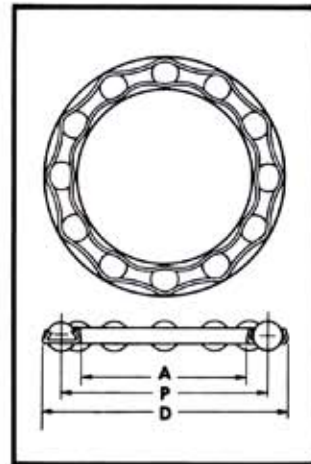
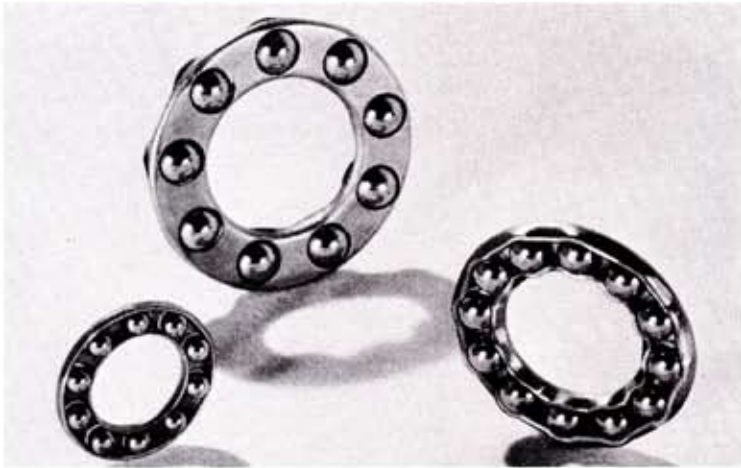


THRUST RETAINERS



The National Thrust Retainer may be used with either a flat race or a grooved race, depending upon loads and speeds. It is also used with either a machined or stamped surface that is an integral part of the shaft or housing.

National Thrust Retainers are designed to provide positive ball retention with a minimum of friction. The channel design possesses exceptional strength and assures extremely long wearing qualities. The Retainer cages are cold formed to close tolerances from selected strips of steel, brass, or stainless steel. Retainers are also available in plastic materials. Thrust Retainers can be loaded with the proper grade and type of ball necessary for the application . . . carbon, chrome alloy, stainless steel, brass, etc.

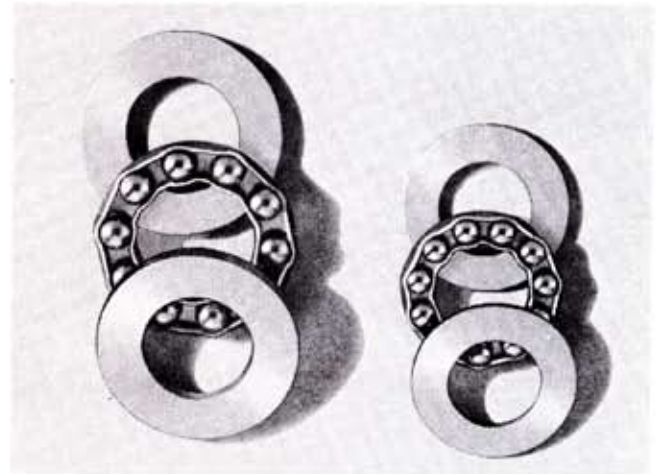
Applications. They range from electronic data processing equipment through portable power tools, hand tools, electromechanical devices, typewriters, phonographs, cameras, point-of-purchase displays, etc.

Quality Controls. All materials used in these retainers are specified and carefully selected. Balls are graded and sized in accordance with AFBMA standards. Rigid in-process and final inspection controls are adhered to. At final inspection retainers are checked for ball retention, freedom of ball movement, burr-free cages, uniformity of crimping plus additional inspections pertinent to the customer's requirement.

Design Flexibility. The long list of dimensional variations shown on these pages provide the Design Engineer with extreme flexibility. Other advantages are: very low starting friction and even lower operating friction; ease of lubrication; long life span; increased thrust capacity; product acceptance at both consumer and industrial levels.

THRUST BEARINGS

National Thrust Bearings are inexpensive and recommended for light loads and speeds up to 2500 rpm. They combine a National Thrust Retainer with corresponding thrust washers. A properly designed thrust ball bearing has a much lower friction coefficient under starting and operating conditions than either a nylon or oilite bushing. It also has the decided advantage of standard replacement and availability, plus greater merchandising value (especially at the consumer level).



THRUST WASHERS

National Thrust Washers are sold separately or in combination with our thrust retainers to form unground Thrust Bearings. By themselves, the washers can be used as races, spacers, etc. Dimensionally they approach the quality of ground washers; the thickness tolerance is closer on ground washers because of different processing.



Stamped Thrust Retainers

1596 Manheim Pike
 Lancaster, PA 17601
 Phone (717)-569-0485
 Fax (717)-569-1605
www.nationalbearings.com

NBC Part Numbet	"A" Inner Diameter	"D" Outer Diameter	"P" Pitch Diameter	Ball Count	Ball Size
405001	1.405	2.335	1.871	12	3/8
405002	1.613	2.509	2.062	14	3/8
405006	1.039	1.712	1.378	13	9/32
405008	2.786	3.703	3.248	22	3/8
405012	1.012	1.616	1.319	14	1/4
405013	1.440	2.020	1.732	19	6MM
405014	1.812	2.517	2.165	20	9/32
405015	3.225	4.069	3.641	28	11/32
405016	3.050	4.950	3.996	14	13/16
405126	0.574	1.045	0.812	10	3/16
405128	0.816	1.450	1.135	10	1/4
405129	0.950	1.550	1.250	12	1/4
405131	1.189	1.814	1.500	12	1/4
405135	1.342	2.100	1.718	10	5/16
405138	1.584	2.060	1.820	14	3/16
405139	1.530	2.178	1.850	17	1/4
405141	1.675	2.458	2.062	12	5/16
405142	1.675	2.458	2.062	16	5/16
405143	1.925	2.825	2.375	17	3/8
405144	1.841	2.477	2.165	18	1/4
405145	0.820	1.234	1.027	15	5/32
405147	0.816	1.289	1.053	12	3/16
405148	1.267	1.735	1.508	19	3/16
405149	1.645	2.403	2.030	14	5/16
405151	0.382	0.665	0.521	10	3/32
405152	0.382	0.665	0.521	5	3/32
405155	1.845	2.350	2.091	8	3/16
405156	0.322	0.629	0.472	5	3/32
405159	0.448	0.775	0.612	10	1/8
405161	0.610	1.006	0.807	12	5/32
405162	0.627	1.006	0.807	6	5/32
405163	0.190	0.444	0.318	5	3/32
405165	0.660	1.275	0.973	11	1/4
405166	0.405	0.695	0.547	5	3/32
405168	2.668	3.385	3.033	24	9/32
405169	2.310	3.240	2.780	12	3/8
405171	4.165	5.085	4.627	28	3/8
405173	2.186	2.965	2.578	21	5/16
405174	2.195	2.967	2.578	12	5/16
405177	2.066	2.855	2.468	16	5/16
405178	2.066	2.855	2.468	8	5/16
405179	0.343	0.660	0.500	9	1/8
405181	0.690	1.021	0.856	12	1/8
405182	0.320	0.520	0.419	5	1/16
405183	0.325	0.725	0.525	6	1/8
405184	0.278	0.550	0.411	8	3/32
405185	0.281	0.550	0.411	5	3/32



Stamped Thrust Retainers

1596 Manheim Pike
 Lancaster, PA 17601
 Phone (717)-569-0485
 Fax (717)-569-1605
www.nationalbearings.com

NBC Part Numbet	"A" Inner Diameter	"D" Outer Diameter	"P" Pitch Diameter	Ball Count	Ball Size
405186	0.406	0.730	0.570	11	1/8
405189	0.515	0.910	0.713	10	5/32
405190	0.812	1.130	0.968	9	1/8
405191	0.257	0.493	0.373	5	5/64
405192	0.473	0.905	0.689	10	5/32
405193	1.380	1.851	1.614	18	3/16
405196	0.654	1.150	0.906	12	3/16
405198	0.275	0.445	0.360	9	1/16
405199	4.155	4.975	4.572	24	5/16
405200	1.604	2.345	1.972	14	5/16
405201	0.765	1.267	1.016	11	3/16
405203	2.943	4.015	3.480	18	7/16
405205	1.040	1.585	1.313	14	3/16
405206	3.225	4.262	3.750	22	7/16
405207	1.034	1.715	1.374	12	1/4
405208	0.190	0.369	0.280	5	1/16
405213	0.667	1.280	0.974	8	1/4
405215	1.189	1.812	1.500	6	1/4
405224	3.220	4.265	3.750	11	7/16
405225	0.508	0.785	0.648	10	3/32
405226	1.584	2.060	1.820	7	3/16
405228	0.347	0.615	0.479	10	3/32
405232	1.380	1.851	1.614	3	3/16
405234	0.521	0.754	0.638	10	3/32
405237	0.565	0.883	0.728	6	3MM
405239	0.277	0.551	0.421	8	3/32
405240	0.535	0.795	0.665	6	2MM
405241	0.610	0.843	0.726	7	5/64
405242	0.967	1.295	1.132	20	3mm
407006	1.040	1.550	1.295	3	.188
407013	0.799	1.311	1.055	3	.188
407014	0.785	1.102	0.925	3	.125
407015	0.640	1.014	0.827	3	.125
408002	0.318	0.623	0.469	10	.094
408004	0.380	0.683	0.531	12	.094