AF15

# AURORA BEARING COMPANY

# Aircraft Bearings Guidebook

**The *Motion - Transfer* Specialists**

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# Introduction and General Information

In 1971 a new company entered the rod end and spherical bearing marketplace. Founded by a group of bearing professionals with backgrounds in all aspects of the rod end and spherical bearing industry, this new firm, Aurora Bearing Company, soon became a major force in the rod end industry. Aurora's initial product offerings were geared toward the commercial/industrial marketplace. By the middle of the 1980's Aurora Bearing's total quality reputation was recognized by the aircraft airframe industry, and Aurora Bearing Company was solicited by the most prestigious airframe manufacturers to build products for them to their specifications. This prompted a decision to seriously enter the aircraft market, and by 1988 Aurora Bearing Company was soliciting aircraft business on a controlled basis only, in order to insure consistent customer satisfaction. These efforts resulted in a smooth and successful entry into the aircraft marketplace.

Today, Aurora Bearing Company produces standard and special spherical bearings, rod ends and bushings, for aircraft manufacturers, their subcontractors, and approved aerospace distributors. Aurora Bearing services unmanned aircraft, missiles, radars, kit planes, general aviation aircraft, commercial passenger aircraft, business jets, military aircraft, gyrocopters, helicopters and space exploration vehicles.

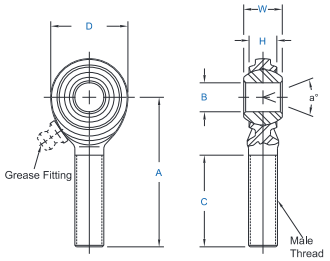
Aurora offers 6 standard series of Military s pecification bearings. Rod End bearings approved for procurement to s AE-As 81935, s pherical Bearings approved to s AE-As 14101 through s AE-As 14104, and bushings approved to s AE-As 81934. All feature Aurora's exclusive AT-3200 PTFE liner, fully approved to s AE-As 81820. Aurora General Aviation Rod Ends are manufactured under the same quality and s PC systems as the military approved bearings. Many have been approved to individual customer specifications and or standards. Dimensions and Configurations follow established industry conventions. Total traceabilities are maintained through manufacturing up to and including shipping.

In addition to the products in this guidebook, Aurora manufactures an extensive range of Rod End and s pherical Bearings to service markets from commercial economy through high performance motorsports. Information for these products and further technical information can be found in Aurora Commercial catalog 610, or on line at www.aurorabearing.com.

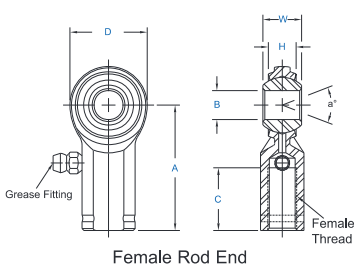
# Key Terms Translation Guide

| | English | French | German | Italian | Portugese | Spanish |
|---|---|---|---|---|---|---|
| | Aerospace | Aérospatial | Luftfahrt | Aerospaziale | Aeroespacial | Aeroespacial |
| | Aluminum | Aluminium | Aluminium | Alluminio | Aluminio | Aluminio |
| | Axial | Axiale | Axial | Assiali | Axial | Axial |
| | Ball | Bague interieure | Innenringe | Anello Interno | anel intero | Esfera |
| | Body | Corps | Gehaeuse | Testa | Corpo | cuerpo |
| A | Base to Center | base pour centrer longueur | Abstand, Unterseite zur Mitte | lunghezza, da base al centro | distância, base ao centro | altura, base a centro |
| B | Bore | Alesages | Bohrung | foro | Furo | agujero |
| | Commercial | | Kommerziell | uso generico | Comercial | Comercial |
| | Chrome plate | chromage | verchromt | cromatura | Placa do cromo | cromado |
| D | Diameter | Diametre | Durchmesser | Diametro | Diametro | Diametro |
| | Female thread | Filetages Femelle | Innengewinde | Filettatura intera | Rosca Femea | rosca hembra |
| | Grease Fitting | Graisseur | Schmiernippel | Ingrassatore | lubrificador | lubricador |
| H | Head or Race Width | largeur de logement | Gehaeusebreite / Lagersschalenbreite | spessore testa / spessore boccola | largura externa do anel | anchura de la pista |
| | Industrial grade | Industriel | Industrie-Qualitaet | qualità industriale | | Industrial |
| | Keyway | Rainure de Clavette | Keilnute | Scanalatura | | cunero |
| | Left Hand | gauche | Links | sinistra | inversa | Rosca izquierda |
| | Load capacity | capacite de charges | belastbar | capacità di carico | Capacidade da carga | Capacidad de Carga |
| | Male thread | Filetages male | Aussengewinde | maschio filettato | Rosca macho | Rosca macho |
| | Military Specification | Spécifications Militaires | Militär-Vorschrift | Specifica Militare | Especificação Militar | Especificacion Militar |
| á | Misalignment | angulaires | Kippwinkel | ribaltamento | inclinacao | desalineamiento |
| | Race | Logement | Lagerschale | boccola / anello esterno | anel externo | Pista |
| | Radial | Radiale | Radial | Radiali | Radial | Radial |
| | Right Hand | Normes, Droite | Rechts | a destra | normal | Rosca Derecha |
| | Radial Static Load Capacity | charge statique | statische Tragzahl | Carico Statico | Capacidades de carga estatica | Carga radial maxima |
| | Rod end | Embouts | Gelenkkopf, pl. Gelenkkoepfe | Teste a Snodo | Terminais Rotulares | Cabezas de articulación |
| | Spherical bearing | Rotules | Gelenklager | Snodi Sferici | Rotulas | Rotula Esferica |
| | Stainless steel | Acier Inoxydable | Rostfrei | Acciaio inox | Aco inox | Acero inoxidable |
| | Steel | Acier | Stahl | Acciaio | Aco | Acero |
| | Thread | Filetage | Gewinde | Filettatura | Rosca | Rosca |
| C | Thread Length | longueur du filetage | Gewindelaenge | lunghezza del filetto | comprimento da rosca | Longitud de Rosca |
| W | Width of ball | largeur bille | Innenringbreite | spessore anello interno | largura interna do anel | anchura de la esfera |

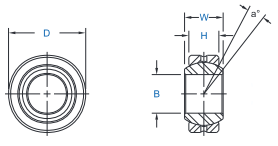
A guide to translate common rod end industry terms from English to noted language. This is a guide only. Consultation with appropriate language references is recommended for best accuracy.



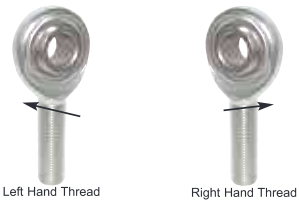
Male Rod End



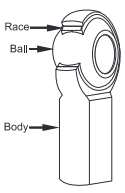
Female Rod End



Spherical Bearing


Left Hand Thread

Right Hand Thread

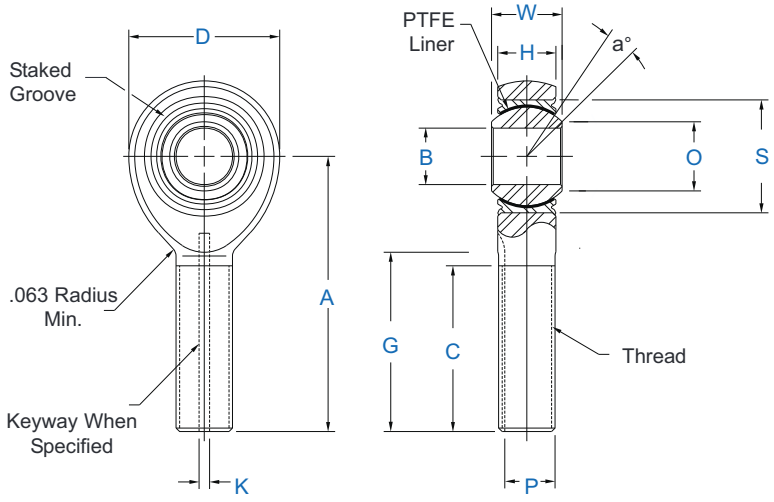


Axial

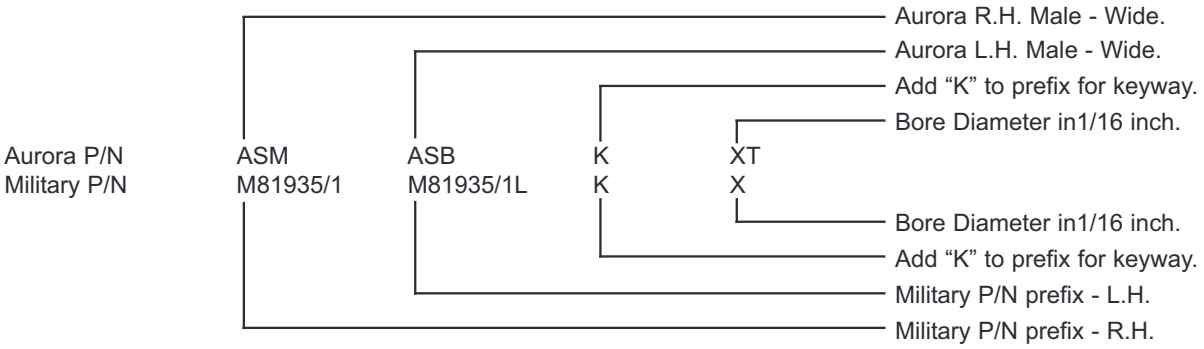
Radial

# ASM-T & ASB-T MALE ROD ENDS

Aerospace Series AS81935/1 (Right Hand) & AS81935/1 (Left Hand)



| MILITARY NO. | | AURORA NO. | | DIMENSIONS IN INCHES | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Right Hand | Left Hand | Right Hand | Left Hand | B +.000 -.0005 | W +.000 -.0005 | H ±.002 | A ±.010 | D ±.010 | O Min. | S Max. Housing ID. | Ball Dia. Ref. | G +.000 -.020 | K +.005 -.000 | P +.000 -.005 |
| M81935/1-03 | M81935/1-03L | ASM-3T | ASB-3T | .1900 | .437 | .337 | 1.562 | .806 | .300 | .6250 | .531 | .980 | .062 | .268 |
| M81935/1-04 | M81935/1-04L | ASM-4T | ASB-4T | .2500 | .437 | .337 | 1.562 | .806 | .300 | .6250 | .531 | .980 | .062 | .268 |
| M81935/1-05 | M81935/1-05L | ASM-5T | ASB-5T | .3125 | .437 | .327 | 1.875 | .900 | .360 | .6875 | .593 | 1.270 | .062 | .268 |
| M81935/1-06 | M81935/1-06L | ASM-6T | ASB-6T | .3750 | .500 | .416 | 1.938 | 1.025 | .470 | .8125 | .687 | 1.235 | .093 | .319 |
| M81935/1-07 | M81935/1-07L | ASM-7T | ASB-7T | .4375 | .562 | .452 | 2.125 | 1.150 | .540 | .9062 | .781 | 1.402 | .093 | .383 |
| M81935/1-08 | M81935/1-08L | ASM-8T | ASB-8T | .5000 | .625 | .515 | 2.438 | 1.337 | .610 | 1.0000 | .875 | 1.589 | .093 | .445 |
| M81935/1-10 | M81935/1-10L | ASM-10T | ASB-10T | .6250 | .750 | .577 | 2.625 | 1.525 | .750 | 1.1875 | 1.062 | 1.683 | .125 | .541 |
| M81935/1-12 | M81935/1-12L | ASM-12T | ASB-12T | .7500 | .875 | .640 | 2.875 | 1.775 | .850 | 1.3750 | 1.250 | 1.808 | .125 | .663 |
| M81935/1-14 | M81935/1-14L | ASM-14T | ASB-14T | .8750 | .875 | .765 | 3.375 | 2.025 | 1.000 | 1.6250 | 1.375 | 2.121 | .156 | .777 |
| M81935/1-16 | M81935/1-16L | ASM-16T | ASB-16T | 1.0000 | 1.375 | 1.015 | 4.125 | 2.775 | 1.270 | 2.1250 | 1.875 | 2.464 | .187 | 1.136 |



# ASM-T & ASB-T MALE ROD ENDS

Aerospace Series AS81935/1 (Right Hand) & AS81935/1 (Left Hand)

| Specifications | |
|---|---|
| **BODY** | 4340 Alloy Steel (AMS-S-5000)<br>Heat Treated<br>Cadmium Plated |
| **BALL** | 440C Stainless Steel (AMS 5630)<br>Heat Treated |
| **RACE** | 17-4 PH Stainless Steel (AMS 5643)<br>Heat Treated |
| **LINER** | AT 3200 Bearing Liner, Permanently<br>Bonded to Race I.D.<br>Qualified to SAE-AS81820 |

| C ± .031 | Thread UNJF-3A | a° Misalign. Angle Min. | Approx. Brg. Wt. Lbs. | Ult. Static Radial Load Lbs. | Fatigue Load Lbs. | Axial Proof Load Lbs. | No Load Rotational Breakaway Torque* In-Lbs. | | AURORA NO. | | MILITARY NO. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Min. | Max. | Right Hand | Left Hand | Right Hand | Left Hand |
| .968 | 5/16-24 | 15 | .072 | 2,360 | 1,470 | 1,000 | .5 | 6 | **ASM-3T** | **ASB-3T** | **M81935/1-03** | **M81935/1-03L** |
| .968 | 5/16-24 | 15 | .072 | 4,860 | 2,380 | 1,000 | .5 | 6 | **ASM-4T** | **ASB-4T** | **M81935/1-04** | **M81935/1-04L** |
| 1.187 | 5/16-24 | 14 | .087 | 7,180 | 2,770 | 1,100 | 1 | 15 | **ASM-5T** | **ASB-5T** | **M81935/1-05** | **M81935/1-05L** |
| 1.187 | 3/8-24 | 8 | .136 | 8,550 | 3,570 | 1,660 | 1 | 15 | **ASM-6T** | **ASB-6T** | **M81935/1-06** | **M81935/1-06L** |
| 1.281 | 7/16-20 | 10 | .183 | 12,000 | 4,800 | 1,850 | 1 | 15 | **ASM-7T** | **ASB-7T** | **M81935/1-07** | **M81935/1-07L** |
| 1.468 | 1/2-20 | 9 | .278 | 19,500 | 7,680 | 2,040 | 1 | 15 | **ASM-8T** | **ASB-8T** | **M81935/1-08** | **M81935/1-08L** |
| 1.562 | 5/8-18 | 12 | .424 | 21,900 | 9,180 | 2,430 | 1 | 15 | **ASM-10T** | **ASB-10T** | **M81935/1-10** | **M81935/1-10L** |
| 1.687 | 3/4-16 | 13 | .639 | 29,300 | 11,600 | 2,810 | 1 | 15 | **ASM-12T** | **ASB-12T** | **M81935/1-12** | **M81935/1-12L** |
| 2.000 | 7/8-14 | 6 | .963 | 34,500 | 13,100 | 3,320 | 1 | 24 | **ASM-14T** | **ASB-14T** | **M81935/1-14** | **M81935/1-14L** |
| 2.343 | 1 1/4-12 | 12 | 2.546 | 80,300 | 30,400 | 4,340 | 1 | 24 | **ASM-16T** | **ASB-16T** | **M81935/1-16** | **M81935/1-16L** |

Temperature Range: -65$^0$F - +325$^0$F (-54$^0$C - +163$^0$C )

*No load rotational breakaway torque can be varied to meet specific application requirements.

Add letter “K” to prefix to designate keyway, ex.: ASM K-6T

As applicable, keyway will conform to SAE -AS81935/1 or AS 559.

All threads are rolled after heat treatment, and conform to UN JF-3A per AS 8879.

AT 3200 Bearing Liner System is qualified for procurement under SAE -AS81820.

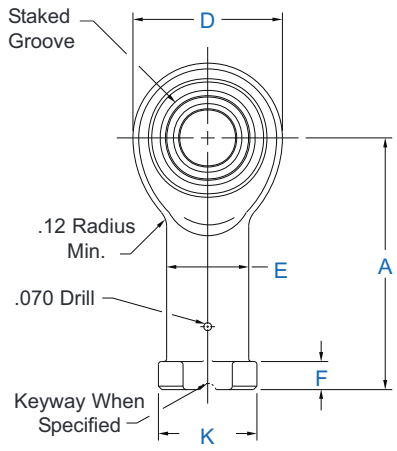
Rod and Bearings listed are manufactured to conform to the dimensions, materials, and configurations of SAE -AS81935/1, and are approved for procurement under this specification.

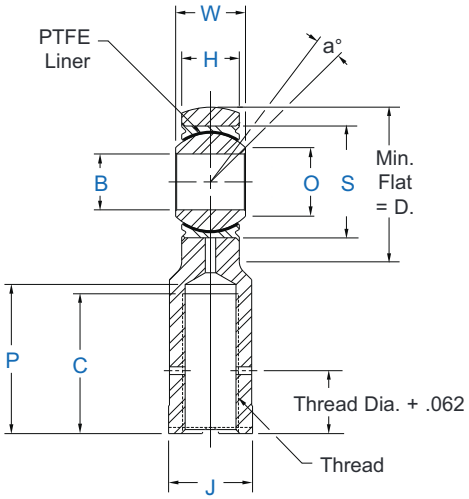
Stainless Steel bodies (not approved to military specs) as well as other non-standard material, dimensional or configuration specifications can be provided. Consult factory for additional information.

The Rod and Bearings listed are available (not aproved to military specs) in non PTFE lined, metal on metal configuration, as well as with alternate Aurora Bearing PTFE liner systems. Consult factory.

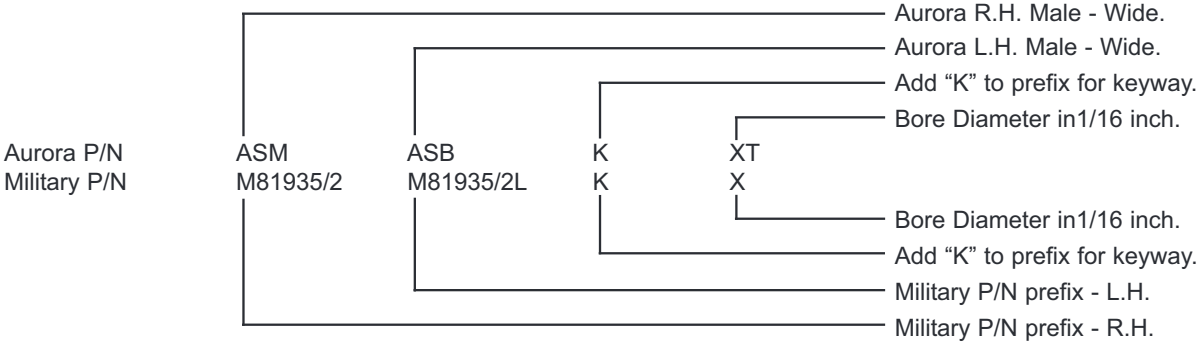
# ASW-T & ASG-T FEMALE ROD ENDS

Aerospace Series AS81935/2 (Right Hand) & AS81935/2 (Left Hand)



| MILITARY NO. | | AURORA NO. | | DIMENSIONS IN INCHES | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Right Hand | Left Hand | Right Hand | Left Hand | B +.0000 - .0005 | W + .000 - .002 | H ± .005 | A ± .010 | D ± .010 | O Min. | S Max. Housing I.D. | E ± .010 | K Ref. Dia. | J +.002 - .010 | F +.010 - .062 | Ball Dia. Ref. |
| M81935/2-03 | M81935/2-03L | ASW-3T | ASG-3T | .1900 | .437 | .337 | 1.375 | .806 | .300 | .6250 | .422 | .500 | .437 | .188 | .531 |
| M81935/2-04 | M81935/2-04L | ASW-4T | ASG-4T | .2500 | .437 | .337 | 1.469 | .806 | .300 | .6250 | .422 | .500 | .437 | .188 | .531 |
| M81935/2-05 | M81935/2-05L | ASW-5T | ASG-5T | .3125 | .437 | .327 | 1.625 | .900 | .360 | .6875 | .485 | .580 | .500 | .250 | .593 |
| M81935/2-06 | M81935/2-06L | ASW-6T | ASG-6T | .3750 | .500 | .416 | 1.812 | 1.025 | .470 | .8125 | .547 | .660 | .562 | .250 | .687 |
| M81935/2-07 | M81935/2-07L | ASW-7T | ASG-7T | .4375 | .562 | .452 | 2.000 | 1.150 | .540 | .9062 | .610 | .720 | .625 | .250 | .781 |
| M81935/2-08 | M81935/2-08L | ASW-8T | ASG-8T | .5000 | .625 | .515 | 2.250 | 1.337 | .610 | 1.0000 | .735 | .880 | .750 | .250 | .875 |
| M81935/2-10 | M81935/2-10L | ASW-10T | ASG-10T | .6250 | .750 | .577 | 2.500 | 1.525 | .750 | 1.1875 | .860 | 1.020 | .875 | .375 | 1.062 |
| M81935/2-12 | M81935/2-12L | ASW-12T | ASG-12T | .7500 | .875 | .640 | 2.875 | 1.775 | .850 | 1.3750 | .985 | 1.160 | 1.000 | .375 | 1.250 |
| M81935/2-14 | M81935/2-14L | ASW-14T | ASG-14T | .8750 | .875 | .765 | 3.375 | 2.025 | 1.000 | 1.6250 | 1.110 | 1.300 | 1.125 | .500 | 1.375 |
| M81935/2-16 | M81935/2-16L | ASW-16T | ASG-16T | 1.0000 | 1.375 | 1.015 | 4.125 | 2.775 | 1.270 | 2.1250 | 1.688 | 2.020 | 1.750 | .563 | 1.875 |



# ASW-T & ASG-T FEMALE ROD ENDS

Aerospace Series As 81935/2 (Right Hand) & As 81935/2 (Left Hand)

| Specifications | |
|---|---|
| **BODY** | 4340 Alloy Steel (AMS-S-5000)<br>Heat Treated<br>Cadmium Plated |
| **BALL** | 440C Stainless Steel (AMS 5630)<br>Heat Treated |
| **RACE** | 17-4 PH Stainless Steel (AMS 5643)<br>Heat Treated |
| **LINER** | AT 3200 Bearing Liner, Permanently<br>Bonded to Race I.D.<br>Qualified to SAE-AS81820 |

| P Max. | C Min. | Thread UNJF-3B | a° Misalign. Angle Min. | Approx. Brg. Wt. Lbs. | Ult. Static Radial Load Lbs. | Fatigue Load Lbs. | Axial Proof Load Lbs. | No Load Rotational Breakaway Torque* In-Lbs. | | AURORA NO. | | MILITARY NO. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Min. | Max. | Right Hand | Left Hand | Right Hand | Left Hand |
| .875 | .750 | 5/16-24 | 15 | .080 | 2,360 | 1,470 | 1,000 | .5 | 6 | ASW-3T | ASG-3T | M81935/2-03 | M81935/2-03L |
| .875 | .750 | 5/16-24 | 15 | .084 | 4,860 | 2,380 | 1,000 | .5 | 6 | ASW-4T | ASG-4T | M81935/2-04 | M81935/2-04L |
| 1.000 | .875 | 3/8-24 | 14 | .102 | 7,180 | 3,020 | 1,100 | 1 | 15 | ASW-5T | ASG-5T | M81935/2-05 | M81935/2-05L |
| 1.125 | 1.000 | 3/8-24 | 8 | .161 | 8,550 | 3,570 | 1,660 | 1 | 15 | ASW-6T | ASG-6T | M81935/2-06 | M81935/2-06L |
| 1.250 | 1.125 | 7/16-20 | 10 | .212 | 12,000 | 4,800 | 1,850 | 1 | 15 | ASW-7T | ASG-7T | M81935/2-07 | M81935/2-07L |
| 1.375 | 1.250 | 1/2-20 | 9 | .325 | 19,500 | 8,260 | 2,040 | 1 | 15 | ASW-8T | ASG-8T | M81935/2-08 | M81935/2-08L |
| 1.500 | 1.375 | 5/8-18 | 12 | .481 | 21,900 | 9,180 | 2,430 | 1 | 15 | ASW-10T | ASG-10T | M81935/2-10 | M81935/2-10L |
| 1.750 | 1.625 | 3/4-16 | 13 | .673 | 29,300 | 11,600 | 2,810 | 1 | 15 | ASW-12T | ASG-12T | M81935/2-12 | M81935/2-12L |
| 2.062 | 1.875 | 7/8-14 | 6 | .959 | 34,500 | 13,100 | 3,320 | 1 | 24 | ASW-14T | ASG-14T | M81935/2-14 | M81935/2-14L |
| 2.312 | 2.125 | 1 1/4-12 | 12 | 2.717 | 80,300 | 30,400 | 4,340 | 1 | 24 | ASW-16T | ASG-16T | M81935/2-16 | M81935/2-16L |

Temperature Range: -65$^0$F - +325$^0$F (-54$^0$C - +163$^0$C)

*No load rotational breakaway torque can be varied to meet specific application requirements.

Add letter “K” to prefix to designate keyway, e x.: As WK-6T

As applicable, keyway will conform to s Ae -As 81935/3 or NAs 559.

All threads are rolled after heat treatment, and conform to UNJF-3A per AS 8879.

AT 3200 Bearing Liner s ystem is qualified for procurement under s Ae -As 81820.

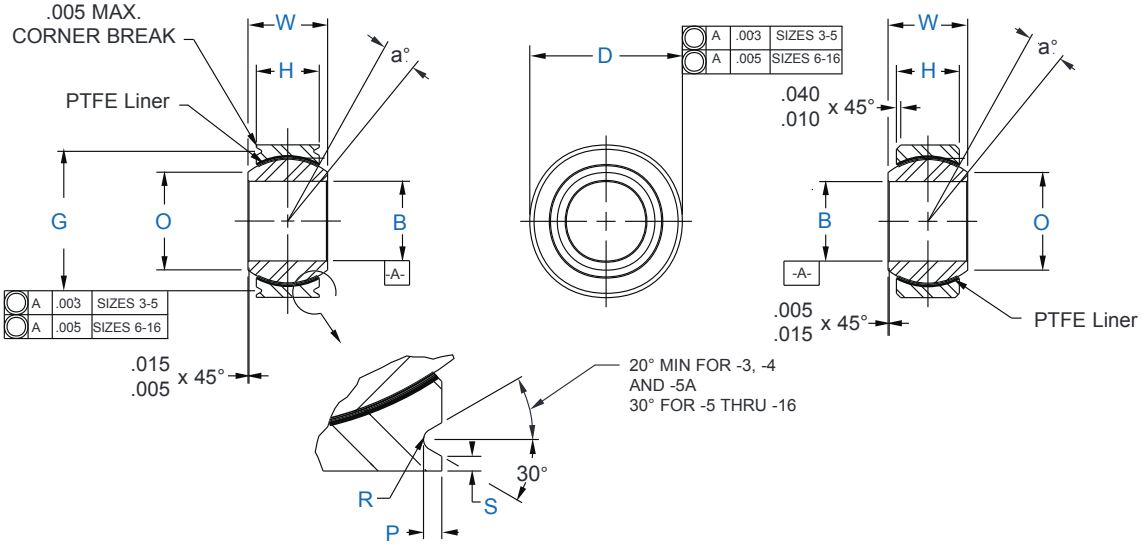
Rod e nd Bearings listed are manufactured to conform to the dimensions, materials, and configurations of s Ae -As 81935/2, and are approved for procurement under this specification.

s tainless s teel bodies (not approved to military specs) as well as other non-standard material, dimensional or configuration specifications can be provided. Consult factory for additional information.

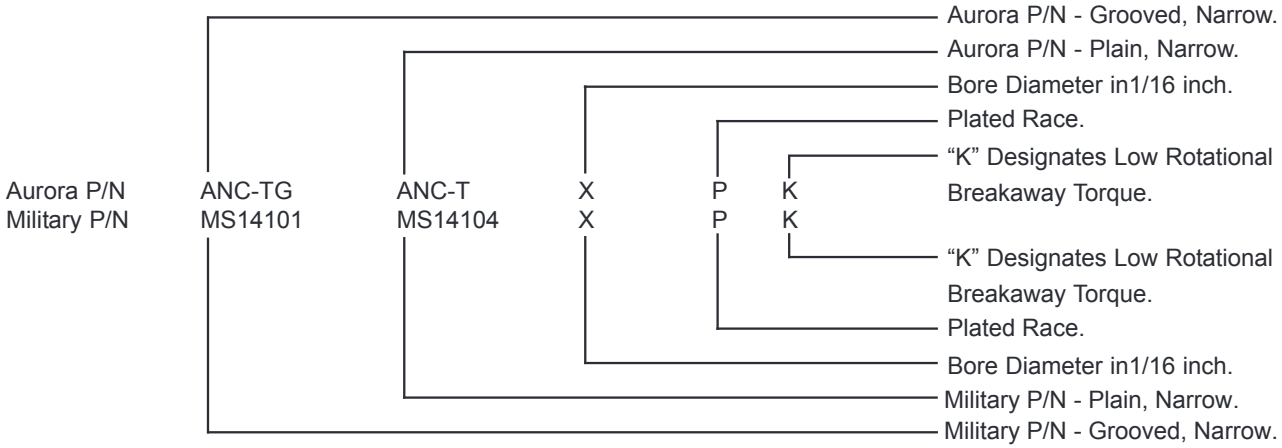
The Rod e nd Bearings listed are available (not aproved to military specs) in non PTFe lined, metal on metal configuration, as well as with alternate Aurora Bearing PTFe liner systems. Consult factory.

# ANC-TG & ANC-T SPHERICAL BEARINGS

Narrow - Aerospace series AS 14101 (Grooved) & AS 14104 (Plain)




| MILITARY NO. | | AURORA NO. | | DIMENSIONS IN INCHES | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GROOVED | PLAIN | GROOVED | PLAIN | B +.0000 -.0005 | D +.0000 -.0005 | W +.000 -.002 | H ±.005 | O Min. | P +.000 -.010 | S Min. | G +.000 -.008 | R‡ +.002 -.005 | Ball Dia. Ref. | a° |
| MS14101-3 | MS14104-3 | ANC-3TG | ANC-3T | .1900 | .5625 | .281 | .218 | .293 | .025 | .010 | .500 | .010 | .406 | 10 |
| MS14101-4 | MS14104-4 | ANC-4TG | ANC-4T | .2500 | .6562 | .343 | .250 | .364 | .025 | .010 | .594 | .010 | .500 | 10 |
| MS14101-5† | MS14104-5 | ANC-5TG† | ANC-5T | .3125 | .7500 | .375 | .281 | .419 | .035 | .020 | .650 | .010 | .562 | 10 |
| MS14101-6 | MS14104-6 | ANC-6TG | ANC-6T | .3750 | .8125 | .406 | .312 | .475 | .035 | .020 | .712 | .015 | .625 | 9 |
| MS14101-7 | MS14104-7 | ANC-7TG | ANC-7T | .4375 | .9062 | .437 | .343 | .530 | .035 | .020 | .806 | .015 | .687 | 8 |
| MS14101-8 | MS14104-8 | ANC-8TG | ANC-8T | .5000 | 1.0000 | .500 | .390 | .600 | .055 | .020 | .876 | .015 | .781 | 8 |
| MS14101-9 | MS14104-9 | ANC-9TG | ANC-9T | .5625 | 1.0937 | .562 | .437 | .670 | .055 | .020 | .970 | .015 | .875 | 8 |
| MS14101-10 | MS14104-10 | ANC-10TG | ANC-10T | .6250 | 1.1875 | .625 | .500 | .739 | .055 | .020 | 1.063 | .015 | .968 | 8 |
| MS14101-12 | MS14104-12 | ANC-12TG | ANC-12T | .7500 | 1.4375 | .750 | .593 | .920 | .055 | .020 | 1.313 | .015 | 1.187 | 8 |
| MS14101-14 | MS14104-14 | ANC-14TG | ANC-14T | .8750 | 1.5625 | .875 | .703 | .980 | .055 | .020 | 1.438 | .015 | 1.312 | 8 |
| MS14101-16 | MS14104-16 | ANC-16TG | ANC-16T | 1.0000 | 1.7500 | 1.000 | .797 | 1.118 | .055 | .020 | 1.626 | .015 | 1.500 | 9 |




Absence of letter "P" indicates no plating on race."E" designates Zinc-Nickel, "P" designates Zinc-Nickel *or* Cadmium.

**Parts are available and approved to additional material specification options.**
**Consult factory for details**

# ANC-TG & ANC-T SPHERICAL BEARINGS

Narrow - Aerospace Series AS14101 (Grooved) & AS14104 (Plain)

| Specifications | |
|---|---|
| **BALL** | 440C Stainless Steel (AMS 5630)<br>Heat Treated |
| **RACE** | 17-4 PH Stainless Steel (AMS 5643)<br>Heat Treated |
| **LINER** | AT 3200 Bearing Liner, Permanently<br>Bonded to Race I.D.<br>Qualified to SAE-AS81820 |

**GROOVED SERIES**

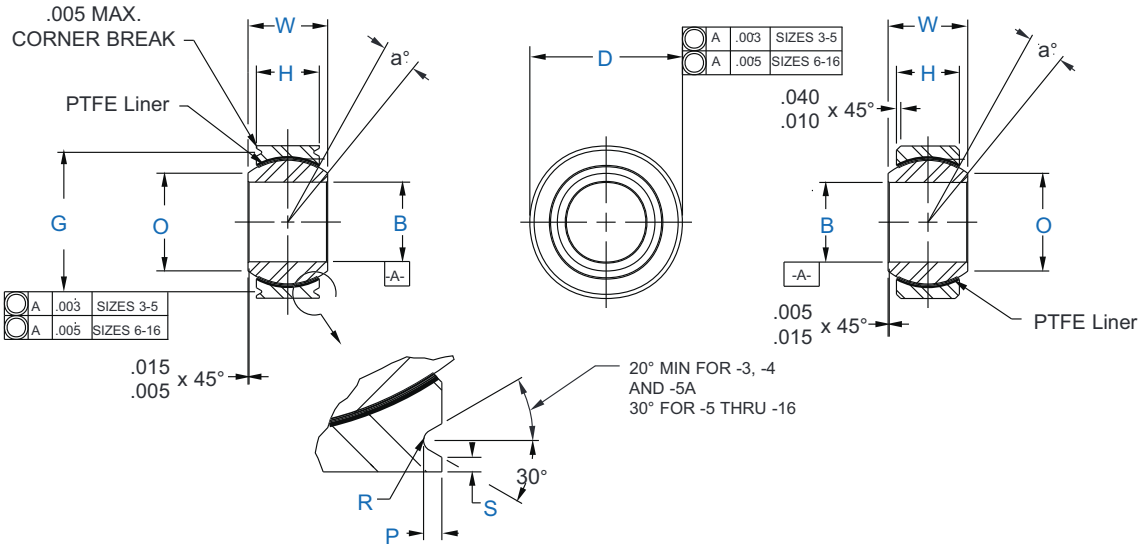
**PLAIN SERIES**

| | | | Bearing Fits | | | | | AURORA NO. | | MILITARY NO. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standard Fit | "K" Fit | | | | | | | |
| Radial Lbs. | Axial Lbs. | Oscil-lating Load Lbs. | No Load Rotational Breakaway Torque Max. In-Lbs. | No Load Rotational Breakaway Torque Max. In-Lbs. | Radial Clearance Max. | Axial Clearance Max. | Approx. Brg. Wt. Lbs. | GROOVED | PLAIN | GROOVED | PLAIN |
| 3,975 | 150 | 1,500 | 0.25 - 5.0 | 0.5 | .0007 | .0028 | .020 | ANC-3TG | ANC-3T | MS14101-3 | MS14104-3 |
| 6,040 | 430 | 3,320 | 0.25 - 5.0 | 0.5 | .0007 | .0028 | .020 | ANC-4TG | ANC-4T | MS14101-4 | MS14104-4 |
| 8,750 | 700 | 5,460 | 0.25 - 8.0 | 1.0 | .0007 | .0028 | .030 | ANC-5TG† | ANC-5T | MS14101-5† | MS14104-5 |
| 10,540 | 1,100 | 6,600 | 0.25 - 8.0 | 1.0 | .0007 | .0028 | .040 | ANC-6TG | ANC-6T | MS14101-6 | MS14104-6 |
| 13,200 | 1,400 | 8,050 | 0.25 - 8.0 | 1.0 | .0007 | .0028 | .050 | ANC-7TG | ANC-7T | MS14101-7 | MS14104-7 |
| 17,900 | 2,100 | 10,400 | 0.25 - 8.0 | 1.0 | .0007 | .0028 | .070 | ANC-8TG | ANC-8T | MS14101-8 | MS14104-8 |
| 23,200 | 3,680 | 13,000 | 0.25 - 8.0 | 1.0 | .0007 | .0028 | .090 | ANC-9TG | ANC-9T | MS14101-9 | MS14104-9 |
| 30,500 | 4,720 | 16,450 | 0.25 - 8.0 | 1.0 | .0007 | .0028 | .120 | ANC-10TG | ANC-10T | MS14101-10 | MS14104-10 |
| 46,400 | 6,750 | 23,600 | 0.25 - 8.0 | 1.0 | .0007 | .0028 | .210 | ANC-12TG | ANC-12T | MS14101-12 | MS14104-12 |
| 62,200 | 9,350 | 30,250 | 0.25 - 12.0 | 2.0 | .0010 | .0040 | .270 | ANC-14TG | ANC-14T | MS14101-14 | MS14104-14 |
| 82,200 | 12,160 | 38,000 | 0.25 - 12.0 | 2.0 | .0010 | .0040 | .390 | ANC-16TG | ANC-16T | MS14101-16 | MS14104-16 |

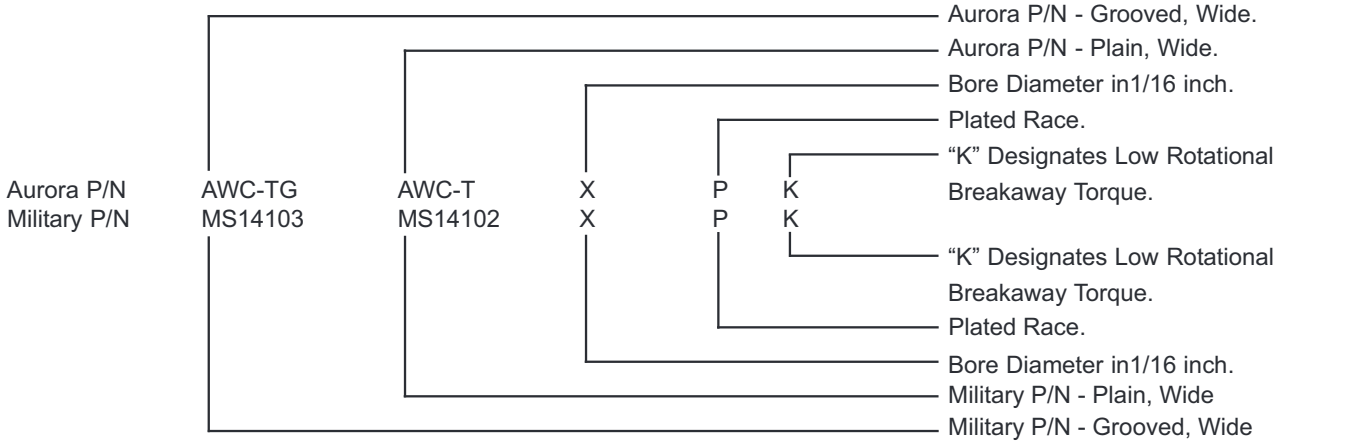
Temperature Range: -65$^0$F - +325$^0$F (-54$^0$C - +163$^0$C)
No load rotational breakaway torque can be varied to meet specific application requirements.
Standard fit bearings are void of any "radial" or "axial" clearance
AT 3200 Bearing Liner System is qualified for procurement under SAE-AS81820.
Spherical Bearings listed are manufactured to conform to the dimensions, materials, and configurations of SAE-AS14101 (Grooved) and SAE-AS14104 (Plain), and are approved for procurement under this specification.
Parts (not approved to military specs) in non-standard material, dimensional or configuration specifications can be provided. Consult factory for additional information.
The Spherical Bearings listed are available (not approved to military specs) in non PTFE lined, metal on metal configuration, as well as with alternate Aurora Bearing PTFE liner systems. Consult factory.
† 5TGA is available, identical to -5TG, with "G" = .660
‡ Sizes -3, -4, -5, -5A, "R" +005, -.010
Oversize Outside Diameter (dimension "D") parts per Military spec. suffix "T" (+.010") and suffix "U" (+.020") are available. Add suffix "D1" to specify .010" oversize, "D2" to specify .020" oversize. Ex.: ANC-6TGD1 (AS14101-6T) or ANC-9TD2 (AS14104-9U).
Consult factory for full specifications. Weight calculations listed are valid for standard Outside Diameter parts only.

# AWC-T & AWC-TG SPHERICAL BEARINGS

## Wide - Aerospace Series AS14102 (Plain) & AS14103 (Grooved)




| MILITARY NO. | | AURORA NO. | | DIMENSIONS IN INCHES | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GROOVED | PLAIN | GROOVED | PLAIN | B +.0000 -.0005 | D +.0000 -.0005 | W +.0 -.002 | H 0±.0005 | O Min. | P +.000 -.010 | S Min. | G +.000 -.008 | R ‡ +.002 -.005 | Ball Dia. Ref. | a° |
| MS14103-3 | MS14102-3 | AWC-3TG | AWC-3T | .1900 | .6250 | .437 | .327 | .300 | .025 | .010 | .563 | .010 | .531 | 15 |
| MS14103-4 | MS14102-4 | AWC-4TG | AWC-4T | .2500 | .6250 | .437 | .327 | .300 | .025 | .010 | .563 | .010 | .531 | 15 |
| MS14103-5 | MS14102-5 | AWC-5TG | AWC-5T | .3125 | .6875 | .437 | .317 | .360 | .025 | .010 | .625 | .010 | .593 | 14 |
| MS14103-6 | MS14102-6 | AWC-6TG | AWC-6T | .3750 | .8125 | .500 | .406 | .466 | .035 | .020 | .712 | .015 | .687 | 8 |
| MS14103-7† | MS14102-7 | AWC-7TG† | AWC-7T | .4375 | .9375 | .562 | .442 | .537 | .035 | .020 | .837 | .015 | .781 | 10 |
| MS14103-8 | MS14102-8 | AWC-8TG | AWC-8T | .5000 | 1.0000 | .625 | .505 | .607 | .035 | .020 | .900 | .015 | .875 | 9 |
| MS14103-9 | MS14102-9 | AWC-9TG | AWC-9T | .5625 | 1.1250 | .687 | .536 | .721 | .035 | .020 | 1.025 | .015 | 1.000 | 10 |
| MS14103-10 | MS14102-10 | AWC-10TG | AWC-10T | .6250 | 1.1875 | .750 | .567 | .747 | .035 | .020 | 1.087 | .015 | 1.062 | 12 |
| MS14103-12 | MS14102-12 | AWC-12TG | AWC-12T | .7500 | 1.3750 | .875 | .630 | .845 | .055 | .020 | 1.251 | .015 | 1.250 | 13 |
| MS14103-14 | MS14102-14 | AWC-14TG | AWC-14T | .8750 | 1.6250 | .875 | .755 | .995 | .055 | .020 | 1.501 | .015 | 1.375 | 6 |
| MS14103-16 | MS14102-16 | AWC-16TG | AWC-16T | 1.0000 | 2.1250 | 1.375 | 1.005 | 1.269 | .055 | .020 | 2.001 | .015 | 1.875 | 12 |




Absence of letter "P" indicates no plating on race."E" designates Zinc-Nickel, "P" designates Zinc-Nickel *or* Cadmium.

**Parts are available and approved to additional material specification options.**
**Consult factory for details**

# AWC-T & AWC-TG SPHERICAL BEARINGS

Wide - Aerospace Series AS14102 (Plain) & AS14103 (Grooved)

| Specifications | |
|---|---|
| **BALL** | 440C Stainless Steel (AMS 5630)<br>Heat Treated |
| **RACE** | 17-4 PH Stainless Steel (AMS 5643)<br>Heat Treated |
| **LINER** | AT 3200 Bearing Liner, Permanently<br>Bonded to Race I.D.<br>Qualified to SAE-AS81820 |

**GROOVED SERIES**

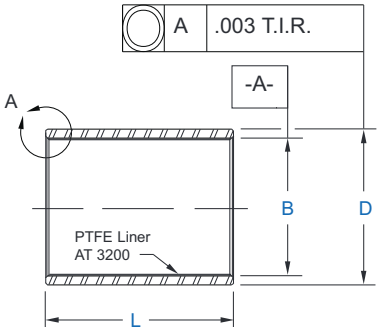
**PLAIN SERIES**

| Bearing Fits | | | | | | | | AURORA NO. | | MILITARY NO. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standard Fit | "K" Fit | | | | | | | |
| Radial Lbs. | Axial Lbs. | Oscil-lating Load Lbs. | No Load Rotational Breakaway Torque Max. In-Lbs. | No Load Rotational Breakaway Torque Max. In-Lbs. | Radial Clearance Max. | Axial Clearance Max. | Approx. Brg. Wt. Lbs. | GROOVED | PLAIN | GROOVED | PLAIN |
| 2,500 | 1,770 | 4,900 | 0.25 - 5.0 | 0.5 | .0007 | .0021 | .031 | AWC-3TG | AWC-3T | MS14103-3 | MS14102-3 |
| 5,500 | 1,770 | 4,900 | 0.25 - 5.0 | 0.5 | .0007 | .0021 | .031 | AWC-4TG | AWC-4T | MS14103-4 | MS14102-4 |
| 9,400 | 1,640 | 6,050 | 0.25 - 8.0 | 1.0 | .0007 | .0021 | .035 | AWC-5TG | AWC-5T | MS14103-5 | MS14102-5 |
| 13,700 | 2,630 | 8,310 | 0.25 - 8.0 | 1.0 | .0007 | .0021 | .060 | AWC-6TG | AWC-6T | MS14103-6 | MS14102-6 |
| 20,700 | 3,650 | 11,750 | 0.25 - 8.0 | 1.0 | .0007 | .0021 | .080 | AWC-7TG† | AWC-7T | MS14103-7† | MS14102-7 |
| 21,400 | 4,970 | 14,950 | 0.25 - 8.0 | 1.0 | .0007 | .0021 | .100 | AWC-8TG | AWC-8T | MS14103-8 | MS14102-8 |
| 26,600 | 5,370 | 18,100 | 0.25 - 8.0 | 1.0 | .0007 | .0021 | .135 | AWC-9TG | AWC-9T | MS14103-9 | MS14102-9 |
| 29,000 | 6,130 | 20,250 | 0.25 - 8.0 | 1.0 | .0007 | .0021 | .160 | AWC-10TG | AWC-10T | MS14103-10 | MS14102-10 |
| 37,000 | 7,730 | 26,200 | 0.25 - 8.0 | 1.0 | .0007 | .0021 | .240 | AWC-12TG | AWC-12T | MS14103-12 | MS14102-12 |
| 65,200 | 10,800 | 33,600 | 0.25 - 12.0 | 2.0 | .0010 | .0030 | .350 | AWC-14TG | AWC-14T | MS14103-14 | MS14102-14 |
| 104,000 | 19,300 | 56,250 | 0.25 - 12.0 | 2.0 | .0010 | .0030 | .970 | AWC-16TG | AWC-16T | MS14103-16 | MS14102-16 |

Temperature Range: -65$^0$F - +325$^0$F (-54$^0$C - +163$^0$C)
No load rotational breakaway torque can be varied to meet specific application requirements.
Standard fit bearings are void of any "radial" or "axial" clearance
AT 3200 Bearing Liner System is qualified for procurement under SAE-AS81820.
Spherical Bearings listed are manufactured to conform to the dimensions, materials, and configurations of SAE-AS14102 (Plain) and SAE-AS14103 (Grooved), and are approved for procurement under this specification.
Parts (not approved to military specs) in non-standard material, dimensional or configuration specifications can be provided. Consult factory for additional information.
The Spherical Bearings listed are available (not approved to military specs) in non PTFE lined, metal on metal configuration, as well as with alternate Aurora Bearing PTFE liner systems. Consult factory.
† 7TGA is available, identical to -7TG, with "D"= .9062' "G" = ..808"
‡ Sizes -3, -4, -5, "R" +.005, -.010
Oversize Outside Diameter (dimension "D") parts per Military spec. suffix "T" (+.010") and suffix "U" (+.020") are available. Add suffix "D1" to specify .010" oversize, "D2" to specify .020" oversize. Ex.: AWC-6TD1 (AS14102-6T) or AWC-9TGD2 (AS14103-9U).
Consult factory for full specifications. Weight calculations listed are valid for standard Outside Diameter parts only.

# AJB-TA / -TC Straight Journal Bushings

SAE-AS81934/1




(See Table 2)

| Specifications | |
|---|---|
| "A" | Aluminum Alloy QQ-A-200/3 or QQ-A-225/6 (2024T851 or 2024T8511), Chemical Film Treatment per MIL-C-5541 |
| "C" | Corrosion Resistant Steel, AMS 5643 (17-4 PH) Condition H-1150 per MIL-H-6875, Passivated per QQ-P-35 (Cad, or Zinc-Nickel plate optional). |
| "T" | AT 3200 Bearing Liner System, Permanently Bonded to Bushing I.D. Qualified to SAE-AS81820 |

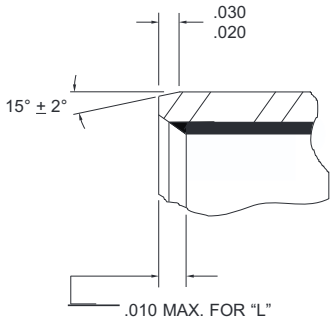
| BUSHING NO. | | DIMENSIONS IN INCHES | | | | |
|---|---|---|---|---|---|---|
| Aluminum | Stainless Steel | B +.0000 -.0010 | D ± .0005 | D +.0000 -.0005 | Weight* Lbs./Inch (Ref) L-1.00 | |
| | | | Alum. | CRES | Alum. | CRES |
| AJB-4TA | AJB-4TC | .2515 | .3760 | | .006 | .016 |
| AJB-5TA | AJB-5TC | .3140 | .4386 | | .007 | .019 |
| AJB-6TA | AJB-6TC | .3765 | .5012 | | .008 | .022 |
| AJB-7TA | AJB-7TC | .4390 | .5638 | | .009 | .025 |
| AJB-8TA | AJB-8TC | .5015 | .6265 | | .011 | .028 |
| AJB-9TA | AJB-9TC | .5640 | .6892 | | .012 | .031 |
| AJB-10TA | AJB-10TC | .6265 | .8142 | | .021 | .056 |
| AJB-11TA | AJB-11TC | .6890 | .8767 | | .022 | .060 |
| AJB-12TA | AJB-12TC | .7515 | .9393 | | .024 | .065 |
| AJB-14TA | AJB-14TC | .8765 | 1.0645 | | .028 | .075 |
| AJB-16TA | AJB-16TC | 1.0015 | 1.1898 | | .031 | .084 |
| AJB-18TA | AJB-18TC | 1.1265 | 1.3148 | | .035 | .094 |
| AJB-20TA | AJB-20TC | 1.2515 | 1.4398 | | .038 | .103 |
| AJB-22TA | AJB-22TC | 1.3765 | 1.5648 | | .041 | .113 |
| AJB-24TA | AJB-24TC | 1.5015 | 1.7523 | | .062 | .171 |
| AJB-26TA | AJB-26TC | 1.6265 | 1.8773 | | .067 | .183 |
| AJB-28TA | AJB-28TC | 1.7515 | 2.0023 | | .071 | .193 |
| AJB-32TA | AJB-32TC | 2.0015 | 2.2523 | | .081 | .222 |

| | | | | | |
|---|---|---|---|---|---|
| Aurora P/N | AJB | 4T | C | 008 | Aurora Prefix. |
| Military P/N | M81934/1 | 04 | C | 008 | Military Prefix. |
| | | | | | Bore Diameter in multiples of 1/16. |
| | | | | | Material code. |
| | | | | | Length in multiples of 1/32 inch. |
| | | | | | Length in multiples of 1/32 inch. |
| | | | | | Material code. |
| | | | | | Bore Diameter in multiples of 1/16. |

Example of weight calculation: AJB-16TA-008: (0.31 lb/in) x .250 = .008 lbs.

# AJB-TA / -TC Straight Journal Bushings

SAE-AS81934/1




**DETAIL A**

.010 MAX. FOR "L"
.375 OR LESS
.025 MAX FOR ALL
OTHER LENGTHS.

**TABLE 2A**

| DASH NO. | NOMINAL SIZE | Length L +.000 -.010 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | .156 | .187 | .218 | .250 | .281 | .312 | .343 | .375 | .437 | .500 | .562 | .625 | .687 | .750 | .875 |
| -04 | 1/4 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | | | | | | |
| -05 | 5/16 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | | | | |
| -06 | 3/8 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | | |
| -07 | 7/16 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -08 | 1/2 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -09 | 9/16 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -10 | 5/8 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -11 | 11/16 | | | | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -12 | 3/4 | | | | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -14 | 7/8 | | | | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -16 | 1 | | | | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -18 | 1 1/8 | | | | | | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -20 | 1 1/4 | | | | | | | | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -22 | 1 3/8 | | | | | | | | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -24 | 1 1/2 | | | | | | | | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -26 | 1 5/8 | | | | | | | | | | 016 | 018 | 020 | 022 | 024 | 028 |
| -28 | 1 3/4 | | | | | | | | | | 016 | 018 | 020 | 022 | 024 | 028 |
| -32 | 2 | | | | | | | | | | 016 | 018 | 020 | 022 | 024 | 028 |

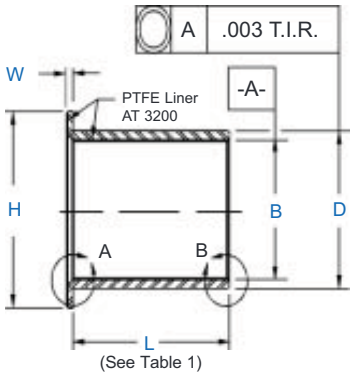
**TABLE 2B**

| DASH NO. | NOMINAL SIZE | Length L +.000 -.010 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.625 | 1.750 | 1.875 | 2.000 | 2.125 | 2.250 | 2.375 | 2.500 | 2.750 | 3.000 |
| -04 | 1/4 | | | | | | | | | | | | | | | |
| -05 | 5/16 | | | | | | | | | | | | | | | |
| -06 | 3/8 | | | | | | | | | | | | | | | |
| -07 | 7/16 | | | | | | | | | | | | | | | |
| -08 | 1/2 | | | | | | | | | | | | | | | |
| -09 | 9/16 | 032 | 036 | | | | | | | | | | | | | |
| -10 | 5/8 | 032 | 036 | 040 | 044 | | | | | | | | | | | |
| -11 | 11/16 | 032 | 036 | 040 | 044 | 048 | 052 | | | | | | | | | |
| -12 | 3/4 | 032 | 036 | 040 | 044 | 048 | 052 | | | | | | | | | |
| -14 | 7/8 | 032 | 036 | 040 | 044 | 048 | 052 | | | | | | | | | |
| -16 | 1 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | | | | | | | |
| -18 | 1 1/8 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | | | | | | | |
| -20 | 1 1/4 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | | | | | |
| -22 | 1 3/8 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | | | | | |
| -24 | 1 1/2 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | 072 | 076 | 080 | 088 | |
| -26 | 1 5/8 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | 072 | 076 | 080 | 088 | 096 |
| -28 | 1 3/4 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | 072 | 076 | 080 | 088 | 096 |
| -32 | 2 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | 072 | 076 | 080 | 088 | 096 |

Stainless Steel parts (suffix "C") are available Cadmium plated (Suffix "P") or Zinc – Nickel plated (Suffix "E"). Ex.: AJB-4TC-008P or AJB-4TC-008E. Consult factory for full specifications.
Oversize Outside Diameter (dimension "D") parts per Military spec. suffix "T" (+.010") and suffix "U" (+.020") are available. Add suffix "D1" to specify .010" oversize, "D2" to specify .020" oversize. Ex.: AJB-4TC-008D1 or AJB-4TC-008D2. Consult factory for full specifications. Weight calculations listed are valid for standard Outside Diameter parts only.

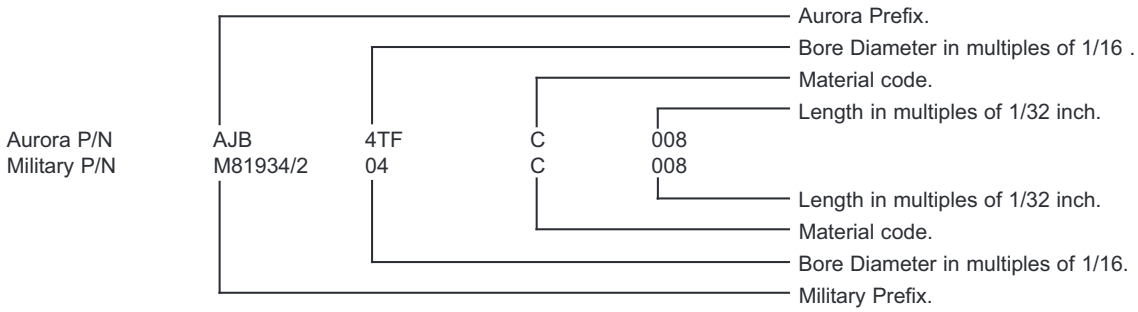
# AJB-TFA / -TFC Flanged Journal Bushings

SAE-AS81934/2




| Specifications | |
|---|---|
| "A" | Aluminum Alloy QQ-A-200/3 or QQ-A-225/6 (2024T851 or 2024T8511), Chemical Film Treatment per MIL-C-5541 |
| "C" | Corrosion Resistant Steel, AMS 5643 (17-4 PH) Condition H-1150 per MIL-H-6875, Passivated per QQ-P-35 (Cad, or Zinc-Nickel plate optional). |
| "T" | AT 3200 Bearing Liner System, Permanently Bonded to Bushing I.D. Qualified to SAE-AS81820 |

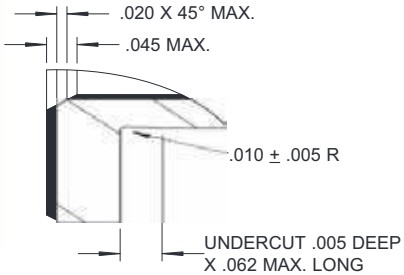
| BUSHING NO. | | DIMENSIONS IN INCHES | | | | | Weight* Lbs./Inch (Ref) L-1.00 | | Flange Weight Lbs. (Ref) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | Stainless Steel | B +.0000 - .0010 | D ± .0005 | D +.0000 - .0005 | H + .000 - .020 | W + .000 - .005 | | | | |
| | | | Alum. | CRES | | | Alum. | CRES | Alum. | CRES |
| AJB-4TFA | AJB-4TFC | .2515 | .3760 | | .750 | .0625 | .006 | .016 | .002 | .006 |
| AJB-5TFA | AJB-5TFC | .3140 | .4386 | | .812 | .0625 | .007 | .019 | .003 | .007 |
| AJB-6TFA | AJB-6TFC | .3765 | .5012 | | .875 | .0625 | .008 | .022 | .003 | .007 |
| AJB-7TFA | AJB-7TFC | .4390 | .5638 | | .937 | .0625 | .009 | .025 | .003 | .008 |
| AJB-7TFA-1 | AJB-7TFC-1 | .4390 | .5638 | | .745 | .0625 | .009 | .025 | .003 | .008 |
| AJB-8TFA | AJB-8TFC | .5015 | .6265 | | 1.000 | .0625 | .011 | .028 | .003 | .009 |
| AJB-9TFA | AJB-9TFC | .5640 | .6892 | | 1.125 | .0625 | .012 | .031 | .004 | .011 |
| AJB-10TFA | AJB-10TFC | .6265 | .8142 | | 1.250 | .0625 | .021 | .056 | .005 | .014 |
| AJB-11TFA | AJB-11TFC | .6890 | .8767 | | 1.375 | .0625 | .022 | .060 | .006 | .016 |
| AJB-12TFA | AJB-12TFC | .7515 | .9393 | | 1.500 | .0625 | .024 | .065 | .007 | .020 |
| AJB-14TFA | AJB-14TFC | .8765 | 1.0645 | | 1.625 | .0625 | .028 | .075 | .008 | .022 |
| AJB-16TFA | AJB-16TFC | 1.0015 | 1.1898 | | 1.750 | .0625 | .031 | .084 | .009 | .024 |
| AJB-18TFA | AJB-18TFC | 1.1265 | 1.3148 | | 1.875 | .0937 | .035 | .094 | .015 | .041 |
| AJB-20TFA | AJB-20TFC | 1.2515 | 1.4398 | | 2.000 | .0937 | .038 | .103 | .016 | .045 |
| AJB-22TFA | AJB-22TFC | 1.3765 | 1.5648 | | 2.125 | .0937 | .041 | .113 | .017 | .048 |
| AJB-24TFA | AJB-24TFC | 1.5015 | 1.7523 | | 2.250 | .0937 | .062 | .171 | .018 | .051 |
| AJB-26TFA | AJB-26TFC | 1.6265 | 1.8773 | | 2.375 | .0937 | .067 | .183 | .020 | .055 |
| AJB-28TFA | AJB-28TFC | 1.7515 | 2.0023 | | 2.500 | .0937 | .071 | .193 | .021 | .058 |
| AJB-32TFA | AJB-32TFC | 2.0015 | 2.2523 | | 2.750 | .0937 | .081 | .222 | .023 | .065 |



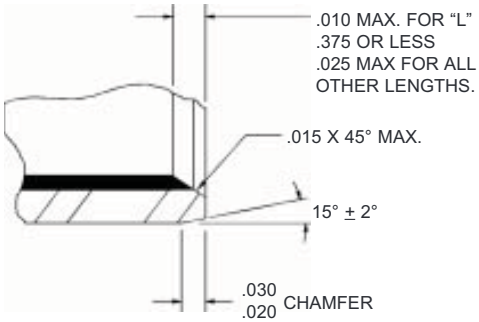

Example of weight calculation: AJB-16TFA-016:
Sleeve Weight:( 0.31 lb/in) x .500 = .0155 lbs
Flange weight = .009 lbs
Total weight =. 0245 lbs

# AJB-TFA / -TFC Flanged Journal Bushings

SAE-AS81934/2




DETAIL A




DETAIL B

**TABLE 1A**

| DASH NO. | NOMINAL SIZE | Length L +.000 -.010 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | .156 | .187 | .218 | .250 | .281 | .312 | .343 | .375 | .437 | .500 | .562 | .625 | .687 | .750 | .875 |
| -04 | 1/4 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | | | | | | |
| -05 | 5/16 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | | | | |
| -06 | 3/8 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | | |
| -07 | 7/16 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -08 | 1/2 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -09 | 9/16 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -10 | 5/8 | 005 | 006 | 007 | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -11 | 11/16 | | | | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -12 | 3/4 | | | | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -14 | 7/8 | | | | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -16 | 1 | | | | 008 | 009 | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -18 | 1 1/8 | | | | | | 010 | 011 | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -20 | 1 1/4 | | | | | | | | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -22 | 1 3/8 | | | | | | | | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -24 | 1 1/2 | | | | | | | | 012 | 014 | 016 | 018 | 020 | 022 | 024 | 028 |
| -26 | 1 5/8 | | | | | | | | | | 016 | 018 | 020 | 022 | 024 | 028 |
| -28 | 1 3/4 | | | | | | | | | | 016 | 018 | 020 | 022 | 024 | 028 |
| -32 | 2 | | | | | | | | | | 016 | 018 | 020 | 022 | 024 | 028 |

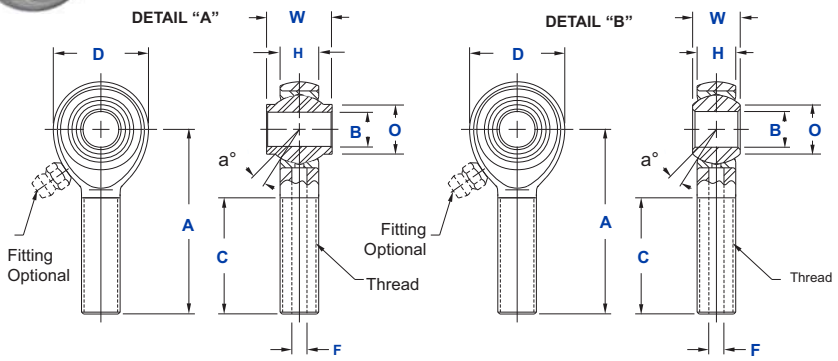
**TABLE 1B**

| DASH NO. | NOMINAL SIZE | Length L +.000 -.010 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.625 | 1.750 | 1.875 | 2.000 | 2.125 | 2.250 | 2.375 | 2.500 | 2.750 | 3.000 |
| -04 | 1/4 | | | | | | | | | | | | | | | |
| -05 | 5/16 | | | | | | | | | | | | | | | |
| -06 | 3/8 | | | | | | | | | | | | | | | |
| -07 | 7/16 | | | | | | | | | | | | | | | |
| -08 | 1/2 | | | | | | | | | | | | | | | |
| -09 | 9/16 | 032 | 036 | | | | | | | | | | | | | |
| -10 | 5/8 | 032 | 036 | 040 | 044 | | | | | | | | | | | |
| -11 | 11/16 | 032 | 036 | 040 | 044 | 048 | 052 | | | | | | | | | |
| -12 | 3/4 | 032 | 036 | 040 | 044 | 048 | 052 | | | | | | | | | |
| -14 | 7/8 | 032 | 036 | 040 | 044 | 048 | 052 | | | | | | | | | |
| -16 | 1 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | | | | | | | |
| -18 | 1 1/8 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | | | | | | | |
| -20 | 1 1/4 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | | | | | |
| -22 | 1 3/8 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | | | | | |
| -24 | 1 1/2 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | 072 | 076 | 080 | 088 | |
| -26 | 1 5/8 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | 072 | 076 | 080 | 088 | 096 |
| -28 | 1 3/4 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | 072 | 076 | 080 | 088 | 096 |
| -32 | 2 | 032 | 036 | 040 | 044 | 048 | 052 | 056 | 060 | 064 | 068 | 072 | 076 | 080 | 088 | 096 |

Stainless Steel parts (suffix "C") are available Cadmium plated (Suffix "P") or Zinc – Nickel plated (Suffix "E").
Ex.: AJB-4TFC-008P or AJB-4TFC-008E. Consult factory for full specifications.
Oversize Outside Diameter (dimension "D") parts per Military spec. suffix "T" (+.010") and suffix "U" (+.020") are available.
Add suffix "D1" to specify .010" oversize, "D2" to specify .020" oversize. Ex.: AJB-4TFC-008D1 or AJB-4TFC-008D2.
Consult factory for full specifications. Weight calculations listed are valid for standard Outside Diameter parts only.

# GMM-M & GMB-M (MALE) and GMW-M & GMG-M (FEMALE) SERIES ROD ENDS

General Aviation - Precision

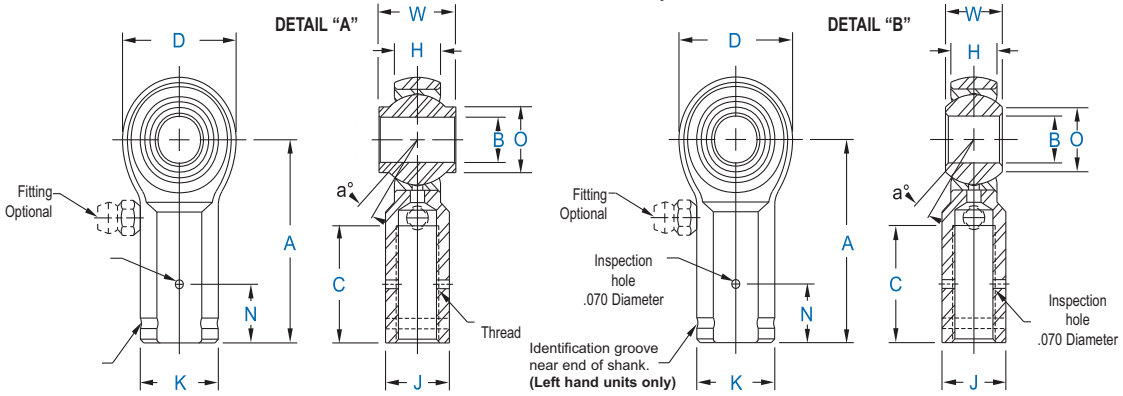



| Specifications | |
|---|---|
| **Body** | Carbon Steel protective coated for corrosion resistance. |
| **Ball** | Alloy steel, Heat treated, Hard Chrome Plated (QQ-C-320, Class 2). |
| **Race** | Carbon Steel, Protective Coated for Corrosion Resistance. |

Units are traceable and magnetic particle inspected after assembly.
Load ratings apply only to rod ends without grease fittings. For load ratings with grease fittings, please consult our engineering department.

| Rod End No. | | DIMENSIONS IN INCHES | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AURORA Part No. | Heim Part No. | Ball Shoulder Configuration | B +.0015 -.0005 | W +.000 -.005 | H ±.005 | A ±.015 | D ±.010 | O Shoulder Dia. Ref. | Ball Dia. Ref. | C Min. | F Drilled Hole Dia Ref. | Thread UNF-3A | a° Misalign. Angle | Ultimate Radial Static Load Capacity | Approx. Brg. Wt. Lbs. |
| GMM-3M-470 | M34-14M | See Detail "A" | .1900 | .437 | .281 | 1.562 | .750 | .315 | .500 | .969 | - | 1/4-28 | 17 | 2,158 | .05 |
| GMM-3M-570 | MD35-14M | See Detail "A" | .1900 | .437 | .328 | 1.375 | .875 | .315 | .500 | .750 | .113 | 5/16-24 | 10 | 2,823 | .07 |
| GMM-3M-670 | MD36-14M | See Detail "A" | .1900 | .437 | .328 | 1.375 | .750 | .315 | .500 | .750 | .113 | 3/8-24 | 10 | 2,850 | .08 |
| GMM-3M-680 | MD36-16M | See Detail "B" | .1900 | .500 | .375 | 1.812 | .833 | .319 | .593 | 1.062 | .136 | 3/8-24 | 18 | 3,269 | .09 |
| GMM-4M-470 | M44-14M | See Detail "B" | .2500 | .437 | .304 | 1.562 | .812 | .353 | .562 | .969 | - | 1/4-28 | 18 | 2,158 | .07 |
| GMM-4M-675 | MD46-15M | See Detail "B" | .2500 | .484 | .335 | 2.312 | .875 | .395 | .625 | 1.500 | .136 | 3/8-24 | 18 | 3,160 | .11 |
| GMM-4M-680 | MD46-16M | See Detail "B" | .2500 | .500 | .335 | 2.062 | .875 | .375 | .625 | 1.500 | .159 | 3/8-24 | 21 | 2,985 | .10 |

Units are supplied without grease fittings. When grease fittings are required, specify by adding suffixes as designated.
Z Zerk type fitting Ex: GMM-3MZ-470 F Flush type fitting Ex: GMM-3MF-470
**For left hand thread use the letter "B" in the prefix Ex: GMB-3M-470**




| Rod End No. | | DIMENSIONS IN INCHES | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AURORA Part No. | Heim Part No. | Ball Shoulder Configuration | B +.0015 -.0005 | W +.000 -.005 | H ±.005 | A ±.015 | D ±.010 | K ±.010 | J ±.010 | N ±.005 | O Shoulder Dia. Ref. | Ball Dia. Ref. | C +.062 -.031 | Thread UNF-3B | a° Misalign. Angle | Ultimate Radial Static Load Capacity | Approx. Brg. Wt. Lbs. |
| GMW-3M-470 | F34-14M | See Detail "A" | .1900 | .437 | .328 | 1.375 | .750 | .468 | .375 | .312 | .315 | .500 | .750 | 1/4-28 | 10 | 2,881 | .06 |
| GMW-3M-471 | F347-14M | See Detail "A" | .1900 | .437 | .328 | 1.062 | .750 | .375 | - | - | .315 | .500 | .437 | 1/4-28 | 10 | 2,881 | .05 |
| GMW-3M-480 | F34-16M | See Detail "A" | .1900 | .500 | .375 | 1.375 | .812 | .468 | .375 | .312 | .312 | .562 | .750 | 1/4-28 | 15 | 3,152 | .08 |
| GMW-3M-570 | F35-14M | See Detail "A" | .1900 | .437 | .328 | 1.375 | .750 | .500 | .437 | .312 | .315 | .500 | .750 | 5/16-24 | 10 | 2,881 | .07 |
| GMW-4M-470 | F44-14M | See Detail "B" | .2500 | .437 | .304 | 1.375 | .812 | .468 | .437 | .312 | .353 | .562 | .750 | 1/4-28 | 18 | 2,950 | .08 |
| GMW-4M-595 | F45-19M | See Detail "A" | .2500 | .593 | .406 | 1.469 | .938 | .500 | .437 | .312 | .485 | .687 | .844 | 5/16-24 | 10 | 3,359 | .10 |

Units are supplied without grease fittings. When grease fittings are required, specify by adding suffixes as designated.
Z Zerk type fitting Ex: GMW-3MZ-470 F Flush type fitting Ex: GMW-3MF-470
**For left hand thread use the letter "G" in the prefix Ex: GMG-3M-470**

# MAJOR SPECIFICATION APPROVALS

For approval status to manufacturer specifications not listed, consult factory

## MILITARY SPECIFICATIONS

| | | |
|---|---|---|
| AS14101 | AS81935/1 | AS81934/1 |
| AS14102 | AS81935/2 | AS81934/2 |
| AS14103 | | |
| AS14104 | | |

## BOEING SPECIFICATIONS

| | | | | |
|---|---|---|---|---|
| BACB10A | BACB10FH | BACB10HP | BACB10Y | 60B10009 |
| BACB10AB | BACB10FJ | BACB10HR | BACB10Z | 60B10024 |
| BACB10AG | BACB10GB | BACB10J | 10-60516 | 60B50350 |
| BACB10CL | BACB10GC | BACB10JA | 10-60545 | 60B50351 |
| BACB10CN | BACB10GD | BACB10JT | 10-60779 | 60B80103 |
| BACB10ER | BACB10HM | BACB10W | 60B00180 | S012T235 |
| BACB10ES | BACB10HN | BACB10X | 60B10007 | S012T237 |
| | | | | 162T4005 |

## AIRBUS SPECIFICATIONS

| | | |
|---|---|---|
| ABS0569 | ABS0570 | ABS0571 |

## LOCKHEED SPECIFICATIONS

### F-16

| | | | |
|---|---|---|---|
| C11653 | C631 | C7537 | 5VR40007 |
| C20308 | C633 | C7546 | 5VR50103 |
| C2959 | C657 | C7547 | |
| C347 | C658 | C7937 | |
| C555 | C7504 | C806 | |

### F-22

### F-35

| | | | | |
|---|---|---|---|---|
| JSFE03 | JSFE17 | JSFE31 | JSFE46 | JSFE61 |
| JSFE04 | JSFE19 | JSFE32 | JSFE47 | JSFE62 |
| JSFE05 | JSFE20 | JSFE34 | JSFE48 | JSFE63 |
| JSFE09 | JSFE22 | JSFE35 | JSFE50 | JSFE65 |
| JSFE11 | JSFE23 | JSFE36 | JSFE51 | JSFE67 |
| JSFE12 | JSFE24 | JSFE37 | JSFE52 | JSFM23 |
| JSFE13 | JSFE25 | JSFE39 | JSFE53 | JSFM62 |
| JSFE14 | JSFE26 | JSFE43 | JSFE55 | JSFM64 |
| JSFE15 | JSFE27 | JSFE44 | JSFE57 | |
| JSFE16 | JSFE28 | JSFE45 | JSFE59 | |

## TEXTRON AVIATION

### CESSNA SPECIFICATIONS

| | | |
|---|---|---|
| S1104 | S2321 | S3313 |
| S1105 | S2409 | S3315 |
| S1106 | S2410 | S3415 |
| S1107 | S2426 | S3469 |
| S1108 | S2901 | S3482 |
| S1581 | S2902 | S3963 |
| S1819 | S3057 | S3985 |
| S1820 | S3058 | S4306 |
| S1823 | S3059 | 0841211 |
| S1866 | S3060 | 0841212 |
| S2009 | S3071 | 7061315 |
| S2015 | S3212 | 7062210 |
| S2022 | S3264 | 7062301 |
| S2049 | S3266 | |

### BEECHCRAFT SPECIFICATIONS

| |
|---|
| 131553 |
| 131554 |
| 131765 |
| 131766 |
| 131881 |

# Military Specifications Interchange Guide

| Mil Spec | Aurora | AMPEP | FJG | Heim | Heim | Kamatics |
|---|---|---|---|---|---|---|
| AS14101 | ANC-TG | 11BNG | FMGN | NRRG | NEG | KR-CNG |
| AS14102 | AWC-T | 11BWZ | FMGB | WRR | WE | KR-CW |
| AS14103 | AWC-TG | 11BWG | FMGB-M | WRRG | WEG | KR-CWG |
| AS14104 | ANC-T | 11BNZ | FMGS | NRR | NE | KR-CN |
| AS81934/1 | AJB-TA/-TC | 13BAZ/13BSZ | FBPA | PBRR | PBE | KRJ |
| AS81934/2 | AJB-TFA/-TFC | 13BAF/13BSF | FBFA | FBRR | FBE | KRJ-UD |
| AS81935/1 | ASM-T | 12BMR | REM W M | MXJRR-AS | ME | KR-M |
| AS81935/2 | ASW-T | 12BFR | REF W M | FXJRR-AS | FE | KR-F |
| | | | | | | |
| Mil Spec | NHBB | NMB | Rose | RBC/TDI | SARMA | Southwest |
| AS14101 | ADB V(L) | HT-V | RNDG | NTG | XRE | SWKN-400 |
| AS14102 | ADW (L) | WHT | RWD | WT | XRL R | SWKR-401 |
| AS14103 | ADW V(L) | WHT-V | RWDG | WTG | XRL | SWKR-400 |
| AS14104 | ADB (L) | HT | RND | NT | XRL R | SWKN-401 |
| AS81934/1 | AD | AJ | BPD | 06-382, 06-282 | BPA | MBAA , MBSS |
| AS81934/2 | ADLF | AJF | BFD | 07-382, 07-282 | BFA | MBAAF, MBSSF |
| AS81935/1 | ADNE J | ANM | | MT | UMJ/XRL | SWRKM-500 |
| AS81935/2 | AND J | ANF | | FT | UFL/XRL | SWRKF-500 |

This is a guide, not a definitive interchange. Consult relevant manufacturers literature for full part numbers and specifications.
This does not imply current approval to listed specifications. Consult manufacturer or current Qualified for Procurement List for manufacturer and part number approval status

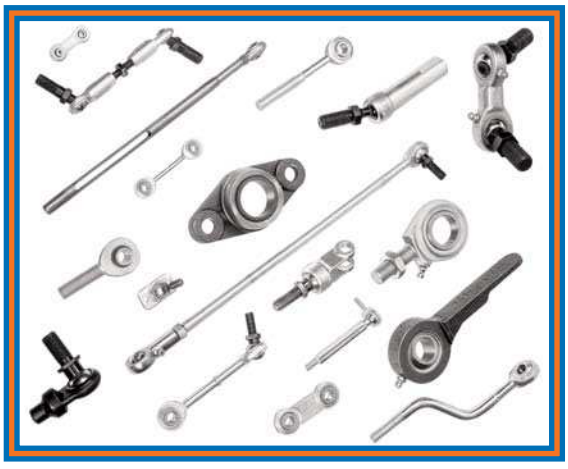
# Aurora PTFE Liner Specifications

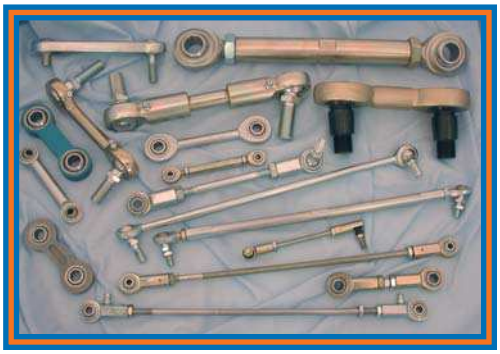
| Liner Designation | AT1400 | AT2100 | AT2300 | AT3200 |
|---|---|---|---|---|
| Construction | PTFE/Dacron Laminate | PTFE/Fiberglass Weave | PTFE/Dacron Weave | PTFE/Nomex Laminate |
| Thickness (in.) | .011 - .013 | .010 - .012 | .013 - .015 | .014 - .016 |
| Temperature (°F) | -65° to 350° | -65° to 250° | -65° to 250° | -65° to 350° |
| Static Limit Load | 80,000 PSI | 60,000 PSI | 60,000 PSI | 80,000 PSI |
| Stiffness | Medium to High | Medium | Low | Medium to High |
| Typical Performance | 37,500 PSI @±25° & 10-20 cpm .0045 wear max.@ 25,000 cycles | 25,000 PSI @±25° & 10-20 cpm .0060 wear max.@ 5,000 cycles | Contact Aurora Engineering Department | 37,500 PSI @±25° & 10-20 cpm .0045 wear max.@ 25,000 cycles |
| Dynamic Capabilities | Light to heavy, unidirectional or alternating loads. Low speed, intermittent to continuous misalignment, intermittent to continuous oscillation. | Light unidirectional loads. Low speed, intermittent to continuous misalignment, intermittent to continuous oscillation | Light to medium, alternating or reversing loads. Medium to High speed, intermittent to continuous misalignment, intermittent to continuous oscillation. | Light to heavy, unidirectional or alternating loads. Low speed, intermittent to continuous misalignment, intermittent to continuous oscillation. |
| Comments | Good multi-purpose system | Excellent stick-slip properties Usually recommended for high splash or underwater applications | Excellent stick-slip properties Good vibratory conditions | Highest performance characteristics for all applications Qualified to SAE-AS81820 |

# Additional Products

In addition to the products featured in this publication, Aurora Bearing Company features the most diverse range of commercial and high performance rod end and spherical bearings in the industry. From economy commercial to high performance bearings for motorsports, Aurora has product solutions for the most demanding motion transfer needs. Sizes from 1/8” to 2”, metric 3 - 30mm available. Further, many of these product lines are available with full traceability and/or magnetic particle inspection for aerospace applications, and are frequently used as such in the aerospace industry.

Beyond the Aurora standard Aircraft and Commercial catalog offerings, Aurora Bearing has the capability to design, engineer, and manufacture special bearings and linkage assemblies.Illustrated below is just a sample of items produced for aerospace (L) and commercial industrial (C & R) customers.





For further information on Aurora products, including access to CAD drawings, see www.aurorabearing.com

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