FEDERAL SUPPLY CLASS
3120

RATIONALE

THE REASON FOR UPDATING THIS SPECIFICATION IS TO ADD THE ZINC NICKEL PLATING ONLY OPTION " E " . THE PLATING OPTION " P " WILL REMAIN AS ZINC NICKEL OR CADMIUM PLATING.

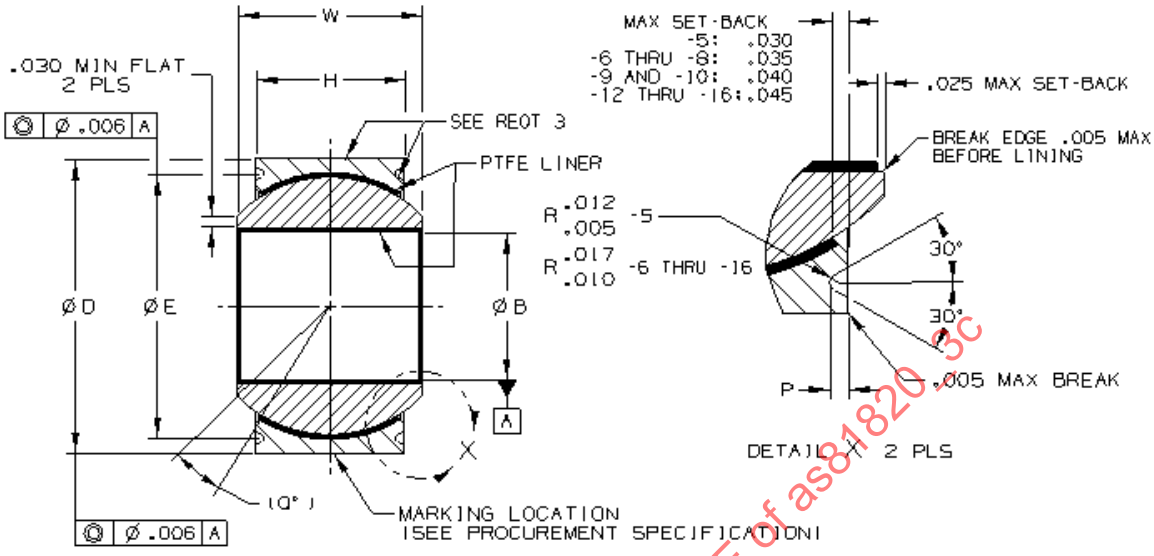


FIGURE 1 – PART CONFIGURATION

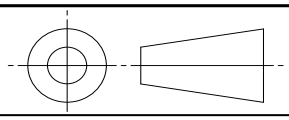
TABLE 1 - DIMENSIONS AND STRENGTHS

PART NO.**	ϕB +.0000 −.0010	ϕD +.0000 −.0005	H ±.005	P +.000 −.010	Q° (REF)	W +.000 −.002	ϕE +.000 −.008	STATIC LIMIT LOAD RADIAL LB	STATIC LIMIT LOAD AXIAL LB	OSCILLATING LOAD LB	NO-LOAD ROTATIONAL BREAKAWAY TORQUE IN-LB STANDARD	NO-LOAD ROTATIONAL BREAKAWAY TORQUE IN-LB * "K" TYPE	WT LB MAX (REF)
M81820/3- 5	.3135	.6875	.317	.025	14	.437	.625	9300	1640	4450	1.0-15.0	0-1.0	.035
M81820/3- 6	.3760	.8125	.406	.035	8	.500	.712	13 000	2630	6200	1.0-15.0	0-1.0	.060
M81820/3- 7	.4385	.9375	.442	.035	10	.562	.837	17 300	3650	8250	1.0-15.0	0-1.0	.080
M81820/3-7A	.4385	.9062	.442	.035	10	.562	.806	17 300	3650	8250	1.0-15.0	0-1.0	.080
M81820/3- 8	.5010	1.0000	.505	.035	9	.625	.900	21 400	4970	10 600	1.0-15.0	0-1.0	.100
M81820/3- 9	.5635	1.1250	.536	.035	10	.687	1.025	26 600	5370	13 200	1.0-15.0	0-1.0	.135
M81820/3-10	.6260	1.1875	.567	.035	12	.750	1.087	29 000	6130	16 150	1.0-15.0	0-1.0	.160
M81820/3-12	.7510	1.3750	.630	.055	13	.875	1.251	37 000	7730	24 800	1.0-15.0	0-1.0	.240
M81820/3-14	.8760	1.6250	.755	.055	6	.875	1.501	56 000	10 800	26 750	1.0-25.0	0-2.0	.350
M81820/3-16	1.0010	2.1250	1.005	.055	12	1.375	2.001	103 000	19 300	49 300	1.0-25.0	0-2.0	.970

* SEE REQUIREMENT 5 "NO-LOAD TORQUE" AND NOTE 5.
** FOR TYPE A BEARINGS, THE CORRESPONDING PART NUMBER WILL HAVE AN "A" DESIGNATION AFTER THE MS PART NUMBER (E.G., M81820/3A-5).

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AS81820/3C

THIRD ANGLE PROJECTION



ISSUED 1998-04 REVISED 2010-06

CUSTODIAN: AIRFRAME CONTROL BEARINGS GROUP

PROCUREMENT SPECIFICATION: AS81820

SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, WIDE, GROOVED RACE, -65 TO +325 °F

TABLE 2 - OVERSIZE BEARING DIMENSIONS 1/ 2/
RESTRICTED USAGE FOR REPAIR WORK ONLY
.010 INCH AND .020 INCH OVERSIZE OUTSIDE DIAMETER FOR
REPLACEMENT OF BEARINGS SHOWN ON SHEET 1

PART NO. 3/	NOMINAL SIZE	1ST OVERSIZE (.010) ϕD
M81820/3- 5T	.3125	.6975
M81820/3- 6T	.3750	.8225
M81820/3- 7T	.4375	.9475
M81820/3-7AT	.4375	.9162
M81820/3- 8T	.5000	1.0100
M81820/3- 9T	.5625	1.1350
M81820/3-10T	.6250	1.1975
M81820/3-12T	.7500	1.3850
M81820/3-14T	.8750	1.6350
M81820/3-16T	1.0000	2.1350

PART NO. 3/	NOMINAL SIZE	2ND OVERSIZE (.020) ϕD
M81820/3- 5U	.3125	.7075
M81820/3- 6U	.3750	.8325
M81820/3- 7U	.4375	.9575
M81820/3-7AU	.4375	.9262
M81820/3- 8U	.5000	1.0200
M81820/3- 9U	.5625	1.1450
M81820/3-10U	.6250	1.2075
M81820/3-12U	.7500	1.3950
M81820/3-14U	.8750	1.6450
M81820/3-16U	1.0000	2.1450

1/ BEFORE INITIATING A REPAIR PROCEDURE TO USE AN OVERSIZE BEARING, APPROVAL FOR MODIFYING AND REIDENTIFYING THE BEARING HOUSING MUST BE OBTAINED FROM THE COGNIZANT ENGINEERING AUTHORITY.
2/ REFER TO NAS0331 FOR INSTALLATION PROCEDURE AND STAKING FORCES.
3/ FOR TYPE A BEARINGS, THE CORRESPONDING PART NUMBER WILL HAVE AN "A" DESIGNATION AFTER THE MS PART NUMBER (E.G., M81820/3A-5).

REQUIREMENTS:

1. MATERIAL:

   BALL: PH13-8 Mo STEEL ALLOY PER AMS5629, CONDITION H1000.

   RACE: 17-4 PH STEEL ALLOY PER AMS5643.

   LINER: PTFE SHALL BE INCLUDED IN THE LINER.

2. SURFACE TEXTURE: BALL DIA Ra 8 MAX; BALL FACES AND RACE DIA Ra 32 MAX; ALL OTHER METALLIC SURFACES Ra 125 MAX. LINER SURFACES ARE EXEMPT FROM SURFACE TEXTURE MEASUREMENTS.

3. SURFACE FINISH:

   RACE: PLATING, WHEN SPECIFIED, SHALL BE ZINC-NICKEL PLATING PER AMS2417, TYPE 2 OR CADMIUM PLATING PER AMS-QQ-P-416, TYPE II, CLASS 2 WITH A THICKNESS RANGE OF 0.0003 TO 0.0006 in. PLATE ON THE OUTSIDE DIAMETER SURFACE AND ON THE FLAT BETWEEN THE OUTSIDE DIAMETER AND THE GROOVE. PLATING RUNOUT MAY EITHER OCCUR IN THE GROOVE OR IN THE AREA BETWEEN THE GROOVE AND THE BALL. . SEE NOTE 5 FOR P/N EXAMPLE AND DESIGNATION.

   THE PTFE LINER IN THE OUTER RACE INSIDE DIAMETER AND IN THE BALL BORE SHALL BE PROTECTED FROM EXPOSURE TO PLATING SOLUTIONS DURING PROCESSING.

   BALL: PASSIVATE BALL AS DETAIL PER AMS2700, METHOD 1 (NITRIC ACID) OR METHOD 2 (CITRIC ACID), OR ASTM A 967. CITRIC 1, OR CITRIC 2, AND CITRIC 3 ARE ACCEPTABLE. CHROME PLATING PER AMS2460 IS ALLOWED. BALL SURFACE FINISH SHALL BE AS ORGINALLY QUALIFIED.

4. HARDNESS: BALL: HRC 43 MIN; RACE: HRC 28 MIN, HRC 37 MAX BEFORE SWAGING.

5. NO-LOAD TORQUE: WHEN THE LETTER "K" IS PRESENT IN THE PART NUMBER, LOWER VALUES OF NO-LOAD TORQUE ARE SPECIFIED PER TABLE 1. IF THE MEASURED TORQUE OF A "K" TYPE BEARING IS LESS THAN 0.1 in-lb, THE INTERNAL RADIAL CLEARANCE SHALL BE MEASURED AND SHALL NOT EXCEED THE VALUES IN TABLE 3. THESE REQUIREMENTS APPLY TO THE TORQUE AND INTERNAL PLAY BETWEEN THE SPHERICAL BALL AND THE RACE. THIS STANDARD DOES NOT DEFINE REQUIREMENTS FOR TORQUE OR INTERNAL PLAY BETWEEN THE BEARING BORE AND SHAFT.