

CONSTRUCTION

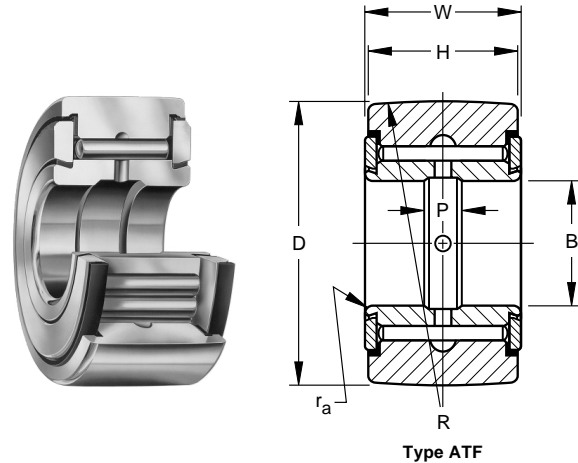
This is a non-separable unit, comprising an inner ring, needle rollers, retaining washers, seal/thrust washers, and an extra-thick outer ring to withstand heavy rolling loads. The end washers are fastened to the inner ring. Type ATF has a single row of rollers and type ATL has two rows of rollers. The outer ring of type ATF bearing is crowned.

The seals on the ATF and ATL bearings are located in counterbores of the outer ring and seal against the O.D. of the end washers, providing a good retention of lubricant and exclusion of foreign material. Seal/thrust washers, made of a self-lubricating resin material, separate the steel thrust surfaces, extending the life of lubricant and bearing.

Grooves and holes for relubrication are provided in the inner ring only, since the outer ring must serve as a roller. Type ATF has a groove in the bore of the outer ring for storage of additional lubricant. For protection from corrosion under heavy rolling loads, the O.D. of the bearing is chrome plated. Other exposed surfaces, as mounted, are cadmium or zinc-nickel plated. Inner rings are oxidized.

DIMENSIONS

Types ATF and ATL are manufactured to inch nominal dimensions. Metric dimensions shown are for the convenience of the user, and the controlling dimensions are in inches. Dimensions listed are for the finished bearing after plating. The shaft diameter dimensions necessary to mount these bearings properly are listed on the facing page.



SPECIFICATIONS AND ORDERING INFORMATION

BEARING DIMENSIONS

Bearing Designation	MS21438 MS21439 Dash No.	B* Bore		D* O.D.		W Widths Δ		H		r _a § Shaft Fillet (max.)	P Inner Ring Groove Width (ref.)		R Crown Radius (ref.)		
		+0.000	+0.000	+0.001	+0.025	+0.000	+0.000	+0.000	+0.000		in.	mm	in.	mm	
		-0.0007	-0.018	-0.001	-0.025	-0.010	-0.25	-0.010	-0.25						
ATF-3	MS21438-103	0.1900	4.826	0.7500	19.05	0.312	7.92	0.280	7.11	0.022	0.56	0.094	2.39	11	279
ATF-4	MS21438-104	0.2500	6.350	0.8750	22.23	0.375	9.53	0.345	8.76	0.022	0.56	0.125	3.18	11	279
ATF-6	MS21438-106	0.3750	9.525	1.0625	26.99	0.500	12.70	0.455	11.56	0.022	0.56	0.188	4.78	11	279
ATF-8	MS21438-108	0.5000	12.700	1.3125	33.34	0.625	15.88	0.580	14.73	0.032	0.81	0.188	4.78	13	330
ATF-10	MS21438-110	0.6250	15.875	1.5000	38.10	0.750	19.05	0.705	17.91	0.032	0.81	0.250	6.35	18	457
ATF-12	MS21438-112	0.7500	19.050	1.7500	44.45	1.000	25.40	0.950	24.13	0.032	0.81	0.250	6.35	31	787
ATF-14	MS21438-114	0.8750	22.225	2.0000	50.80	1.125	28.58	1.075	27.31	0.032	0.81	0.250	6.35	36	914
ATF-16	MS21438-116	1.0000	25.400	2.2500	57.15	1.125	28.58	1.075	27.31	0.032	0.81	0.250	6.35	27	686
ATF-20	MS21438-120	1.2500	31.750	2.5000	63.50	1.250	31.75	1.200	30.48	0.032	0.81	0.375	9.53	61	1549
ATF-24	MS21438-124	1.5000	38.100	3.0000	76.20	1.500	38.10	1.440	36.58	0.032	0.81	0.375	9.53	61	1549
ATF-28	MS21438-128	1.7500	44.450	3.4375	87.31	1.500	38.10	1.440	36.58	0.032	0.81	0.375	9.53	61	1549
ATF-32	MS21438-132	2.0000	50.800	3.8750	98.43	1.500	38.10	1.440	36.58	0.032	0.81	0.375	9.53	61	1549
ATL-4	MS21439-104	0.2500	6.350	0.8750	22.23	0.750	19.05	0.710	18.03	0.022	0.56	0.188	4.78	-	-
ATL-6	MS21439-106	0.3750	9.525	1.1250	28.58	1.000	25.40	0.940	23.88	0.022	0.56	0.188	4.78	-	-
ATL-8	MS21439-108	0.5000	12.700	1.3750	34.93	1.250	31.75	1.190	30.23	0.032	0.81	0.250	6.35	-	-
ATL-10	MS21439-110	0.6250	15.875	1.6250	41.28	1.500	38.10	1.440	36.58	0.032	0.81	0.375	9.53	-	-
ATL-12	MS21439-112	0.7500	19.050	1.8750	47.63	1.750	44.45	1.690	42.93	0.032	0.81	0.375	9.53	-	-
ATL-14	MS21439-114	0.8750	22.225	2.1250	53.98	2.000	50.80	1.940	49.28	0.032	0.81	0.375	9.53	-	-
ATL-16	MS21439-116	1.0000	25.400	2.3750	60.33	2.250	57.15	2.190	55.63	0.032	0.81	0.375	9.53	-	-
ATL-20	MS21439-120	1.2500	31.750	2.7500	69.85	2.500	63.50	2.440	61.98	0.032	0.81	0.375	9.53	-	-
ATL-24	MS21439-124	1.5000	38.100	3.0000	76.20	2.750	69.85	2.690	68.33	0.032	0.81	0.375	9.53	-	-
ATL-28	MS21439-128	1.7500	44.450	3.4375	87.31	3.000	76.20	2.940	74.68	0.032	0.81	0.375	9.53	-	-
ATL-32	MS21439-132	2.0000	50.800	3.8750	98.43	3.000	76.20	2.940	74.68	0.032	0.81	0.375	9.53	3	-

* 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 bearing chamfers.

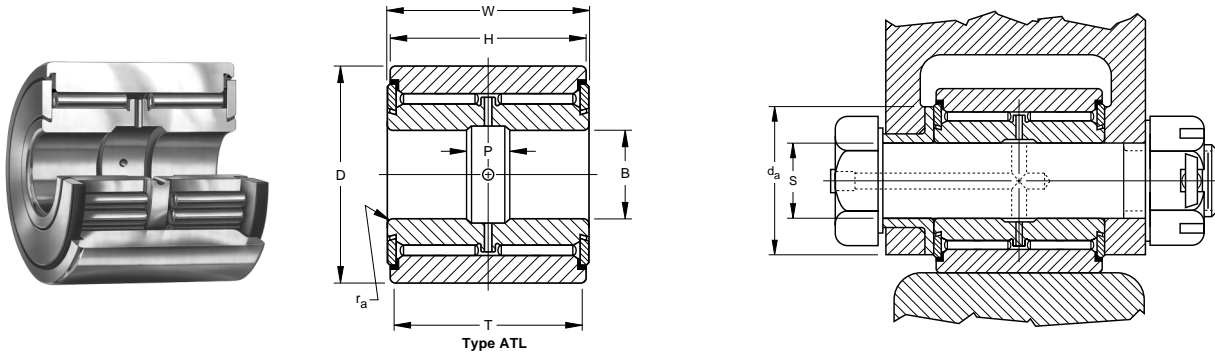
Δ Tolerance for width C for ATL series is +0.000 -0.005 in.

AIRFRAME CONTROL NEEDLE ROLLER BEARINGS

MOUNTING

Types ATF and ATL bearings are designed for heavy rolling loads. The type ATF bearing is usually clevis mounted or cantilever mounted on a high strength shaft or bolt. The type ATL bearing must be straddle-mounted on a high strength shaft or bolt.

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.



LOAD RATINGS

Bearings are constructed to provide maximum capacity under rolling loads.

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 2/3 of the Aircraft Static Capacity ratings.

Load ratings are given in pounds-force:
 $1 \text{ lbf} = 0.454 \text{ kgf} = 4.448 \text{ N}$

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

SPECIFICATIONS AND ORDERING INFORMATION

MOUNTING DIMENSIONS

T Track Contact Width (minimum)	Weight (approx.)		S Shaft Diameters				d_a Clamping Diameter (minimum)	Clamping Force (max.)		Bearing Capacity					
			Transition Fits (loose fits)		Transition Fits (tight range)					as a Track Roller (CTR)		Limit Load Rating			
in. mm	lbs	kgs	in.	in.	in.	in.	in.	mm	lbf	N	lbf	N	lbf	N	
-	-	0.030	0.01	0.1894	0.1889	0.1902	0.1897	0.438	11.13	480	2100	900	4000	1200	5300
-	-	0.051	0.02	0.2494	0.2489	0.2502	0.2497	0.516	13.11	870	3900	1430	6400	1910	8500
-	-	0.103	0.05	0.3119	0.3114	0.3127	0.3122	0.672	17.07	2100	9300	2700	12000	3600	16000
-	-	0.187	0.08	0.3744	0.3739	0.3752	0.3747	0.844	21.44	3840	17100	4300	19100	5780	25700
-	-	0.279	0.13	0.4369	0.4364	0.4277	0.4272	0.953	24.21	6150	27400	6400	28500	8530	37900
-	-	0.520	0.24	0.4994	0.4989	0.5002	0.4997	1.109	28.17	8950	39800	10700	47600	14200	63200
-	-	0.749	0.34	0.6244	0.6239	0.6252	0.6247	1.219	30.96	12200	54300	14400	64100	19300	85900
-	-	0.931	0.42	0.7494	0.7489	0.7502	0.7497	1.500	38.10	16300	72500	16400	73000	21800	97000
-	-	1.160	0.53	0.8744	0.8739	0.8752	0.8747	1.625	41.28	25800	114800	18900	84100	25300	112500
-	-	2.360	1.07	0.9994	0.9989	1.0002	0.9997	2.000	50.80	25800	114800	28400	126300	37900	168600
-	-	2.710	1.23	1.2494	1.2488	1.2503	1.2497	2.281	57.94	25800	114800	33500	149000	44600	198400
-	-	3.367	1.53	1.2494	1.2488	1.2503	1.2497	2.562	65.07	25800	114800	36700	163200	48900	217500
-	-	0.107	0.05	0.2494	0.2489	0.2502	0.2497	0.576	14.63	870	3900	2310	10300	3080	13700
0.815	20.70	0.239	0.11	0.3119	0.3114	0.3127	0.3122	0.672	17.07	2100	9300	5370	23900	7130	31700
1.065	27.05	0.437	0.20	0.3744	0.3739	0.3752	0.3747	0.891	22.63	3840	17100	9370	41700	12500	55600
1.315	33.40	0.728	0.33	0.4369	0.4364	0.4377	0.4372	1.109	28.17	6150	27400	15000	66700	19900	88500
1.565	39.75	1.130	0.51	0.4994	0.4989	0.5002	0.4997	1.281	32.54	8950	39800	21400	95200	28500	126800
1.895	48.13	1.630	0.74	0.6244	0.6239	0.6252	0.6247	1.469	37.31	12200	54300	28900	128600	38500	171300
2.045	51.94	2.310	1.05	0.7494	0.7489	0.7502	0.7497	1.578	40.08	16300	72500	33600	149500	44900	199700
2.225	56.52	3.260	1.48	0.8744	0.8739	0.8752	0.8747	1.844	46.84	25800	114800	44600	198400	59500	264700
2.475	62.87	4.330	1.96	0.9994	0.9989	1.0002	0.9997	1.984	50.39	25800	114800	53600	238400	71300	317200
2.685	68.20	6.090	2.76	1.2494	1.2488	1.2503	1.2497	2.281	57.94	25800	114800	69000	306900	92000	409200
2.685	68.20	7.350	3.33	1.2494	1.2488	1.2503	1.2497	2.562	65.07	25800	114800	76000	338100	102000	453700