



spherical bearings
loader slot bearings
rod end bearings
sleeve bearings

ASTRO DIVISION
PRODUCTS AND
ENGINEERING



Welcome to the Astro Division of NHBB

The Astro Division of NHBB has firmly established its leadership position in the rod-end and spherical-bearing business by providing engineering solutions for complex application problems.

Product quality is NHBB's first priority. The employees of the Astro Division are dedicated to manufacturing products that meet the exacting specifications of today's demanding market environment. Initiatives such as AS9000, D1-9000 Rev A., and ISO 9001 are the foundation for our organization's commitment to quality.

While the Astro Division is well positioned to provide a standard product line at a competitive price, the Division also has extraordinary strength in custom design and production. This catalog is designed to help you find both the custom and standard products you may need for your applications.

Please contact Astro's sales or engineering groups for assistance with your specific requirements.



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SECTION 1

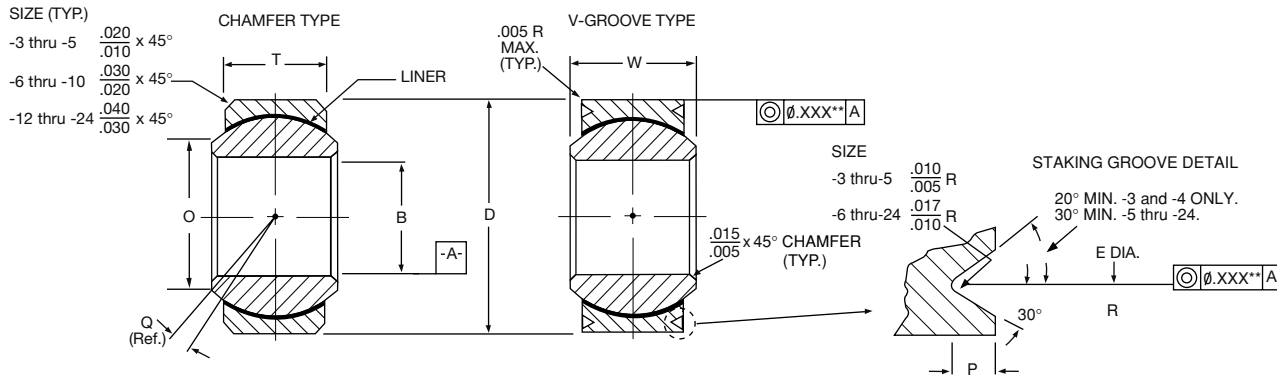
SPHERICAL BEARINGS – Self-Lubricating

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SPHERICAL BEARINGS – Self-Lubricating

AS81820 Narrow



Part Number	MS Dash No.	(B) Bore Diameter	(D) Outside Diameter	(W) Ball Width	(T) Race Width	(Q) Shoulder Diameter	Ball Diameter	(E) Pitch Diameter	(P) Groove Depth	(Q°) Misalignment	Limit Static Radial Load	Limit Static Axial Load	Dynamic Osc. Radial Load	Weight
V-Grooved*		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Degree	lbs.	lbs.	lbs.	lbs.
MS14101		+ .0000	+ .0000	+ .000	± .005	Min.	Ref.	+ .000	+ .000	Ref.				Ref.
MS14104		- .0005	- .0005	- .002				- .008	- .010					
ADB3V(L)	-3	.1900	.5625	.281	.218	.293	.406	.500	.025	10°	3975	150	1500	.020
ADB4V(L)	-4	.2500	.6562	.343	.250	.364	.500	.594	.025	10°	6040	430	3320	.020
ADB5V(L)	-5	.3125	.7500	.375	.281	.419	.562	.650	.035	10°	8750	700	5460	.030
ADB5VA(L)	-5A	.3125	.7500	.375	.281	.419	.562	.660	.035	10°	8750	700	5460	.030
ADB6V(L)	-6	.3750	.8125	.406	.312	.475	.656	.712	.035	9°	10540	1100	6600	.040
ADB7V(L)	-7	.4375	.9062	.437	.343	.530	.718	.806	.035	8°	13200	1400	8050	.050
ADB8V(L)	-8	.5000	1.0000	.500	.390	.600	.813	.876	.055	8°	17900	2100	10400	.070
ADB9V(L)	-9	.5625	1.0937	.562	.437	.670	.875	.970	.055	8°	23200	3680	13000	.090
ADB10V(L)	-10	.6250	1.1875	.625	.500	.739	.968	1.063	.055	8°	30500	4720	16450	.120
ADB12V(L)	-12	.7500	1.4375	.750	.593	.920	1.187	1.313	.055	8°	46400	6750	23600	.210
ADB14V(L)	-14	.8750	1.5625	.875	.703	.980	1.312	1.438	.055	8°	62200	9350	30250	.270
ADB16V(L)	-16	1.0000	1.7500	1.000	.797	1.118	1.500	1.626	.055	8°	82200	12160	38000	.390
ADB18V(L)	-	1.1250	2.1250	1.125	.900	1.334	1.750	2.003	.055	8°	105880	13500	42350	.720
ADB20V(L)	-	1.2500	2.3125	1.250	1.000	1.473	1.937	2.190	.055	8°	131230	16930	52490	.930
ADB22V(L)	-	1.3750	2.5625	1.375	1.100	1.654	2.156	2.440	.055	8°	161700	20750	64680	1.280
ADB24V(L)	-	1.5000	2.8125	1.500	1.200	1.794	2.344	2.690	.055	8°	191973	24950	77110	1.670

*For chamfered version, delete 'V' from part number.

Notes:

- Bearing sizes 3 through 16 listed in the tables are approved for procurement to AS81820 and Aerospace Standards AS14101 through AS14104.
 - Bearing sizes 18 through 24 listed are not included in current Aerospace Standards, but are offered as NHBB catalog items only.
 - Temperature: Operating temperature range per AS81820 is -65° to 325°F. Broader temperature capabilities are achievable.
- **Concentricity .XXX is .003 for sizes -3 through -5. Concentricity .XXX is .005 for sizes -6 and up.

Materials

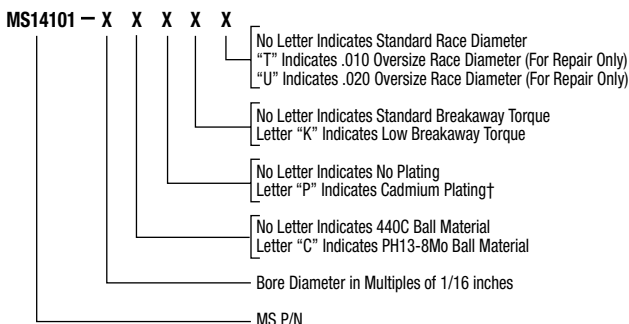
Part No.	Ball	Race	Liner
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required
Catalog No. + 13-8	CRES PH13-8Mo AMS 5629 Rc43-47	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required

TEFLON® is a Du Pont registered trademark

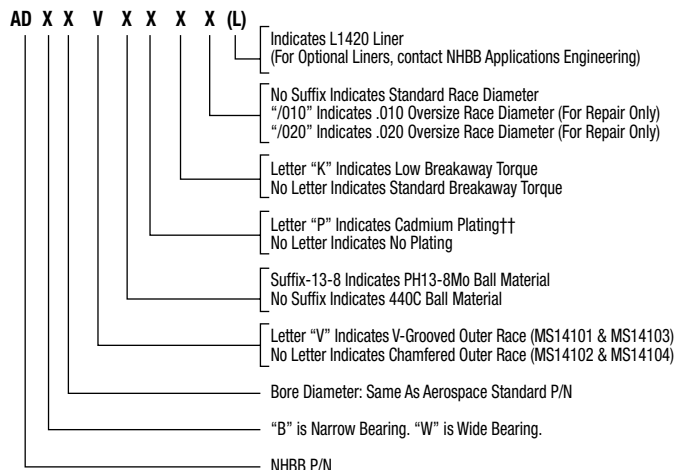


AS81820 Wide

Aerospace Standard P/N



NHBB P/N



P/N Series	NHBB P/N	Description
MS14101	ADB V	Narrow Grooved
MS14102	ADW	Wide Chamfered
MS14103	ADW V	Wide Grooved
MS14104	ADB	Narrow Chamfered

† Cadmium plate MS14102 & MS14104 O.D. and O.D. chamfers per AMS-QQ-P-416, Type II, Class 2. Dimensions apply after plating.

†† Cadmium plate MS14101 & MS14103 O.D. and on the flats between the outside diameter and the grooves per AMS-QQ-P-416, Type II, Class 2. Dimensions apply after plating.

Part Number	MS Dash No.	(B) Bore Diameter	(D) Outside Diameter	(W) Ball Width	(T) Race Width	(O) Shoulder Diameter	Ball Diameter	(E) Pitch Diameter	(P) Groove Depth	(Q°) Misalignment	Limit Static Radial Load	Limit Static Axial Load	Dynamic Osc. Radial Load	Weight
V-Grooved*		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Degree	lbs.	lbs.	lbs.	lbs.
MS14102		+ .0000	+ .0000	+ .000		Min.	Ref.	+ .000	+ .000	Ref.				Ref.
MS14103		- .0005	- .0005	- .002	± .005			- .008	- .010					
ADW3V(L)	-3	.1900	.6250	.437	.327	.300	.531	.563	.025	15°	2500	1770	4900	.031
ADW4V(L)	-4	.2500	.6250	.437	.327	.300	.531	.563	.025	15°	5500	1770	4900	.031
ADW5V(L)	-5	.3125	.6875	.437	.317	.360	.593	.625	.025	14°	9400	1640	6050	.035
ADW6V(L)	-6	.3750	.8125	.500	.406	.466	.687	.712	.035	8°	13700	2630	8310	.060
ADW7V(L)	-7	.4375	.9375	.562	.442	.537	.781	.837	.035	10°	20700	3650	11750	.080
ADW7V52(L)	-7A	.4375	.9062	.562	.442	.537	.781	.806	.035	10°	19700	3650	11750	.080
ADW8V(L)	-8	.5000	1.0000	.625	.505	.607	.875	.900	.035	9°	21400	4970	14950	.100
ADW9V(L)	-9	.5625	1.1250	.687	.536	.721	1.000	1.025	.035	10°	26600	5370	18100	.135
ADW10V(L)	-10	.6250	1.1875	.750	.567	.747	1.062	1.087	.035	12°	29000	6130	20250	.160
ADW12V(L)	-12	.7500	1.3750	.875	.630	.845	1.250	1.251	.055	13°	37000	7730	26200	.240
ADW14V(L)	-14	.8750	1.6250	.875	.755	.995	1.375	1.501	.055	6°	65200	10800	33600	.350
ADW16V(L)	-16	1.0000	2.1250	1.375	1.005	1.269	1.875	2.001	.055	12°	104000	19300	56250	.970
ADW18V(L)	-	1.1250	2.2500	1.437	1.067	1.338	1.968	2.128	.055	14°	142570	19640	57000	1.000
ADW20V(L)	-	1.2500	2.3750	1.500	1.130	1.460	2.093	2.253	.055	13°	159200	21970	63680	1.120
ADW20-5V(L)	-	1.2500	2.0000	1.093	.942	1.406	1.781	1.878	.055	6°	112360	14890	44940	.564
ADW22V(L)	-	1.3750	2.5625	1.687	1.223	1.535	2.281	2.440	.055	15°	190000	25970	76000	1.390
ADW24V(L)	-	1.5000	2.6875	1.687	1.223	1.693	2.390	2.567	.055	14°	199000	25970	79640	1.480

*For chamfered version, delete 'V' from part number.

No Load Breakaway Torque

Bore Sizes	Standard (in - lbs.)	"K" Type
3 & 4	.25 to 5.0	0 to 0.5
5 to 12	.25 to 8.0	0 to 1.0
14 & 16	.25 to 12.0	0 to 2.0
18 & 20	.25 to 18.0	0 to 2.0
22 & 24	.25 to 24.0	0 to 2.0

Radial and Axial Play

P/N Series MS14101 & MS14104

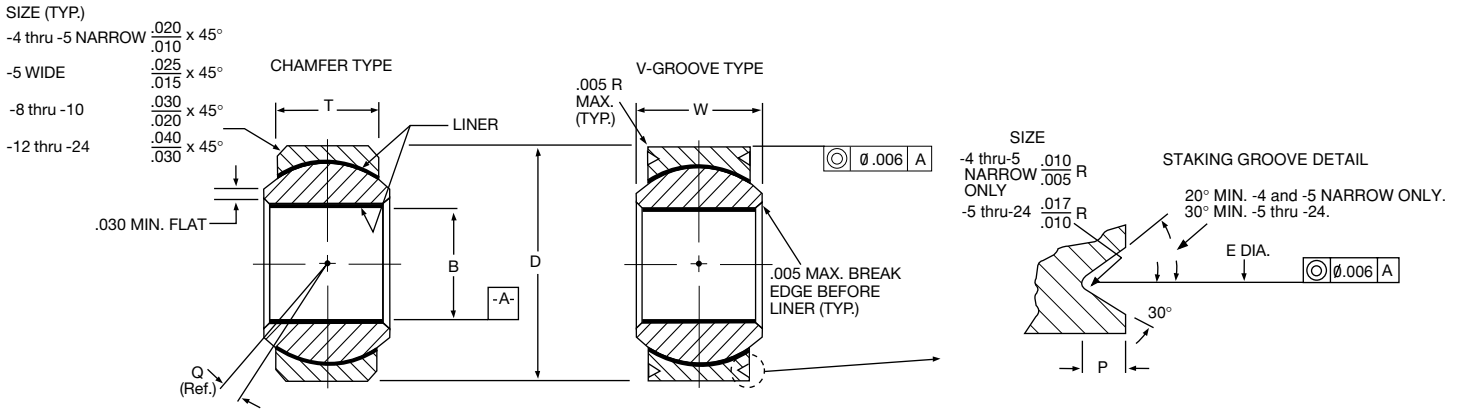
Bore Size	Max. Radial Play	Max. Axial Play
3K Thru 12K	0.0007 Inch	0.0028 Inch
14K Thru 16K	0.0010 Inch	0.0040 Inch

P/N Series MS14102 & MS14103

Bore Size	Max. Radial Play	Max. Axial Play
3K Thru 12K	0.0007 Inch	0.0021 Inch
14K Thru 16K	0.0010 Inch	0.0030 Inch

SPHERICAL BEARINGS – Self-Lubricating

AS81820 Lined Bore Series – Narrow



Part Number	MS Dash No.	(B) Bore Diameter	(D) Outside Diameter	(W) Ball Width	(T) Race Width	Ball Diameter	(E) Pitch Diameter	(P) Groove Depth	(Q°) Mis-alignment	Limit Static Radial Load	Limit Static Axial Load	Dynamic Osc. Radial Load	Weight
M81820/1		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Degree	lbs.	lbs.	lbs.	lbs.
M81820/4		+ .0000	+ .0000	+ .000	± .005	Ref.	+ .000	+ .000	Ref.				Ref.
		- .0010	- .0005	- .002			- .008	- .010					
ADBL4V(L)	-4	.2510	.6562	.343	.250	.500	.594	.025	10°	5550	430	2650	.020
ADBL5V(L)	-5	.3135	.7500	.375	.281	.562	.660	.035	10°	7700	700	3700	.030
ADBL6V(L)	-6	.3760	.8125	.406	.312	.656	.712	.035	9°	10200	1100	4900	.040
ADBL7V(L)	-7	.4385	.9062	.437	.343	.718	.806	.035	8°	12950	1400	6700	.050
ADBL8V(L)	-8	.5010	1.0000	.500	.390	.813	.876	.055	8°	17250	2100	8250	.070
ADBL9V(L)	-9	.5635	1.0937	.562	.437	.875	.970	.055	8°	22150	3680	10600	.090
ADBL10V(L)	-10	.6260	1.1875	.625	.500	.968	1.063	.055	8°	27700	4720	13250	.120
ADBL12V(L)	-12	.7510	1.4375	.750	.593	1.187	1.313	.055	8°	40600	6750	19400	.210
ADBL14V(L)	-14	.8760	1.5625	.875	.703	1.312	1.438	.055	8°	55950	9350	26750	.270
ADBL16V(L)	-16	1.0010	1.7500	1.000	.797	1.500	1.626	.055	9°	73800	12160	35250	.390
ADBL18V(L)	-	1.1260	2.1250	1.125	.900	1.750	2.001	.055	8°	94080	13500	37870	.720
ADBL20V(L)	-	1.2510	2.3125	1.250	1.000	1.937	2.188	.055	8°	116250	16930	46920	.930
ADBL22V(L)	-	1.3760	2.5625	1.375	1.100	2.156	2.438	.055	8°	140770	20750	56950	1.280
ADBL24V(L)	-	1.5010	2.8125	1.500	1.200	2.344	2.688	.055	8°	167630	24950	67950	1.670

*For chamfered version, delete 'V' from part number.

Notes:

- All dimensions, materials and configurations of sizes 4 through 16 conform to requirements of Aerospace Standards. Consult QPL for NHBB approvals to P/N series AS81820/1 through AS81820/4.
- Bearing sizes 18 thru 24 are not included in current Aerospace Standards but are offered as NHBB catalog items only.
- Temperature: Operating temperature range per AS81820 is -65° to 325°F. Broader temperature capabilities are achievable.

Materials

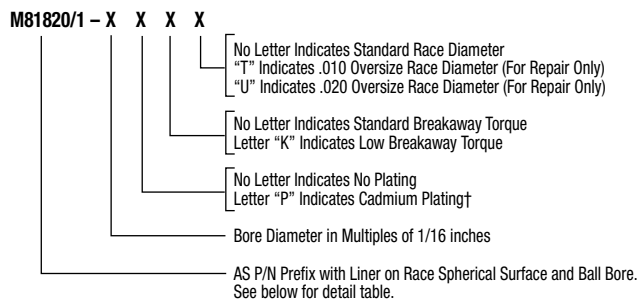
Part No.	Ball	Race	Liner
Catalog No.	CRES PH13-8Mo AMS 5629 Cond. H-1000 (Rc43 min.)	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. & Ball Bore No Lub. Required

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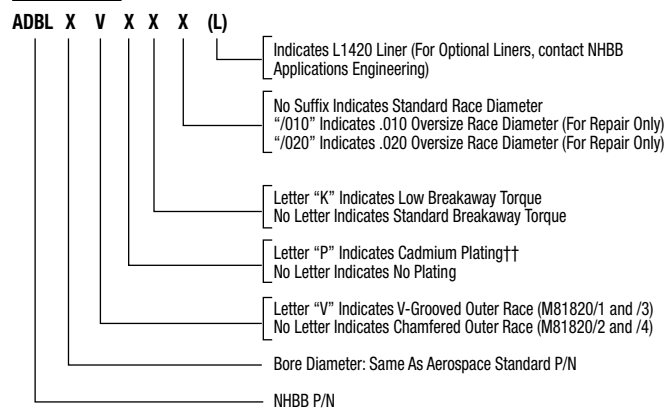


AS81820 Lined Bore Series – Wide

Aerospace Standard P/N



NHBB P/N



† Cadmium plate M81820/1 & M81820/3 O.D. and on the flats between the outside diameter and the grooves per AMS-QQ-P-416, Type II, Class 2. Dimensions apply after plating.
 †† Cadmium plate M81820/2 & M81820/4 O.D. and O.D. chamfers per AMS-QQ-P-416, Type II, Class 2. Dimensions apply after plating.

Aerospace Standard P/N	NHBB P/N	Description
M81820/1	ADBL V	Narrow Grooved
M81820/2	ADWL	Wide Chamfered
M81820/3	ADWL V	Wide Grooved
M81820/4	ADBL	Narrow Chamfered

Part Number	MS Dash No.	(B) Bore Diameter	(D) Outside Diameter	(W) Ball Width	(T) Race Width	Ball Diameter	(E) Pitch Diameter	(P) Groove Depth	(Q°) Mis-alignment	Limit Static Radial Load	Limit Static Axial Load	Dynamic Osc. Radial Load	Weight
M81820/2		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Degree	lbs.	lbs.	lbs.	lbs.
M81820/3		+0.000	+0.000	+0.000	±.005	Ref.	+0.000	+0.000	Ref.				Ref.
		-0.010	-0.0005	-0.002			-0.008	-0.010					
ADWL5V(L)	-5	.3135	.6875	.437	.317	.593	.625	.025	14°	9250	1640	4450	.035
ADWL6V(L)	-6	.3760	.8125	.500	.406	.687	.712	.035	8°	13000	2630	6200	.060
ADWL7V(L)	-7	.4385	.9375	.562	.442	.781	.837	.035	10°	17300	3650	8250	.080
ADWL7V52(L)	-7A	.4385	.9062	.562	.442	.781	.806	.035	10°	17250	3650	8250	.080
ADWL8V(L)	-8	.5010	1.0000	.625	.505	.875	.900	.035	9°	21400	4970	10600	.100
ADWL9V(L)	-9	.5635	1.1250	.687	.536	1.000	1.025	.035	10°	26600	5370	13200	.135
ADWL10V(L)	-10	.6260	1.1875	.750	.567	1.062	1.087	.035	12°	29000	6130	16150	.160
ADWL12V(L)	-12	.7510	1.3750	.875	.630	1.250	1.251	.055	13°	37000	7730	24800	.240
ADWL14V(L)	-14	.8760	1.6250	.875	.755	1.375	1.501	.055	6°	56000	10800	26750	.350
ADWL16V(L)	-16	1.0010	2.1250	1.375	1.005	1.875	2.001	.055	12°	103300	19300	49300	.970
ADWL18V(L)	-	1.1260	2.2500	1.437	1.067	1.968	2.126	.055	14°	120410	19640	48760	1.000
ADWL20V(L)	-	1.2510	2.3750	1.500	1.130	2.093	2.251	.055	13°	139690	21970	56620	1.120
ADWL20-5V(L)	-	1.2510	2.0000	1.093	.942	1.781	1.876	.055	6°	101540	14890	40840	.564
ADWL22V(L)	-	1.3760	2.5625	1.687	1.223	2.281	2.438	.055	15°	172940	25970	70250	1.390
ADWL24V(L)	-	1.5010	2.6875	1.687	1.223	2.390	2.563	.055	14°	188670	25970	76640	1.480

*For chamfered version, delete "V" from part number.

No Load Breakaway Torque

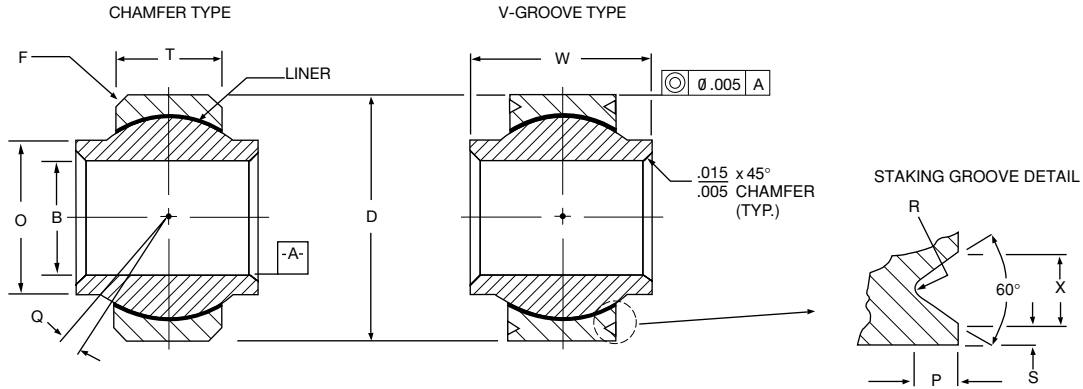
Bore Sizes	Standard (in - lbs.)	"K" Type
4 (Narrow only)	1.0 to 5.0	0 to 0.5
5 to 12	1.0 to 15.0	0 to 1.0
14 to 24	1.0 to 25.0	0 to 2.0

Radial and Axial Play

P/N Series M81820/1 & M81820/4		
Bore Size	Max. Radial Play	Max. Axial Play
3K Thru 12K	0.0007 Inch	0.0028 Inch
14K Thru 16K	0.0010 Inch	0.0040 Inch
P/N Series M81820/2 & M81820/3		
Bore Size	Max. Radial Play	Max. Axial Play
3K Thru 12K	0.0007 Inch	0.0021 Inch
14K Thru 16K	0.0010 Inch	0.0030 Inch

SPHERICAL BEARINGS – Self-Lubricating

High Misalignment



Part Number V-Grooved*	(B)	(D)	(W)	(T)	(O)	Ball Diameter	(F)	(Q)	(P)	(R) (S) (X)			No Load Rotational Breakaway Torque	Limit Static Radial Load	Dynamic Osc. Radial Load	Weight	
	Bore Diameter	Outside Diameter	Ball Width	Race Width	Shoulder Diameter		Race Chamfered x 45°	Mis-alignment		Staking Groove Data							
	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Ref.	Inch	Inch	Inch	Inch	Inch - lbs.	lbs.	lbs.	lbs.	
	+ .0000 - .0005	+ .0000 - .0005	+ .000 - .005	+ .010 - .000	Ref.	Ref.	+ .000 - .010		+ .000 - .015	+ .000 - .010	+ .000 - .010	+ .000 - .010					Ref.
ADBY3V(L)	.1900	.5625	.500	.205	.319	.437	.020	15°	.030	.015	.020	.045	.25-5	6440	3780	.018	
ADBY4V(L)	.2500	.7400	.593	.250	.390	.593	.020	24°	.030	.015	.020	.045	.25-5	10790	5390	.036	
ADBY5V(L)	.3125	.6875	.625	.250	.418	.593	.020	20°	.030	.015	.020	.045	1-15	10790	5390	.029	
ADBY6V(L)	.3750	.9060	.813	.340	.512	.781	.030	23°	.030	.015	.020	.045	1-15	19170	9580	.068	
ADBY7V(L)	.4375	1.0000	.875	.340	.618	.875	.030	22°	.030	.015	.020	.045	1-15	21720	10860	.095	
ADBY8V(L)	.5000	1.1250	.937	.396	.730	1.000	.030	20°	.030	.015	.020	.045	1-15	28810	14400	.159	
ADBY10V(L)	.6250	1.3750	1.200	.562	.856	1.250	.030	20°	.040	.020	.030	.055	1-15	50260	25130	.245	
ADBY12V(L)	.7500	1.5625	1.280	.615	.970	1.375	.040	18°	.060	.020	.030	.080	1-15	60500	30250	.315	
ADBY14V(L)	.8750	1.7500	1.400	.620	1.140	1.531	.040	18°	.060	.020	.030	.080	1-24	68640	34320	.430	
ADBY16V(L)	1.0000	2.1250	1.875	.830	1.278	1.875	.040	21°	.060	.020	.030	.080	1-24	111280	55640	.831	
ADBY18V(L)	1.1250**	2.3125**	1.875	.937	1.400	2.062	.040	20°	.060	.020	.030	.080	1-24	138100	68970	1.096	
ADBY20V(L)	1.2500**	2.5000**	1.875	1.000	1.523	2.250	.040	21°	.060	.020	.030	.080	1-24	160660	80330	1.318	
ADBY22V(L)	1.3750**	2.7500**	2.125	1.093	1.670	2.500	.040	22°	.060	.020	.030	.080	1-24	195310	97550	1.800	
ADBY24V(L)	1.5000**	3.0000**	2.250	1.170	1.800	2.672	.040	21°	.060	.020	.030	.080	1-24	223470	111740	2.223	

* For chamfered version, delete 'V' from part number.
 ** Bore and O.D. tolerances: +.0000, -.0008.

Notes:

- Temperature: Operating temperature range -65° to 325°F. Broader temperature capabilities are achievable.
- Options: Bearings with PH13-8Mo balls will be designated by "13-8" suffix (Example: ADBY16-13-8(L)). For outside race diameter with plate per AMS-QQ-P-416, Type II, Class 2, add suffix "P" (Example: ADBY16VP(L)).
- Qualification: Liner approved to AS81820.

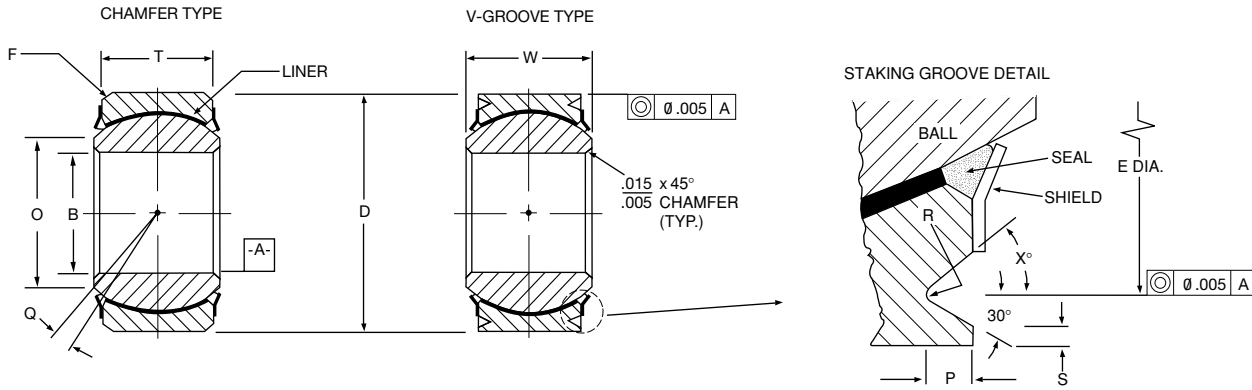
Materials

Part No.	Ball	Race	Liner
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required
Catalog No. + 13-8	CRES PH13-8Mo AMS 5629 Rc43-47	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required

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SPHERICAL BEARINGS – Self-Lubricating

Sealed Narrow



Part Number V-Grooved*	(B)	(D)	(W)	(T)	(O)	Ball Diameter	(F)	(Q)	(E)	(P)	(R)	(X)	No Load Rotational Breakaway Torque	Limit Static Radial Load	Limit Static Axial Load	Dynamic Osc. Radial Load	Weight
	Bore Diameter	Outside Diameter	Ball Width	Race Width	Shoulder Diameter		Race Chamfered x45°	Mis-alignment	Pitch Diam.	Staking Groove Data							
	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Min.	Inch	Inch	Inch		Inch - lbs.	lbs.	lbs.	lbs.	lbs.
ADB3VN(L)	.1900	.5625	.281	.218	.293	.406	.020	5°	.502	.030	.005-.010	20° min.	.25-8.0	3975	150	1500	.020
ADB4VN(L)	.2500	.6562	.343	.250	.364	.500	.020	5°	.596	.030	.005-.010	20° min.	.25-8.0	6040	430	3320	.020
ADB5VN(L)	.3125	.7500	.375	.281	.419	.562	.020	5°	.652	.040	.005-.010	30°	1.0-20.0	8750	700	5460	.030
ADB5VAN(L)	.3125	.7500	.375	.281	.419	.562	—	5°	.662	.040	.005-.010	20°	1.0-20.0	8750	700	5460	.030
ADB6VN(L)	.3750	.8125	.406	.312	.475	.656	.030	4.5°	.714	.040	.010-.020	30°	1.0-20.0	10540	1100	6600	.040
ADB7VN(L)	.4375	.9062	.437	.343	.530	.718	.030	4°	.808	.040	.010-.020	30°	1.0-20.0	13200	1400	8050	.050
ADB8VN(L)	.5000	1.0000	.500	.390	.600	.813	.030	4°	.878	.060	.010-.020	30°	1.0-20.0	17900	2100	10400	.070
ADB9VN(L)	.5625	1.0937	.562	.437	.670	.875	.030	4°	.972	.060	.010-.020	30°	1.0-20.0	23200	3680	13000	.090
ADB10VN(L)	.6250	1.1875	.625	.500	.739	.968	.030	4°	1.065	.060	.010-.020	30°	1.0-20.0	30500	4720	16450	.120
ADB12VN(L)	.7500	1.4375	.750	.593	.920	1.187	.040	4°	1.315	.060	.010-.020	30°	1.0-20.0	46400	6750	23600	.210
ADB14VN(L)	.8750	1.5625	.875	.703	.980	1.312	.040	4°	1.440	.060	.010-.020	30°	1.0-30.0	62200	9350	30250	.270
ADB16VN(L)	1.0000	1.7500	1.000	.797	1.118	1.500	.040	4.5°	1.628	.060	.010-.020	30°	1.0-30.0	82200	12160	38000	.390
ADB18VN(L)	1.1250	2.1250	1.125	.900	1.334	1.750	.040	4°	2.003	.060	.010-.020	30°	1.0-30.0	105880	13500	42350	.720
ADB20VN(L)	1.2500	2.3125	1.250	1.000	1.473	1.937	.040	4°	2.190	.060	.010-.020	30°	1.0-30.0	131230	16930	52490	.930
ADB22VN(L)	1.3750	2.5625	1.375	1.100	1.654	2.156	.040	4°	2.440	.060	.010-.020	30°	1.0-30.0	161700	20750	64680	1.280
ADB24VN(L)	1.5000	2.8125	1.500	1.200	1.794	2.344	.040	4°	2.690	.060	.010-.020	30°	1.0-30.0	192780	24950	77110	1.670

*For chamfered version, delete 'V' from part number.

Notes:

- For more information on sealed bearings, see page 70.
- Temperature: Operating temperature range -65° to 325°F. Broader temperature capabilities are achievable.
- Options: Bearings with PH13-8Mo balls will be designated by "13-8" suffix (Example: ADB16VN13-8(L)). For outside race diameter with cadmium plate per AMS-QQ-P-416, Type II, Class 2, add suffix "P" (Example: ADW16VN(L)).
- Qualification: Liner approved to AS81820.

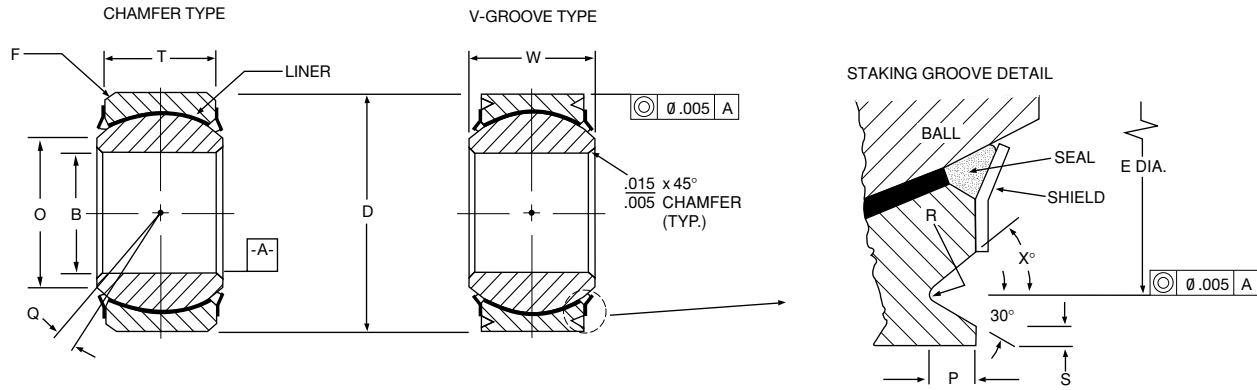
Materials

Part No.	Ball	Race	Liner
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required
Catalog No. + 13-8	CRES PH13-8Mo AMS 5629 Rc43-47	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required

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Sealed Wide



Part Number	(B) Bore	(D) Outside	(W) Ball	(T) Race	(O) Shoulder	Ball	(F) Race Chamfered x 45°	(Q) Mis-	(E) Pitch Diam.	(P)	(R)	(X)	No Load Rotational Breakaway Torque	Limit Static	Limit Static	Dynamic Osc.	
	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Min.	Inch	Inch	Inch		Inch - lbs.	lbs.	lbs.	lbs.	lbs.
	+0.000 -0.005	+0.000 -0.005	+0.00 -0.02	±0.05	Min.	Ref.	+0.00 -0.10		+0.00 -0.10	+0.00 -0.15							Ref.
ADW3VN(L)	.1900	.6250	.437	.327	.300	.531	.025	7.5°	.565	.030	.005-.015	20° min.	.25-8.0	2500	1770	4900	.031
ADW4VN(L)	.2500	.6250	.437	.327	.300	.531	.025	7.5°	.565	.030	.005-.015	20° min.	.25-8.0	5500	1770	4900	.031
ADW5VN(L)	.3125	.6875	.437	.317	.360	.593	.025	7°	.627	.030	.005-.015	30°	1.0-20.0	9400	1640	6050	.035
ADW6VN(L)	.3750	.8125	.500	.406	.466	.687	.030	4°	.714	.040	.010-.020	30°	1.0-20.0	13700	2630	8310	.060
ADW7VN(L)	.4375	.9375	.562	.442	.537	.781	.030	5°	.839	.040	.010-.020	30°	1.0-20.0	20700	3650	11750	.080
ADW7V52N(L)	.4375	.9062	.562	.442	.537	.781	—	5°	.808	.040	.010-.020	30°	1.0-20.0	19700	3650	11750	.080
ADW8VN(L)	.5000	1.0000	.625	.505	.607	.875	.030	4.5°	.902	.040	.010-.020	30°	1.0-20.0	21400	4970	14950	.100
ADW9VN(L)	.5625	1.1250	.687	.536	.721	1.000	.030	5°	1.027	.040	.010-.020	30°	1.0-20.0	26600	5370	18100	.135
ADW10VN(L)	.6250	1.1875	.750	.567	.747	1.062	.030	6°	1.089	.040	.010-.020	30°	1.0-20.0	29000	6130	20250	.160
ADW12VN(L)	.7500	1.3750	.875	.630	.845	1.250	.040	7.5°	1.253	.060	.010-.020	30°	1.0-20.0	37000	7730	26200	.240
ADW14VN(L)	.8750	1.6250	.875	.755	.995	1.375	.040	3°	1.503	.060	.010-.020	30°	1.0-30.0	65200	10800	33600	.350
ADW16VN(L)	1.0000	2.1250	1.375	1.005	1.269	1.875	.040	6°	2.003	.060	.010-.020	30°	1.0-30.0	104000	19300	56250	.970
ADW18VN(L)	1.1250	2.2500	1.437	1.067	1.338	1.968	.040	7°	2.128	.060	.010-.020	30°	1.0-30.0	142570	19640	57000	1.000
ADW20VN(L)	1.2500	2.3750	1.500	1.130	1.460	2.093	.040	6.5°	2.253	.060	.010-.020	30°	1.0-30.0	159200	21970	63680	1.120
ADW20-5VN(L)	1.2500	2.0000	1.093	.942	1.406	1.781	.040	3°	1.878	.060	.010-.020	30°	1.0-30.0	112360	14890	44940	.564
ADW22VN(L)	1.3750	2.5625	1.687	1.223	1.535	2.281	.040	7.5°	2.440	.060	.010-.020	30°	1.0-30.0	190000	25970	76000	1.390
ADW24VN(L)	1.5000	2.6875	1.687	1.223	1.693	2.390	.040	7°	2.567	.060	.010-.020	30°	1.0-30.0	199000	25970	79640	1.480

*For chamfered version, delete 'V' from part number.

Notes:

- For more information on sealed bearings, see page 70.
- Temperature: Operating temperature range -65° to 325°F. Broader temperature capabilities are achievable.
- Options: Bearings with PH13-8Mo balls will be designated by "13-8" suffix (Example: ADB16VN13-8(L)). For outside race diameter with cadmium plate per AMS-QQ-P-416, Type II, Class 2, add suffix "P" (Example: ADW16VNP(L)).
- Qualification: Liner approved to AS81820.

Materials

Part No.	Ball	Race	Liner
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required
Catalog No. + 13-8	CRES PH13-8Mo AMS 5629 Rc43-47	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required

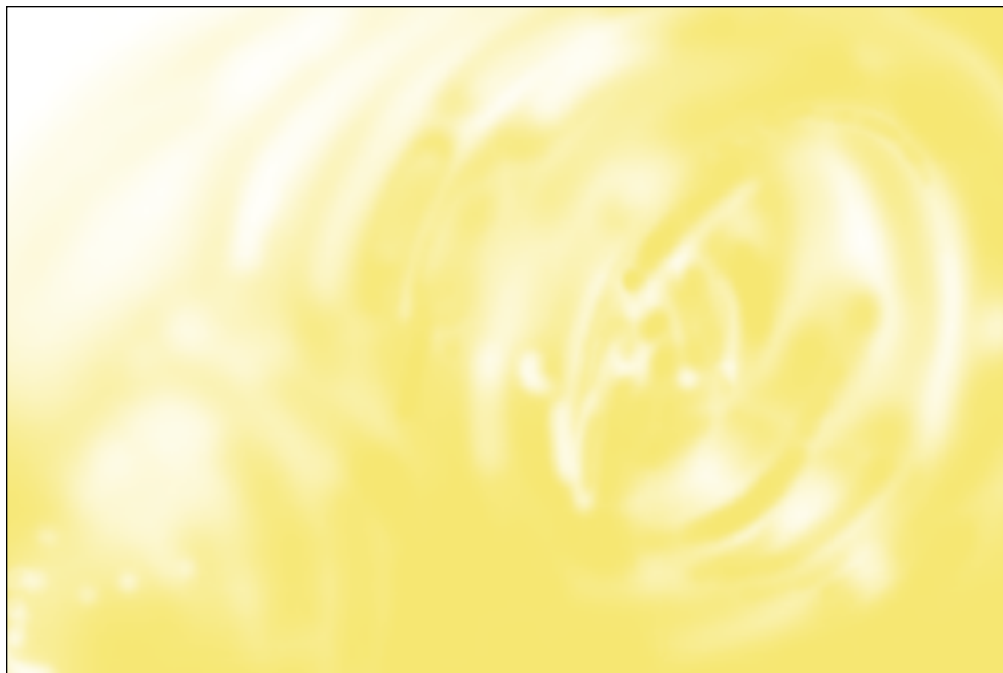
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SECTION 2

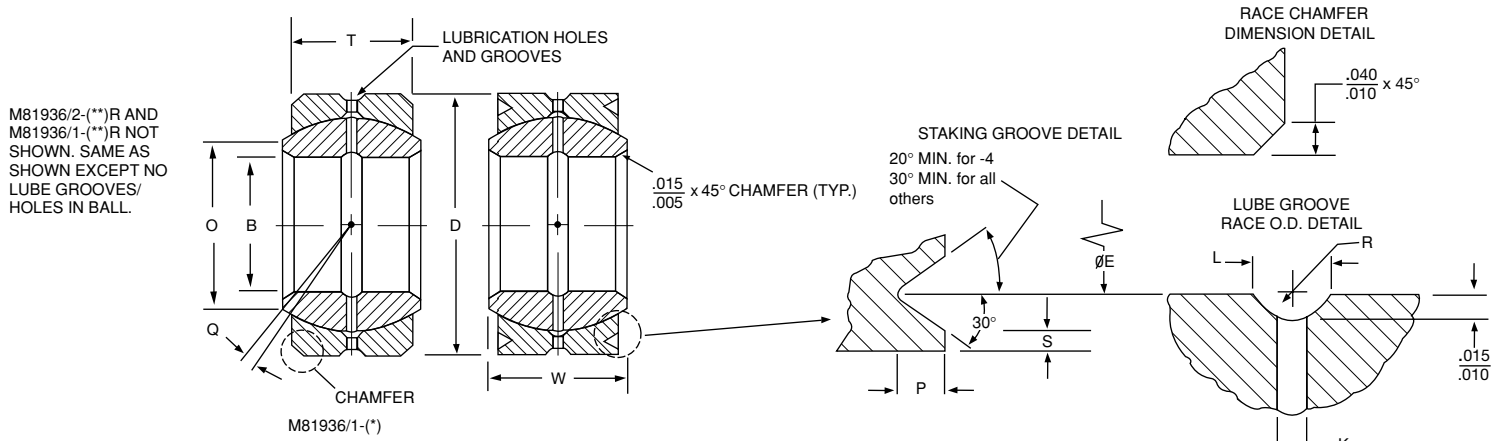
SPHERICAL BEARINGS – Metal-to-Metal

AS81936 Beryllium Copper Ball	14
MIL-B-8976 (proposed as AS8976) – Narrow	16
Narrow	18
Wide	19
High Misalignment	20
High Temperature	21



SPHERICAL BEARINGS – Metal-to-Metal

AS81936 Beryllium Copper Ball



Part Number V-Grooved*	Part Number V-Grooved*	(B) Bore Diameter	(D) Outside Diameter	(W) Ball Width	(T) Race Width	(O) Shoulder Diameter	(Ø) Ball Diameter	(K) Lube Hole Diameter	(L) Groove Width ID & OD of Race & ID of Ball	(R) Groove Radius ID & OD of Race & ID of Ball
		Inch +.0000 -.0005	Inch +.0000 -.0005	Inch +.000 -.002	Inch +.000 -.005	Inch Min.	Inch Ref.	Inch	Inch	Inch
M81936/1-(**) R	M81936/1-(**)									
AGB4V	AGB4VA	.2500	.6562	.343	.250	.357	.501	.032-.062	.042-.078	.030-.062
AGB5V	AGB5VA	.3125	.7500	.375	.281	.413	.563	.042-.062	.042-.078	.030-.062
AGB6V	AGB6VA	.3750	.8125	.406	.312	.509	.657	.042-.062	.042-.078	.030-.062
AGB7V	AGB7VA	.4375	.9062	.437	.343	.563	.719	.052-.062	.065-.094	.060-.094
AGB8V	AGB8VA	.5000	1.0000	.500	.390	.634	.814	.052-.062	.065-.094	.060-.094
AGB9V	AGB9VA	.5625	1.0937	.562	.437	.664	.876	.052-.062	.065-.094	.060-.094
AGB10V	AGB10VA	.6250	1.1875	.625	.500	.732	.969	.062-.078	.073-.109	.070-.125
AGB12V	AGB12VA	.7500	1.4375	.750	.593	.913	1.188	.062-.078	.073-.109	.070-.125
AGB13V	AGB13VA	.8125	1.5625	.812	.650	.984	1.282	.062-.078	.073-.109	.070-.125
AGB14V	AGB14VA	.8750	1.6562	.875	.703	1.054	1.376	.062-.078	.073-.109	.070-.125
AGB16V	AGB16VA	1.0000	1.8750	1.000	.797	1.193	1.563	.078-.093	.082-.109	.090-.125
AGB18V	AGB18VA	1.1250	2.1250	1.125	.900	1.334	1.751	.078-.093	.082-.109	.090-.125
AGB20V	AGB20VA	1.2500	2.3125	1.250	1.000	1.473	1.938	.078-.093	.082-.109	.090-.125
AGB22V	AGB22VA	1.3750	2.5625	1.375	1.100	1.654	2.157	.078-.093	.082-.109	.090-.125
AGB24V	AGB24VA	1.5000	2.8125	1.500	1.200	1.794	2.345	.078-.093	.082-.109	.090-.125

* For chamfered version, delete 'V' from part number.

** Add bore codes in multiples of 1/16.

Notes:

- Radial Clearance: Free turning to 0.001.
- Axial Clearance: Free turning to 0.005.
- Concentricity: Outside diameter (D) and pitch diameter (E) to bore diameter (B) within .005 FIM.
- Bearings prepacked with MIL-PRF-81322.
- Temperature: Operating temperature range -65° to 350°F.
- Groove dimensions on ID of race and grease holes through race are before bearing assembly, but swaging shall not restrict grease flow.

Materials

Ball	Race
BeCu, ASTM B196†	CRES 17-4PH, AMS 5643
Condition TH04††	Cond. H-1150
Rc37 min.	(Rc28-36)

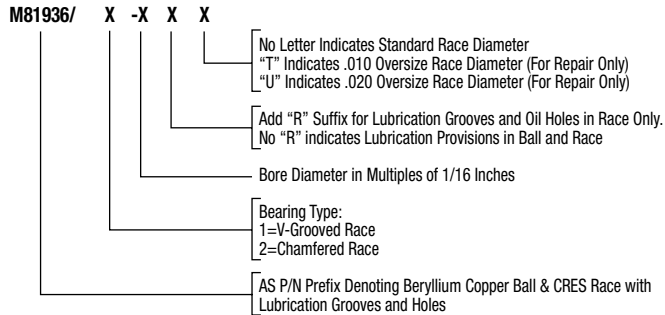
†Formerly QQ-C-530 ††Formerly HT

Lubrication

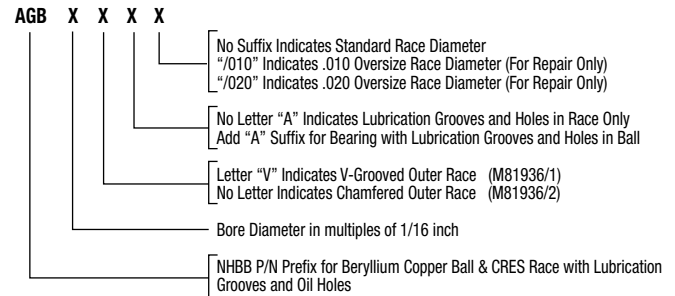
AGB & AGB-V	Lubrication grooves in race and 3 equally spaced holes through race only.
AGB-A & AGB-VA	Lubrication grooves in race and bore of ball and 3 equally spaced holes through race and ball.



Aerospace Standard P/N



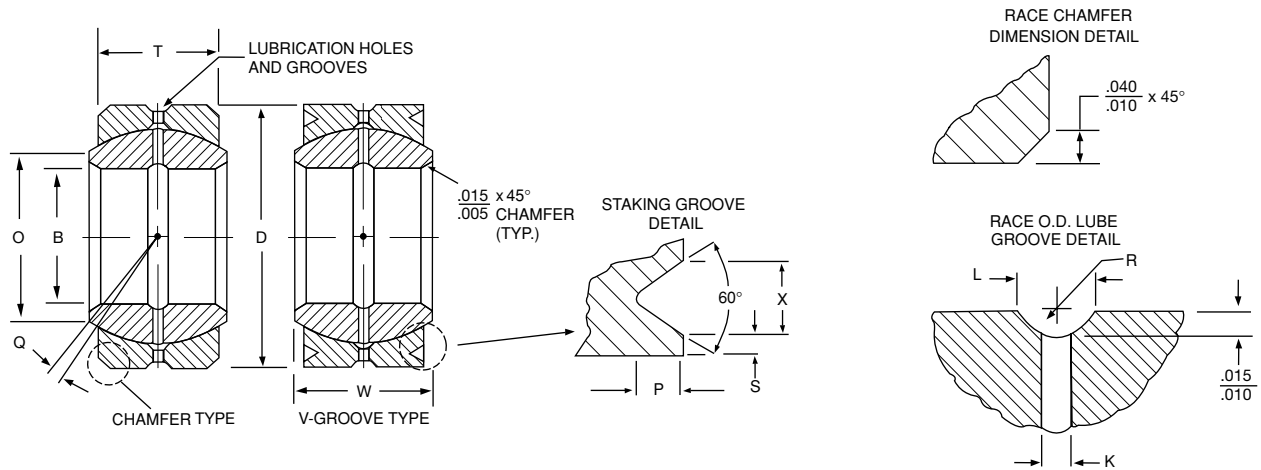
NHBB P/N



(E) Pitch Diameter	(S)	(P)	Limit Static Radial Load	Limit Static Axial Load	Weight
Staking Groove Data					
Inch	Inch	Inch	lbs.	lbs.	lbs.
+.000	+.000	+.000			Ref.
-.010	-.010	-.015			
.596	.020	.030	6330	1930	.02
.652	.030	.040	8460	2450	.03
.714	.030	.040	11400	3090	.04
.808	.030	.040	14800	3740	.05
.878	.030	.060	20400	4860	.07
.972	.030	.060	26700	6100	.09
1.065	.030	.060	33100	8080	.11
1.315	.030	.060	50000	11440	.21
1.440	.030	.060	59000	13800	.24
1.534	.030	.060	70300	16160	.27
1.753	.030	.060	77700	20850	.39
2.003	.030	.060	121500	26740	.72
2.190	.030	.060	152000	33065	.93
2.440	.030	.060	186000	40120	1.28
2.690	.030	.060	224000	47820	1.67

SPHERICAL BEARINGS – Metal-to-Metal

MIL-B-8976 (proposed as AS8976) – Narrow



Part Number V-Grooved* Steel Race	Part Number V-Grooved* Bronze Race	(B)	(D)	(W)	(T)	(O)	Ball Diameter		(K)	(L)	(Q)
		Bore Diameter	Outside Diameter	Ball Width	Race Width	Shoulder Diameter	Bronze Race	Steel Race	Lube Hole Diameter	Groove Width ID & OD of Race & ID of Ball	Misalignment
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Min.
		+ .0000	+ .0000	+ .000	+ .005	Min.	Max.	Max.	+ .010	+ .005	
		- .0005	- .0005	- .002	- .005				- .010	- .005	
MS21154S(**)	MS21154B(**)										
ABG3VA(L)	ABG3VA-501(L)	.1900	.5625	.281	.218	.293	.438	.407	.047	.062	10°
ABG4VA(L)	ABG4VA-501(L)	.2500	.6562	.343	.250	.364	.501	.501	.047	.062	10°
ABG5VA(L)	ABG5VA-501(L)	.3125	.7500	.375	.281	.419	.594	.563	.062	.078	10°
ABG6VA(L)	ABG6VA-501(L)	.3750	.8125	.406	.312	.475	.657	.657	.062	.078	9°
ABG7VA(L)	ABG7VA-501(L)	.4375	.9062	.437	.343	.530	.719	.719	.062	.078	8°
ABG8VA(L)	ABG8VA-501(L)	.5000	1.0000	.500	.390	.600	.814	.814	.062	.078	8°
ABG9VA(L)	ABG9VA-501(L)	.5625	1.0937	.562	.437	.670	.907	.907	.062	.078	8°
ABG10VA(L)	ABG10VA-501(L)	.6250	1.1875	.625	.500	.739	1.001	.907	.078	.093	8°
ABG12VA(L)	ABG12VA-501(L)	.7500	1.4375	.755	.593	.920	1.251	1.188	.078	.093	8°
ABG14VA(L)	ABG14VA-501(L)	.8750	1.5625	.875	.703	.980	1.376	1.313	.078	.093	8°
ABG16VA(L)	ABG16VA-501(L)	1.0000	1.7500	1.000	.797	1.118	1.563	1.501	.078	.093	9°

* For chamfered version MS21155, delete 'V' from part number.
 ** Add bore codes in multiples of 1/16.

Notes:

- Radial Clearance: 0.0005 to 0.0020.
- Axial Clearance: 0.010 Maximum.
- Dimensions: All dimensions apply after plating.
- Concentricity: Outside diameter (D) to bore diameter (B) within .005 FIM.
- Temperature: Operating temperature range -65° to 250°F.
- Lubrication: MIL-PRF-21164.
- Groove dimensions on ID of race and grease holes through race are before bearing assembly, but swaging shall not restrict grease flow.

Materials

Part No.	Ball	Race
ABG-A	ABG-VA	52100 Alloy Steel Rc56 Min. Chrome Plated†
ABG-A-501	ABG-VA-501	4340 STL/AMS6415 4130 STL, or 8630 STL Rc27-36, Cadmium Plated
		Aluminum Bronze (AMPCO® 15), Cadmium Plated

† Plating: When specified in materials block, ball spherical diameter and ends are hard chrome plated per AMS-QQ-C-320, CL. 2 (.0002 to .0005 inch thickness). All external surfaces of race are cadmium plated per AMS-QQ-P-416.

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Aerospace Standard P/N

MS21154 S 03

- Bore Diameter in Multiples of 1/16 Inch (2 Digits)
- Letter "S" Indicates Alloy Steel (4340, 4130 or 8630) Race Material
- Letter "B" Indicates Aluminum Bronze (AMPCO® 15) Race Material
- AS P/N Prefix Denoting Narrow, Metal on Metal Spherical Bearing with Lube Grooves and Lube Holes in Race and Ball (MS21154=V-Grooved, MS21155=Chamfered)

NHBB P/N

ABG 3 V A X X (L)

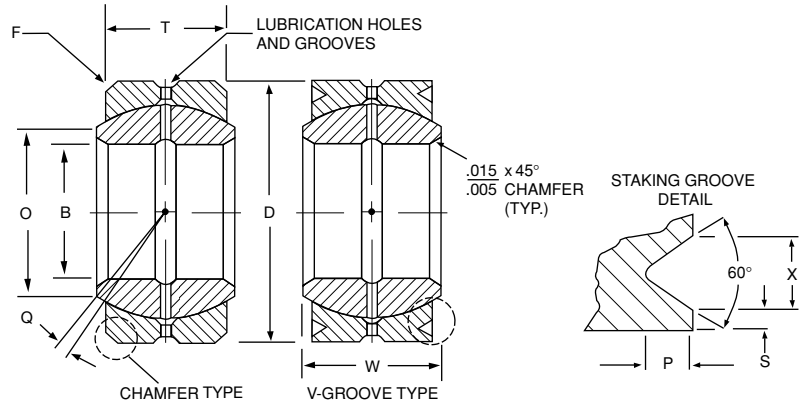
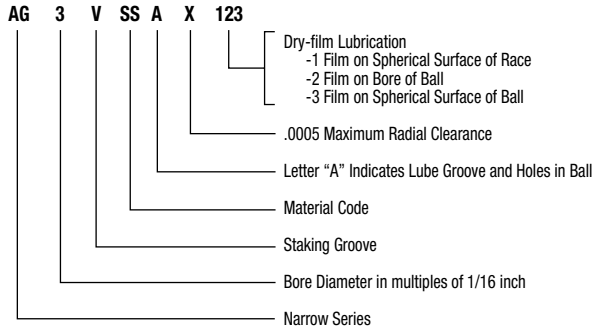
- NHBB Manufacturing Code
- Letters "CR" Indicate Optional 440C Ball Material
- "-501" Indicates Aluminum Bronze (AMPCO® 15) Race Material
- Blank Indicates Alloy Steel (4340, 4130 or 8630) Race Material
- Letter "A" Indicates Lube Groove and Lube Holes in Ball
- Letter "V" Indicates V-Grooved Outer Race (MS21154)
- No Letter "V" Indicates Chamfered Outer Race (MS21155)
- Bore Diameter in multiples of 1/16 inch
- NHBB P/N Prefix for Narrow, Metal-to-Metal Spherical Bearing

(R) Groove Radius ID & OD of Race & ID of Ball	(S)	(P)	(X)	Limit Static Load				Weight
				Bronze Race		Steel Race		
				Radial	Axial	Radial	Axial	
Inch Ref.	Inch +.000 -.010	Inch +.000 -.015	Inch +.000 -.010	lbs.	lbs.	lbs.	lbs.	lbs. Ref.
.045	.020	.030	.045	2800	850	4600	2100	.02
.045	.020	.030	.045	4300	1100	7080	2800	.02
.065	.030	.040	.055	5200	1400	8500	3550	.03
.065	.030	.040	.055	6750	1760	11050	4400	.04
.065	.030	.040	.055	8500	2150	13900	5400	.05
.065	.030	.060	.080	11500	2800	18850	7050	.07
.065	.030	.060	.080	15600	3550	25500	8900	.09
.088	.030	.060	.080	19500	4650	31950	11700	.11
.088	.030	.060	.080	28500	6575	46750	16500	.21
.088	.030	.060	.080	38300	9300	62750	23300	.27
.088	.030	.060	.080	51000	12000	83350	30000	.39

SPHERICAL BEARINGS – Metal-to-Metal

Narrow

NHBB P/N



Part Number V-Grooved*	(B)	(D)	(W)	(T)	(O)	Ball Diameter	(F)	(Q)	(P)	(R)	(S)	(X)	Limit Static Radial Load		Weight
	Bore Diameter	Outside Diameter	Ball Width	Race Width	Shoulder Diameter		Race Chamfered x 45°	Mis- alignment	Inch	Inch	Inch	Inch	lbs.	Steel Race	
	Inch +.0000 -.0005	Inch +.0000 -.0005	Inch +.000 -.005	Inch +.005 -.005	Inch Ref.	Inch Ref.	Inch +.000 -.010	Ref.	Inch +.000 -.015	Inch +.000 -.010	Inch +.000 -.010	Inch +.000 -.010	lbs.	lbs.	lbs. Ref.
AG3V	.1900	.5625	.281	.218	.293	.406	.020	11°	.030	.015	.020	.045	2350	4060**	.02
AG4V	.2500	.6562	.343	.250	.364	.500	.022	13°	.030	.015	.020	.045	3700	6660	.02
AG5V	.3125	.7500	.375	.281	.419	.562	.032	11° 30'	.040	.020	.030	.055	4580	8240	.03
AG6V	.3750	.8125	.406	.312	.517	.656	.032	9° 30'	.040	.020	.030	.055	6360	11450	.04
AG7V	.4375	.9062	.437	.343	.572	.718	.032	9°	.040	.020	.030	.055	8080	14540	.05
AG8V	.5000	1.0000	.500	.390	.642	.813	.032	9°	.060	.020	.030	.080	11060	19900	.07
AG9V	.5626	1.0937	.562	.437	.671	.875	.032	10°	.060	.020	.030	.080	13960	25120	.09
AG10V	.6250	1.1875	.625	.500	.739	.968	.032	9°	.060	.020	.030	.080	17760	31970	.11
AG12V	.7500	1.4375	.750	.593	.920	1.187	.040	9°	.060	.020	.030	.080	27300	49140	.21
AG14V	.8750	1.5625	.875	.703	.980	1.312	.040	9°	.060	.020	.030	.080	36080	64940	.27
AG16V	1.0000	1.7500	1.000	.797	1.118	1.500	.040	9° 30'	.060	.020	.030	.080	48300	86940	.39
AG18V	1.1250	2.1250	1.125	.900	1.334	1.750	.040	8°	.060	.020	.030	.080	63000	113400	.72
AG20V	1.2500	2.3125	1.250	1.000	1.473	1.937	.040	8°	.060	.020	.030	.080	79420	142950	.93
AG22V	1.3750	2.5625	1.375	1.100	1.654	2.156	.040	8°	.060	.020	.030	.080	99180	178520	1.28
AG24V	1.5000	2.8125	1.500	1.200	1.794	2.344	.040	8°	.060	.020	.030	.080	119540	215180	1.67

* For chamfered version, delete 'V' from part number.

** Based on pin limitation.

Notes:

- Radial Clearance: Free running to .002 max.
- Dimensions: All dimensions apply after plating.
- Options: For bearings without lubrication holes and grooves, add suffix "300" to part number (Example: AG5-300, AG16VCR300).
- Groove dimensions on ID of race and grease holes through race are before bearing assembly, but swaging shall not restrict grease flow.

Materials

Part No.	Ball	Race
Catalog No.	52100 Alloy Steel Chrome Plated†	Aluminum Bronze (AMPCO® 15), Cadmium Plated†
Catalog No. + S	"	4130 Alloy Steel Cadmium Plated†
Catalog No. + SS	"	CRES 17-4PH
Catalog No. + CR	CRES 440C	"
Catalog No. + CRP	CRES 440C, Chrome Plated†	"

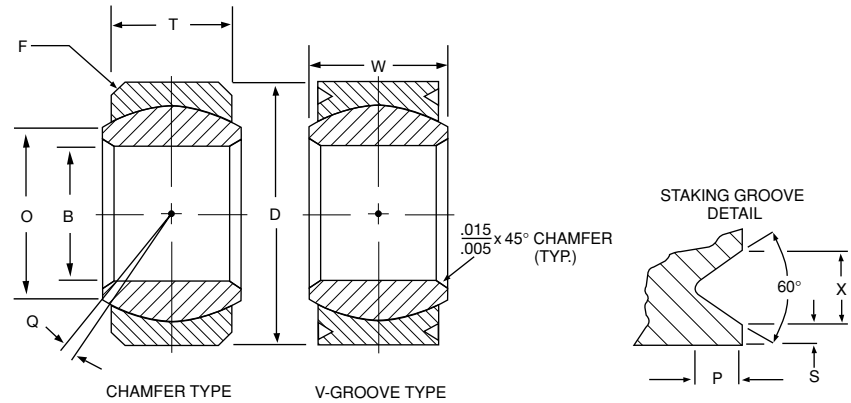
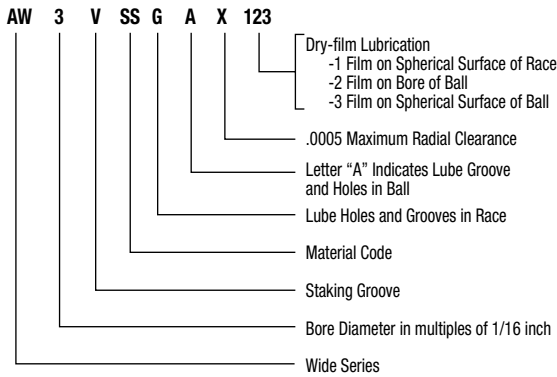
† Plating: When specified in materials block, ball spherical diameter and ends are hard chrome plated per AMS-QQ-C-320, CL. 2 (.0002 to .0005 inch thickness). All external surfaces of race are cadmium plated per AMS-QQ-P-416.

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Wide

NHBB P/N

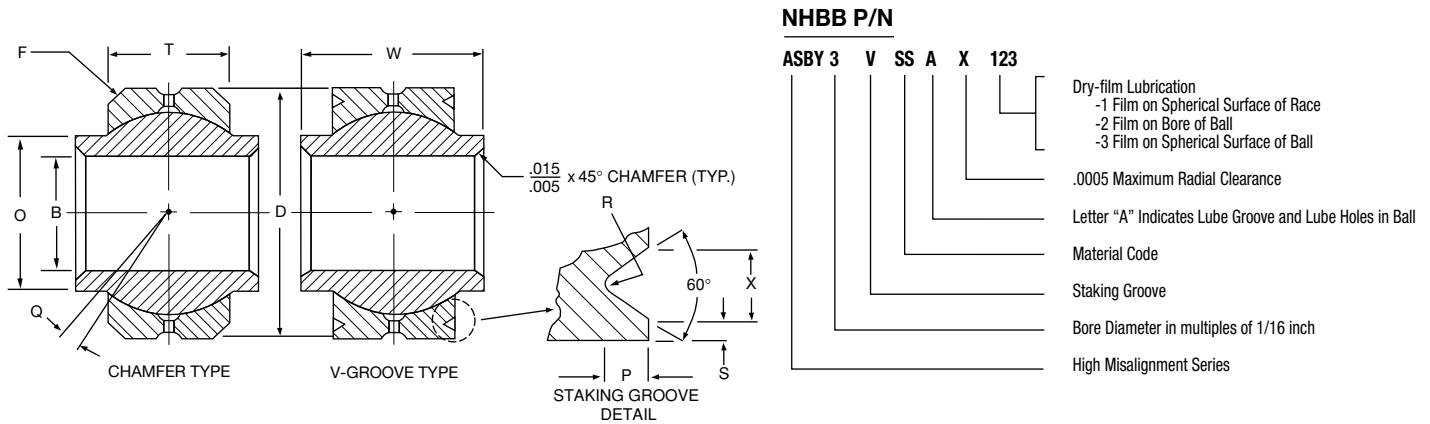


Part Number V-Grooved*	(B)	(D)	(W)	(T)	(O)	Ball Diameter	(F)	(Q)	(P)	(R)	(S)	(X)	Limit Static Radial Load(†)		Weight
	Bore Diameter	Outside Diameter	Ball Width	Race Width	Shoulder Diameter		Race Chamfered x 45°	Mis- alignment		Staking Groove Data			Bronze Race	Steel Race	
	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Ref.	Inch	Inch	Inch	Inch	lbs.	lbs.	lbs.
	+ .0000 - .0005	+ .0000 - .0005	+ .000 - .005	+ .010 - .000	Ref.	Ref.	+ .000 - .015		+ .000 - .015	+ .000 - .010	+ .000 - .010	+ .000 - .010			Ref.
AW3-5V	.1900	.6250	.437	.322	.301	.531	.025	18°	.030	.015	.020	.045	4060**	4060**	.030
AW3V	.1900	.5000	.359	.281	.249	.437	.025	15°	.030	.015	.020	.045	4060**	4060**	.015
AW4V	.2500	.6250	.437	.322	.301	.531	.025	18°	.030	.015	.020	.045	7040**	7040**	.030
AW5V	.3125	.6875	.437	.312	.401	.593	.025	15° 30'	.030	.015	.020	.045	8360	11010**	.033
AW6V	.3750	.8125	.500	.401	.471	.687	.025	11°	.040	.020	.030	.055	12740	15860**	.053
AW7V	.4375	.9375	.562	.437	.542	.781	.025	12°	.040	.020	.030	.055	15890	21600**	.079
AW8V	.5000	1.0000	.625	.500	.612	.875	.035	10° 30'	.040	.020	.030	.055	20560	28220**	.097
AW9V	.5625	1.1250	.687	.531	.726	1.000	.035	11°	.040	.020	.030	.055	23550	35720**	.133
AW10V	.6250	1.1875	.750	.562	.752	1.062	.035	13°	.040	.020	.030	.055	26660	44110**	.140
AW12V	.7500	1.3750	.875	.625	.892	1.250	.035	14°	.060	.020	.030	.080	35310	63520	.232
AW14V	.8750	1.6250	.875	.750	1.061	1.375	.035	6° 30'	.060	.020	.030	.080	47440	85390	.346
AW15-101V	.9375	1.3750	.450	.350	1.100	1.188	.025	5°	.060	.020	.030	.080	19010	34210	.090
AW16V	1.0000	2.1250	1.375	1.000	1.275	1.875	.035	15°	.060	.020	.030	.080	88120	112980**	.970
AW18V	1.1250	2.2500	1.437	1.067	1.338	1.968	.035	14°	.060	.020	.030	.080	98600	143010**	1.000
AW20V	1.2500	2.3750	1.500	1.125	1.460	2.093	.035	13°	.060	.020	.030	.080	111450	176570**	1.110
AW20-5V	1.2500	2.0000	1.093	.937	1.406	1.781	.035	6°	.060	.020	.030	.080	78100	140570	.564
AW22V	1.3750***	2.5625	1.687	1.218	1.535	2.281	.045	15°	.060	.020	.030	.080	129790	213670**	1.390
AW24V	1.5000***	2.6875	1.687	1.218	1.693	2.390	.045	14°	.060	.020	.030	.080	135990	244780	1.480
AW26V	1.6250***	2.8750	1.750	1.281	1.828	2.531	.045	13°	.060	.020	.030	.080	121580	273570	1.750
AW28V	1.7500***	3.0000***	1.812	1.312	1.964	2.672	.045	13°	.060	.020	.030	.080	131670	296270	1.910
AW30V	1.8750***	3.1250***	1.875	1.343	2.096	2.812	.045	13°	.060	.020	.030	.080	142060	319640	2.120
AW32V	2.0000***	3.2500***	1.937	1.375	2.208	2.937	.045	13°	.060	.020	.030	.080	152140	342310	2.220
AW36V	2.2500***	3.6250***	2.000	1.406	2.442	3.156	.045	12° 30'	.060	.020	.030	.080	167390	376640	2.780
AW40V	2.5000***	3.9375***	2.062	1.437	2.750	3.437	.045	12°	.060	.020	.030	.080	186560	419760	3.280
AW44V	2.7500***	4.1250***	2.187	1.500	2.968	3.687	.045	12°	.060	.020	.030	.080	209420	471200	3.550
AW48V	3.0000***	4.3750***	2.312	1.562	3.187	3.937	.045	12° 30'	.060	.020	.030	.080	233380	525120	4.000

* For chamfered version, delete 'V' from part number.
 ** Based on pin limitation.
 *** Tolerance: +.0000-.0008.
 † Loads based on parts with no lubrication grooves.

SPHERICAL BEARINGS – Metal-to-Metal

High Misalignment



Part Number V-Grooved*	(B)	(D)	(W)	(T)	(O)	(F)	(Q)	(P)	(R)	(S)	(X)	Limit Static Radial Load		Weight	
	Bore Diameter	Outside Diameter	Ball Width	Race Width	Shoulder Diameter	Ball Diameter	Race Chamfered x 45°	Mis- alignment	Staking Groove Data			Bronze Race	Steel Race		
	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Ref.	Inch	Inch	Inch	Inch	lbs.	lbs.	lbs.
	+ .0000 - .0005	+ .0000 - .0005	+ .000 - .005	+ .010 - .000	Ref.	Ref.	+ .000 - .010		+ .000 - .015	+ .000 - .010	+ .000 - .010	+ .000 - .010			Ref.
ASBY3V	.1900	.5625	.500	.205	.319	.437	.020	15°	.030	.015	.020	.045	2470	4060**	.018
ASBY4V	.2500	.7400	.593	.250	.390	.593	.022	24°	.030	.015	.020	.045	4680	7040**	.036
ASBY5V	.3125	.6875	.625	.250	.418	.593	.022	20°	.030	.015	.020	.045	4680	8430	.029
ASBY6V	.3750	.9060	.813	.340	.512	.781	.032	23°	.030	.015	.020	.045	9060	15860**	.068
ASBY7V	.4375	1.0000	.875	.340	.618	.875	.032	22°	.030	.015	.020	.045	10150	18270	.095
ASBY8V	.5000	1.1250	.937	.396	.730	1.000	.032	20°	.040	.020	.030	.055	14400	25920	.159
ASBY10V	.6250	1.3750	1.200	.562	.856	1.250	.032	20°	.040	.020	.030	.055	27440	49390	.245
ASBY12V	.7500	1.5625	1.280	.615	.970	1.375	.044	18°	.040	.020	.030	.055	33820	60880	.315
ASBY14V	.8750	1.7500	1.400	.620	1.140	1.531	.044	18°	.060	.020	.030	.080	36510	65720	.430
ASBY16V	1.0000	2.1250	1.875	.830	1.278	1.875	.044	21°	.060	.020	.030	.080	64410	115930	.831
ASBY18V	1.1250***	2.3125***	1.875	.937	1.400	2.062	.044	20°	.060	.020	.030	.080	78560	141410	1.096
ASBY20V	1.2500***	2.5000***	1.875	1.000	1.523	2.250	.044	21°	.060	.020	.030	.080	92810	167060	1.318
ASBY22V	1.3750***	2.7500***	2.125	1.093	1.670	2.500	.044	22°	.060	.020	.030	.080	91800	206550	1.800
ASBY24V	1.5000***	3.0000***	2.250	1.170	1.800	2.672	.044	21°	.060	.020	.030	.080	106340	239280	2.223

* For chamfered version, delete 'V' from part number.

** Based on pin limitation.

*** Bore and O.D. tolerance: +.0000-.0008.

Notes:

- Radial Clearance: Free running to .002 max.
- Dimensions: All dimensions apply after plating.
- Options: For bearings without lubrication holes and grooves, add suffix "300" to part number (Example: ASBY5-300, ASBY16VCR300).
- Groove dimensions on ID of race and grease holes through race are before bearing assembly, but swaging shall not restrict grease flow.

Materials

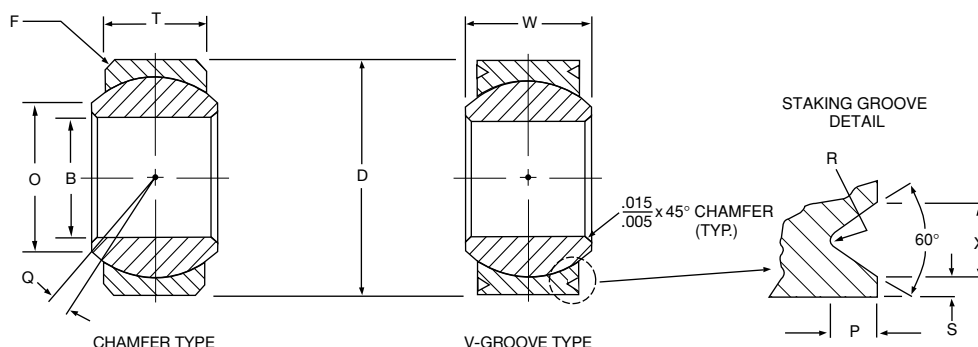
Part No.	Ball	Race
Catalog No.	52100 Alloy Steel, Chrome Plated†	Aluminum Bronze (AMPACO® 15), Cadmium Plated†
Catalog No. + S	"	4130 Alloy Steel, Cadmium Plated†
Catalog No. + SS	"	CRES 17-4PH
Catalog No. + CR	CRES 440C	"
Catalog No. + CRP	CRES 440C, Chrome Plated†	"

†Plating: When specified in materials block, ball spherical diameter and ends are hard chrome plated per AMS-QQ-C-320, CL. 2 (.0002 to .0005 inch thickness). All external surfaces of race are cadmium plated per AMS-QQ-P-416.

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High Temperature



Part Number V-Grooved*	Part Number V-Grooved*	(B)	(D)	(W)	(T)	(O)	Ball Diameter	(F)	(Q)	(P)	(R)	(S)	(X)	Limit Static Radial Load		Weight
		Bore Diameter	Outside Diameter	Ball Width	Race Width	Shoulder Diameter		Race Chamfered x 45°	Mis- alignment		Staking Groove Data				Bronze Race	
		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Ref.	Inch	Inch	Inch	Inch	lbs.	lbs.	lbs.
		+ .0000	+ .0000	+ .000	+ .000	Ref.	Ref.	+ .000		+ .000	+ .000	+ .000	+ .000			Ref.
		- .0005	- .0005	- .005	- .005			- .010		- .015	- .010	- .010	- .010			
AHT3V	AHET3V	.1900	.5625	.281	.218	.293	.406	.020	11°	.030	.015	.020	.045	4060**	4060**	.02
AHT4V	AHET4V	.2500	.6562	.343	.250	.364	.500	.022	13°	.030	.015	.020	.045	7040**	6390	.02
AHT5V	AHET5V	.3125	.7500	.375	.281	.419	.562	.032	11° 30'	.040	.020	.030	.055	10080	8210	.03
AHT6V	AHET6V	.3750	.8125	.406	.312	.517	.656	.032	9° 30'	.040	.020	.030	.055	13250	10790	.04
AHT7V	AHET7V	.4375	.9062	.437	.343	.572	.718	.032	9°	.040	.020	.030	.055	16120	13140	.05
AHT8V	AHET8V	.5000	1.0000	.500	.390	.642	.813	.032	9°	.060	.020	.030	.080	21040	17140	.07
AHT9V	AHET9V	.5625	1.0937	.562	.437	.671	.875	.032	10°	.060	.020	.030	.080	23730	19330	.09
AHT10V	AHET10V	.6250	1.1875	.625	.500	.739	.968	.032	9°	.060	.020	.030	.080	30700	25010	.11
AHT12V	AHET12V	.7500	1.4375	.750	.593	.920	1.187	.040	9°	.060	.020	.030	.080	45690	37230	.21
AHT14V	AHET14V	.8750	1.5625	.875	.703	.980	1.312	.040	9°	.060	.020	.030	.080	61020	49720	.27
AHT16V	AHET16V	1.0000	1.7500	1.000	.797	1.118	1.500	.040	9° 30'	.060	.020	.030	.080	80040	65220	.39

* For chamfered version, delete 'V' from part number.

** Based on pin limitation.

Notes:

- Load ratings are based on short-term exposure. Not intended for continuous use at temperature shown.
- Radial clearance: Free running to .002 max.

Materials

Series	Ball	Race	Temp.
AHT	Inconel® 718, thin dense chrome plated	CRES A-286, solution treated and aged, spherical surface silver plated	Brief exposure to 1000°F
AHET	Stellite® #3, thin dense chrome plated	"	Brief exposure to 1200°F

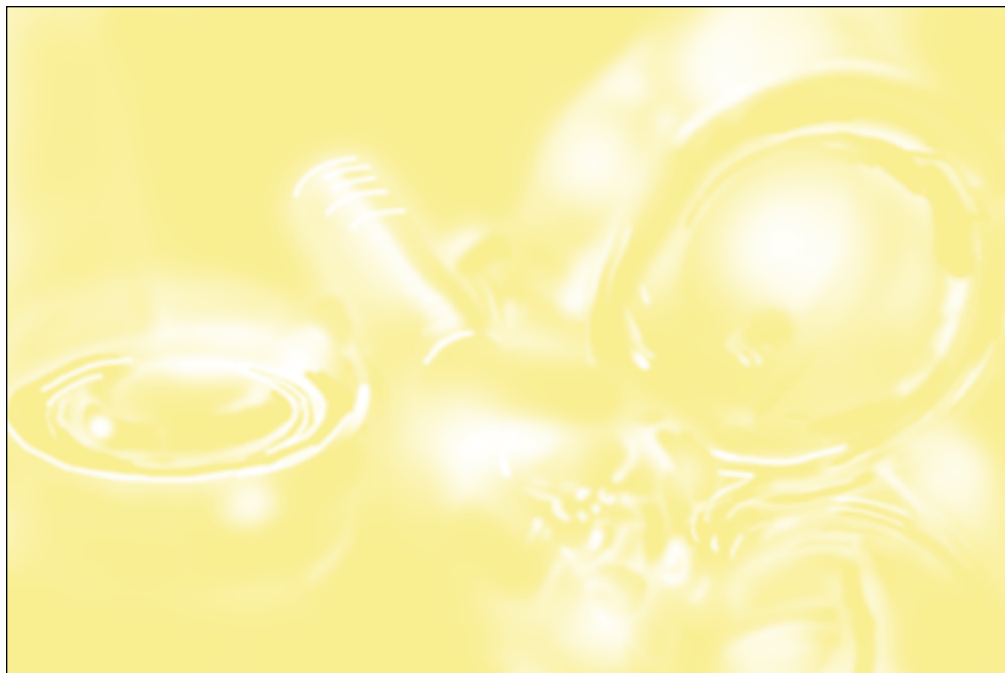
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SECTION 3

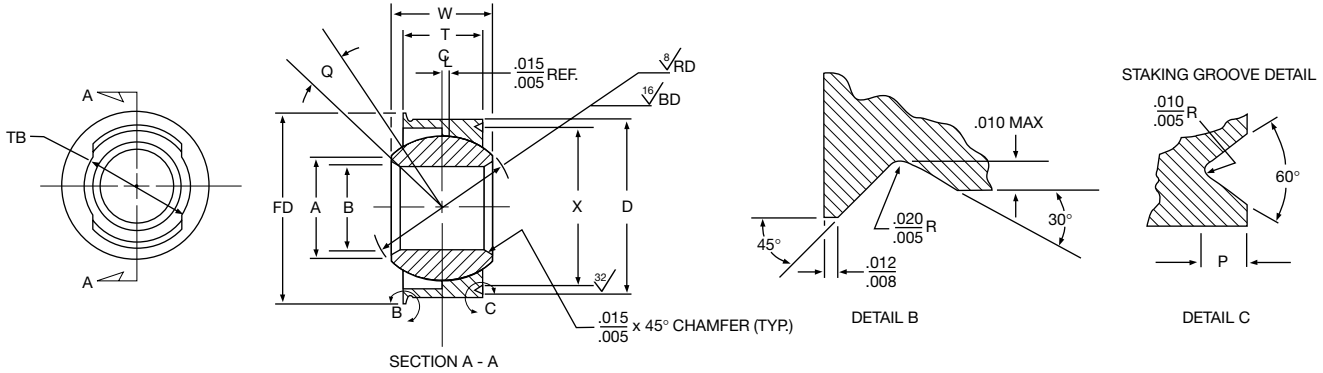
LOADER SLOT BEARINGS

Plain	24
Sealed	25
Rod End – 2-Piece Male Thread	26



LOADER SLOT BEARINGS

Plain



Part Number	(B) Bore Diameter	(D) Outside Diameter	(W) Ball Width	(T) Race Width	(BD) Ball Spherical Diameter	(RD) Race Spherical Diameter	(A) Ball Flat Diameter	(TB) Thru Bore	(Q) Mis-alignment	(FD) Flange Diameter	(P) V-Groove Depth	(X) V-Groove Centerline	Radial Static Limit Load [◇]	Axial Static Limit Load [◇]	Weight
	Inch +.0000 -.0005	Inch +.0000 -.0005	Inch +.000 -.002	Inch +.003 -.003	Inch +.0000 -.0005	Inch +.0005 -.0000	Inch Ref.	Inch +.003 -.003	Ref.	Inch +.002 -.002	Inch +.004 -.004	Inch +.003 -.003	lbs.	lbs. Ref.	lbs. Ref.
AMB3	.1900	.5625	.281	.218	.4060	.4070	.293	.360	10°	.582	.026	.494	2820	995	.02
AMB4	.2500	.6562	.343	.250	.5000	.5010	.364	.449	12°	.676	.026	.588	4880	1160	.02
AMB5	.3125	.7500	.375	.281	.5625	.5635	.419	.503	11°	.770	.026	.682	8920	1320	.03
AMB6	.3750	.8125	.406	.312	.6250	.6260	.475	.563	10°	.852	.036	.714	14260	1630	.04
AMB7	.4375	.9062	.437	.343	.7180	.7190	.572	.651	9°	.946	.036	.808	20800	1810	.05
AMB8	.5000	1.0000	.500	.390	.8125	.8135	.640	.733	9°	1.040	.036	.902	23800	2000	.07
AMB9	.5625	1.0937	.562	.437	.8750	.8760	.671	.785	9°	1.174	.056	.970	26890	2550	.09
AMB10	.6250	1.1875	.625	.500	.9680	.9690	.739	.875	9°	1.267	.056	1.064	29070	2770	.11
AMB12	.7500	1.4375	.750	.593	1.1870	1.1880	.920	1.056	9°	1.517	.056	1.314	35210	3350	.21
AMB14	.8750	1.5625	.875	.703	1.3120	1.3130	.978	1.138	9°	1.642	.056	1.439	40500	3640	.27
AMB16	1.0000	1.7500	1.000	.797	1.5000	1.5010	1.118	1.300	9°	1.830	.056	1.627	46580	4080	.39

◇ Static limit loads calculated are approximate values, based on the following:
 Radial - .0018 inch pin deflection.
 Axial - bearing push-out (of housing).

Notes:

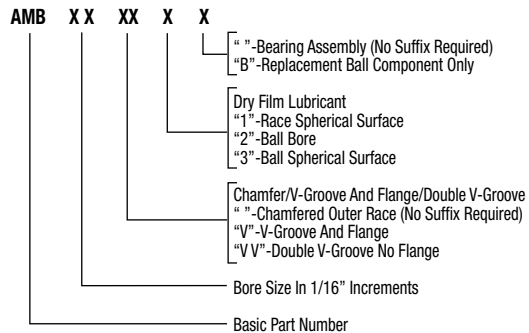
- Nitride or Malcomize spherical race ID.
- Balls rotate freely under finger pressure @ 72°F.
- Balls are fully interchangeable. No selective assembly allowed.
- Operating temperature range -65°F to 350°F.

Materials (AMB)

Part No.	Ball	Race
Catalog No.	Stellite® #6 AMS 5387 Rc37 min.	17-4PH AMS 5643 Rc34-40

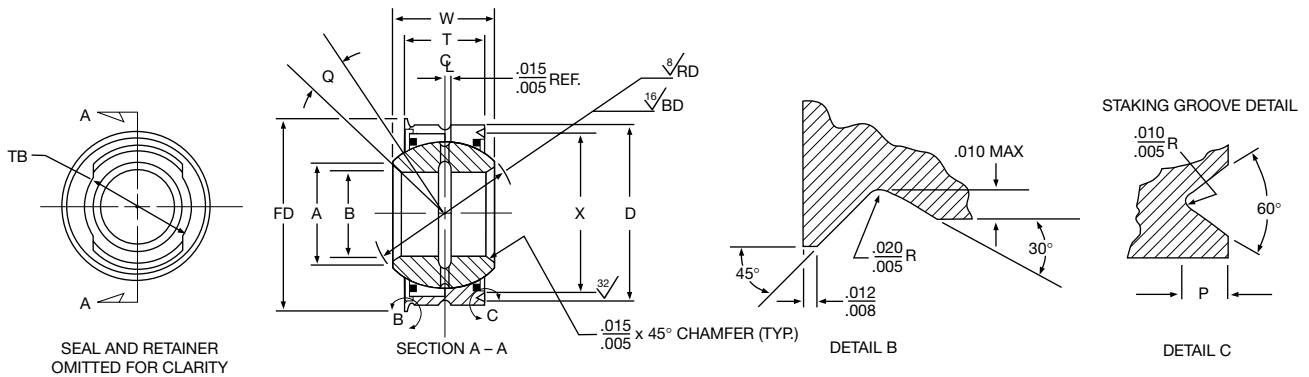
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NHBB Part Numbering





Sealed



Part Number	(B) Bore Diameter	(D) Outside Diameter	(W) Ball Width	(T) Race Width	(BD) Ball Spherical Diameter	(RD) Race Spherical Diameter	(A) Ball Flat Diameter	(TB) Thru Bore	(Q) Mis-alignment	(FD) Flange Diameter	(P) V-Groove Depth	(X) V-Groove Centerline	Radial Static Limit Load [∠]	Axial Static Limit Load [∠]	Weight
	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Ref.	Inch	Inch	Inch	lbs.	lbs.	lbs.
	+ .0000 - .0005	+ .0000 - .0005	+ .000 - .002	+ .002 - .002	+ .0000 - .0003	+ .0005 - .0000	+ .003 - .003			+ .002 - .002	+ .004 - .004	+ .003 - .003			Ref.
AMBG4	.2500	.7500	.375	.280	.5625	.5635	.419	.515	11°	.770	.026	.682	3650	1320	.04
AMBG5	.3125	.8125	.375	.300	.6250	.6260	.500	.574	7° 30'	.852	.036	.714	8370	1630	.04
AMBG6	.3750	.8750	.406	.312	.6865	.6875	.554	.635	8°	.915	.036	.777	14200	1750	.05
AMBG7	.4375	.9375	.437	.360	.7500	.7510	.610	.698	6° 30'	.977	.036	.839	19900	1880	.06
AMBG8	.5000	1.0000	.500	.410	.8125	.8135	.640	.740	7°	1.040	.036	.902	22750	2000	.08
AMBG9	.5625	1.1250	.562	.460	.9060	.9070	.710	.814	7° 30'	1.205	.056	1.002	25690	2620	.11
AMBG10	.6250	1.2500	.625	.510	1.0000	1.0010	.780	.900	7° 30'	1.330	.056	1.127	26530	2910	.15
AMBG12	.7500	1.5000	.750	.624	1.1875	1.1885	.920	1.075	7°	1.580	.056	1.377	33640	3500	.25
AMBG14	.8750	1.7500	.875	.730	1.3750	1.3760	1.060	1.238	7°	1.830	.056	1.627	39140	4080	.40
AMBG16	1.0000	1.8750	1.000	.812	1.5625	1.5635	1.200	1.410	8°	1.955	.056	1.752	45790	4370	.49
AMBG18	1.1250	2.1250	1.125	.936	1.7500*	1.7510	1.340	1.556	7° 30'	2.205	.056	2.002	50420	7960	.73
AMBG20	1.2500	2.3125	1.250	1.030	1.9375*	1.9385	1.480	1.720	8°	2.392	.056	2.189	56870	8670	.94
AMBG22	1.3750	2.5625	1.375	1.124	2.1250*	2.1260	1.620	1.885	7° 30'	2.642	.056	2.439	62560	9610	1.27
	+ .0010 - .0000	+ .0000 - .0008	+ .000 - .003		+ .0000 - .0005	+ .0006 - .0000									
AMBG24	1.5000	2.8125	1.500	1.250	2.3125*	2.3135	1.760	2.030	7° 30'	2.892	.056	2.689	67280	10540	1.70
AMBG26	1.6250	3.0000	1.625	1.350	2.5000*	2.5010	1.900	2.190	7° 30'	3.080	.056	2.877	73060	11250	2.07
AMBG28	1.7500	3.1875	1.750	1.450	2.6875	2.6885	2.040	2.350	8°	3.267	.056	3.064	78840	11950	2.49
AMBG30	1.8750	3.3750	1.875	1.560	2.8750	2.8760	2.180	2.505	7° 30'	3.455	.056	3.252	84150	12650	2.96
AMBG32	2.0000	3.6250	2.000	1.680	3.1250	3.1260	2.401	2.725	7°	3.705	.056	3.502	88980	13590	3.72

* Ball spherical diameter tolerance +.0000/- .0004.

∠ Static limit loads are calculated approximate values, based on the following: Radial - .0018 inch pin deflection. Axial - bearing push-out (of housing).

Notes:

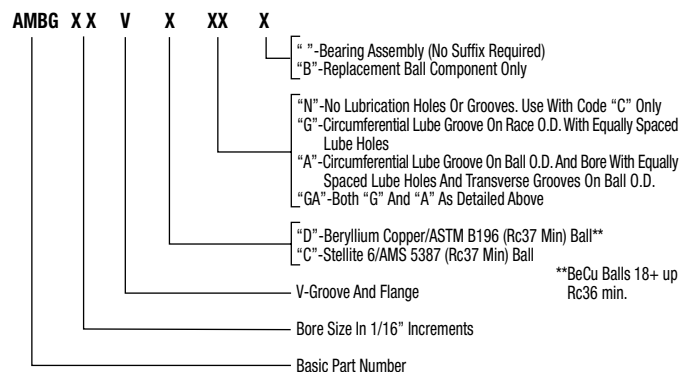
- Nitride or Malcomize spherical race ID.
- Balls rotate freely under finger pressure @ 72°F.
- Balls are fully interchangeable. No selective assembly allowed.
- Operating temperature range -65°F to 350°F.

Materials (AMBG)

Part Number	Ball	Race	Seal	Retainer	Pellet/Patch
Catalog No. + D	BeCu ASTM B196 Rc36 min.	17-4PH AMS 5643 Rc34-40	TEFLON®	17-4PH AMS 5643 Rc40-44	Nylon
Catalog No. + C	Stellite® #6 AMS 5387 Rc37 min.	"	"	"	"

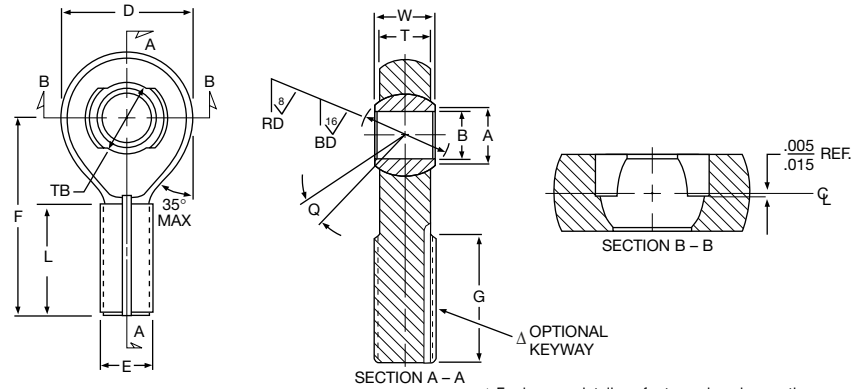
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NHBB Part Numbering



LOADER SLOT BEARINGS

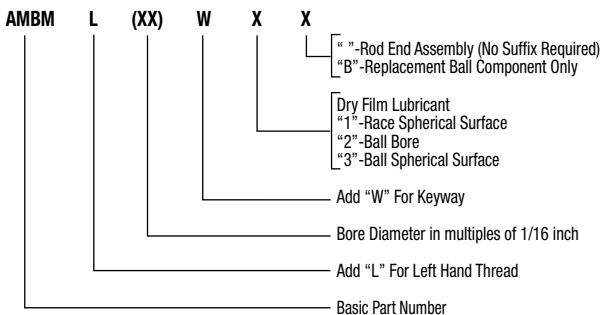
Rod End – 2-Piece Male Thread



Part Number	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(BD) Ball Spherical Diameter	(RD) Rod End Spherical Diameter	(A) Ball Flat Diameter	(Q) Mis-alignment	(TB) Thru Bore	(F) Ball C/L To End	(E) Thread Size	(L) Thread Length	(G) Keyway Flat	Limit Static Radial Load	Ultimate Static Radial Load	Weight
	Inch +.0000 -.0005	Inch +.010 -.010	Inch +.000 -.002	Inch +.010 -.010	Inch +.0000 -.0005	Inch +.0005 -.0000	Inch Ref.	Ref.	Inch +.003 -.003	Inch +.010 -.010	UNJF-3A	Inch +.031 -.031	Inch +.020 -.020	lbs.	lbs.	lbs. Ref.
AMBM3	.1900	.680	.281	.228	.4060	.4070	.293	10°	.360	1.315	1/4-28	.775	.896	2820	4950	.04
AMBM4	.2500	.827	.343	.260	.5000	.5010	.364	10°	.449	1.443	1/4-28	.775	.896	3380	7200	.05
AMBM5	.3125	.984	.375	.291	.5625	.5635	.419	10°	.503	1.948	5/16-24	1.187	1.308	5440 *	11250	.08
AMBM6	.3750	1.131	.406	.322	.6250	.6260	.475	9°	.563	2.030	3/8-24	1.187	1.308	8380 *	15750	.12
AMBM7	.4375	1.294	.437	.353	.7180	.7190	.530	8°	.651	2.250	7/16-20	1.281	1.402	11320 *	19350	.17
AMBM8	.5000	1.459	.500	.400	.8125	.8135	.600	8°	.733	2.544	1/2-20	1.468	1.589	15420 *	25200	.25
AMBM10	.6250	1.763	.625	.510	.9680	.9690	.739	8°	.857	2.832	5/8-18	1.562	1.683	24910 *	40500	.46
AMBM12	.7500	2.140	.750	.603	1.1870	1.1880	.920	8°	1.056	3.193	3/4-16	1.687	1.808	35210	58500	.77
AMBM14	.8750	2.372	.875	.713	1.3120	1.3130	.980	8°	1.138	3.677	7/8-14	2.000	2.121	40500	78300	1.14
AMBM16	1.0000	2.681	1.000	.807	1.5000	1.5010	1.118	9°	1.300	3.968	1-12	2.100	2.221	46580	101250	1.65

*Shank limited.

NHBB Part Numbering



Notes:

- Nitride or Malcomize spherical body ID.
- Balls rotate freely under finger pressure @ 72°F.
- Balls are fully interchangeable. No selective assembly allowed.
- After limit load, slight crazing of the Nitride/Malcomized surface treatment may occur.

Materials

Part No.	Ball	Body
Catalog No.	Stellite® #6, AMS 5387, Rc37 min.	17-4PH AMS 5643 or AMS 5355, Rc34-40

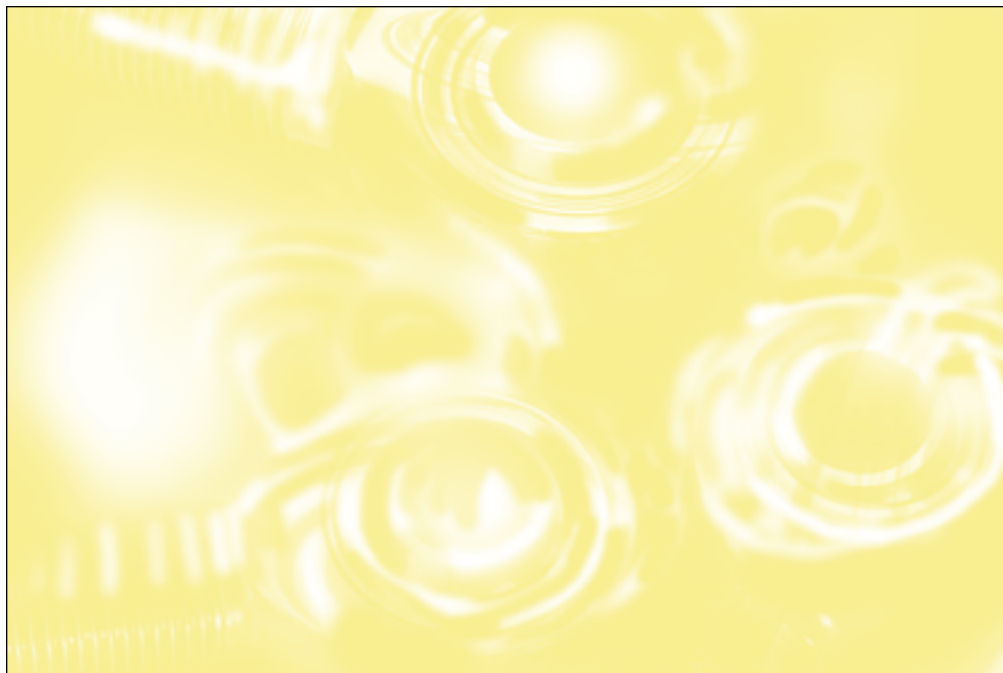
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SECTION 4

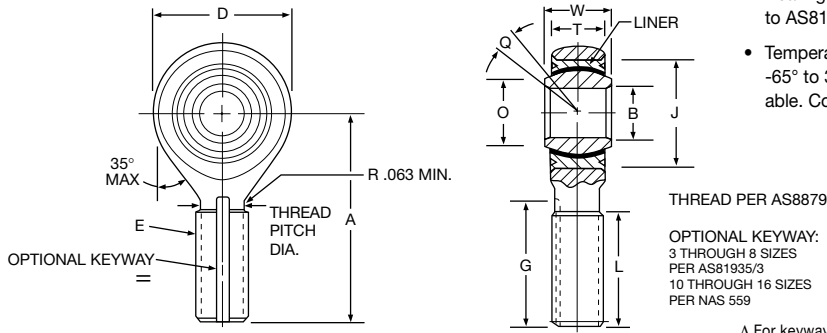
ROD END BEARINGS – Self Lubricating

AS81935 Narrow – Male Thread	30
AS81935 Wide – Male Thread	31
AS81935 Narrow – Female Thread.	32
AS81935 Wide – Female Thread	33
3-Piece Heavy Duty – Male & Female Threads	34
3-Piece High Misalignment – Male & Female Threads.	35



ROD END BEARINGS - SELF LUBRICATING

AS81935 Narrow – Male Thread



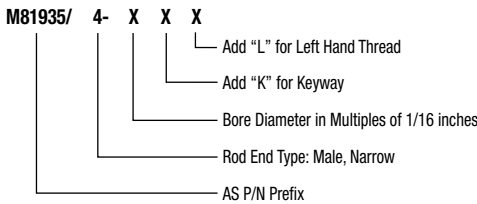
Notes:

- Bearings listed in the tables are approved for procurement to AS81935.
- Temperature: Operating temperature range per AS81935; -65° to 325°F . Broader temperature capabilities are achievable. Contact NHBB Applications Engineering.

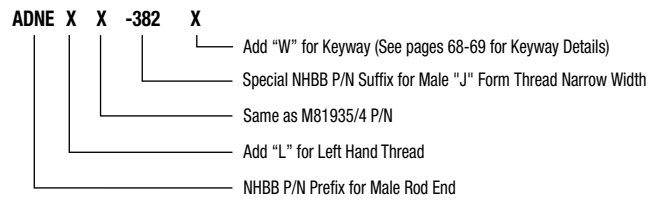
Δ For keyway details, refer to the engineering section, pages 68-69.

Part Number	MS Dash No.	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	Ball Diameter	(A) Ball C/L to End	(E) Thread Size	(L) Complete Thread	(J) Housing I.D.	(G) Keyway Flat	(Q) Mis-alignment
		Inch +.0000 -.0005	Inch +.010 -.010	Inch +.000 -.002	Inch +.005 -.005	Inch Min.	Inch Ref.	Inch +.010 -.010		Inch +.031 -.031	Inch Max.	Inch +.000 -.020	Ref.
M81935/4									UNJF-3A				
ADNE3-382	-3	.1900	.680	.281	.228	.293	.406	1.315	1/4-28	.775	.5625	.896	10°
ADNE4-382	-4	.2500	.827	.343	.260	.364	.500	1.443	1/4-28	.775	.6562	.896	10°
ADNE5-382	-5	.3125	.984	.375	.291	.419	.562	1.948	5/16-24	1.187	.7500	1.308	10°
ADNE6-382	-6	.3750	1.131	.406	.322	.475	.656	2.030	3/8-24	1.187	.8125	1.308	9°
ADNE7-382	-7	.4375	1.294	.437	.353	.530	.718	2.250	7/16-20	1.281	.9062	1.402	8°
ADNE8-382	-8	.5000	1.459	.500	.400	.600	.813	2.544	1/2-20	1.468	1.0000	1.589	8°
ADNE10-382	-10	.6250	1.763	.625	.510	.739	.968	2.832	5/8-18	1.562	1.1875	1.683	8°
ADNE12-382	-12	.7500	2.140	.750	.603	.920	1.187	3.193	3/4-16	1.687	1.4375	1.808	8°
ADNE14-382	-14	.8750	2.372	.875	.713	.980	1.312	3.677	7/8-14	2.000	1.5625	2.121	8°
ADNE16-382	-16	1.0000	2.681	1.000	.807	1.118	1.500	3.968	1-12	2.100	1.7500	2.221	9°

Aerospace Standard P/N - Narrow



NHBB P/N - Narrow



Materials

Part No.	Ball	Race	Liner	Body
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required	4340 Alloy Steel AMS6415 Rc39-42 H.T. Cadmium Plated††
Catalog No. + CR†	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required	CRES 17-4PH AMS 5643 Rc39-44 Passivated

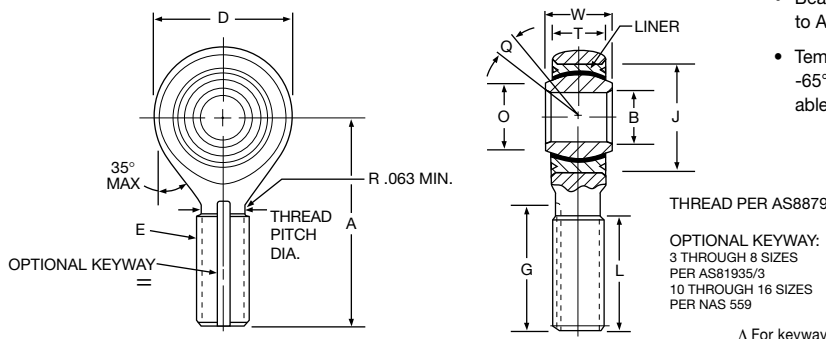
†† Body cadmium plated per AMS-QQ-P-416, Type II, CL. 2 on all surfaces including body bore.
† Stainless Steel Series is not available to Aerospace Standard, but may be ordered to NHBB Part Number as indicated. Example: ADNE4CRJ or ADNE4-382CR
TEFLON® is a Du Pont registered trademark

Performance Properties - Narrow

MS Dash No.	No Load Rotational Breakaway Torque	Ultimate Static Radial Load	Axial Static Proof Load	Fatigue Load	Approx. Weight	
						In-lbs.
M81935/4						
ADNE3-382	-3	.5-6	3000	150	1100	.045
ADNE4-382	-4	.5-6	5300	430	1500	.060
ADNE5-382	-5	1-15	8600	700	2400	.100
ADNE6-382	-6	1-15	13000	1100	3600	.135
ADNE7-382	-7	1-15	17800	1400	5000	.200
ADNE8-382	-8	1-15	24200	2040	6800	.285
ADNE10-382	-10	1-15	38500	2430	10800	.505
ADNE12-382	-12	1-15	56600	2940	16000	.830
ADNE14-382	-14	1-24	77400	3190	21900	1.235
ADNE16-382	-16	1-24	101400	3570	28600	1.725



AS81935 Wide – Male Thread



Notes:

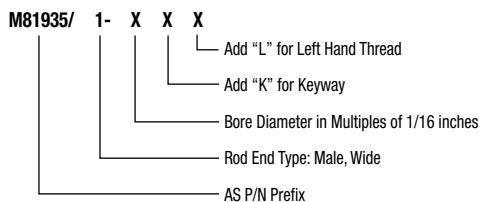
- Bearings listed in the tables are approved for procurement to AS81935.
- Temperature: Operating temperature range per AS81935; -65° to 325°F . Broader temperature capabilities are achievable. Contact NHBB Applications Engineering.

Δ For keyway details, refer to the engineering section, pages 68-69.

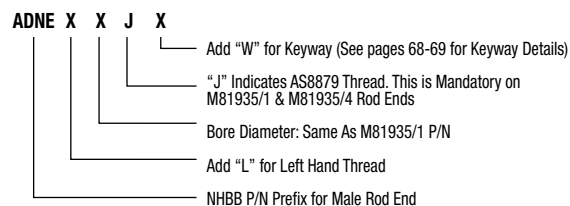
Part Number	MS Dash No.	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	Ball Diameter	(A) Ball C/L to End	(E) Thread Size	(L) Complete Thread	(J) Housing I.D.	(G) Keyway Flat	(Q) Mis-alignment
		Inch	Inch	Inch	Inch	Inch	Inch	Inch		Inch	Inch	Inch	Ref.
M81935/1*		+0.0000 -0.0005	+0.010 -0.010	+0.000 -0.002	+0.005 -0.005	Min.	Ref.	+0.010 -0.010	UNJF-3A	+0.031 -0.031	Max.	+0.000 -0.020	
ADNE3J	-3	.1900	.806	.437	.337	.300	.531	1.562	5/16-24	.968	.6250	.980	15°
ADNE4J	-4	.2500	.806	.437	.337	.300	.531	1.562	5/16-24	.968	.6250	.980	15°
ADNE5J	-5	.3125	.900	.437	.327	.360	.593	1.875	5/16-24	1.187	.6875	1.270	14°
ADNE6J	-6	.3750	1.025	.500	.416	.470	.687	1.938	3/8-24	1.187	.8125	1.235	8°
ADNE7J	-7	.4375	1.150	.562	.452	.540	.781	2.125	7/16-20	1.281	.9062	1.402	10°
ADNE8J	-8	.5000	1.337	.625	.515	.610	.875	2.438	1/2-20	1.468	1.0000	1.589	9°
ADNE10J	-10	.6250	1.525	.750	.577	.750	1.062	2.625	5/8-18	1.562	1.1875	1.683	12°
ADNE12J	-12	.7500	1.775	.875	.640	.850	1.250	2.875	3/4-16	1.687	1.3750	1.808	13°
ADNE14J	-14	.8750	2.025	.875	.765	1.000	1.375	3.375	7/8-14	2.000	1.6250	2.121	6°
ADNE16J	-16	1.0000	2.775	1.375	1.015	1.270	1.875	4.125	1 1/4-12	2.343	2.1250	2.464	12°

*For rod ends with threads per MIL-S-7742 Rev. D (UNF-3A), omit "J" from part number.

Aerospace Standard P/N - Wide



NHBB P/N - Wide



Materials

Part No.	Ball	Race	Liner	Body
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required	4340 Alloy Steel AMS6415 Rc39-42 H.T. Cadmium Plated††
Catalog No. + CR†	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required	CRES 17-4PH AMS 5643 Rc39-44 Passivated

†† Body cadmium plated per AMS-QQ-P-416, Type II, CL. 2 on all surfaces including body bore.

† Stainless Steel Series is not available to Aerospace Standard, but may be ordered to NHBB Part Number as indicated. Example: ADNE4CRJ or ADNE4-382CR

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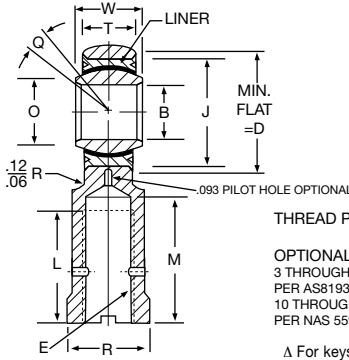
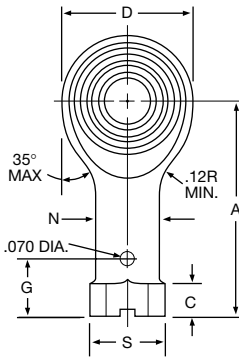
Performance Properties - Wide

WIDE M81935/1* MS Dash No.	No Load Rotational Breakaway Torque		Ultimate Static Radial Load		Axial Static Proof Load		Fatigue Load		Approx. Weight	
	In-lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
ADNE3J	-3	.5-6	2360	1000	1470	.072				
ADNE4J	-4	.5-6	4860	1000	2380	.072				
ADNE5J	-5	1-15	7180	1100	2770	.087				
ADNE6J	-6	1-15	8550	1660	3570	.136				
ADNE7J	-7	1-15	12000	1850	4800	.183				
ADNE8J	-8	1-15	19500	2040	7680	.278				
ADNE10J	-10	1-15	21900	2430	9180	.424				
ADNE12J	-12	1-15	29300	2810	11600	.639				
ADNE14J	-14	1-24	34500	3320	13100	.963				
ADNE16J	-16	1-24	80300	4340	30400	2.546				

*For rod ends with threads per MIL-S-7742 Rev. D (UNF-3A), omit "J" from part number.

ROD END BEARINGS – Self-Lubricating

AS81935 Narrow – Female Thread



Notes:

- Bearings listed in the tables are approved for procurement to AS81935.
- Temperature: Operating temperature range per AS81935; -65° to 325°F. Broader temperature capabilities are achievable.

THREAD PER AS8879

OPTIONAL KEYSLOT:
3 THROUGH 8 SIZES
PER AS81935/5
10 THROUGH 16 SIZES
PER NAS 559 OR NAS 513

Δ For keyslot details, refer to the engineering section, pages 68-69.

Part Number	MS Dash No.	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	Ball Diameter	(A) Ball C/L to End	(E) Thread Size	(L) Complete Thread	(N) Shank Diameter	(M) Drill Depth	(C) Flange Thickness	(R) Wrench Flat	(S) Corners or Diam.	(G) Drill C/L to End	(J) Housing I.D.	(Q) Mis-alignment
M81935/5		Inch +.0000 -.0005	Inch +.010 -.010	Inch +.000 -.002	Inch +.005 -.005	Inch Min.	Inch Ref.	Inch +.010 -.010	UNJF-3B	Inch Min.	Inch +.010 -.010	Inch Max.	Inch +.010 -.062	Inch +.002 -.010	Inch Ref.	Inch +.020 -.020	Inch Max.	Ref.
ADN3-345	-3	.1900	.680	.281	.228	.293	.406	1.210	1/4-28	.625	.329	.750	.188	.375	.430	.312	.5625	10°
ADN4-345	-4	.2500	.827	.343	.260	.364	.500	1.338	1/4-28	.625	.329	.750	.188	.375	.430	.312	.6562	10°
ADN5-345	-5	.3125	.984	.375	.291	.419	.562	1.566	5/16-24	.750	.413	.875	.188	.437	.500	.375	.7500	10°
ADN6-345	-6	.3750	1.131	.406	.322	.475	.656	1.908	3/8-24	1.000	.501	1.125	.250	.625	.720	.437	.8125	9°
ADN7-345	-7	.4375	1.294	.437	.353	.530	.718	2.125	7/16-20	1.125	.584	1.250	.250	.625	.720	.500	.9062	8°
ADN8-345	-8	.5000	1.459	.500	.400	.600	.813	2.356	1/2-20	1.250	.672	1.375	.375	.875	1.020	.562	1.0000	8°
ADN10-345	-10	.6250	1.763	.625	.510	.739	.968	2.707	5/8-18	1.375	.845	1.500	.375	.875	1.020	.687	1.1875	8°
ADN12-345	-12	.7500	2.140	.750	.603	.920	1.187	3.193	3/4-16	1.625	1.017	1.750	.500	1.125	1.300	.812	1.4375	8°
ADN14-345	-14	.8750	2.372	.875	.713	.980	1.312	3.677	7/8-14	1.875	1.187	2.062	.500	1.250	1.375	.937	1.5625	8°
ADN16-345	-16	1.0000	2.681	1.000	.807	1.118	1.500	4.101	1-12	2.125	1.356	2.312	.500	1.375	1.590	1.062	1.7500	9°

Materials

Part No.	Ball	Race	Liner	Body
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required	4340 Alloy Steel, AMS6415 Rc39-42 Cadmium Plated††
Catalog No. + CR†	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required	CRES 17-4PH AMS 5643 Rc39-44 Passivated

†† Body Cadmium plated per AMS-QQ-P-416, Type II, CL. 2 on all surfaces including body bore.

† Stainless Steel Series is not available to Aerospace Standard, but may be ordered to NHBB Part Number as indicated. Example: ADN4CRJ or ADN 4-345CR

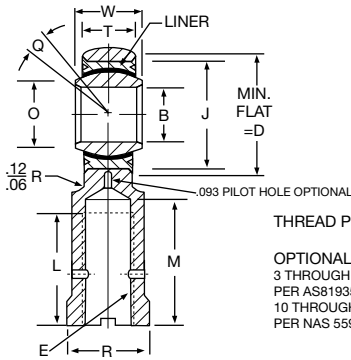
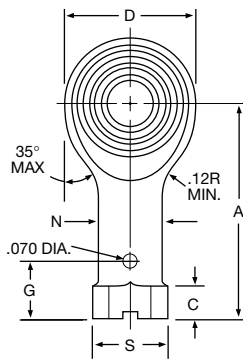
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Performance Properties – Narrow

MS Dash No.	No Load Rotational Breakaway Torque	Ultimate Static Radial Load	Axial Static Proof Load	Fatigue Load	Approx. Weight	
						In-lbs.
M81935/5						
ADN 3-345	-3	.5-6	3000	150	1100	.045
ADN 4-345	-4	.5-6	5500	430	1300	.060
ADN 5-345	-5	1-15	8900	700	2000	.100
ADN 6-345	-6	1-15	13400	1100	3100	.145
ADN 7-345	-7	1-15	18200	1400	4200	.215
ADN 8-345	-8	1-15	24600	2040	5700	.303
ADN 10-345	-10	1-15	39500	2430	9200	.550
ADN 12-345	-12	1-15	57200	2940	13500	.930
ADN 14-345	-14	1-24	77800	3100	18400	1.390
ADN 16-345	-16	1-24	101100	3570	24000	1.975



AS81935 Wide – Female Thread



THREAD PER AS8879

OPTIONAL KEYSLOT:
3 THROUGH 8 SIZES
PER AS81935/2
10 THROUGH 16 SIZES
PER NAS 559 OR NAS 513

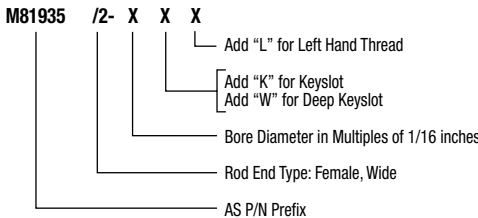
Notes:

- Bearings listed in the tables are approved for procurement to AS81935.
- Temperature: Operating temperature range per AS81935; -65° to 325°F. Broader temperature capabilities are achievable.

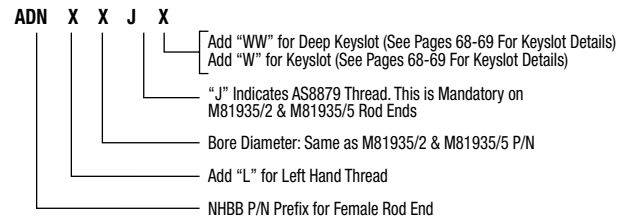
Part Number	MS Dash No.	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	Ball Diameter	(A) Ball C/L to End	(E) Thread Size	(L) Complete Thread	(N) Shank Diameter	(M) Drill Depth	(C) Flange Thickness	(R) Wrench Flat	(S) Corners or Diam.	(G) Drill C/L to End	(J) Housing I.D.	(Q) Mis-alignment
		Inch	Inch	Inch	Inch	Inch	Inch	Inch		Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Ref.
M81935/2*		+ .0000 - .0005	+ .010 - .010	+ .000 - .002	+ .005 - .005	Min.	Ref.	+ .010 - .010	UNJF-3B	Min.	+ .010 - .010	Max.	+ .010 - .062	+ .002 - .010	Ref.	+ .020 - .020	Max.	
ADN3J	-3	.1900	.806	.437	.337	.300	.531	1.375	5/16-24	.750	.422	.875	.188	.437	.500	.375	.6250	15°
ADN4J	-4	.2500	.806	.437	.337	.300	.531	1.469	5/16-24	.750	.422	.875	.188	.437	.500	.375	.6250	15°
ADN5J	-5	.3125	.900	.437	.327	.360	.593	1.625	3/8-24	.875	.485	1.000	.250	.500	.580	.437	.6875	14°
ADN6J	-6	.3750	1.025	.500	.416	.470	.687	1.812	3/8-24	1.000	.547	1.125	.250	.562	.660	.437	.8125	8°
ADN7J	-7	.4375	1.150	.562	.452	.540	.781	2.000	7/16-20	1.125	.610	1.250	.250	.625	.720	.500	.9062	10°
ADN8J	-8	.5000	1.337	.625	.515	.610	.875	2.250	1/2-20	1.250	.735	1.375	.250	.750	.880	.562	1.0000	9°
ADN10J	-10	.6250	1.525	.750	.577	.750	1.062	2.500	5/8-18	1.375	.860	1.500	.375	.875	1.020	.687	1.1875	12°
ADN12J	-12	.7500	1.775	.875	.640	.850	1.250	2.875	3/4-16	1.625	.985	1.750	.375	1.000	1.160	.812	1.3750	13°
ADN14J	-14	.8750	2.025	.875	.765	1.000	1.375	3.375	7/8-14	1.875	1.110	2.062	.500	1.125	1.300	.937	1.6250	6°
ADN16J	-16	1.0000	2.775	1.375	1.015	1.270	1.875	4.125	1 1/4-12	2.125	1.688	2.312	.563	1.750	2.020	1.312	2.1250	12°

* For rod ends with threads per MIL-S-7742 Rev. D (UNF-3B), omit "J" from part number.

Aerospace Standard P/N - Wide



NHBB P/N - Wide



Materials

Part No.	Ball	Race	Liner	Body
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required	4340 Alloy Steel, AMS6415 Rc39-42 Cadmium Plated††
Catalog No. + CR†	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON®/Fabric Bonded to Race I.D. No Lub. Required	CRES 17-4PH AMS 5643 Rc39-44 Passivated

†† Body Cadmium plated per AMS-QQ-P-416, Type II, CL. 2 on all surfaces including body bore.
† Stainless Steel Series is not available to Aerospace Standard, but may be ordered to NHBB Part Number as indicated. Example: ADN4CRJ or ADN 4-345CR
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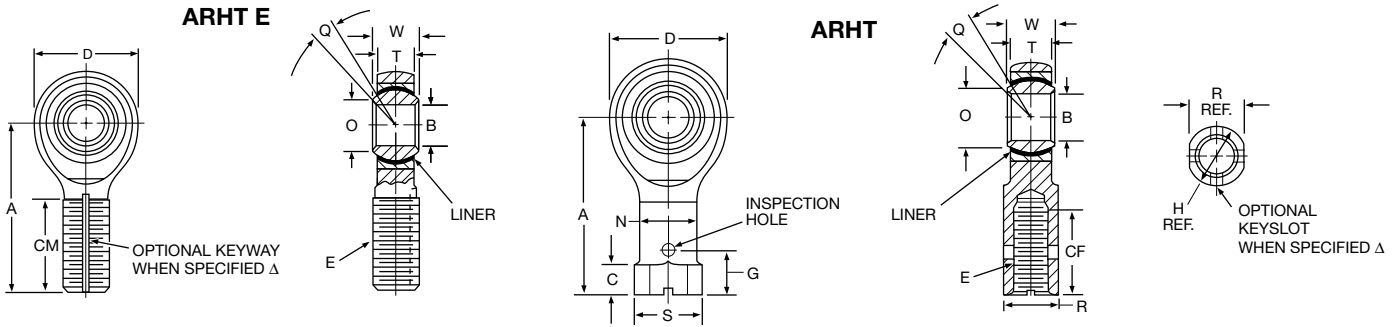
Performance Properties – Wide

MS Dash No.	No Load Rotational Breakaway Torque	Ultimate Static Radial Load	Axial Static Proof Load	Fatigue Load	Approx. Weight	
						In-lbs.
M81935/2*						
ADN 3J	-3	.5-6	2360	1000	1470	.080
ADN 4J	-4	.5-6	4860	1000	2380	.084
ADN 5J	-5	1-15	7180	1100	3020	.102
ADN 6J	-6	1-15	8550	1660	3570	.161
ADN 7J	-7	1-15	12000	1850	4800	.212
ADN 8J	-8	1-15	19500	2040	8260	.325
ADN 10J	-10	1-15	21900	2430	9180	.481
ADN 12J	-12	1-15	29300	2810	11600	.673
ADN 14J	-14	1-24	34500	3320	13100	.959
ADN 16J	-16	1-24	80300	4340	30400	2.717

* For rod ends with threads per MIL-S-7742 Rev. D (UNF-3B), omit "J" from part number

ROD END BEARINGS – Self-Lubricating

3-Piece Heavy Duty – Male & Female Threads



Δ For keyway and keyslot details, refer to the engineering section, pages 68-69.

Part Number	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Ball Diameter	(A) Flat Diameter	(E) Ball C/L to End	(Q) Thread Size	(M) Mis-alignment	(CM) Thread Length	(CF) Thread Depth	(G) Inspection Hole Dimension	(N) Shank Diameter	(S) Flange Diameter	(C) Flange Thickness	(R) Wrench Flat	No Load Rotational Breakaway Torque	Limit Static Radial Load	Axial Static Proof Load	Weight
	Inch +.0000 -.0005	Inch +.010 -.010	Inch +.000 -.002	Inch +.005 -.005	Inch Ref.	Inch Ref.	Inch +.010 -.010	UNF - 3A* UNF - 3B*	Ref.	Inch +.031 -.031	Inch Min.	Inch Ref.	Inch +.010 -.010	Inch Ref.	Inch +.010 +.062	Inch +.002 -.010	Inch - lbs.	lbs.	lbs.	lbs. Ref.
ARHT4E ARHT4	.2500	.806	.375	.337	.531	.375	1.562	5/16 - 24	5°	.968	.750	.375	.485	.562	.188	.500	.5 - 6	6060	1000	.067 .084
ARHT5E ARHT5	.3125	.900	.437	.327	.593	.401	1.875	3/8 - 24	14°	1.187	.875	.437	.547	.625	.250	.562	1 - 10	7290	1100	.095 .102
ARHT6E ARHT6	.3750	1.025	.500	.416	.687	.471	1.938	7/16 - 20	9°	1.187	1.000	.500	.610	.687	.250	.625	1 - 10	8870	1660	.140 .160
ARHT7E ARHT7	.4375	1.150	.562	.452	.781	.542	2.125	1/2 - 20	10°	1.281	1.125	.562	.735	.875	.250	.750	1 - 10	9560	1850	.210 .230
ARHT8E ARHT8	.5000	1.337	.625	.515	.875	.612	2.438	5/8 - 18	9°	1.468	1.250	.687	.860	1.000	.250	.875	1 - 10	18560	2040	.330 .340
ARHT10E ARHT10	.6250	1.525	.750	.577	1.062	.752	2.625	3/4 - 16	12°	1.562	1.375	.812	.985	1.125	.375	1.000	1 - 10	20610	2430	.480 .490
ARHT12E ARHT12	.7500	1.775	.875	.640	1.250	.892	2.875	7/8 - 14	13°	1.687	1.625	.937	1.110	1.250	.375	1.125	1 - 10	27640	2810	.730 .740

* UNF-3A = Male Thread. UNF-3B = Female Thread per MIL-S-7742, Rev. D.

Notes:

- † Plating: When specified in materials block, body cadmium plated all surfaces per AMS-QQ-P-416.
- Dimensions: Dimensions apply after plating.
- Temperature: Operating temperature range -65° to 350°F (ADY only).
- Qualifications: Liner is approved to MIL-B-8942 Rev. A (ARHT series only).
- Options:
 1. For left hand threads, add "L" to prefix. (Examples: ARHTL4E or ARHTL4)
 2. For Keyway or keyslot options add suffix "W" to part number.
 3. For "J" form threads per AS8879, add suffix "J" to part number. (Examples: ARHT10EJW or ARHT10JW)

Materials (ARHT)

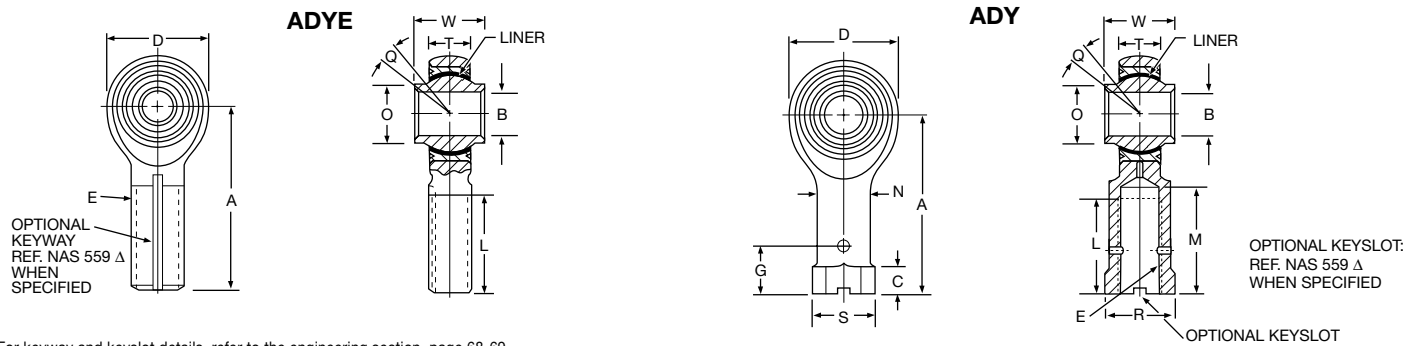
Designation	Ball	Race	Liner	Body
Basic†	CRES 440C	Stainless	TEFLON®	C.M. Steel
Part No.	AMS 5630 Rc55-62	Steel, H.T.††	Fabric Bonded to Race I.D.	H.T., Cadmium Plated
No. + CR	CRES 440C AMS 5630	Stainless Steel, H.T.††	TEFLON® Fabric Bonded to Race I.D.	CRES 17-4PH AMS 5643 H.T

† Stainless Steel Series may be ordered to NHBB Part Number as indicated.

†† Part No. designation as shown furnished with CRES 410 race material. To specify CRES 17-4PH race material, add suffix "H" to designation. Examples: ARHT8ECRH or ARHT8CRH. TEFLON® is a Du Pont registered trademark



3-Piece High Misalignment – Male & Female Threads



Δ For keyway and keyslot details, refer to the engineering section, page 68-69.

Part Number	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	(A) Ball Diameter	(E) Ball C/L to End	(Q) Thread Size	(L) Mis-alignment	(N) Thread Length	(R) Shank Diameter	(S) Wrench Flat	(C) Flange Diameter	(G) Flange Thickness	(G) Drill C/L to End	No Load Rotational Breakaway Torque	Limit Static Radial Load	Weight
	Inch +.0000 -.0005	Inch Max.	Inch +.000 -.005	Inch +.005 -.005	Inch Ref.	Inch Ref.	Inch +.06 -.06	UNF - 3A* UNF - 3B*	Ref.	Inch +.06 -.06	Inch +.010 -.010	Inch Ref. Ref.	Inch +.010 +.062	Inch +.002 -.010	Inch - lbs.	lbs.	lbs.	
ADYE3(L) ADY3(L)	.1900	.781	.560	.337	.301	.531	1.562 1.625	5/16 - 24	16°	1.000 .750	.500	.515 .562	.250	.375	.5 - 6	2425	.07 .08	
ADYE3-101(L) ADY3-101(L)	.1900	.750	.500	.220	.319	.437	1.500 1.375	5/16 - 24	15°	1.000 .750	.437	.452 .500	.250	.375	.5 - 6	4060**	.07 .06	
ADYE4(L) ADY4(L)	.2500	1.000	.593	.265	.390	.593	1.938 1.625	3/8 - 24	23°	1.250 .937	.562	.577 .625	.250	.437	1 - 15	7040**	.11 .11	
ADYE5(L) ADY5(L)	.3125	1.125	.813	.355	.512	.781	2.125 1.812	7/16 - 20	23°	1.375 1.062	.625	.640 .688	.250	.500	1 - 15	8260	.16 .18	
ADYE6(L) ADY6(L)	.3750	1.125	.813	.355	.512	.781	2.125 1.812	7/16 - 20	23°	1.375 1.062	.625	.640 .688	.250	.500	1 - 15	8260	.15 .17	
ADYE7(L) ADY7(L)	.4375	1.312	.875	.355	.618	.875	2.437 2.125	1/2 - 20	22°	1.500 1.125	.750	.765 .812	.250	.562	1 - 15	12420	.25 .26	
ADYE8(L) ADY8(L)	.5000	1.500	.937	.411	.730	1.000	2.625 2.625	5/8 - 18	20°	1.625 1.500	.875	.890 .938	.375	.687	1 - 15	17430	.39 .40	
ADYE10(L) ADY10(L)	.6250	1.750	1.200	.577	.856	1.250	2.875 2.875	3/4 - 16	20°	1.750 1.750	1.000	1.015 1.125	.375	.812	1 - 15	23620	.62 .63	
ADYE12(L) ADY12(L)	.7500	2.000	1.280	.630	.970	1.375	3.375 3.375	7/8 - 14	18°	1.875 1.875	1.125	1.140 1.250	.500	.937	1 - 24	30550	.90 .87	
ADYE14(L) ADY14(L)	.8750	2.200	1.400	.635	1.140	1.531	3.750 3.750	7/8 - 14	18°	2.000 2.000	1.125	1.140 1.250	.500	.937	1 - 24	31970	1.08 1.01	
ADYE16(L) ADY16(L)	1.0000	2.750	1.875	.845	1.278	1.875	4.125 4.125	1 1/4 - 12	21°	2.125 2.125	1.688	1.703 1.813	.562	1.312	1 - 24	59510	2.20 2.31	
ADYE20(L) ADY20(L)	1.2500	3.125	1.875	1.015	1.523	2.250	5.000 5.000	1 1/4 - 12	21°	2.875 3.125	1.688	1.703 1.813	.562	1.312	1 - 24	70060	3.10 3.15	

* UNF-3A = Male Thread. UNF-3B = Female Thread per MIL-S-7742, Rev. D.

** Load based on pin limitation.

Notes:

- † Plating: When specified in materials block, body cadmium plated all surfaces per AMS-QQ-P-416.
- Dimensions: Dimensions apply after plating.
- Temperature: Operating temperature range -65° to 350°F (ADY only).
- Qualifications: Liner is approved to AS81820 (ADY series only).
- Options:
 1. For left hand threads, add "L" to prefix.
(Examples: ADYEL4(L) or ADYL4(L))
 2. For Keyway or keyslot options add suffix "W" to part number.
 3. For "J" form threads per AS8879, add suffix "J" to part number.
(Examples: ADYE4JW(L) or ADY4JW(L))

Materials (ADYE & ADY)

Part No.	Ball	Race	Liner	Body
Catalog No.	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON® Fabric Bonded to Race I.D. No Lub. Required	4130 Alloy Steel H.T., and Cadmium Plated†
Catalog No. + SS	CRES 440C AMS 5630 Rc55-62	CRES 17-4PH AMS 5643 Rc28-37	TEFLON® Fabric Bonded to Race I.D. No Lub. Required	CRES 17-4PH AMS 5643 H.T., and Passivated

† Stainless Steel Series may be ordered to NHBB Part Number as indicated.
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SECTION 5

ROD END BEARINGS – Metal-to-Metal

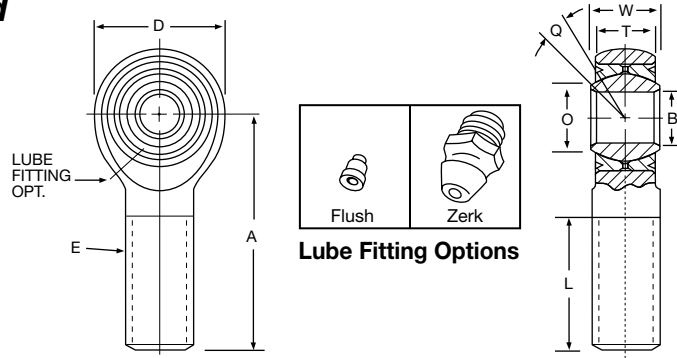
Metal-to-Metal

3-Piece Male Thread	38
3-Piece Female Thread	39
3-Piece Heavy Duty – Male & Female Threads	40
3-Piece Standard – Male & Female Threads	41
3-Piece High Misalignment – Male Thread	42
3-Piece High Misalignment – Female Thread	43



ROD END BEARINGS – Metal-to-Metal

3-Piece Male Thread



Part Number	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	Ball Diameter	(Q) Misalignment	(A) Ball C/L to End	(E) Thread Size	(L) Thread Length	Ultimate Static Radial Load*	Weight
	Inch +.0000 -.0005	Inch Max.	Inch +.000 -.005	Inch +.005 -.005	Inch Ref.	Inch Ref.	Ref.	Inch +.06 -.06	UNF - 3A	Inch +.06 -.06	lbs.	lbs. Ref.
AB3E101	.1900	.875	.500	.337	.318	.593	23°	1.812	3/8 - 24	1.062	6840	.09
AB3E	.1900	.781	.437	.337	.301	.531	16°	1.562	5/16 - 24	1.000	5170	.07
AB4E101	.2500	.875	.500	.327	.318	.593	23°	1.812	3/8 - 24	1.062	6840	.09
AB4E	.2500	.781	.437	.337	.301	.531	16°	1.562	5/16 - 24	1.000	5170	.07
ARB4E	.2500	.750	.375	.281	.376	.531	13°	1.562	5/16 - 24	1.000	4550	.06
AB5E	.3125	.875	.437	.327	.402	.593	14°	1.875	5/16 - 24	1.062	6840	.08
ARB5E	.3125	.875	.437	.344	.402	.593	12°	1.875	3/8 - 24	1.250	6940	.09
AB6E101	.3750	1.312	.812	.577	.468	.937	22°	2.531	7/16 - 20	1.500	15150	.28
AB6E	.3750	1.000	.500	.406	.472	.687	10° 30'	1.938	3/8 - 24	1.250	9540	.12
ARB6E	.3750	1.000	.500	.406	.472	.687	10° 30'	1.938	7/16 - 20	1.250	9540	.13
AB7E	.4375	1.125	.562	.442	.544	.781	11° 30'	2.125	7/16 - 20	1.375	10430	.17
ARB7E	.4375	1.125	.562	.437	.544	.781	12°	2.125	1/2 - 20	1.375	10350	.19
AB8E	.5000	1.312	.625	.515	.614	.875	9° 30'	2.438	1/2 - 20	1.500	18620	.28
ARB8E	.5000	1.312	.625	.500	.614	.875	10° 30'	2.438	5/8 - 18	1.500	18210	.30
AB10E	.6250	1.500	.750	.567	.752	1.062	12° 30'	2.625	5/8 - 18	1.625	20030	.41
ARB10E	.6250	1.500	.750	.562	.752	1.062	13°	2.625	3/4 - 16	1.625	19890	.47
AB12E	.7500	1.750	.875	.640	.894	1.250	13° 30'	2.875	3/4 - 16	1.750	28200	.63
ARB12E	.7500	1.750	.875	.687	.894	1.250	11°	2.875	7/8 - 14	1.750	29740	.70
AB14E	.8750	2.000	.875	.750	1.060	1.375	7°	3.375	7/8 - 14	1.875	42390	.90
ARB14E	.8750	2.000	.875	.765	1.062	1.375	6°	3.375	1 - 12	1.875	43040	1.07
AB16E	1.0000	2.750	1.375	1.000	1.275	1.875	15°	4.125	1 1/4 - 12	2.125	77500	2.50
ARB16E	1.0000	2.750	1.375	1.015	1.275	1.875	14° 30'	4.124	1 1/4 - 12	2.125	78410	2.50
AB20E	1.2500	2.875	1.500	1.140	1.460	2.093	12°	5.000	1 1/2 - 12	3.125	66620	3.10
ARB20E	1.2500	2.875	1.500	1.250	1.460	2.093	7° 30'	5.000	1 1/2 - 12	3.125	86380	3.80

* Load ratings are for rod ends without lubricators.

Notes:

- Radial Clearance: .002 max.
- † Plating: When specified in materials block, ball spherical diameter and ends are hard chrome plated per AMS-QQ-C-320, CL. 2 (.0002 to .0005 thickness). All external surfaces of race and/or body are cadmium plated per AMS-QQ-P-416.
- Dimensions: All dimensions apply after plating.
- Options: Radial clearance, lubrication holes and groove in ball, lubrication fittings, dry film lubrication, keyways, left hand or AS8879 threads see page 39.

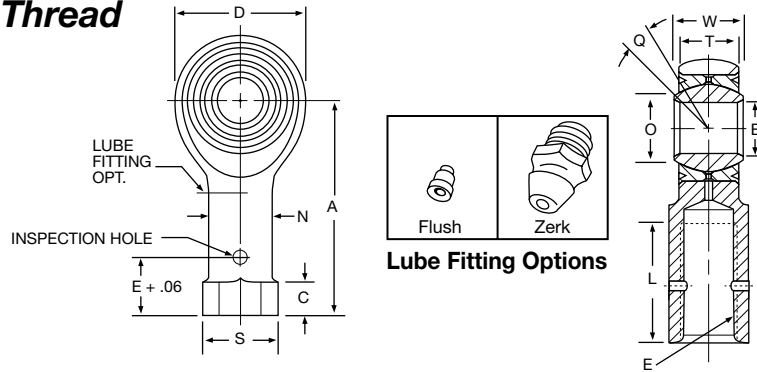
Materials

Part No.	Ball	Race	Body
Catalog No. †	52100 Alloy Steel, H.T., Chrome Plated Rc59-63	Aluminum Bronze (AMPCO® 15), Cadmium Plated	4130 Alloy Steel, H.T., Cadmium Plated
Catalog No. + S†	"	4130 Alloy Steel, H.T., Cadmium Plated	"
Catalog No. + SS†	"	CRES 17-4PH AMS5643	CRES 17-4PH AMS5643
Catalog No. + CR	CRES 440C AMS5630	"	"
Catalog No. + CRP†	CRES 440C, AMS5630 Chrome Plated	"	"

AMPCO® is a registered trademark of AMPCO Metal, Inc.



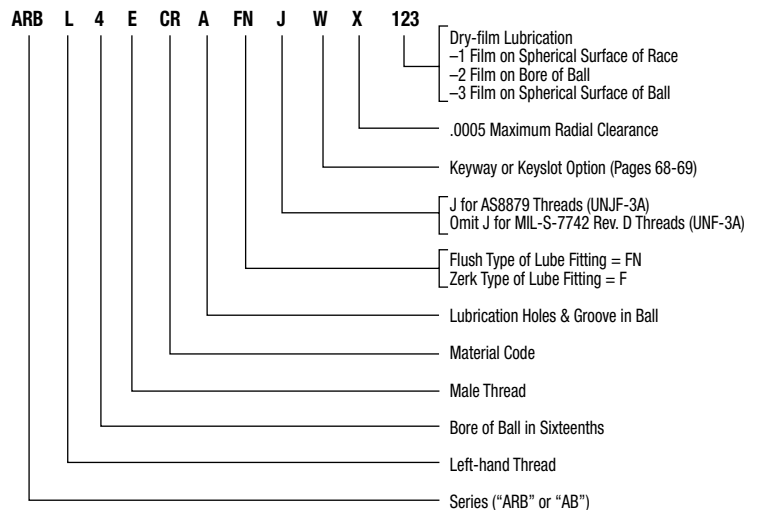
3-Piece Female Thread



Part Number	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	Ball Diameter	(A) Ball C/L to End	(E) Thread Size	(Q) Misalignment	(L) Thread Depth	(N) Shank Diameter	(S) Flange Diameter	(C) Flange Thickness	Ultimate Static Radial Load*	Weight
	Inch	Inch	Inch	Inch	Inch	Inch	Inch			Inch	Inch	Inch	Inch	lbs.	lbs.
	+ .0000		+ .000	+ .005			+ .06			+ .00	+ .010				Ref.
	-.0005	Max.	-.005	-.005	Ref.	Ref.	-.06	UNF - 3B	Ref.	-.09	-.010	Ref.	Ref.		
AB3	.1900	.781	.437	.337	.301	.531	1.375	5/16 - 24	16°	.750	.437	.500	.180	5170	.06
AB3-101	.1900	.781	.437	.337	.301	.531	1.000	1/4 - 28	16°	.375	.375	.440	.180	5170	.06
AB3-102	.1900	.781	.437	.337	.301	.531	1.375	1/4 - 28	16°	.750	.375	.440	.180	5170	.07
AB3-103	.1900	.875	.500	.337	.318	.593	1.625	5/16 - 24	23°	.750	.500	.560	.180	6840	.11
AB4	.2500	.781	.437	.337	.301	.531	1.375	1/4 - 28	16°	.750	.375	.440	.180	5170	.07
AB4-101	.2500	.781	.437	.337	.301	.531	1.469	5/16 - 24	16°	.750	.437	.500	.180	5170	.08
AB4-102	.2500	.875	.500	.327	.318	.593	1.625	5/16 - 24	24°	.750	.500	.560	.180	6680	.10
AB4-103	.2500	.750	.375	.296	.376	.531	1.312	1/4 - 28	11°	.750	.375	.440	.180	4750	.06
ARB4	.2500	.750	.375	.281	.376	.531	1.312	1/4 - 28	13°	.750	.375	.437	.180	4550	.06
AB5	.3125	.875	.437	.327	.402	.593	1.375	5/16 - 24	14°	.750	.437	.500	.180	6680	.08
ARB5	.3125	.875	.437	.344	.402	.593	1.375	5/16 - 24	12°	.750	.437	.500	.180	6940	.07
AB6	.3750	1.000	.500	.406	.472	.687	1.625	3/8 - 24	10° 30'	.937	.562	.620	.180	9540	.12
ARB6	.3750	1.000	.500	.406	.472	.687	1.625	3/8 - 24	10° 30'	.937	.562	.625	.180	9540	.12
AB7	.4375	1.125	.562	.442	.544	.781	1.812	7/16 - 20	11° 30'	1.062	.625	.680	.180	10430	.18
ARB7	.4375	1.125	.562	.437	.544	.781	1.812	7/16 - 20	12°	1.062	.625	.750	.180	10350	.18
AB8	.5000	1.312	.625	.515	.614	.875	2.125	1/2 - 20	9° 30'	1.125	.750	.870	.180	18620	.28
ARB8	.5000	1.312	.625	.500	.614	.875	2.125	1/2 - 20	10° 30'	1.187	.750	.875	.180	18210	.28
AB10	.6250	1.500	.750	.567	.752	1.062	2.625	5/8 - 18	12° 30'	1.500	.875	.930	.250	20030	.42
ARB10	.6250	1.500	.750	.562	.752	1.062	2.500	5/8 - 18	13°	1.500	.875	.937	.250	19890	.42
AB12	.7500	1.750	.875	.640	.894	1.250	2.875	3/4 - 16	13° 30'	1.750	1.000	1.060	.250	28200	.63
ARB12	.7500	1.750	.875	.687	.894	1.250	2.875	3/4 - 16	11°	1.750	1.000	1.062	.250	29740	.63
ARB14	.8750	2.000	.875	.765	1.062	1.375	3.375	7/8 - 14	6°	1.875	1.125	1.187	.312	43040	.90
ARB16	1.0000	2.750	1.375	1.015	1.275	1.875	4.125	1 - 12	14° 30'	2.125	1.250	1.312	.375	78410	2.00
ARB20	1.2500	2.875	1.500	1.250	1.460	2.093	5.000	1 1/4 - 12	7° 30'	3.125	1.688	1.750	.375	86380	3.10

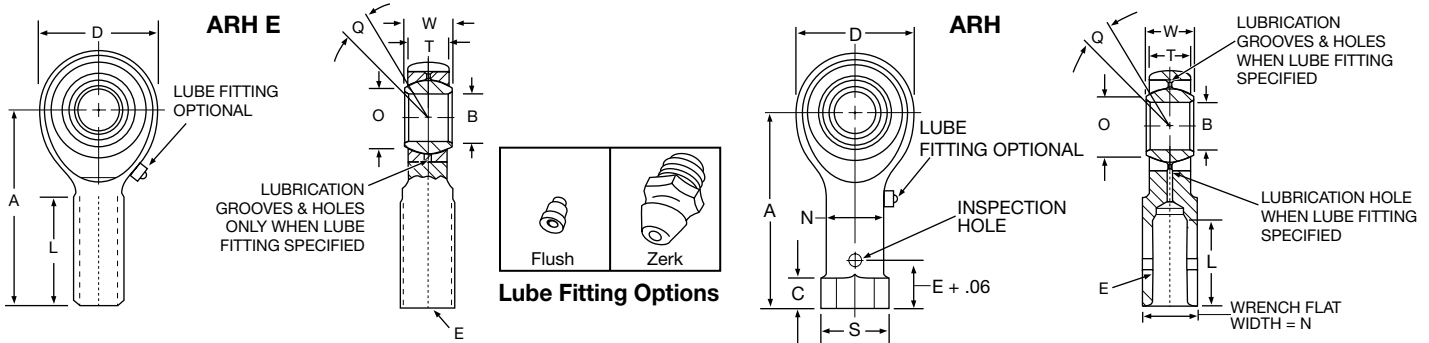
* Load ratings are for rod ends without lubrication fittings.

NHBB P/N



ROD END BEARINGS – Metal-to-Metal

3-Piece Heavy Duty – Male & Female Threads



Part Number	(B)	(D)	(W)	(T)	(O)	Ball Diameter	(A)	(E)	(L)	(Q)	(N)	(S)	(C)	Static Radial Limit Load**		Weight
	Bore Diameter	Head Diameter	Ball Width	Body Width	Shoulder Diameter		Ball C/L to End	Thread Size	Thread Length	Misalignment	Shank Diameter	Flange Diameter	Flange Thickness	Steel Race	Bronze Race	
	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch	Inch		Inch	Inch	Inch	lbs.	lbs.	lbs.
	+ .0005 - .0005	+ .010 - .010	+ .000 - .005	+ .005 - .005	Ref.	Ref.	+ .010 - .010	UNF - 3A* UNF - 3B*	+ .062 - .031	Ref.	Ref.	Ref.	+ .010 - .062			Ref.
ARH4E ARH4	.2500	.806	.375	.337	.375	.531	1.562 1.469	5/16 - 24	.968 .750	5°	.485	.562	.188	6060	6060	.067 .084
ARH5E ARH5	.3125	.900	.437	.327	.401	.593	1.875 1.625	3/8 - 24	1.187 .875	14°	.547	.625	.250	7290	7290	.095 .102
ARH6E ARH6	.3750	1.025	.500	.416	.471	.687	1.938 1.812	7/16 - 20	1.187 1.000	9°	.610	.687	.250	8860	8860	.140 .160
ARH7E ARH7	.4375	1.150	.562	.452	.542	.781	2.125 2.000	1/2 - 20	1.281 1.125	10°	.735	.875	.250	9560	9560	.210 .230
ARH8E ARH8	.5000	1.337	.625	.515	.612	.875	2.438 2.225	5/8 - 18	1.468 1.250	9°	.860	1.000	.250	18560	18560	.330 .340
ARH10E ARH10	.6250	1.525	.750	.577	.752	1.062	2.625 2.500	3/4 - 16	1.562 1.375	12°	.985	1.125	.375	20610	20610	.480 .490
ARH12E ARH12	.7500	1.775	.875	.644	.892	1.250	2.875 2.875	7/8 - 14	1.687 1.625	13°	1.110	1.250	.375	27640	27640	.730

* UNF-3A = Male Thread, UNF-3B = Female Thread, per MIL-S-7742 Rev. D.

** Load ratings are based on male rod ends without lubrication fitting. For rod end load ratings with lubrication fittings please contact NHBB engineering department.

Notes:

- Radial Clearance: .002 max.
- † Plating: When specified in materials block, ball spherical diameter and ends are hard chrome plated per AMS-QQ-C-320, CL. 2 (.0002 to .0005 thickness). All external surfaces of race and/or body are cadmium plated per AMS-QQ-P-416.
- Unless otherwise noted, part number designation as shown furnished with CRES 410 race material. To specify CRES 17-4PH, add suffix "H" to designation. Example: ARH8ECRPLH or ARH8CRPLH.
- Dimensions: All dimensions apply after plating.
- Options: Radial clearance, lubrication holes and groove in ball, lubrication fittings, dry film lubrication, keyways, left hand or AS8879 threads see page 41.

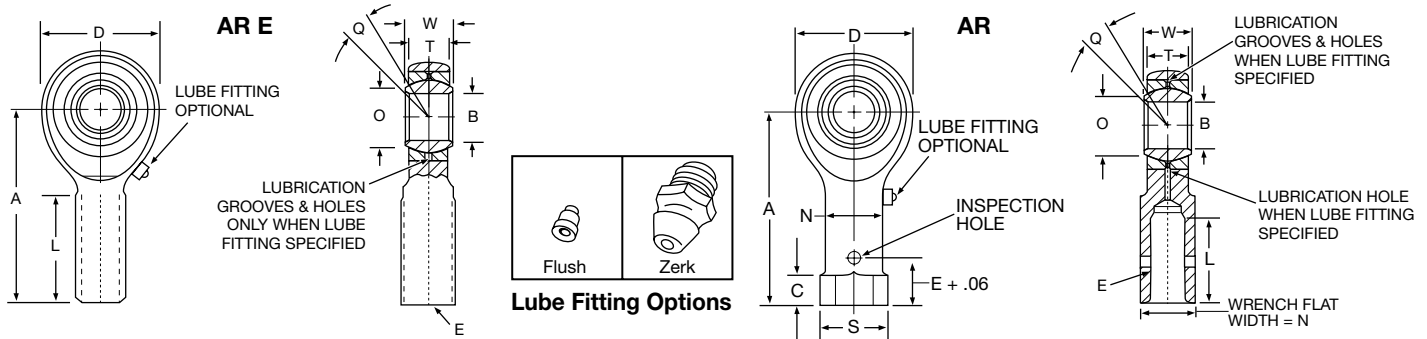
Materials

Designation	Ball	Race	Body
Basic Part No. †	52100 Alloy Steel, H.T. & Chrome Plated	4130 Alloy Steel, H.T. & Cad. Plated	C.M. Steel, H.T. & Cad. Plated
Part No. + SS †	52100 Alloy Steel, H.T. & Chrome Plated	Stainless Steel † H.T.	C.M. Steel, H.T. & Cad. Plated
Part No. + CR †	CRES 440C H.T.	Stainless Steel † H.T.	CRES 17-4PH H.T.
Part No. + CRPL †	CRES 440C H.T. & Chrome Plated	Stainless Steel † H.T.	CRES 17-4PH H.T.
Part No. + 501 †	52100 Alloy Steel, H.T. & Chrome Plated	Aluminum Bronze (AMPCO® 15) Cad. Plated	C.M. Steel, H.T. & Cad. Plated

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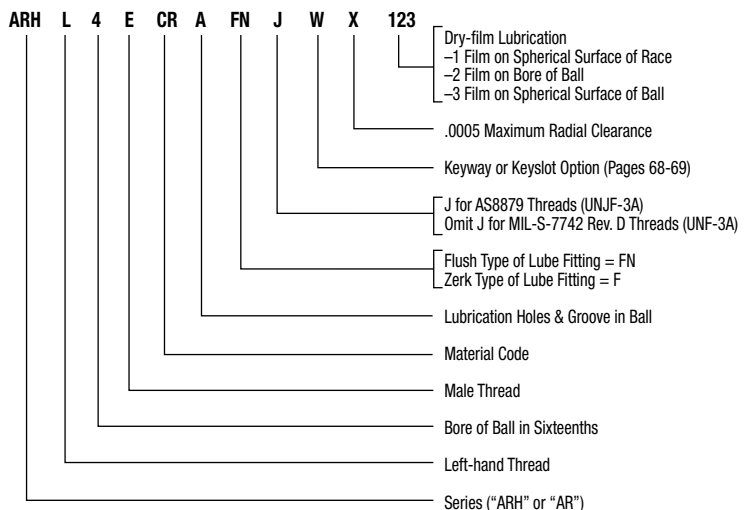
3-Piece Standard – Male & Female Threads



Part Number	(B)	(D)	(W)	(T)	(O)	Ball Diameter	(A)	(E)	(L)	(Q)	(N)	(S)	(C)	Static Radial Limit Load**		Weight
	Bore Diameter	Head Diameter	Ball Width	Body Width	Shoulder Diameter		Ball C/L to End	Thread Size	Thread Length	Thread Length	Misalignment	Shank Diameter	Flange Diameter	Flange Thickness	Steel Race	
	Inch +.0015 -.0005	Inch +.010 -.010	Inch +.000 -.005	Inch +.005 -.005	Inch Ref.	Inch Ref.	Inch +.010 -.010	UNF - 3A* UNF - 3B*	Inch +.062 -.031		Inch Ref.	Inch +.010 -.010	Inch +.010 -.062	lbs.	lbs.	lbs.
AR3E AR3	.1900	.806	.437	.337	.301	.531	1.562 1.375	5/16 - 24	.968 .750	16°	.422	.500	.188	4060 [◇]	4060 [◇]	.07 .08
AR4E AR4	.2500	.806	.437	.337	.301	.531	1.562 1.469	5/16 - 24	.968 .750	16°	.422	.500	.188	6060	6060	.07 .08
AR5E AR5	.3125	.900	.437	.327	.401	.593	1.875 1.625	5/16 - 24	1.187 .875	14°	.485	.580	.250	7290	7290	.08 .10
AR6E AR6	.3750	1.025	.500	.416	.471	.687	1.938 1.812	3/8 - 24	1.187 1.000	9°	.547	.660	.250	8860	8860	.13 .16
AR7E AR7	.4375	1.150	.562	.452	.542	.781	2.125 2.000	7/16 - 20	1.281 1.125	11°	.610	.720	.250	9560	9560	.18 .21
AR8E AR8	.5000	1.337	.625	.515	.612	.875	2.438 2.250	1/2 - 20	1.468 1.250	9°	.735	.880	.250	18560	18560	.27 .32
AR10E AR10	.6250	1.525	.750	.577	.752	1.062	2.625 2.500	5/8 - 18	1.562 1.375	12°	.860	1.020	.375	20610	20610	.42 .48
AR12E AR12	.7500	1.775	.875	.640	.892	1.250	2.875 2.875	3/4 - 16	1.687 1.625	14°	.985	1.160	.375	27640	27640	.63 .87
AR14E AR14	.8750	2.025	.875	.765	1.061	1.375	3.375 3.375	7/8 - 14	2.000 1.875	6°	1.110	1.300	.500	32140	32140	.96 .95
AR16E AR16	1.0000	2.775	1.375	1.015	1.275	1.875	4.125 4.125	1 1/4 - 12	2.343 2.125	14°	1.688	2.020	.563	72270	72270	2.54

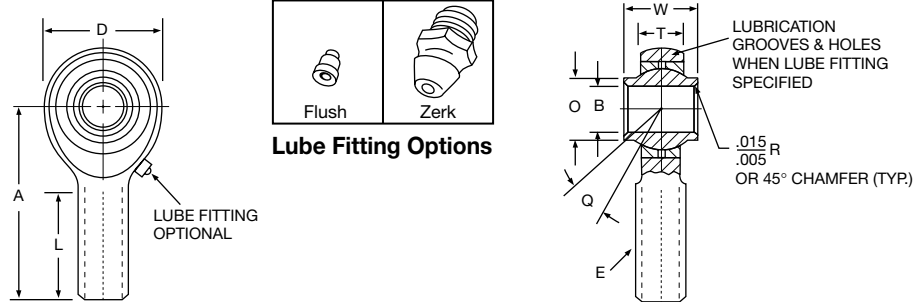
* UNF-3A = Male Thread, UNF-3B = Female Thread, per MIL-S-7742 Rev. D.
 ** Load ratings are based on male rod ends without lubrication fitting.
 For rod end load ratings with lubrication fittings please contact NHBB engineering department.
 ◇ Load based on pin limitation.

NHBB P/N



ROD END BEARINGS – Metal-to-Metal

3-Piece High Misalignment – Male Thread



Part Number	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	Ball Diameter	(A) Ball C/L to End	(E) Thread Size	(L) Thread Length	(Q) Misalignment	Limit Static Radial Load**	Weight
	Inch +.0000 -.0005	Inch Max.	Inch +.000	Inch +.005 -.005	Inch Ref. -.005	Inch Ref.	Inch +.06 -.06	UNF - 3A* UNF - 3B*	Inch +.06 -.06	Ref.	lbs.	lbs. Ref.
ARY3	.1900	.781	.560	.337	.301	.531	1.562	5/16 - 24	1.000	16°	4060 \diamond	.07
ARY3-101	.1900	.750	.500	.220	.319	.437	1.500	5/16 - 24	1.000	15°	4060 \diamond	.07
ARY4	.2500	1.000	.593	.265	.390	.593	1.938	3/8 - 24	1.250	23°	7040 \diamond	.11
ARY5	.3125	1.125	.813	.355	.512	.781	2.125	7/16 - 20	1.375	23°	8260	.16
ARY5-101	.3125	.875	.625	.265	.418	.593	1.875	5/16 - 24	1.062	16°	5290	.09
ARY 6	.3750	1.125	.813	.355	.512	.781	2.125	7/16 - 20	1.375	23°	8260	.15
ARY7	.4375	1.312	.875	.355	.618	.875	2.437	1/2 - 20	1.500	22°	12420	.25
ARY8	.5000	1.500	.937	.411	.730	1.000	2.625	5/8 - 18	1.625	20°	17430	.39
ARY10	.6250	1.750	1.200	.577	.856	1.250	2.875	3/4 - 16	1.750	20°	23620	.62
ARY12	.7500	2.000	1.280	.630	.970	1.375	3.375	7/8 - 14	1.875	18°	30550	.90
ARY14	.8750	2.200	1.400	.635	1.140	1.531	3.750	7/8 - 14	2.000	18° 30'	31970	1.08
ARY16	1.0000	2.750	1.875	.845	1.278	1.875	4.125	1 1/4 - 12	2.125	21°	59510	2.20
ARY20	1.2500	3.125	1.875	1.015	1.523	2.250	5.000	1 1/4 - 12	2.875	21°	70060	3.10

* UNF-3A = Male Thread, per MIL-S-7742 Rev. D.

** Load ratings are for rod ends without lubrication fittings.

\diamond Based on pin limitation.

Notes:

- Radial Clearance: .002 max.
- † Plating: When specified in materials block, ball spherical diameter and ends are hard chrome plated per AMS-QQ-C-320, CL. 2 (.0002 to .0005 thickness). All external surfaces of race and/or body are cadmium plated per AMS-QQ-P-416.
- Dimensions: All dimensions apply after plating.
- Options: Radial clearance, lubrication holes and groove in ball, lubrication fittings, dry film lubrication, keyways, left hand or AS8879 threads see page 43.

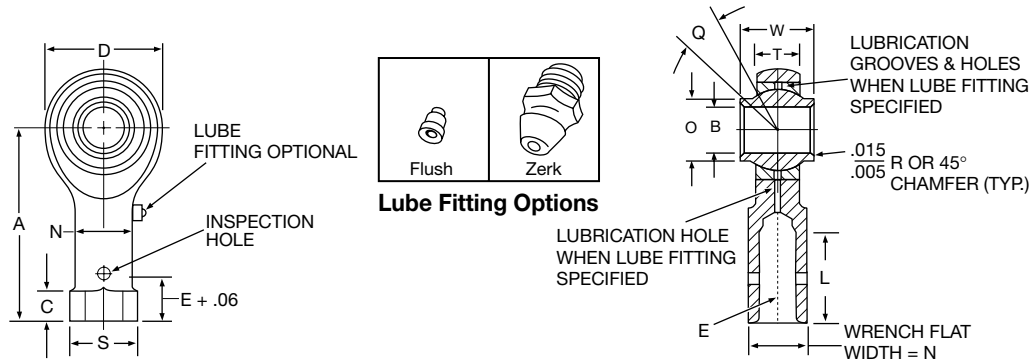
Materials

Part No.	Ball	Race	Body
Catalog No.†	52100 Alloy Steel, H.T., Chrome Plated Rc59-63	Aluminum Bronze, (AMPCO® 15), Cadmium Plated	4130 Alloy Steel, H.T., Cadmium Plated
Catalog No. + S†	"	4130 Alloy Steel, H.T., Cadmium Plated	"
Catalog No. + SS†	"	CRES 17-4PH AMS5643	CRES 17-4PH AMS5643
Catalog No. + CR†	CRES 440C AMS5630	"	"
Catalog No. + CRP†	CRES 440C, AMS5630 Chrome Plated	"	"

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3-Piece High Misalignment – Female Thread



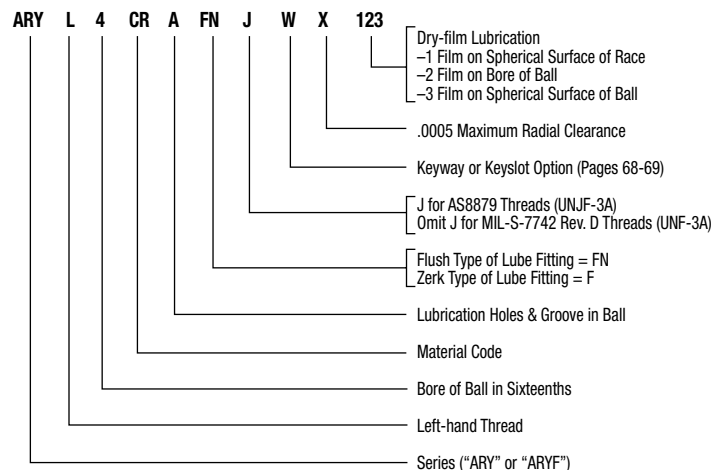
Part Number	(B) Bore Diameter	(D) Head Diameter	(W) Ball Width	(T) Body Width	(O) Shoulder Diameter	Ball Diameter	(A) Ball C/L to End	(E) Thread Size	(L) Thread Length	(Q) Misalignment	(N) Shank Diameter	(S) Flange Diameter	(C) Flange Thickness	Limit Static Radial Load**	Weight
	Inch +.0000 -.0005	Inch Max.	Inch +.000 -.005	Inch +.005 -.005	Inch Ref.	Inch Ref.	Inch +.06 -.06	UNF - 3A* UNF - 3B*	Inch +.06 -.06	Ref.	Inch +.010 -.010	Inch Ref.	Inch Ref.	lbs. Ref.	lbs. Ref.
ARYF3	.1900	.781	.560	.337	.301	.531	1.625	5/16 - 24	.750	16°	.500	.562	.250	4060 ◇	.08
ARYF3-101	.1900	.750	.500	.220	.319	.437	1.375	5/16 - 24	.750	15°	.437	.500	.250	4060 ◇	.06
ARYF4	.2500	1.000	.593	.265	.390	.593	1.625	3/8 - 24	.937	23°	.562	.625	.250	7040 ◇	.11
ARYF5	.3125	1.125	.813	.355	.512	.781	1.812	7/16 - 20	1.062	23°	.625	.688	.250	8260	.18
ARYF5-101	.3125	.875	.625	.265	.418	.593	1.375	5/16 - 24	.750	16°	.437	.500	.250	5290	.10
ARYF6	.3750	1.125	.813	.355	.512	.781	1.812	7/16 - 20	1.062	23°	.625	.688	.250	8260	.17
ARYF7	.4375	1.312	.875	.355	.618	.875	2.125	1/2 - 20	1.125	22°	.750	.812	.250	12420	.26
ARYF8	.5000	1.500	.937	.411	.730	1.000	2.625	5/8 - 18	1.500	20°	.875	.938	.375	17430	.40
ARYF10	.6250	1.750	1.200	.577	.856	1.250	2.875	3/4 - 16	1.750	20°	1.000	1.125	.375	23620	.63
ARYF12	.7500	2.000	1.280	.630	.970	1.375	3.375	7/8 - 14	1.875	18°	1.125	1.250	.500	30550	.87
ARYF14	.8750	2.200	1.400	.635	1.140	1.531	3.750	7/8 - 14	2.000	18° 30'	1.125	1.250	.500	31970	1.01
ARYF16	1.0000	2.750	1.875	.845	1.278	1.875	4.125	1 1/4 - 12	2.125	21°	1.688	1.813	.562	59510	2.31
ARYF20	1.2500	3.125	1.875	1.015	1.523	2.250	5.000	1 1/4 - 12	3.125	21°	1.688	1.813	.562	70060	3.15

* UNF-3B = Female Thread per MIL-S-7742 Rev. D.

** Load ratings are for rod ends without lubrication fittings.

◇ Based on pin limitation.

NHBB P/N





SECTION 6

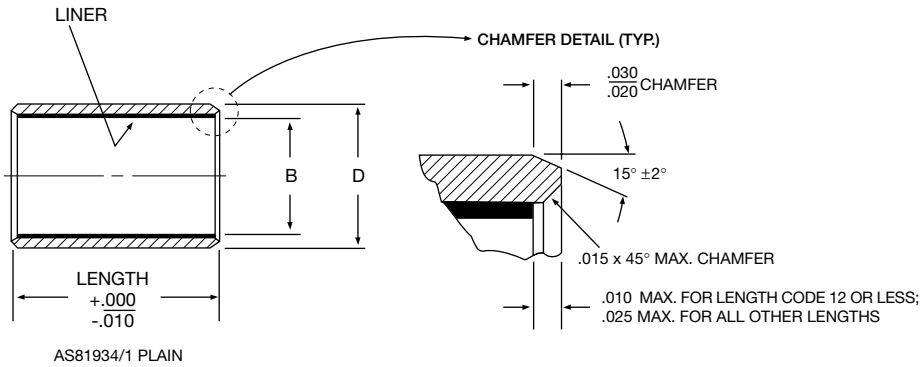
SLEEVE BEARINGS – Self-Lubricating

AS81934 Plain.....	46
AS81934 Flanged.....	48



SLEEVE BEARINGS – Self-Lubricating

AS81934 Plain



Part Number	(B) Bore Diameter	(D) Outside Diameter			Weight lbs./In/ (Ref)	
		Alum. Tol. +.0005/-.0005	CRES Tol. +.0000/-.0005	Standard	L = 1.000 Alum.	CRES
	Inch				lb/in	lb/in
M81934/1	+ .0000 - .0010					
AD04	.2512	.3760	.3860	.3960	.006	.016
AD05	.3140	.4386	.4486	.4586	.007	.019
AD06	.3765	.5012	.5112	.5212	.008	.022
AD07	.4390	.5638	.5738	.5838	.009	.025
AD08	.5015	.6265	.6365	.6465	.011	.028
AD09	.5640	.6892	.6992	.7092	.012	.031
AD10	.6265	.8142	.8242	.8342	.021	.056
AD11	.6890	.8767	.8867	.8967	.022	.060
AD12	.7515	.9393	.9493	.9593	.024	.065
AD14	.8765	1.0645	1.0745	1.0845	.028	.075
AD16	1.0015	1.1898	1.1998	1.2098	.031	.084
AD18	1.1265	1.3148	1.3248	1.3348	.035	.094
AD20	1.2515	1.4398	1.4498	1.4598	.038	.103
AD22	1.3765	1.5648	1.5748	1.5848	.041	.113
AD24	1.5015	1.7523	1.7623	1.7723	.062	.171
AD26	1.6265	1.8773	1.8873	1.8973	.067	.183
AD28	1.7515	2.0023	2.0123	2.0223	.071	.196
AD32	2.0015	2.2523	2.2623	2.2723	.081	.222

Notes:

- Static Limit Load:
Alum., 50,000 psi X B(L - .10) = lbs.
CRES, 78,500 psi X B(L - .10) = lbs.
- Dynamic Capacity: 37,500 X B(L - .10) = lbs.
- Temperature: Operating temperature range -65° to 325°F.
- Concentricity tolerance between B and D diameters shall not exceed .003 FIM.
- Bearings listed in table are approved for procurement to AS81934 .

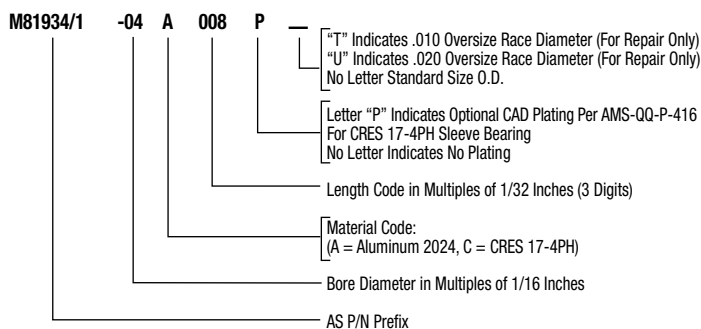
Materials

Material Code	Sleeve	Liner
A	Aluminum Alloy 2024-T851 or 2024-T8511 per AMS-QQ-A-225/6 or AMS-QQ-A-200/3.Finish Anodized per AMS-A-8625, Type I or II or Alodine per AMS-C-5541	TEFLON®/Fabric Bonded to Bore, No Lub. Required
C	CRES 17-4PH H.T. to Condition H-1150 per AMS-H-6875	"

TEFLON® is a Du Pont registered trademark



Aerospace Standard P/N



Length (Tolerance +.000, -.010)

Bore Code	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 3/4	3
04	05	06	07	08	09	10	11	12	14																					
05	05	06	07	08	09	10	11	12	14	16	18																			
06	05	06	07	08	09	10	11	12	14	16	18	20	22																	
07	05	06	07	08	09	10	11	12	14	16	18	20	22	24	28															
08	05	06	07	08	09	10	11	12	14	16	18	20	22	24	28															
09	05	06	07	08	09	10	11	12	14	16	18	20	22	24	28	32	36													
10	05	06	07	08	09	10	11	12	14	16	18	20	22	24	28	32	36	40	44											
11				08	09	10	11	12	14	16	18	20	22	24	28	32	36	40	44	48	52									
12				08	09	10	11	12	14	16	18	20	22	24	28	32	36	40	44	48	52									
14				08	09	10	11	12	14	16	18	20	22	24	28	32	36	40	44	48	52									
16				08	09	10	11	12	14	16	18	20	22	24	28	32	36	40	44	48	52	56	60							
18					10	11	12	14	16	18	20	22	24	28	32	36	40	44	48	52	56	60								
20								12	14	16	18	20	22	24	28	32	36	40	44	48	52	56	60	64	68					
22								12	14	16	18	20	22	24	28	32	36	40	44	48	52	56	60	64	68					
24								12	14	16	18	20	22	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	88	
26										16	18	20	22	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	88	96
28										16	18	20	22	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	88	96
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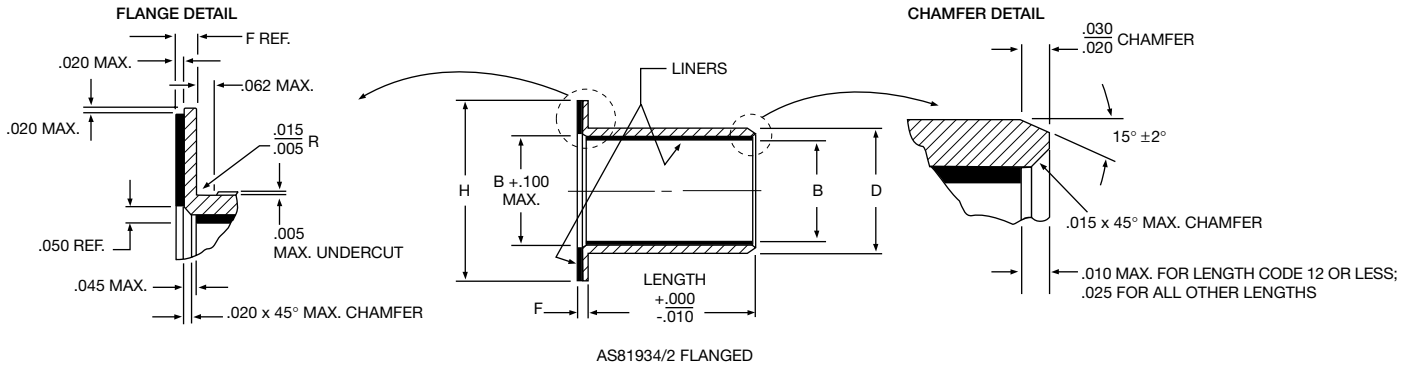
Shaft and Housing Information

For optimum performance with lined sleeve bearings, considerable care must be exercised in the design of housings and shafts. For extreme applications involving dissimilar materials, elevated temperatures, or extreme loads, contact NHBB Applications Engineering for application recommendations. The adjacent table applies to normal conditions.

	Shaft	Housing
Diameter	B - .001 to - .002	D - .0006 to - .0011
Taper and .0005	Not to Roundness	Not to exceed .0005 exceed
Finish	8 max. Polished or honed after grind	
Hardness	Rc50 min.	

SLEEVE BEARINGS – Self-Lubricating

AS81934 Flanged



AS81934/2 FLANGED

Part Number	(B) Bore Diameter	(D) Outside Diameter			(H) Flange Diameter	(F) Flange Thickness	Approx. Sleeve Weight LB. In. (Ref.) L = 1.000		Flange Weight lbs. (Ref.)	
		Alum. Tol. +.0005/- .0005 Standard	CRES Tol. +.0000/- .0005 1st Oversize	2nd Oversize			Alum.	CRES	Alum.	CRES
	Inch				Inch	Inch	Inch	Inch	lb/in	lb/in
M81934/2	+ .0000 - .0010				+ .000 - .020	+ .000 - .005	- .005 - .005			
ADLF04	.2512	.3760	.3860	.3960	.750	.0625	.006	.016	.002	.006
ADLF05	.3140	.4386	.4486	.4586	.812	.0625	.007	.019	.003	.007
ADLF06	.3765	.5012	.5112	.5212	.875	.0625	.008	.022	.003	.007
ADLF07	.4390	.5638	.5738	.5838	.937	.0625	.009	.025	.003	.008
ADLF08	.5015	.6265	.6365	.6465	1.000	.0625	.011	.028	.003	.009
ADLF09	.5640	.6892	.6992	.7092	1.125	.0625	.012	.031	.004	.011
ADLF10	.6265	.8142	.8242	.8342	1.250	.0625	.021	.056	.005	.014
ADLF11	.6890	.8767	.8867	.8967	1.375	.0625	.022	.060	.006	.016
ADLF12	.7515	.9393	.9493	.9593	1.500	.0625	.024	.065	.007	.020
ADLF14	.8765	1.0645	1.0745	1.0845	1.625	.0625	.028	.075	.008	.022
ADLF16	1.0015	1.1898	1.1998	1.2098	1.750	.0625	.031	.084	.009	.024
ADLF18	1.1265	1.3148	1.3248	1.3348	1.875	.0937	.035	.094	.015	.041
ADLF20	1.2515	1.4398	1.4498	1.4598	2.000	.0937	.038	.103	.016	.045
ADLF22	1.3765	1.5648	1.5748	1.5848	2.125	.0937	.041	.113	.017	.048
ADLF24	1.5015	1.7523	1.7623	1.7723	2.250	.0937	.062	.171	.018	.051
ADLF26	1.6265	1.8773	1.8873	1.8973	2.375	.0937	.067	.183	.020	.055
ADLF28	1.7515	2.0023	2.0123	2.0223	2.500	.0937	.071	.196	.021	.058
ADLF32	2.0015	2.2523	2.2623	2.2723	2.750	.0937	.081	.222	.023	.065

Notes:

- Static Limit Load:
Alum., 50,000 psi X B(L + F - .13) = lbs.
CRES, 78,500 psi X B(L + F - .13) = lbs.
- Dynamic Capacity: 37,500 X B(L + F - .13) = lbs.
- Temperature: Operating temperature range -65° to 325°F.
- Concentricity tolerance between B and D diameters shall not exceed .003 FIM.
- Bearings listed in table are approved for procurement to AS81934.

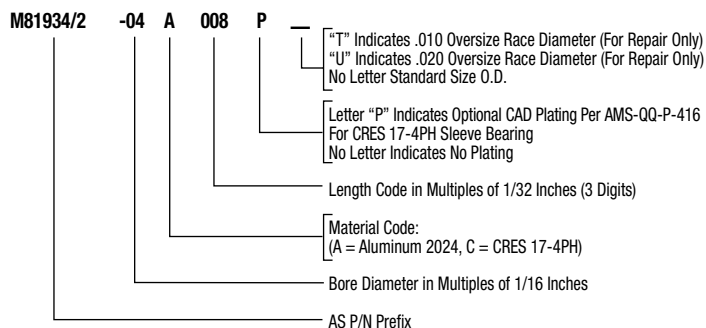
Materials

Material Code	Sleeve	Liner
A	Aluminum Alloy 2024-T851 or 2024-T8511 per AMS-QQ-A-225/6 or AMS-QQ-A-200/3. Finish Anodized per AMS-A-8625, Type I or II or Alodine per AMS-C-5541	TEFLON®/Fabric Bonded to Bore and Flange Face. No Lub. Required.
C	CRES 17-4PH H.T. to Condition H-1150 per AMS-H-6875	"

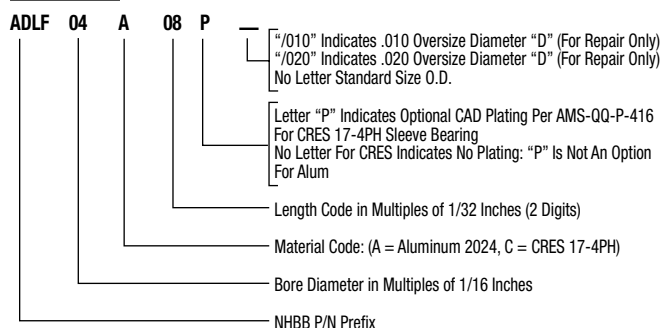
TEFLON® is a Du Pont registered trademark



Aerospace Standard P/N



NHBB P/N



Length (Tolerance +.000, -.010)

Bore Code	5/32	3/16	7/32	1/4	9/32	5/16	11/32	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 3/4	3
04	05	06	07	08	09	10	11	12	14																					
05	05	06	07	08	09	10	11	12	14	16	18																			
06	05	06	07	08	09	10	11	12	14	16	18	20	22																	
07	05	06	07	08	09	10	11	12	14	16	18	20	22	24	28															
08	05	06	07	08	09	10	11	12	14	16	18	20	22	24	28															
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10	05	06	07	08	09	10	11	12	14	16	18	20	22	24	28	32	36	40	44											
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