	.6295	.0001	.0004
8026	1.0236	1.0234	1.0238	1.0235			1.0235	1.0232		

HOUSING MOUNTING FITS—For A.B.E.C.—3 Tolerances

Single Row Type 30. N-D Seal Bearings not to Standard Single Row Widths

The fits given in this table are intended for applications requiring greater accuracy in certain respects than for general use.

Modification for some conditions may be required, such as for soft metal housings, particularly when revolving, or those subject to heavy or vibratory loads, where somewhat tighter fits are necessary. Housings should be smoothly finished as by grinding or reaming.

Fits for any special conditions will be supplied by New Departure Sales Engineer.

Actual fits with these limits will be closer than listed under "Theoretical Fits" below. See page 60.

Bearing Numbers	BEARING OUTER DIAM.		HOUSING STATIONARY				HOUSING REVOLVING			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
34	.6299	.6296	.6302	.6298			.6299	.6295		
35, 36	.7480	.7477	.7483	.7479	.0001	.0006	.7480	.7476	.0004	.0003
37, 38	.8661	.8658	.8664	.8660			.8661	.8657		
39, 8039	1.0236	1.0233	1.0239	1.0235			1.0236	1.0232		
8037, 8038	.8661	.8658	.8664	.8660						
8006, 7 & 8	.9449	.9446	.9452	.9448	.0001	.0006				
8009	1.1811	1.1808	1.1814	1.1810						
8011, 8013	1.2598	1.2595	1.2602	1.2597	.0001	.0007				
8014, 8016	1.3780	1.3777	1.3784	1.3779	.0001	.0007				
8026	2.0472	2.0468	2.0476	2.0471	.0001	.0008				

ABEC-5

SHAFT AND HOUSING MOUNTING FITS—For A.B.E.C.—5 Tolerances

Single Row Type 30

The fits given in these tables are for parts requiring considerable accuracy and rigidity in mounting. Shaft seats and housing bores should be smoothly ground or brought to size by method giving a quality of finish equal to the bearing bore and O.D.

Some conditions, such as soft shafts or soft alloy housings, heavy or vibratory loads or special preloads, may require modification of these fits. Proper fits for any special conditions will be furnished by the New Departure Sales Engineer.

Actual fits obtained from the limits listed will be closer than given under "Theoretical Fits" below. See page 60.

Shaft

Bearing Numbers	BEARING BORE		SHAFT REVOLVING				SHAFT STATIONARY			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
34	.1575	.1573	.1575	.1573			.1575	.1573		
35	.1969	.1967	.1969	.1967	.0002	.0002	.1969	.1967	.0002	.0002
36	.2362	.2360	.2362	.2360			.2362	.2360		
37	.2756	.2754	.2756	.2754			.2756	.2754		
38	.3150	.3148	.3150	.3148	.0002	.0002	.3150	.3148	.0002	.0002
39	.3543	.3541	.3543	.3541			.3543	.3541		

Housing

Bearing Numbers	BEARING OUTER DIAM.		HOUSING STATIONARY				HOUSING REVOLVING			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
34	.6299	.6297	.6302	.6299			.6299	.6296		
35, 36	.7480	.7478	.7483	.7480	.0000	.0005	.7480	.7477	.0003	.0002
37, 38	.8661	.8659	.8664	.8661			.8661	.8658		
39	1.0236	1.0234	1.0239	1.0236			1.0236	1.0233		

ABEC-1

SHAFT AND HOUSING MOUNTING FITS—For A.B.E.C.—1 Tolerances

Inch Series Bearings

These fits are intended for all general or average bearing applications. In some instances, conditions such as soft shafts, soft alloy housings, heavy or vibratory loads, etc., may require modification of the fits. Correct fits for such circumstances may be obtained from the New Departure Sales Engineer.

Actual fits obtained with the limits given will be closer than listed under "Theoretical Fits" below. See page 60 for explanation of "Expected," and "Theoretical" fits.

Shaft

Bearing Numbers	BEARING BORE Diameters		SHAFT REVOLVING Diameters		Expected Fit		Theoret. Fit		SHAFT STATIONARY Diameters		Expected Fit		Theoret. Fit	
	Max.	Min.	Max.	Min.	Loose or Tight	Tight	Loose	Tight	Max.	Min.	Max. Loose	Min. Loose	Loose	Tight
R-2	.1250	.1247	.1251	.1248					.1249	.1246				
R-2-A	.1250	.1247	.1251	.1248	.0001L	.0003	.0002	.0004	.1249	.1246	.0003	.0001T	.0004	.0002
R-3	.1875	.1872	.1876	.1873					.1874	.1871				
R-4	.2500	.2497	.2501	.2498					.2499	.2496				
R-4-A	.2500	.2497	.2501	.2498	.0001L	.0003	.0002	.0004	.2499	.2496	.0003	.0001T	.0004	.0002
R-6	.3750	.3747	.3751	.3748					.3749	.3746				
R-8	.5000	.4997	.5002	.4999	.0000L	.0004	.0001	.0005	.4998	.4995	.0004	.0000	.0005	.0001
R-10	.6250	.6247	.6252	.6249	.0000L	.0004	.0001	.0005	.6248	.6245	.0004	.0000	.0005	.0001
R-12	.7500	.7496	.7503	.7499	.0000L	.0006	.0001	.0007	.7497	.7493	.0006	.0000	.0007	.0001
R-14	.8750	.8746	.8753	.8749					.8747	.8743				
R-16	1.0000	.9996	1.0003	.9999	.0000L	.0006	.0001	.0007	.9997	.9993	.0006	.0000	.0007	.0001
R-18	1.1250	1.1246	1.1253	1.1249					1.1247	1.1243				
R-20	1.2500	1.2495	1.2504	1.2499					1.2496	1.2491				
R-22	1.3750	1.3745	1.3754	1.3749	.0001T	.0007	.0001	.0009	1.3746	1.3741	.0007	.0001	.0009	.0001
R-24	1.5000	1.4995	1.5004	1.4999					1.4996	1.4991				

Housing

Bearing Numbers	BEARING OUTER DIAM. Diameters		HOUSING STATIONARY Diameters		Theoret. Fit		HOUSING REVOLVING Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
R-2	.3750	.3746	.3754	.3749			.3750	.3745		
R-2-A	.5000	.4996	.5004	.4999	.0001	.0008	.5000	.4995	.0005	.0004
R-3	.5000	.4996	.5004	.4999			.5000	.4995		
R-4	.6250	.6246	.6254	.6249			.6250	.6245		
R-4-A	.7500	.7496	.7504	.7499	.0001	.0008	.7500	.7495	.0005	.0004
R-6	.8750	.8746	.8754	.8749			.8750	.8745		
R-8	1.1250	1.1246	1.1254	1.1249	.0001	.0008	1.1250	1.1245	.0005	.0004
R-10	1.3750	1.3745	1.3755	1.3749	.0001	.0010	1.3750	1.3744	.0006	.0005
R-12	1.6250	1.6245	1.6255	1.6249	.0001	.0010	1.6250	1.6244	.0006	.0005
R-14	1.8750	1.8745	1.8755	1.8749			1.8750	1.8744		
R-16	2.0000	1.9995	2.0005	1.9999	.0001	.0010	2.0000	1.9994	.0006	.0005
R-18	2.1250	2.1245	2.1255	2.1249			2.1250	2.1244		
R-20	2.2500	2.2495	2.2505	2.2499			2.2500	2.2494		
R-22	2.5000	2.4995	2.5005	2.4999	.0001	.0010	2.5000	2.4994	.0006	.0005
R-24	2.6250	2.6245	2.6255	2.6249			2.6250	2.6244		

ABEC-3

SHAFT AND HOUSING MOUNTING FITS—For A.B.E.C.—3 Tolerances

Inch Series Bearings

These fits are intended for applications requiring greater accuracy in certain respects than for general use. In some instances, conditions such as the use of soft alloy housings, heavy or vibratory loads, etc., may require modification of the fits. Correct fits for such circumstances may be obtained from the New Departure Sales Engineer.

Actual fits obtained with the limits given will be closer than listed under "Theoretical Fits" below. See page 60 for explanation of "Expected," and "Theoretical" fits.

Shaft

Bearing Numbers	BEARING BORE		SHAFT REVOLVING				SHAFT STATIONARY			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
R-2	.1250	.1248	.1251	.1248			.1250	.1247		
R-2-A	.1250	.1248	.1251	.1248	.0003	.0002	.1250	.1247	.0002	.0003
R-3	.1875	.1873	.1876	.1873			.1875	.1872		
R-4	.2500	.2498	.2501	.2498			.2500	.2497		
R-4-A	.2500	.2498	.2501	.2498	.0003	.0002	.2500	.2497	.0002	.0003
R-6	.3750	.3748	.3751	.3748			.3750	.3747		
R-8	.5000	.4998	.5002	.4999			.4999	.4996		
R-10	.6250	.6248	.6252	.6249	.0004	.0001	.6249	.6246	.0001	.0004
R-12	.7500	.7498	.7502	.7499			.7499	.7496		
R-14	.8750	.8748	.8752	.8749			.8749	.8746		
R-16	1.0000	.9998	1.0002	.9999	.0004	.0001	.9999	.9996	.0001	.0004
R-18	1.1250	1.1248	1.1252	1.1249			1.1249	1.1246		
R-20	1.2500	1.2497	1.2503	1.2499			1.2498	1.2494		
R-22	1.3750	1.3747	1.3753	1.3749	.0006	.0001	1.3748	1.3744	.0001	.0006
R-24	1.5000	1.4997	1.5003	1.4999			1.4998	1.4994		

Housing

Bearing Numbers	BEARING OUTER DIAM.		HOUSING STATIONARY				HOUSING REVOLVING			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
R-2	.3750	.3747	.3753	.3749			.3750	.3746		
R-2-A	.5000	.4997	.5003	.4999	.0001	.0006	.5000	.4996	.0004	.0003
R-3	.5000	.4997	.5003	.4999			.5000	.4996		
R-4	.6250	.6247	.6253	.6249			.6250	.6246		
R-4-A	.7500	.7497	.7503	.7499	.0001	.0006	.7500	.7496	.0004	.0003
R-6	.8750	.8747	.8753	.8749			.8750	.8746		
R-8	1.1250	1.1247	1.1253	1.1249			1.1250	1.1246		
R-10	1.3750	1.3747	1.3753	1.3749	.0001	.0006	1.3750	1.3746	.0004	.0003
R-12	1.6250	1.6247	1.6253	1.6249			1.6250	1.6246		
R-14	1.8750	1.8747	1.8753	1.8749	.0001	.0006	1.8750	1.8746	.0004	.0003
R-16	2.0000	1.9996	2.0004	1.9999	.0001	.0008	2.0000	1.9995	.0005	.0004
R-18	2.1250	2.1246	2.1254	2.1249	.0001	.0008	2.1250	2.1245	.0005	.0004
R-20	2.2500	2.2496	2.2504	2.2499			2.2500	2.2495		
R-22	2.5000	2.4996	2.5004	2.4999	.0001	.0008	2.5000	2.4995	.0005	.0004
R-24	2.6250	2.6246	2.6254	2.6249			2.6250	2.6245		

ABEC-5

SHAFT AND HOUSING MOUNTING FITS—For A.B.E.C.—5 Tolerances

Inch Series Bearings

The fits given in these tables are for parts requiring considerable accuracy and rigidity in mounting. Shaft seats and housing bores should be smoothly ground or brought to size by methods giving a quality of finish equal to the bearing bore and O.D.

Some conditions, such as soft shafts or soft alloy housings, heavy or vibratory loads or special preloads, may require modification of these fits. Proper fits for any special conditions will be furnished by the New Departure Sales Engineer.

Actual fits obtained from the limits listed will be closer than given under "Theoretical Fits" below. See page 60.

Shaft

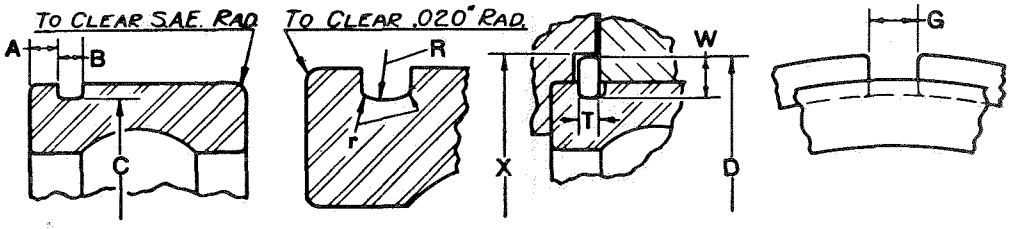
Bearing Numbers	BEARING BORE		SHAFT REVOLVING				SHAFT STATIONARY			
	Diameters		Diameters		Theoret. Fit.		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
R-2	.1250	.1248	.1250	.1248			.1250	.1248		
R-2-A	.1250	.1248	.1250	.1248	.0002	.0002	.1250	.1248	.0002	.0002
R-3	.1875	.1873	.1875	.1873			.1875	.1873		
R-4	.2500	.2498	.2500	.2498			.2500	.2498		
R-4-A	.2500	.2498	.2500	.2498	.0002	.0002	.2500	.2498	.0002	.0002
R-6	.3750	.3748	.3750	.3748			.3750	.3748		
R-8	.5000	.4998	.5001	.4999			.4999	.4997		
R-10	.6250	.6248	.6251	.6249	.0003	.0001	.6249	.6247	.0001	.0003
R-12	.7500	.7498	.7501	.7499			.7499	.7497		
R-14	.8750	.8748	.8751	.8749			.8749	.8747		
R-16	1.0000	.9998	1.0001	.9999	.0003	.0001	.9999	.9997	.0001	.0003
R-18	1.1250	1.1248	1.1251	1.1249			1.1249	1.1247		
R-20	1.2500	1.2498	1.2502	1.2499			1.2499	1.2496		
R-22	1.3750	1.3748	1.3752	1.3749	.0004	.0001	1.3749	1.3746	.0001	.0004
R-24	1.5000	1.4998	1.5002	1.4999			1.4999	1.4996		

Housing

Bearing Numbers	BEARING OUTER DIAM.		HOUSING STATIONARY				HOUSING REVOLVING			
	Diameters		Diameters		Theoret. Fit		Diameters		Theoret. Fit	
	Max.	Min.	Max.	Min.	Tight	Loose	Max.	Min.	Tight	Loose
R-2	.3750	.3748	.3753	.3750			.3750	.3747		
R-2-A	.5000	.4998	.5003	.5000	.0000	.0005	.5000	.4997	.0003	.0002
R-3	.5000	.4998	.5003	.5000			.5000	.4997		
R-4	.6250	.6248	.6253	.6250			.6250	.6247		
R-4-A	.7500	.7498	.7503	.7500	.0000	.0005	.7500	.7497	.0003	.0002
R-6	.8750	.8748	.8753	.8750			.8750	.8747		
R-8	1.1250	1.1248	1.1253	1.1250			1.1250	1.1247		
R-10	1.3750	1.3748	1.3753	1.3750	.0000	.0005	1.3750	1.3747	.0003	.0002
R-12	1.6250	1.6248	1.6253	1.6250			1.6250	1.6247		
R-14	1.8750	1.8748	1.8753	1.8750	.0000	.0005	1.8750	1.8747	.0003	.0002
R-16	2.0000	1.9997	2.0003	2.0000	.0000	.0006	2.0000	1.9997	.0003	.0003
R-18	2.1250	2.1247	2.1253	2.1250	.0000	.0006	2.1250	2.1247	.0003	.0003
R-20	2.2500	2.2497	2.2503	2.2500			2.2500	2.2497		
R-22	2.5000	2.4997	2.5003	2.5000	.0000	.0006	2.5000	2.4997	.0003	.0003
R-24	2.6250	2.6247	2.6253	2.6250			2.6250	2.6247		

SNAP RINGS

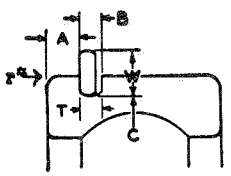
Snap rings are available for the bearings so indicated in the preceding sections (ABEC spec. 1 & 3) and the detailed dimensions are shown below.



Bearing Number				A L00 Series	A 2, 3, 400 Series	B Width	C Dia.	R Rad.	r Rad.	D Dia.	T Thick	W Width	G Gap	X C'Bore Min.
Extra Light	Lt.	Med.	Hvy.											
L00														
L01														
	200				.078	.056	1.109	.040	.010	1 23/64	.042	.125	1/8	1 25/64
L02	201			.078	.078	.056	1.187	.040	.010	1 7/16	.042	.125	1/8	1 15/32
L03	202	300		.078	.078	.056	1.306	.040	.010	1 35/64	.042	.125	1/8	1 37/64
		301			.078	.056	1.369	.040	.010	1 39/64	.042	.125	1/8	1 41/64
	203				.078	.056	1.500	.040	.010	1 3/4	.042	.125	1/8	1 25/32
L04		302		.078	.078	.056	1.565	.040	.010	1 13/16	.042	.125	1/8	1 27/32
L05	204	303		.078	.094	.056	1.756	.040	.010	2 1/16	.042	.156	1/8	2 3/32
	205	304			.094	.056	1.958	.040	.010	2 17/64	.042	.156	3/16	2 19/64
L06				.078		.056	2.071	.040	.010	2 3/8	.042	.156	3/16	2 13/32
L07	206	305	403	.078	.125	.078	2.347	.060	.015	2 31/32	.065	.156	3/16	2 11/16
L08				.094		.078	2.552	.060	.015	2 59/64	.065	.188	3/16	2 63/64
	207	306	404		.125	.078	2.709	.060	.015	3 5/64	.065	.188	3/16	3 9/64
L09				.094		.078	2.828	.060	.015	3 13/64	.065	.188	3/16	3 17/64
L10	208	307	405	.094	.125	.078	3.024	.060	.015	3 13/32	.065	.188	3/16	3 15/32
	209				.125	.078	3.221	.060	.015	3 19/32	.065	.188	3/16	3 21/32
L11	210	308	406	.109	.125	.109	3.417	.080	.020	3 51/64	.095	.188	3/16	3 55/64
L12				.109		.109	3.615	.080	.020	3 63/64	.095	.188	3/16	4 3/64
L13	211	309	407	.109	.125	.109	3.811	.080	.020	4 3/16	.095	.188	3/16	4 1/4
L14	212	310	408	.109	.125	.109	4.205	.080	.020	4 37/64	.095	.188	3/16	4 41/64
L15				.109		.109	4.402	.080	.020	4 25/32	.095	.188	3/16	4 27/32
	213	311	409		.156	.125	4.536	.090	.020	5 3/32	.109	.281	9/32	5 5/32
L16	214			.109	.156	.125	4.733	.090	.020	5 19/64	.109	.281	9/32	5 23/64
L17	215	312	410	.109	.156	.125	4.930	.090	.020	5 1/2	.109	.281	9/32	5 9/16
L18	216	313	411	.141	.188	.125	5.324	.090	.020	5 57/64	.109	.281	9/32	5 61/64
L19				.141		.125	5.521	.090	.020	6 5/64	.109	.281	9/32	6 9/64
L20	217	314	412	.141	.188	.125	5.718	.090	.020	6 9/32	.109	.281	9/32	6 11/32
L21	218	315	413	.141	.188	.125	6.111	.090	.020	6 43/64	.109	.281	9/32	6 47/64
L22	219	316		.141	.219	.141	6.443	.100	.020	7 3/16	.120	.375	3/8	7 1/4
L24	220	317	414	.141	.219	.141	6.837	.100	.020	7 19/32	.120	.375	3/8	7 21/32
	221	318	415		.219	.141	7.230	.100	.020	7 63/64	.120	.375	3/8	8 3/64
L26	222	319	416	.219	.219	.141	7.624	.100	.020	8 3/8	.120	.375	3/8	8 7/16
L28			417	.219	.219	.141	8.018	.100	.020	8 49/64	.120	.375	3/8	8 53/64
	224	320			.219	.141	8.215	.100	.020	8 31/32	.120	.375	3/8	9 1/32
L30		321	418	.219	.219	.141	8.608	.100	.020	9 23/64	.120	.375	3/8	9 27/64
	226				.219	.141	8.805	.100	.020	9 9/16	.120	.375	3/8	9 5/8
L32		322		.219	.219	.141	9.199	.100	.020	9 61/64	.120	.375	3/8	10 1/64

Snap Ring and Groove Tolerances

AFBMA and ND Standards



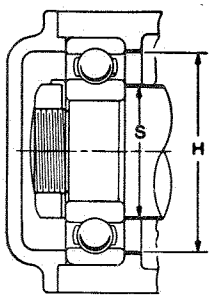
B = ±.003
T = ±.002
W = ±.003

Bore Numbers				A	C
Extra Light	Light	Medium	Heavy		
1-5	0-5	0-4		±.003	+.000 −.010
6				±.004	+.000 −.010
7-17	6-15	5-12	3-10	±.004	+.000 −.020
18-32	16-26	13-22	11-18	±.005	±.000 −.020

*On snap ring side of all snap ring bearings; r to clear .020" radius.

SHAFT AND HOUSING SHOULDERS

Single Row Radial, Ex.-Light, Light & Medium Series—Single Row Ang. Contact Extra-Light Series



"Recommended" shaft and housing shoulder diameters should be used whenever possible to assure adequate support of bearing under all load conditions. These shoulders will resist the maximum thrust which may be safely applied to bearing without developing stresses detrimental to any of the metals used for shafts or housings, including aluminum. Little is gained by shaft or housing shoulders greater than recommended. Larger shoulders may interfere with closures of sealed or shielded bearings. In general, "recommended" diameters expose enough inner ring face to allow removal without damage to sealed or shielded bearings.

"Minimum" shaft and "maximum" housing shoulder diameters are those considered necessary to align bearings properly and to provide ample resistance to light thrust loads.

Bearing Bore No.	EXTRA-LIGHT SERIES 3L00, 0L00 and H0L00 Shoulder Diameter				LIGHT SERIES 1200 and *3200 Shoulder Diameter				MEDIUM SERIES 1300 and *3300 Shoulder Diameter			
	S		H		S		H		S		H	
	Rec.	Min.	Rec.	Max.	Rec.	Min.	Rec.	Max.	Rec.	Min.	Rec.	Max.
0	.500		.920		.494		1.05		.494		1.23	
1	.570		1.000		.572		1.12		.632		1.26	
2	.690		1.15		.691		1.23		.750		1.44	
3	.780		1.27		.769		1.37		.829		1.62	
4	.940		1.50		1.000	.947	1.64		1.000	.947	1.78	1.85
5	1.14		1.69		1.20	1.14	1.84		1.24	1.14	2.16	2.24
6	1.37		1.94		1.40	1.34	2.18	2.24	1.44	1.34	2.55	2.64
7	1.58		2.21		1.63	1.54	2.56	2.64	1.70	1.62	2.77	2.85
8	1.78	1.74	2.44	2.48	1.82	1.73	2.85	2.95	1.92	1.82	3.15	3.24
9	2.00	1.93	2.70	2.75	2.05	1.93	3.05	3.15	2.14	2.01	3.50	3.64
10	2.19	2.13	2.90	2.95	2.21	2.13	3.24	3.34	2.44	2.29	3.80	3.93
11	2.43	2.32	3.27	3.34	2.48	2.40	3.55	3.64	2.75	2.48	4.18	4.32
12	2.63	2.52	3.46	3.54	2.74	2.60	3.91	4.03	2.97	2.68	4.55	4.72
13	2.83	2.72	3.65	3.74	2.90	2.80	4.28	4.42	3.20	2.88	4.92	5.11
14	3.06	2.92	4.02	4.13	3.11	3.00	4.49	4.62	3.42	3.08	5.29	5.51
15	3.24	3.11	4.22	4.33	3.39	3.19	4.68	4.82	3.65	3.27	5.66	5.90
16	3.47	3.31	4.58	4.72	3.67	3.47	4.99	5.11	3.88	3.47	6.02	6.29
17	3.67	3.51	4.78	4.92	3.90	3.67	5.34	5.50	4.16	3.75	6.33	6.59
18	3.92	3.78	5.08	5.21	4.11	3.86	5.73	5.90	4.38	3.94	6.70	6.98
19	4.11	3.98	5.28	5.41	4.34	4.06	6.10	6.29	4.62	4.14	7.06	7.37
20	4.31	4.18	5.48	5.61	4.57	4.26	6.46	6.69	4.84	4.34	7.64	7.96
21	4.57	4.45	5.78	5.90	4.80	4.45	6.83	7.08	5.07	4.53	8.01	8.36
22	4.83	4.65	6.16	6.29	5.03	4.65	7.19	7.47	5.29	4.73	8.59	8.95
24	5.22	5.04	6.56	6.69	5.44	5.04	7.76	8.06				
26	5.66	5.44	7.30	7.47	5.90	5.52	8.27	8.56				
28	6.05	5.83	7.69	7.87	6.36	5.91	9.00	9.34				
30	6.47	6.23	8.26	8.46								
36	7.75	7.41	10.30	10.62								

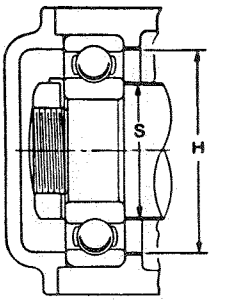
*Type **8000 and 9000** ND-Seal bearings based on type 3000 use same shoulders as Series 3200 and 3300 above.

SHAFT AND HOUSING SHOULDERS—Continued

Single Row Angular Contact—Light and Medium Series

"Recommended" shaft and housing shoulder diameters should be used whenever possible to assure adequate support of bearing under all load conditions. These shoulders will resist the maximum thrust which may be safely applied to bearing without developing stresses detrimental to any of the metals used for shafts or housings, including aluminum. Little is gained by shaft or housing shoulders greater than recommended. Larger shoulders may interfere with closures of sealed or shielded bearings. In general, "recommended" diameters expose enough inner ring face to allow removal without damage to sealed or shielded bearings.

"Minimum" shaft and "maximum" housing shoulder diameters are those considered necessary to align bearings properly and to provide ample resistance to light thrust loads.



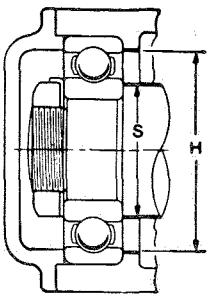
Bearing Bore No.	LIGHT SERIES 20,200, H20,200 and 30,200				MEDIUM SERIES 20,300, H20,300 and 30,300			
	Shoulder Diameter				Shoulder Diameter			
	S		H		S		H	
	Rec.	Min.	Rec.	Max.	Rec.	Min.	Rec.	Max.
0	.545	.494	1.05		.584	.494	1.23	
1	.636	.572	1.12		.698	.632	1.26	
2	.748	.691	1.23		.835	.751	1.44	
3	.880	.829	1.37		.927	.829	1.62	
4	1.02	.947	1.64		1.09	.947	1.78	1.85
5	1.20	1.14	1.84		1.30	1.14	2.16	2.24
6	1.45	1.34	2.18	2.24	1.51	1.34	2.55	2.64
7	1.67	1.54	2.56	2.64	1.78	1.62	2.77	2.85
8	1.89	1.74	2.85	2.95	2.00	1.82	3.15	3.24
9	2.08	1.93	3.05	3.15	2.25	2.01	3.50	3.64
10	2.27	2.13	3.24	3.34	2.53	2.29	3.80	3.93
11	2.56	2.40	3.55	3.64	2.75	2.48	4.18	4.32
12	2.78	2.60	3.91	4.03	2.97	2.68	4.55	4.72
13	3.01	2.80	4.28	4.42	3.20	2.88	4.92	5.11
14	3.19	3.00	4.49	4.62	3.42	3.08	5.29	5.51
15	3.39	3.19	4.68	4.82	3.65	3.27	5.66	5.90
16	3.67	3.47	4.99	5.11	3.88	3.47	6.02	6.29
17	3.90	3.67	5.34	5.50	4.16	3.75	6.33	6.59
18	4.11	3.86	5.73	5.90	4.38	3.94	6.70	6.98
19	4.34	4.06	6.10	6.29	4.62	4.14	7.06	7.37
20	4.57	4.26	6.46	6.69	4.84	4.34	7.64	7.96
21	4.80	4.45	6.83	7.08	5.07	4.53	8.01	8.36
22	5.03	4.65	7.19	7.47	5.29	4.73	8.59	8.95
24	5.44	5.04	7.76	8.06	5.80	5.12	9.28	9.74
26	5.90	5.52	8.27	8.56	6.30	5.60	9.96	10.42
28	6.36	5.91	9.00	9.34	6.75	5.99	10.70	11.21
30	6.81	6.31	9.75	10.13	7.21	6.39	11.43	12.00

SHAFT AND HOUSING SHOULDERS—Continued

Extra Small Single Row and ND-Seal

"Recommended" shaft and housing shoulder diameters should be used whenever possible to assure adequate support of bearing under all load conditions. These shoulders will resist the maximum thrust which may be safely applied to bearing without developing stresses detrimental to any of the metals used for shafts or housings, including aluminum. Little is gained by shaft or housing shoulders greater than recommended. Larger shoulders may interfere with closures of sealed or shielded bearings. In general, "recommended" diameters expose enough inner ring face to allow removal without damage to sealed or shielded bearings.

"Minimum" shaft and "maximum" housing shoulder diameters are those considered necessary to align bearings properly and to provide ample resistance to light thrust loads.



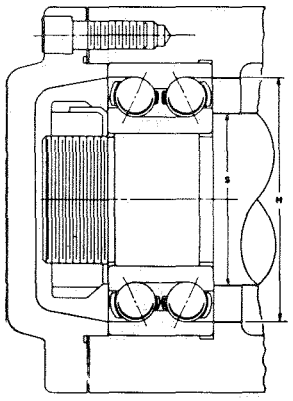
INCH SERIES TYPE R				
Bearing No.	Shoulder Diameter			
	S		H	
	Rec.	Min.	Rec.	Max.
R2	.173		.315	
R2A	.173		.440	
R3	.236		.440	
R4	.298		.565	
R4A	.314		.670	
R6	.439		.795	
R8	.612	.564	1.04	
R10	.780	.749	1.22	
R12	.927	.874	1.47	
R14	1.05	1.000	1.72	
R16	1.17	1.12	1.84	
R18	1.31	1.25	1.97	

ND SEAL				
Bearing No.	Shoulder Diameter			
	S		H	
	Rec.	Min.	Rec.	Max.
8006	.300		.865	
8007	.341		.865	
8008	.379		.865	
8009	.494		1.05	
8011	.572		1.12	
8013	.612		1.12	
8014	.691		1.23	
8016	.730		1.23	
8026	1.20		1.84	
EXTRA-SMALL TYPE *30				
34	.222		.550	
35	.261		.668	
36	.300		.668	
37	.341		.786	
38	.379		.786	
39	.454		.899	

**ND-Seal bearings 8035 to 8039, based on extra small 30 bearings use same shoulders as type 30.*

SHAFT AND HOUSING SHOULDERS—Continued

Double Row, Types 5000 and 5000W—Light and Medium Series



"Recommended" shaft and housing shoulder diameters should be used whenever possible to assure adequate support of bearing under all load conditions. These shoulders will resist the maximum thrust which may be safely applied to bearing without developing stresses detrimental to any of the metals used for shafts or housings, including aluminum. Little is gained by shaft or housing shoulders greater than recommended. Larger shoulders may interfere with closures of sealed or shielded bearings. In general "recommended" diameters expose enough inner ring face to allow removal without damage to sealed or shielded bearings.

"Minimum" shaft and "maximum" housing shoulder diameters are those considered necessary to align bearings properly and to provide ample resistance to light thrust loads.

Bearing Bore No.	LIGHT SERIES 5200				MEDIUM SERIES 5300				LIGHT SERIES 5200W				Bearing Bore No.	MEDIUM SERIES 5300W			
	Shoulder Diameter				Shoulder Diameter				Shoulder Diameter					Shoulder Diameter			
	S		H		S		H		S		H			S		H	
	Rec.	Min.	Rec.	Max.	Rec.	Min.	Rec.	Max.	Rec.	Min.	Rec.	Max.		Rec.	Min.	Rec.	Max.
0	.546	.494	1.06		.656	.494	1.24						6	1.54	1.34	2.54	2.64
1	.638	.572	1.13		.724	.632	1.26						7	1.80	1.62	2.77	2.85
2	.750	.691	1.25		.811	.751	1.45										
3	.903	.829	1.37		1.02	.829	1.61	1.65					9	2.25	2.01	3.52	3.64
4	1.09	.947	1.62		1.13	.947	1.81	1.85					10	2.45	2.29	3.82	3.93
5	1.27	1.14	1.82		1.38	1.14	2.21	2.24	1.21	1.14	1.84		11	2.65	2.48	4.18	4.32
6	1.53	1.34	2.18	2.24	1.64	1.34	2.60	2.64					12	2.88	2.68	4.53	4.72
7	1.75	1.54	2.56	2.64	1.84	1.62	2.80	2.85	1.70	1.54	2.55	2.64	14	3.10	2.88	4.90	5.11
8	2.00	1.74	2.84	2.95	2.12	1.82	3.18	3.24									
9	2.19	1.93	3.03	3.15	2.40	2.01	3.55	3.64					20	4.70	4.34	7.80	7.96
10	2.38	2.13	3.23	3.34	2.59	2.29	3.86	3.93	2.28	2.13	3.25	3.34					
11	2.68	2.40	3.53	3.64	2.83	2.48	4.23	4.32	2.57	2.40	3.55	3.64					
12	2.89	2.60	3.92	4.03	3.14	2.68	4.55	4.72	2.78	2.60	3.94	4.03					
13	3.12	2.80	4.29	4.42	3.37	2.88	4.92	5.11	3.00	2.80	4.31	4.42					
14	3.34	3.00	4.47	4.62	3.61	3.08	5.30	5.51									
15	3.55	3.19	4.65	4.82	3.81	3.27	5.69	5.90	3.41	3.19	4.67	4.82					
16	3.83	3.47	4.96	5.11	4.04	3.47	6.06	6.29	3.68	3.47	4.99	5.11					
17	4.08	3.67	5.32	5.50	4.33	3.75	6.37	6.59									
18	4.33	3.86	5.68	5.90	4.55	3.94	6.76	6.98	4.15	3.86	5.71	5.90					
19	4.58	4.06	6.04	6.29													
20	4.83	4.26	6.40	6.69													
21																	
22	5.50	4.65	7.19	7.47					4.92	4.65	7.32	7.47					
24																	

DECIMAL EQUIVALENTS

				Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Millimeters	Inches
1-64	.0156	33-64	.5156	1	0.0394	26	1.0236	51	2.0079	76	2.9921
1-32	.0313	17-32	.5313	2	0.0787	27	1.0630	52	2.0472	77	3.0315
3-64	.0469	35-64	.5469	3	0.1181	28	1.1024	53	2.0866	78	3.0709
1-16	.0625	9-16	.5625								
5-64	.0781	37-64	.5781	4	0.1575	29	1.1417	54	2.1260	79	3.1102
3-32	.0938	19-32	.5938	5	0.1969	30	1.1811	55	2.1654	80	3.1496
7-64	.1094	39-64	.6094	6	0.2362	31	1.2205	56	2.2047	81	3.1890
1-8	.125	5-8	.625								
9-64	.1406	41-64	.6406	7	0.2756	32	1.2598	57	2.2441	82	3.2283
5-32	.1563	21-32	.6563	8	0.3150	33	1.2992	58	2.2835	83	3.2677
11-64	.1719	43-64	.6719	9	0.3543	34	1.3386	59	2.3228	84	3.3071
3-16	.1875	11-16	.6875								
13-64	.2031	45-64	.7031	10	0.3937	35	1.3780	60	2.3622	85	3.3465
7-32	.2188	23-32	.7188	11	0.4331	36	1.4173	61	2.4016	86	3.3858
15-64	.2344	47-64	.7344	12	0.4724	37	1.4567	62	2.4409	87	3.4252
1-4	.250	3-4	.750								
17-64	.2656	49-64	.7656	13	0.5118	38	1.4961	63	2.4803	88	3.4646
9-32	.2813	25-32	.7813	14	0.5512	39	1.5354	64	2.5197	89	3.5039
19-64	.2969	51-64	.7969	15	0.5906	40	1.5748	65	2.5591	90	3.5433
5-16	.3125	13-16	.8125								
21-64	.3281	53-64	.8281	16	0.6299	41	1.6142	66	2.5984	91	3.5827
11-32	.3438	27-32	.8438	17	0.6693	42	1.6535	67	2.6378	92	3.6220
23-64	.3594	55-64	.8594	18	0.7087	43	1.6929	68	2.6772	93	3.6614
3-8	.375	7-8	.875								
25-64	.3906	57-64	.8906	19	0.7480	44	1.7323	69	2.7165	94	3.7008
13-32	.4063	29-32	.9063	20	0.7874	45	1.7717	70	2.7559	95	3.7402
27-64	.4219	59-64	.9219	21	0.8268	46	1.8110	71	2.7953	96	3.7795
7-16	.4375	15-16	.9375								
29-64	.4531	61-64	.9531	22	0.8661	47	1.8504	72	2.8346	97	3.8189
15-32	.4688	31-32	.9688	23	0.9055	48	1.8898	73	2.8740	98	3.8583
31-64	.4844	63-64	.9844	24	0.9449	49	1.9291	74	2.9134	99	3.8976
1-2	.500	1″	1.0000								
				25	0.9843	50	1.9685	75	2.9528	100	3.9370

NOTE: While every care has been used in compiling this catalog it is impossible to guarantee completeness and accuracy of data.

DECIMAL EQUIVALENTS

INCHES TO MILLIMETERS

In.	Mm.	In.	Mm.
1	25.4	51	1295.4
2	50.8	52	1320.8
3	76.2	53	1346.2
4	101.6	54	1371.6
5	127.0	55	1397.0
6	152.4	56	1422.4
7	177.8	57	1447.8
8	203.2	58	1473.2
9	228.6	59	1498.6
10	254.0	60	1524.0
11	279.4	61	1549.4
12	304.8	62	1574.8
13	330.2	63	1600.2
14	355.6	64	1625.6
15	381.0	65	1651.0
16	406.4	66	1676.4
17	431.8	67	1701.8
18	457.2	68	1727.2
19	482.6	69	1752.6
20	508.0	70	1778.0
21	533.4	71	1803.4
22	558.8	72	1828.8
23	584.2	73	1854.2
24	609.6	74	1879.6
25	635.0	75	1905.0
26	660.4	76	1930.4
27	685.8	77	1955.8
28	711.2	78	1981.2
29	736.6	79	2006.6
30	762.0	80	2032.0
31	787.4	81	2057.4
32	812.8	82	2082.8
33	838.2	83	2108.2
34	863.6	84	2133.6
35	889.0	85	2159.0
36	914.4	86	2184.4
37	939.8	87	2209.8
38	965.2	88	2235.2
39	990.6	89	2260.6
40	1016.0	90	2286.0
41	1041.4	91	2311.4
42	1066.8	92	2336.8
43	1092.2	93	2362.2
44	1117.6	94	2387.6
45	1143.0	95	2413.0
46	1168.4	96	2438.4
47	1193.8	97	2463.8
48	1219.2	98	2489.2
49	1244.6	99	2514.6
50	1270.0	100	2540.0

The above table is exact on the basis: 1 in. = 25.4 mm.

MILLIMETERS TO INCHES

Mm.	In.	Mm.	In.
1	0.039370	51	2.007874
2	0.078740	52	2.047244
3	0.118110	53	2.086614
4	0.157480	54	2.125984
5	0.196850	55	2.165354
6	0.236220	56	2.204724
7	0.275591	57	2.244094
8	0.314961	58	2.283465
9	0.354331	59	2.322835
10	0.393701	60	2.362205
11	0.433071	61	2.401575
12	0.472441	62	2.440945
13	0.511811	63	2.480315
14	0.551181	64	2.519685
15	0.590551	65	2.559055
16	0.629921	66	2.598425
17	0.669291	67	2.637795
18	0.708661	68	2.677165
19	0.748031	69	2.716535
20	0.787402	70	2.755906
21	0.826772	71	2.795276
22	0.866142	72	2.834646
23	0.905512	73	2.874016
24	0.944882	74	2.913386
25	0.984252	75	2.952756
26	1.023622	76	2.992126
27	1.062992	77	3.031496
28	1.102362	78	3.070866
29	1.141732	79	3.110236
30	1.181102	80	3.149606
31	1.220472	81	3.188976
32	1.259843	82	3.228346
33	1.299213	83	3.267717
34	1.338583	84	3.307087
35	1.377953	85	3.346457
36	1.417323	86	3.385827
37	1.456693	87	3.425197
38	1.496063	88	3.464567
39	1.535433	89	3.503937
40	1.574803	90	3.543307
41	1.614173	91	3.582677
42	1.653543	92	3.622047
43	1.692913	93	3.661417
44	1.732283	94	3.700787
45	1.771654	95	3.740157
46	1.811024	96	3.779528
47	1.850394	97	3.818898
48	1.889764	98	3.858268
49	1.929134	99	3.897638
50	1.968504	100	3.937008

The above table is approximate on the basis: 1 in. = 25.4 mm. $1/25.4 = 0.039370078740+$

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