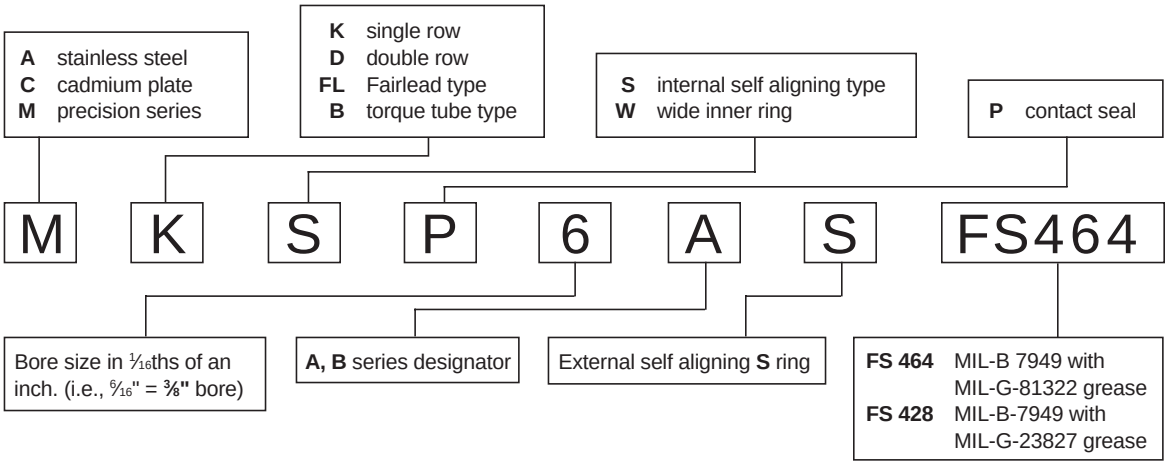
Control and Rod End Bearings

Rod End

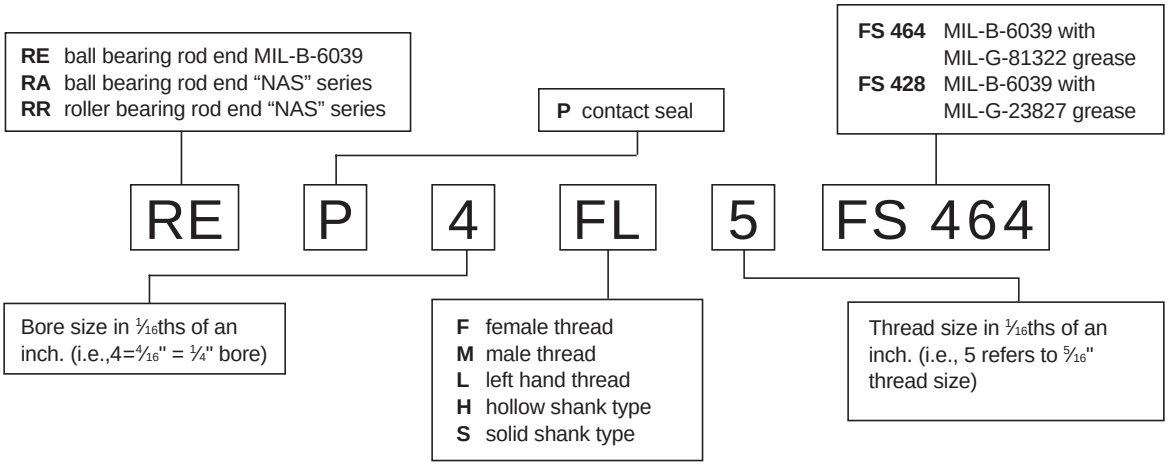
ROD END BEARINGS

Nomenclature

Control Bearings



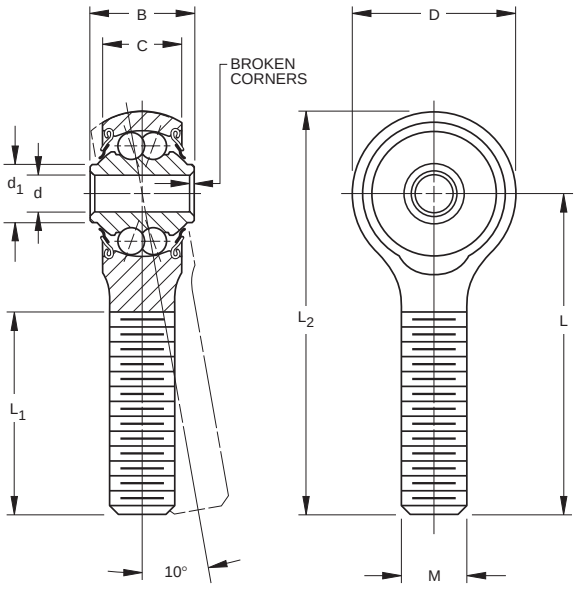
Rod End Bearings



REP Series External Thread

MS21151 • MIL-B-6039

- Precision series.
- Double row, ball, self-aligning.
- 10° permissible misalignment in either direction.
- These bearings are manufactured with an internal play of .0004" (.010mm) max. Inner and outer raceway surface finish = 8 micro inches AA max.
- Equipped with Teflon seals.
- Exposed surfaces except bore, cap, and seals are cadmium plated.
- Outer shank – 90,000 p.s.i. Min. Tensile Strength.
- Prelubricated. (See Table 1, page 87 for options.)



TO ORDER, SPECIFY BEARING NUMBER AND FACTORY SPECIFICATION. SEE PAGE 87. (Example REPB3N FS464)

Bearing Number	MS 21151 Dash No.	Bore d +0.0000,-.0003 +0.000,-.008		Outside Diameter D ±.010 ±.25		Widths B +0.000,-.005 +0.00,-.13		Widths C ±.010 ±.25		d_1 Approx.		L ±.010 ±.25		L_2 REF.		L_1[1] ±.031 ±.79		M UNJF-3A Threads Per MIL-S-8879 Size	Wt. Approx.		Radial Limit Load Rating	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		lbs.	kg	lbs.	N
REP3MR3	-2	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	10-32RH	0.04	0.018	1000	4400
REP3ML3	-1	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	10-32LH	0.04	0.018	1000	4400
REP3M4-6	-7	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.953	49.61	1.000	25.40	1/4-28RH	0.05	0.023	1000	4400
REP3MS4-6[2]	-7C	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.953	49.61	1.000	25.40	1/4-28RH	0.05	0.023	1000	4400
REP3M6-2N	-4	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	3/8-24RH	0.05	0.023	1000	4400
REP3MS6-2N[2]	-4C	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	3/8-24RH	0.05	0.023	1000	4400
REP3ML6-2N	-5	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	3/8-24LH	0.05	0.023	1000	4400
REP3MLS6[2]	-5C	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	3/8-24LH	0.05	0.023	1000	4400
RAP3M4-2	-6	0.1900	4.826	0.781	19.84	0.500	12.70	0.438	11.13	0.312	7.92	1.812	46.02	2.202	55.93	0.938	23.83	1/4-28RH	0.10	0.045	1000	4400
***RAP3MS4-2**[2]	-6C	0.1900	4.826	0.781	19.84	0.500	12.70	0.438	11.13	0.312	7.92	1.812	46.02	2.202	55.93	0.938	23.83	1/4-28RH	0.10	0.045	1000	4400
REP3M6A	-3	0.1900	4.826	0.969	24.61	0.500	12.70	0.407[4]	10.34	0.304	7.72	2.031	51.59	2.516	63.91	1.313	33.35	3/8-24RH	0.115	0.052	1200	5300
***REP3MS6A**[2]	-3C	0.1900	4.826	0.969	24.61	0.500	12.70	0.407[4]	10.34	0.304	7.72	2.031	51.59	2.516	63.91	1.313	33.35	3/8-24RH	0.115	0.052	1200	5300
REP4M6	-8	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	1.125	28.58	3/8-24RH	0.10	0.045	1720	7650
REP4M6-4[2]	-8C	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	1.125	28.58	3/8-24RH	0.10	0.045	1720	7650
REP4ML6	-9	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	1.125	28.58	3/8-24LH	0.10	0.045	1720	7650
REP4ML6-4[2]	-9C	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	1.125	28.58	3/8-24LH	0.10	0.045	1720	7650
REP5M6	-10	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.506	12.85	2.438	61.93	3.063	77.8	1.563	39.70	3/8-24RH	0.24	0.109	2920	12900
***REP5M6-2**[2]	-10C	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.506	12.85	2.438	61.93	3.063	77.8	1.563	39.70	3/8-24RH	0.24	0.109	2920	12900
REP5M7	-11	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.506	12.85	2.438	61.93	3.063	77.8	1.563	39.70	7/16-20RH	0.24	0.109	2920	12900
***REP5MS7**[2]	-11C	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.506	12.85	2.438	61.93	3.063	77.8	1.563	39.70	7/16-20RH	0.24	0.109	2920	12900
***REP5M10**	-12	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.506	12.85	2.438	61.93	3.063	77.8	1.563	39.70	5/8-18RH	0.24	0.109	2920	12900
***REP5MS10**[2]	-12C	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.506	12.85	2.438	61.93	3.063	77.8	1.563	39.70	5/8-18RH	0.24	0.109	2920	12900
REP8M10[3]	-	0.5000	12.700	1.875	47.62	1.000	25.40	0.844	21.44	0.688	17.48	3.031	76.99	3.968	100.79	1.750	44.45	5/8-18RH	0.55	0.249	6900	30500
***RAP10M10**	-13	0.6250	15.875	2.000	50.80	1.125	28.58	0.938	23.83	0.875	22.22	2.750	69.85	3.750	95.25	1.500	38.10	5/8-18RH	0.71	0.322	7090	31500
***RAP10MS10**[2]	-13C	0.6250	15.875	2.000	50.80	1.125	28.58	0.938	23.83	0.875	22.22	2.750	69.85	3.750	95.25	1.500	38.10	5/8-18RH	0.71	0.322	7090	31500

[1] Length includes maximum of two incomplete threads.

[2] NAS 513 keyway in shank.

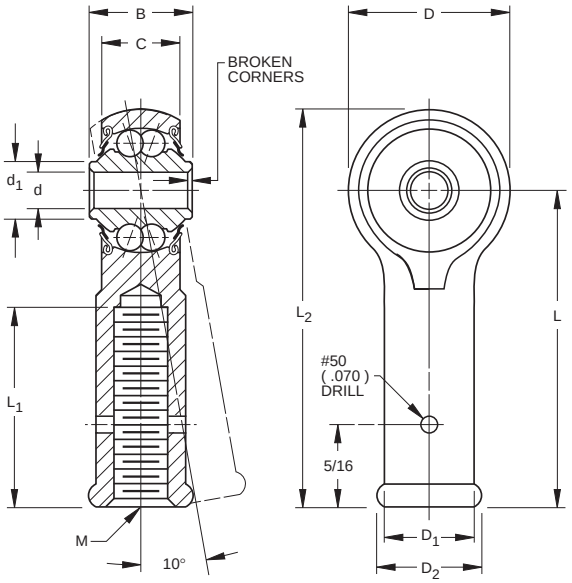
[3] 5° permissible misalignment in either direction.

[4] +.000" (+.00 mm), -.015" (-.38mm).

* Check for availability.

REP Series
Internal Thread

MS21153 • MIL-B-6039
This series is similar in features to those shown on page 116.



TO ORDER, SPECIFY BEARING NUMBER AND FACTORY SPECIFICATION. SEE PAGE 87. (Example REPB3N FS464)

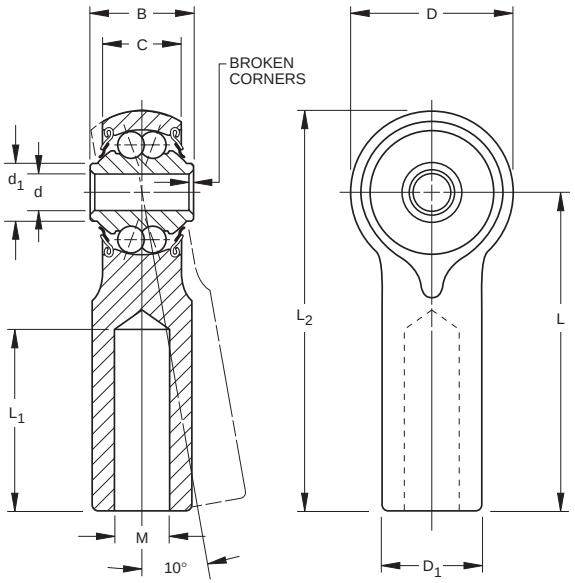
Bearing Number	MS 21153 Dash No.	Bore d +0.0000,-.0003 +0.000,-.008 in.	Bore d mm	Outside Diameter D ±.010 ±.25 in.	Outside Diameter D mm	Widths B +0.000,-.005 +0.00,-.13 in.	Widths B mm	Widths C ±.010 ±.25 in.	Widths C mm	d_1 Approx. in.	d_1 mm	L ±.010 ±.25 in.	L mm	L_2 REF. in.	L_2 mm	L_1[1] ±.031 ±.79 in.	L_1[1] mm	D_2 ±.010 ±.25 in.	D_2 mm	D_1 ±.010 ±.25 in.	D_1 mm	M UNJF-3B Threads Per MIL-S-8879 Size	Wt. Approx. lbs.	Wt. kg	Radial Limit Load Rating lbs.	Radial Limit Load Rating N
REPB3N	-1	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	0.438[3]	11.13[3]	0.375	9.52	1/4-28RH	0.05	0.023	1000	4400
REP3FL4-3	-5	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	0.438[3]	11.13[3]	0.375	9.52	1/4-28LH	0.05	0.023	1000	4400
REPB3N-2	-2	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	0.438[4]	11.13[4]	0.483	11.13	5/16-24RH	0.06	0.027	1000	4400
REP3F4	-3	0.1900	4.826	0.781	19.84	0.500	12.70	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	0.438[3]	11.13[3]	0.375	9.52	1/4-28RH	0.06	0.027	1000	4400
REP3FL4	-4	0.1900	4.826	0.781	19.84	0.500	12.70	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.750	19.05	0.438[3]	11.13[3]	0.375	9.52	1/4-28LH	0.06	0.027	1000	4400
REP4F5	-6	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.469	37.31	1.938	49.23	0.750	19.05	0.438[4]	11.13[4]	0.483	11.13	5/16-24RH	0.07	0.032	1720	7650
REP4F5-5[2]	-6C	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.469	37.31	1.938	49.23	0.750	19.05	0.438[4]	11.13[4]	0.483	11.13	5/16-24RH	0.07	0.032	1720	7650
REP4FL5[2]	-7	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.469	37.31	1.938	49.23	0.750	19.05	0.438[4]	11.13[4]	0.483	11.13	5/16-24LH	0.07	0.032	1720	7650
***REP4FL5-5**[2]	-7C	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.469	37.31	1.938	49.23	0.750	19.05	0.438[4]	11.13[4]	0.483	11.13	5/16-24LH	0.07	0.032	1720	7650
REP4F7	-8	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	1.125	28.58	0.625	15.88	0.625	15.88	7/16-20RH	0.08	0.036	1720	7650
***REP4FL7**	-9	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	1.125	28.58	0.625	15.88	0.625	15.88	7/16-20LH	0.08	0.036	1720	7650
REP5F5	-10	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.501	12.73	1.875	47.62	2.500	63.50	1.000	25.40	0.483	11.13	0.483	11.13	5/16-24RH	0.1	0.045	2920	12900
REP5FL5	-11	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.501	12.73	1.875	47.62	2.500	63.50	1.000	25.40	0.483	11.13	0.483	11.13	5/16-24LH	0.1	0.045	2920	12900

(1) Length includes maximum of two incomplete threads.
(2) NAS 513 locking slot in shank.
(3) Bead diameter.
(4) Hex diameter across flats.

* Check for availability.

REP Series
Hollow & Solid Shank

MS21152/MS21150 • MIL-B-6039
- Precision series.
- Double row, ball, self-aligning.
- 10° permissible misalignment in either direction.
- These bearings are manufactured with an internal play of .0004" (.010mm) max. Inner and outer raceway surface finish = 8 micro inches AA max.
- Equipped with Teflon seals.
- Exposed surfaces except bore, cap, and seals are cadmium plated.
- Outer shank - 90,000 p.s.i. Min. Tensile Strength.
- Prelubricated. (See Table 1, page 87 for options.)

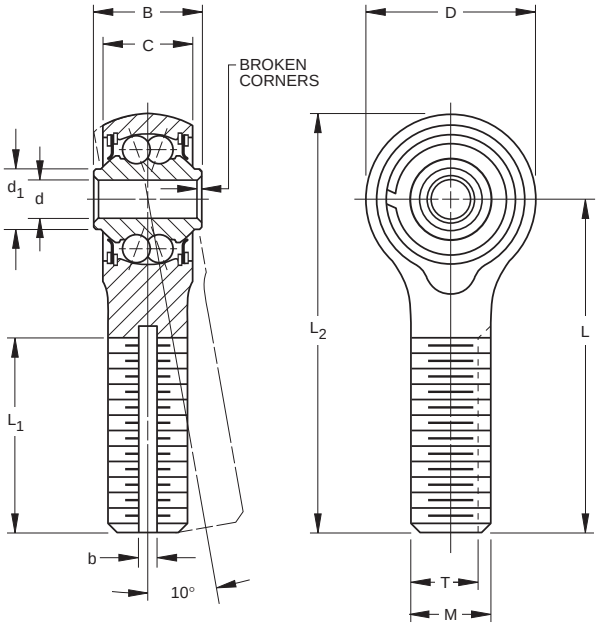


TO ORDER, SPECIFY BEARING NUMBER AND FACTORY SPECIFICATION. SEE PAGE 87. (Example REPB3N FS464)

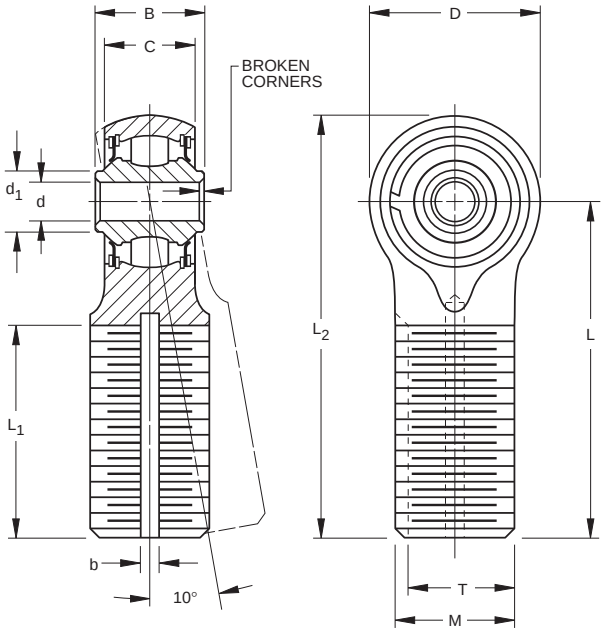
Bearing Number	MS 21152 Dash No.	Bore d		Outside Diameter D		Widths B		Widths C		d_1		L		L_2		L_1		D_1		M		Wt.		Radial Limit Load Rating	
		+0.0000,-.0003	+0.000,-.008	±.010	±.25	+0.000,-.005	+0.00,-.13	±.010	±.25	Approx.		±.010	±.25	REF.		±.031	±.79	+0.000,-.002	+0.00,-.05	±.010	±.25	Approx.			
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	N
HOLLOW SHANK																									
REP3H5	-1	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	0.875	22.22	0.430	10.92	0.272	6.91	0.06	0.027	1000	4400
REP4H8	-3	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.625	41.28	2.093	53.16	0.875	22.22	0.625	15.88	0.515	13.08	0.08	0.036	1720	7650
REP4H5-2	-4	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	0.750	19.05	0.438	11.13	0.346	8.79	0.12	0.054	1720	7650
REP4H8-2	-5	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	1.125	28.58	0.625	15.88	0.500	12.70	0.09	0.041	1720	7650
REP4H6	-2	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	1.219	30.96	0.625	15.88	0.386	9.80	0.12	0.054	1720	7650
REP5H8	–	0.3125	7.938	1.250	31.75	0.870	22.10	0.656	16.66	0.506	12.85	2.438	61.93	3.063	77.80	1.562	39.67	0.625	15.88	0.500	12.70	0.15	0.068	2920	12900
REP8H10	–	0.5000	12.700	1.875	47.62	1.000	25.40	0.844	21.44	0.688	17.48	3.031	76.99	3.968	100.79	1.640	41.66	0.625	15.88	0.438	11.13	0.55	0.249	6900	30500
	MS 21150																								
SOLID SHANK																									
REP3S7	-1	0.1900	4.826	0.781	19.84	0.437	11.10	0.328	8.33	0.281	7.14	1.375	34.92	1.766	44.86	–	–	0.430	10.92	–	–	0.07	0.032	1000	4400
REP4S10	-2	0.2500	6.350	0.938	23.83	0.593	15.06	0.438	11.13	0.345	8.76	1.875	47.62	2.344	59.54	–	–	0.625	15.88	–	–	0.16	0.073	1720	7650

RA/RR Series
External Thread

- NAS-659 series[1].
- Self-aligning.
- 3-Way balanced design brings shank strength, bolt strength and bearing capacity all in balance.
- "Pressurized" shanks are designed to withstand column action under compression with angularity as high as 9°.
- Exposed surfaces except bore, cap, and seals are cadmium plated.
- Keyway in shank is designed in accordance with NAS-513 standards for use with NAS-509 drilled jam nuts and either NAS-513 rod end locking washers or NAS-559 rod end key type locks.
- Permissible misalignment is 10° in either direction (total 20°).
- Ultimate shank tensile strength is 125,000 to 180,000 p.s.i.
- Equipped with Buna N rubber seals.



RA Ball Type



RR Roller Type

DIMENSIONS – TOLERANCES

Bearing[1] Number	NAS 659 Dash No.	Bore d +0.0000,-.0005 +0.000,-.013		Outside Diameter D ±.010 ±.25		Widths B +0.000,-.005 +0.00,-.13		Widths C +0.010,-.005 +0.25,-.13		d_1 Approx.		L ±.010 ±.25		L_2 REF.		L_1[2] ±.010 ±.25		b[3] +0.005,-.000 +0.13,-.00		T[3] +0.000,-.005 +0.00,-.13		M UNJF-3A Thread per MIL-S-8879 Size	Wt. Approx.		Radial Limit Load[2] Rating	
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm		lbs.	kg	lbs.	N
*RA3M5	-3-5	0.1900	4.826	0.781	19.84	0.562	14.27	0.438	11.13	0.312	7.92	1.938	49.23	2.328	59.13	1.375	34.92	0.062	1.57	0.26	6.6	5/16-24	0.07	0.032	1000	4400
*RA3M5-2[5]	–	0.1900	4.826	0.781	19.84	0.500	12.70	0.438	11.13	0.312	7.92	1.938	49.23	2.328	59.13	1.375	34.92	0.062	1.57	0.26	6.6	5/16-24	0.07	0.032	1000	4400
*RA4M7	-4-7	0.2500	6.350	0.938	23.83	0.687	17.45	0.531	13.49	0.365	9.27	2.250	57.15	2.719	69.06	1.625	41.28	0.093	2.36	0.37	9.4	7/16-20	0.13	0.059	1720	7650
*RR4M9	R4-9	0.2500	6.350	1.063	27.00	0.625	15.88	0.469	11.91	0.404	10.26	2.563	65.10	3.094	78.59	1.875	47.62	0.125	3.18	0.478	12.14	9/16-18	0.21	0.095	3025	13400
*RR5M12	R5-12	0.3125	7.938	1.438	36.53	0.812	20.62	0.656	16.66	0.515	13.08	3.125	79.38	3.844	97.64	2.219	56.36	0.125	3.18	0.663	16.84	3/4-16	0.47	0.213	7350	32500
*RR6M14	R6-14	0.3750	9.525	1.750	44.45	0.937	23.80	0.750	19.05	0.564	14.33	3.563	90.50	4.438	112.73	2.438	61.93	0.156	3.96	0.777	19.74	7/8-14	0.72	0.327	9600	42500

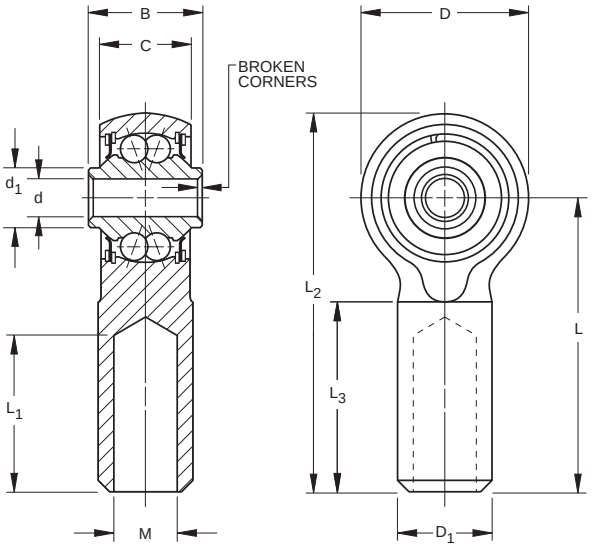
(1) When ordering as NAS part, add Suffix "FS237" to part number. (Example RA4M7 FS237)
(2) Threads: UNJF-3A (based on length of engagement = 1.25 thd. diam. + 5/8).
(3) Slots conform to NAS 513 Standards.
(4) Thrust rating is 20% of radial load rating.
* Check for availability

(5) This size not covered by NAS 659.
Lightening Holes in shank RR5M12-1/4" x 2 5/16"
RR6M14-3/8" x 2 9/16"

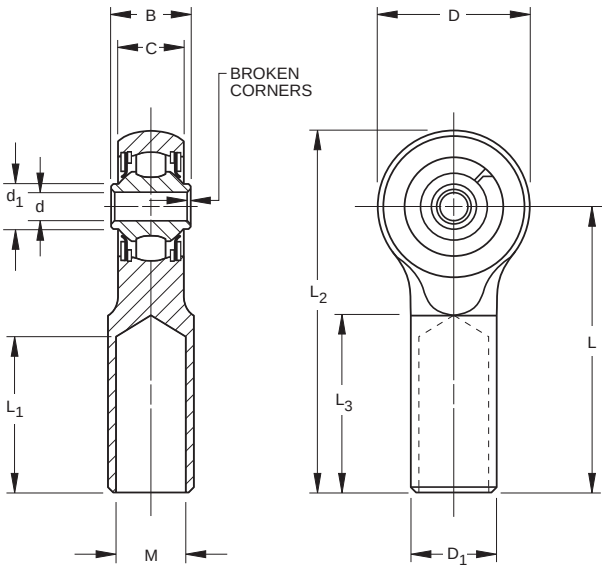
Left hand threaded units can be furnished as requirements justify production. Add letter "L" to part number for left hand threads. Example: RA3ML5.

RA/RR Series Hollow Shank

- NAS-660 series[1].
- Self-aligning.
- 3-Way balanced design brings shank strength, bolt strength and bearing capacity all in balance.
- "Pressurized" shanks are designed to withstand column action under compression with angularity as high as 9°.
- Permissible misalignment is 10° in either direction (total 20°).
- Ultimate shank tensile strength is 125,000 to 180,000 p.s.i.
- Equipped with Buna N rubber seals.
- Exposed surfaces except bore, cap, and seals are cadmium plated.
- Prepacked with lubricant conforming to MIL-G-23827.



RA Ball Type



RR Roller Type

DIMENSIONS – TOLERANCES

Brg. No.[1]	NAS 660 Dash No.	Bore d +0.0000,-.0005 +0.000,-.013		Outside Diameter D ±.010 ±.25		Widths B +0.000,-.005 +0.00,-.13		Widths C ±.010 +0.25		d_1 Approx.		L ±.010 ±.25		L_2 REF.		L_1 ±0.10 ±.25		D_1 +0.000,-0.002 +0.25,-.05		L_3		M +0.010,-0.001 +0.25,-.03		Wt. Approx.		Radial Limit Load Rating
		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kg	lbs.	N
*RA3H7	-3-7	0.1900	4.826	0.781	19.84	0.562	14.27	0.438	11.13	0.312	7.92	1.538	39.07	1.934	49.12	0.785	19.94	0.430	10.92	0.975	24.76	0.281	7.14	0.06	0.027	1000	4400
*RA4H9	-4-9	0.2500	6.350	0.938	23.83	0.687	17.45	0.531	13.49	0.365	9.27	1.75	44.45	2.219	56.36	0.941	23.90	0.555	14.10	1.125	28.58	0.406	10.31	0.12	0.054	1720	7650
*RA4H11	R4-11	0.2500	6.350	1.063	27.00	0.625	15.88	0.469	11.91	0.404	10.26	2.163	54.94	2.694	68.43	1.285	32.64	0.680	17.27	1.475	37.46	0.516	13.11	0.19	0.086	3025	13400
*RR5H14	R5-14	0.3125	7.938	1.438	36.53	0.812	20.62	0.656	16.66	0.515	13.08	2.906	73.81	3.625	92.08	1.785	45.34	0.870	22.10	2.094	53.19	0.703	17.86	0.4	0.181	7350	32500
*RR6H16	R6-16	0.3750	9.525	1.750	44.45	0.937	23.80	0.750	19.05	0.564	14.33	3.25	82.55	4.125	104.78	1.785	45.34	0.995	25.27	2.000	50.80	0.812	20.62	0.66	0.299	9600	42500

[1]When ordering as NAS part, add Suffix "FS237" to part number. (Example RA4H11 FS237)
[2]Thrust rating is 20% of radial load rating.

*Check for availability.