

CONSTRUCTION

This is a non-separable unit, comprising an of inner ring, outer ring, needle rollers, and retaining washers which are fastened to the inner ring.

Grooves and hole for relubrication are provided in the inner ring and outer ring.

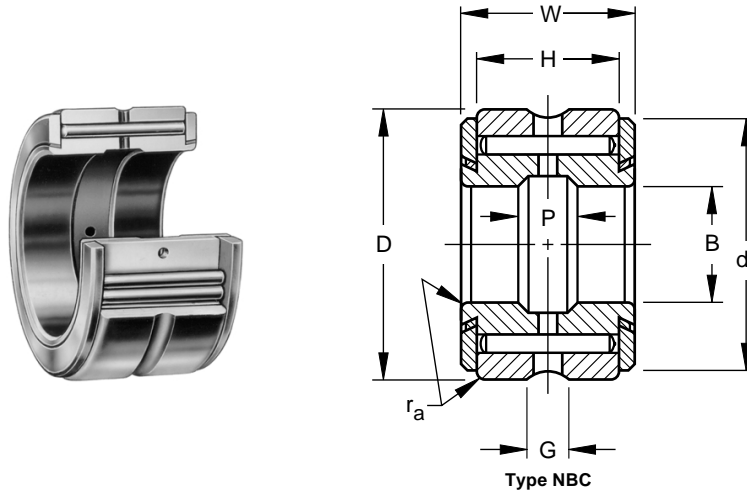
External surfaces, except the inner ring bore, are cadmium plated.

DIMENSIONS

Dimensions listed are for the finished bearing after plating.

Bearings are made to ISO and U.S. Military Specifications, and are constructed to have low radial clearance when mounted to minimize vibration and backlash.

The shaft diameter and housing bore dimensions necessary to mount these bearings properly are listed on the facing page.



SPECIFICATIONS AND ORDERING INFORMATION

BEARING DIMENSIONS

Bearing Designation	MS24461 Dash No.	B* Bore		D* O.D.		W Widths		H		ra § Shaft Fillet (max.)	d1 End Washer Diameter (ref.)		G Outer Ring Groove Width (ref.)						
		max.	min.	max.	min.	+0.000 -0.005	+0.000 -0.13	+0.000 -0.005	+0.000 -0.13		in.	mm	in.	mm					
3NBC511ZP†	MS24461-3	0.1900	4.826	0.1893	4.808	0.6875	17.46	0.6870	17.45	0.312	7.92	0.218	5.54	0.022	0.56	0.625	15.88	0.062	1.57
4NBC612ZP†	MS24461-4	0.2500	6.350	0.2493	6.332	0.7500	19.05	0.7495	19.04	0.375	9.53	0.281	7.14	0.022	0.56	0.688	17.48	0.094	2.39
5NBC713ZP†	MS24461-5	0.3125	7.938	0.3118	7.920	0.8125	20.64	0.8120	20.62	0.437	11.10	0.344	8.74	0.022	0.56	0.750	19.05	0.094	2.39
6NBC914YZP	MS24461-6	0.3750	9.525	0.3743	9.507	0.8750	22.23	0.8745	22.21	0.562	14.27	0.469	11.91	0.022	0.56	0.812	20.62	0.125	3.18
7NBC1015YZP	MS24461-7	0.4375	11.113	0.4368	11.095	0.9375	23.81	0.9370	23.80	0.625	15.88	0.531	13.49	0.032	0.81	0.875	22.23	0.125	3.18
8NBC1218YZP	MS24461-8	0.5000	12.700	0.4993	12.682	1.1250	28.58	1.1245	28.56	0.750	19.05	0.656	16.66	0.032	0.81	1.031	26.19	0.125	3.18
9NBC1419YZP	MS24461-9	0.5625	14.288	0.5618	14.270	1.1875	30.16	1.1870	30.15	0.875	22.23	0.781	19.84	0.032	0.81	1.094	27.79	0.156	3.96
10NBC1620YZP	MS24461-10	0.6250	15.875	0.6243	15.857	1.2500	31.75	1.2495	31.74	1.000	25.40	0.906	23.01	0.032	0.81	1.156	29.36	0.156	3.96
12NBC1822YZP	MS24461-12	0.7500	19.050	0.7493	19.032	1.3750	34.93	1.3745	34.91	1.125	28.58	1.000	25.40	0.032	0.81	1.281	32.54	0.156	3.96
14NBC2026YZP	MS24461-14	0.8750	22.225	0.8743	22.207	1.6250	41.28	1.6245	41.26	1.250	31.75	1.125	28.58	0.032	0.81	1.500	38.10	0.156	3.96
16NBC2028YZP	MS24461-16	1.0000	25.400	0.9993	25.382	1.7500	44.45	1.7495	44.44	1.250	31.75	1.125	28.58	0.032	0.81	1.625	41.28	0.156	3.96
20NBC2032YZP	MS24461-20	1.2500	31.750	1.2493	31.732	2.0000	50.80	1.9994	50.78	1.250	31.75	1.049	26.64	0.032	0.81	1.906	48.41	0.156	3.96
24NBC2036YZP	MS24461-24	1.5000	38.100	1.4993	38.082	2.2500	57.15	2.2494	57.13	1.250	31.75	1.049	26.64	0.032	0.81	2.156	54.76	0.156	3.96
28NBC2040YZP	MS24461-28	1.7500	44.450	1.7493	44.432	2.5000	63.50	2.4994	63.48	1.250	31.75	1.049	26.64	0.032	0.81	2.406	61.11	0.156	3.96
32NBC2044YZP	MS24461-32	2.0000	50.800	1.9993	50.782	2.7500	69.85	2.7494	69.83	1.250	31.75	1.049	26.64	0.032	0.81	2.656	67.46	0.156	3.96
36NBC2048YZP	MS24461-36	2.2500	57.150	2.2493	57.132	3.0000	76.20	2.9994	76.18	1.250	31.75	1.049	26.64	0.032	0.81	2.906	73.81	0.156	3.96
40NBC2052YZP	MS24461-40	2.5000	63.500	2.4993	63.482	3.2500	82.55	3.2492	82.53	1.250	31.75	1.049	26.64	0.032	0.81	3.156	80.16	0.156	3.96
44NBC2056YZP	MS24461-44	2.7500	69.850	2.7493	69.832	3.5000	88.90	3.4992	88.88	1.250	31.75	1.049	26.64	0.032	0.81	3.406	86.51	0.156	3.96
48NBC2060YZP	MS24461-60	3.0000	76.200	2.9993	76.182	3.7500	95.25	3.7492	95.23	1.250	31.75	1.049	26.64	0.032	0.81	3.656	92.86	0.156	3.96
52NBC2064YZP	MS24461-52	3.2500	82.550	3.2382	82.250	4.0000	101.60	3.9992	101.58	1.250	31.75	1.049	26.64	0.032	0.81	3.906	99.21	0.156	3.96
56NBC2070YZP	MS24461-56	3.5000	88.900	3.4992	88.880	4.3750	111.13	4.3742	111.10	1.250	31.75	1.049	26.64	0.044	1.12	4.219	107.16	0.156	3.96
60NBC2074YZP	MS24461-60	3.7500	95.250	3.7492	95.230	4.6250	117.48	4.6242	117.45	1.250	31.75	1.049	26.64	0.044	1.12	4.469	113.51	0.156	3.96
64NBC2078YZP	MS24461-64	4.0000	101.600	3.9992	101.580	4.8750	123.83	4.8740	123.80	1.250	31.75	1.049	26.64	0.044	1.12	4.719	119.86	0.156	3.96

*Bore and O.D. tolerance limits correspond to the single mean diameter (the arithmetical mean of the largest and smallest diameters in a single radial plane).

§ Equal to minimum inner bearing chamfers.

AIRFRAME CONTROL NEEDLE ROLLER BEARINGS

MOUNTING

The housing bore dimensions shown below are applicable to bearings mounted in steel. These dimensions should be decreased .0002 in. (.005mm) when aluminum alloy housings are used.

The end washers are fastened to the inner ring in a manner only to maintain the integrity of the assembly while handling and installing the bearing. Therefore, when mounted, they should be firmly backed up by washers or other clamping surfaces that are flat and square with the shaft center line. To provide sufficient washer support, the outside diameter of the clamping surfaces should be at least as large as the minimum clamping diameter (d_a) listed below.

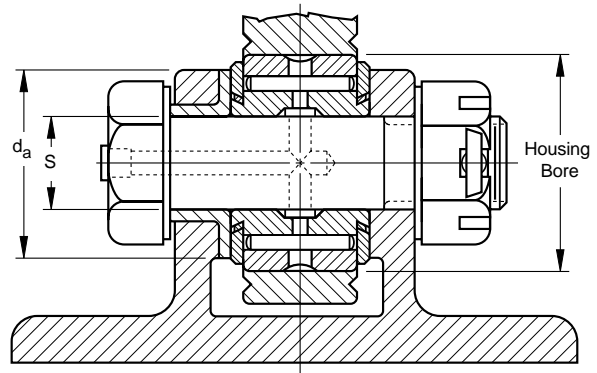
Tight range transitional fitting practice should not be used for both the outer and the inner rings, since this may cause excessive preloading of the bearing. If this type of mounting becomes necessary, consult the RBC Aerospace Engineering Department for specific recommendations.

LOAD RATINGS

The limit load ratings (also called “allowable working load ratings”) of the bearings are listed below. The ultimate load ratings are not less than 1.5 times the limit load ratings. The ultimate load ratings correspond to the Aircraft Static Capacity ratings.

Load ratings are given in pounds-force:
 1 lbf = 0.454 kgf = 4.448 N

Before final bearing selection is made, please consult the RBC Aerospace Engineering Department.



SPECIFICATIONS AND ORDERING INFORMATION

MOUNTING DIMENSIONS

P Inner Ring Groove Width (ref.)	Weight (approx.)	S Shaft Diameters				Housing Bore				d_a Clamping Diameter (minimum)	Clamping Force (max.)		Limit Load Rating			
		Transition Fits (loose range)		Transition Fits (tight range)		Transition Fits (tight range)		Transition Fits (loose range)			lbf	N	lbf	N		
		max.	min.	max.	min.	max.	min.	max.	min.							
-	0.028	0.01	0.1894	0.1889	0.1902	0.1897	0.6867	0.6872	0.6874	0.6879	0.438	11.13	480	2100	1800	8000
-	0.040	0.02	0.2494	0.2489	0.2502	0.2497	0.7492	0.7497	0.7499	0.7504	0.516	13.11	870	3900	2870	12800
-	0.057	0.03	0.3119	0.3114	0.3127	0.3122	0.8117	0.8122	0.8124	0.8129	0.578	14.68	1400	6200	4070	18100
0.188	0.075	0.03	0.3744	0.3739	0.3752	0.3747	0.8742	0.8747	0.8749	0.8754	0.641	16.28	2100	9300	6330	28200
0.188	0.097	0.04	0.4369	0.4364	0.4377	0.4372	0.9367	0.9372	0.9374	0.9379	0.703	17.86	2850	12700	8000	35600
0.188	0.165	0.07	0.4994	0.4989	0.5002	0.4997	1.1242	1.1247	1.1249	1.1254	0.844	21.44	3840	17100	11600	51600
0.188	0.207	0.09	0.5619	0.5614	0.5627	0.5622	1.1867	1.1872	1.1874	1.1879	0.891	22.63	4870	21700	15000	66700
0.250	0.252	0.11	0.6244	0.6239	0.6252	0.6247	1.2492	1.2497	1.2499	1.2504	0.953	24.21	6150	27400	18900	84100
0.250	0.336	0.15	0.7494	0.7489	0.7502	0.7497	1.3741	1.3747	1.3749	1.3755	1.078	27.38	8950	39800	23900	106300
0.375	0.423	0.19	0.8744	0.8739	0.8752	0.8747	1.6241	1.6247	1.6249	1.6255	1.250	31.75	12200	54300	30500	135700
0.375	0.510	0.23	0.9994	0.9989	1.0002	0.9997	1.7491	1.7497	1.7499	1.7505	1.375	34.93	16300	72500	33900	150800
0.375	0.600	0.27	1.2494	1.2488	1.2503	1.2497	1.9991	1.9997	1.9999	2.0005	1.625	41.28	25800	114800	37900	168600
0.375	0.710	0.32	1.4994	1.4988	1.5003	1.4997	2.2488	2.2496	2.2499	2.2507	1.875	47.63	25800	114800	44200	196600
0.375	0.780	0.35	1.7494	1.7488	1.7503	1.7497	2.4988	2.4996	2.4999	2.5007	2.125	53.98	25800	114800	50500	224600
0.375	0.880	0.40	1.9994	1.9987	2.0003	1.9996	2.7488	2.7496	2.7499	2.7507	2.375	60.33	25800	114800	56800	252700
0.375	0.980	0.44	2.2494	2.2487	2.2503	2.2496	2.9988	2.9996	2.9999	3.0007	2.625	66.68	25800	114800	63100	280700
0.375	1.060	0.48	2.4994	2.4987	2.5003	2.4996	3.2485	3.2495	3.2498	3.2508	2.875	73.03	25800	114800	69400	308700
0.375	1.150	0.52	2.7494	2.7487	2.7503	2.7496	3.4985	3.4995	3.4998	3.5008	3.125	79.38	25800	114800	75700	336700
0.375	1.240	0.56	2.9994	2.9987	3.0003	2.9996	3.7485	3.7495	3.7498	3.7508	3.375	85.73	25800	114800	82000	364800
0.375	1.340	0.61	3.2494	3.2486	3.2504	3.2496	3.9985	3.9995	3.9998	4.0008	3.641	92.48	25800	114800	88300	392800
0.375	1.730	0.78	3.4994	3.4986	3.5004	3.4996	4.3735	4.3745	4.3748	4.3758	3.969	100.81	25800	114800	96700	430100
0.375	1.840	0.83	3.7494	3.7486	3.7504	3.7496	4.6235	4.6245	4.6248	4.6258	4.219	107.16	25800	114800	103000	458200
0.375	1.990	0.90	3.9994	3.9986	4.0004	3.9996	4.8735	4.8745	4.8748	4.8758	4.469	113.51	25800	114800	109000	484900

AIRFRAME CONTROL NEEDLE ROLLER BEARINGS