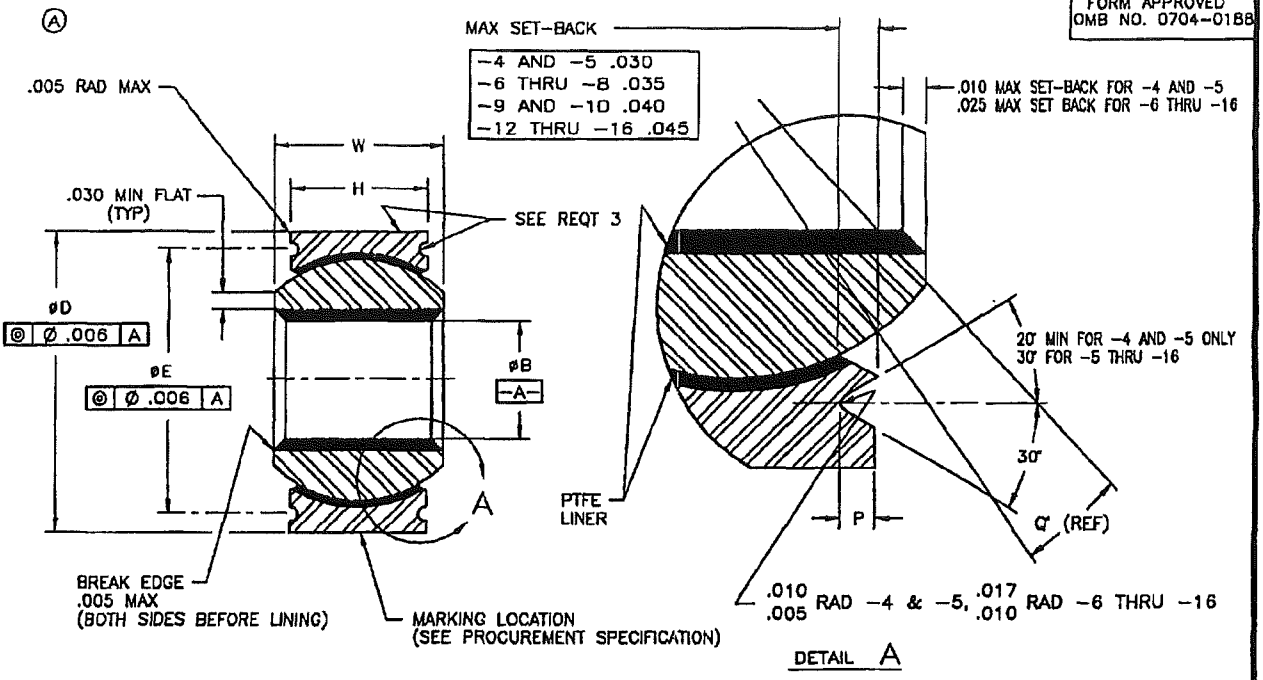
FORM APPROVED
OMB NO. 0704-0188



Ⓐ TABLE I. DIMENSIONS AND STRENGTHS

DASH NO.	øB +.0000 −.0010	øD +.0000 −.0005	H ±.005	P +.000 −.010	Q (REF)	W +.000 −.002	øE +.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)
−4	.2510	.6562	.250	.025	10	.343	.594	5550	430	.2650	1.0–5.0	0–0.5	.020
−5	.3135	.7500	.281	.035	10	.375	.660	7700	700	3700	1.0–15.0	0–1.0	.030
−6	.3760	.8125	.312	.035	9	.406	.712	10200	1100	4900	1.0–15.0	0–1.0	.040
−7	.4385	.9062	.343	.035	8	.437	.806	12950	1400	6700	1.0–15.0	0–1.0	.050
−8	.5010	1.0000	.390	.055	8	.500	.876	17250	2100	8250	1.0–15.0	0–1.0	.070
−9	.5635	1.0937	.437	.055	8	.562	.970	22150	3680	10600	1.0–15.0	0–1.0	.090
−10	.6260	1.1875	.500	.055	8	.625	1.063	27700	4720	13250	1.0–15.0	0–1.0	.120
−12	.7510	1.4375	.593	.055	8	.750	1.313	40600	6750	19400	1.0–15.0	0–1.0	.210
−14	.8760	1.5625	.703	.055	8	.875	1.438	55950	9350	26750	1.0–25.0	0–2.0	.270
−16	1.0010	1.7500	.797	.055	9	1.000	1.626	73800	12160	35250	1.0–25.0	0–2.0	.390

* SEE REQUIREMENT 5 "NO-LOAD TORQUE" AND NOTE 5.

Ⓐ DENOTES CHANGES

PREPARING ACTIVITY: NAVY – AS
CUSTODIANS: ARMY-AV NAVY-
AIR FORCE-99 DLA-
REVIEW: DLA-IS, ARMY-MI
PROJECT NUMBER: 3120-0742-01

MILITARY SPECIFICATION SHEET

TITLE
BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, NARROW, GROOVED OUTER RING, −65° TO 325° F

SPECIFICATION SHEET NUMBER
MIL-B-81820/1 REV A 5 DEC 94

SUPERSEDING
MIL-B-81820/1 31 JAN 90

AMSC – N/A FSC 3120

DD FORM 1 MAY 88 672

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

Ⓐ TABLE II. OVERSIZE BEARING DIMENSIONS 1/ 2/

RESTRICTED USAGE FOR REPAIR WORK ONLY

.010 AND .020 OVERSIZE OUTSIDE DIAMETER FOR REPLACEMENT OF BEARINGS SHOWN ON SHEET 1

DASH NO.	NOMINAL SIZE	1st OVERSIZE øD
-4	.2500	.6662
-5	.3125	.7600
-6	.3750	.8225
-7	.4375	.9162
-8	.5000	1.0100
-9	.5625	1.1037
-10	.6250	1.1975
-12	.7500	1.4475
-14	.8750	1.5725
-16	1.0000	1.7600

DASH NO.	NOMINAL SIZE	2nd OVERSIZE øD
-4	.2500	.6762
-5	.3125	.7700
-6	.3750	.8325
-7	.4375	.9262
-8	.5000	1.0200
-9	.5625	1.1137
-10	.6250	1.2075
-12	.7500	1.4575
-14	.8750	1.5825
-16	1.0000	1.7700

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.

REQUIREMENTS:

OUTER RING: 17-4 PH STEEL ALLOY PER AMS-5643.
LINER: POLYTETRAFLUOROETHYLENE (PTFE) SHALL BE INCLUDED IN THE LINER.

2. SURFACE TEXTURE: BALL DIA Ra 8; BALL FACES, Ra 16; OUTER RACE DIA Ra 32; ALL OTHER METALLIC SURFACES Ra 125. LINER SURFACES ARE EXEMPT FROM SURFACE TEXTURE MEASUREMENTS.

3. SURFACE FINISH:

Ⓐ OUTER RACE: PLATING, WHEN SPECIFIED, SHALL BE ZINC-NICKEL PLATING PER AMS-2417, TYPE 2 OR CADMIUM PLATING PER QQ-P-416, TYPE II, CLASS 2 WITH A THICKNESS RANGE OF 0.0003 TO 0.0006 INCHES.

PLATE ON THE OUTSIDE DIAMETER SURFACE AND ON THE FLAT BETWEEN THE OUTSIDE DIAMETER AND THE GROOVE.

PLATING RUNOUT MAY OCCUR EITHER IN THE GROOVE OR IN THE AREA BETWEEN THE GROOVE AND THE BALL.

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

BALL: PASSIVATE PER MIL-S-5002.

4. HARDNESS: BALL: Rc 43 MIN; OUTER RING: Rc 28 MIN, Rc 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 I. IF THE MEASURED TORQUE OF A " K " TYPE BEARING IS LESS THAN 0.1 INCH-POUND, THE INTERNAL RADIAL CLEARANCE SHALL BE MEASURED AND SHALL NOT EXCEED THE VALUES IN TABLE III. THESE REQUIREMENTS APPLY TO THE TORQUE AND INTERNAL PLAY BETWEEN THE SPHERICAL BALL AND THE OUTER RING. THIS STANDARD DOES NOT DEFINE REQUIREMENTS FOR TORQUE OR INTERNAL PLAY BETWEEN THE BEARING BORE AND SHAFT.

Ⓐ TABLE III. INTERNAL CLEARANCE

DASH NO.	MAXIMUM RADIAL PLAY	MAXIMUM AXIAL PLAY
-4K THRU -12K	0.0007 INCH	0.0028 INCH
-14K THRU -16K	0.0010 INCH	0.0040 INCH

6. BREAK SHARP EDGES AND CORNERS AND REMOVE ALL BURRS AND SLIVERS.

7. DIMENSIONS ARE IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE; DECIMALS ±.010 AND ANGLES ±0.5'.

NOTES:

1. WHEN TESTED TO THE FLUID CONTAMINATION AND SUB-ZERO TEMPERATURE REQUIREMENTS OF THE PROCUREMENT SPECIFICATION, THE OSCILLATING LOAD SHALL BE DECREASED TO 75% OF THE SPECIFIED LOAD.
2. WHEN FLUIDS AND ELEVATED TEMPERATURES (ABOVE 200° F) ARE BOTH PRESENT IN AN APPLICATION, THEN REDUCTIONS IN OPERATING LOADS OR BEARING LIFE MAY BE REQUIRED.
3. DASH NUMBER DESIGNATES NOMINAL BORE DIA IN SIXTEENTHS OF AN INCH.
4. DIMENSION " ØD " TO BE MET AFTER PLATING.
5. (A) EXAMPLE OF PART NO.

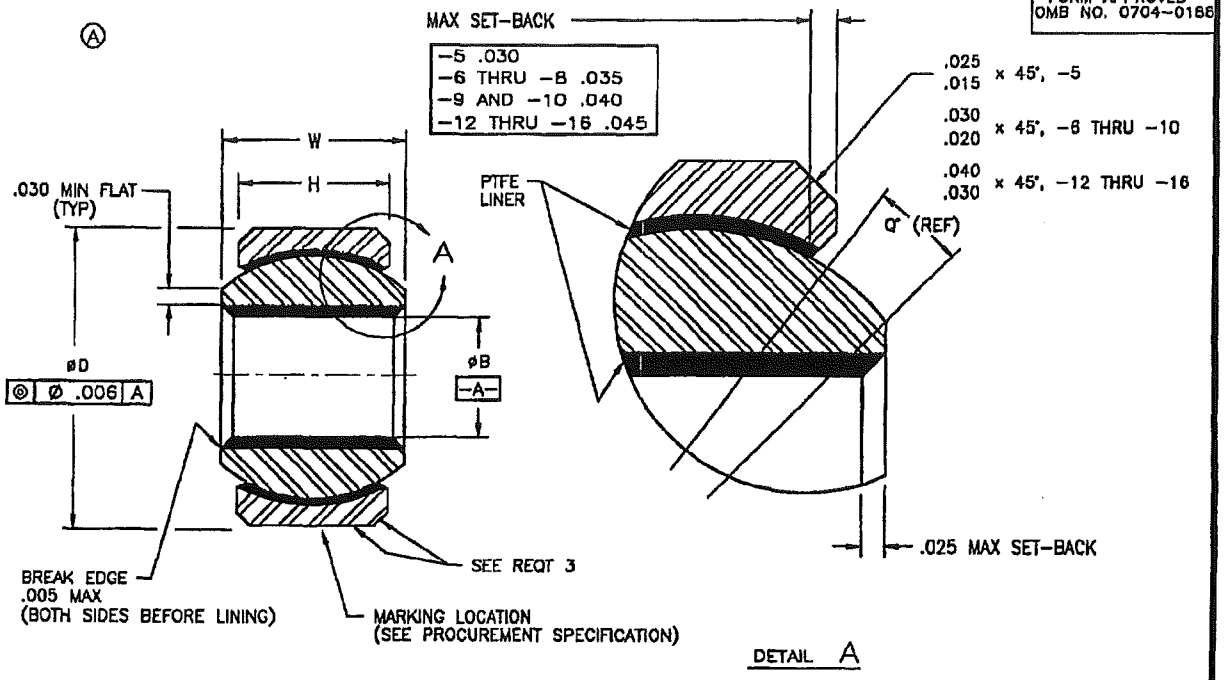
M81820/1 -6 P K T = .375 NOMINAL BORE DIA, PH13-8Mo BALL MATERIAL, ZINC-NICKEL PLATED, LOW TORQUE, .010 INCH OVERSIZE O.D., (DIMENSION ØD).

- ABSENCE OF THE LETTERS " T " AND " U " INDICATE STANDARD OUTER DIAMETER (ØD), (SEE TABLE I).
- T = .010 OVERSIZE ØD (FOR REPAIR ONLY, SEE TABLE II).
- U = .020 OVERSIZE ØD (FOR REPAIR ONLY, SEE TABLE II).
- ABSENCE OF THE LETTER " K " INDICATES STANDARD BREAKAWAY TORQUE (SEE TABLE I).
- LETTER " K " INDICATES LOW BREAKAWAY TORQUE (SEE TABLE I).
- ABSENCE OF THE LETTER " P " INDICATES NO PLATING.
- LETTER " P " INDICATES ZINC-NICKEL OR CADMIUM PLATING (SEE REQUIREMENT 3).
- SIZE - BORE DIAMETER (DASH NO. FROM TABLE I).
- BASIC PART NUMBER.

6. IN THE EVENT OF A CONFLICT BETWEEN THE TEXT OF THIS STANDARD AND THE REFERENCES CITED HEREIN, THE TEXT OF THIS STANDARD SHALL TAKE PRECEDENCE.
7. REFERENCED GOVERNMENT (OR NON-GOVERNMENT) DOCUMENTS OF THE ISSUE LISTED IN THAT ISSUE OF THE DEPARTMENT OF DEFENSE INDEX OF SPECIFICATIONS AND STANDARDS DODISS SPECIFIED IN THE SOLICITATION FORM A PART OF THIS STANDARD TO THE EXTENT SPECIFIED HEREIN.

PREPARING ACTIVITY: NAVY - AS CUSTODIANS: ARMY-AV NAVY- AIR FORCE-99 DLA- REVIEW: DLA-IS, ARMY-MI PROJECT NUMBER: 3120-0742-01	MILITARY SPECIFICATION SHEET TITLE BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, NARROW, GROOVED OUTER RING, -65° TO 325° F	SPECIFICATION SHEET NUMBER MIL-B-81820/1 REV A 5 DEC 94 SUPERSEDING MIL-B-81820/1 31 JAN 90 AMSC - N/A FSC 3120
DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.		PAGE 3 OF 3

FORM APPROVED
OMB NO. 0704-0188



DETAIL A

Ⓐ TABLE I. DIMENSIONS AND STRENGTHS

DASH NO.	øB +.0000 −.0010	øD +.0000 −.0005	H ±.005	α (REF)	W +.000 −.002	STATIC LIMIT LOAD		OSCIL-LATING LOAD LB	NO-LOAD ROTATIONAL BREAKAWAY TORQUE IN-LB		WT LB MAX (REF)
						RADIAL LB	AXIAL LB		STANDARD	* "K" TYPE	
-5	.3135	.6875	.317	14	.437	9250	1640	4450	1.0-15.0	0-1.0	.035
-6	.3760	.8125	.406	8	.500	13000	2630	8200			.060
-7	.4385	.9375	.442	10	.562	17250	3650	8250			.080
-8	.5010	1.0000	.505	9	.625	21400	4970	10600			.100
-9	.5635	1.1250	.536	10	.687	26600	5370	13200			.135
-10	.6260	1.1875	.567	12	.750	29000	6130	16150			.160
-12	.7510	1.3750	.630	13	.875	37000	7730	24800			.240
-14	.8760	1.6250	.755	6	.875	56000	10800	26750	1.0-25.0	0-2.0	.350
-16	1.0010	2.1250	1.005	12	1.375	103300	19300	49300			.970

* SEE REQUIREMENT 5 "NO-LOAD TORQUE" AND NOTE 5.

Ⓐ DENOTES CHANGES

PREPARING ACTIVITY: NAVY - AS CUSTODIANS: ARMY-AV NAVY- AIR FORCE-99 DLA- REVIEW: DLA-IS, ARMY-MI PROJECT NUMBER: 3120-0742-02	MILITARY SPECIFICATION SHEET TITLE BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, WIDE, CHAMFERED OUTER RING, -65° TO 325° F	SPECIFCATION SHEET NUMBER MIL-B-81820/2 REV A 5 DEC 94 SUPERSEDING MIL-B-81820/2 31 JAN 90 AMSC - N/A FSC 3120

Ⓐ

DD FORM 1 MAY 88 672

FORM APPROVED
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Ⓐ TABLE II. OVERSIZE BEARING DIMENSIONS 1/ 2/

RESTRICTED USAGE FOR REPAIR WORK ONLY

.010 AND .020 OVERSIZE OUTSIDE DIAMETER FOR REPLACEMENT OF BEARINGS SHOWN ON SHEET 1

DASH NO.	NOMINAL SIZE	1st OVERSIZE (.010) ØD
-5	.3125	.8975
-6	.3750	.8225
-7	.4375	.9475
-8	.5000	1.0100
-9	.5625	1.1350
-10	.6250	1.1975
-12	.7500	1.3850
-14	.8750	1.6350
-16	1.0000	2.1350

DASH NO.	NOMINAL SIZE	2nd OVERSIZE (.020) ØD
-5	.3125	.7075
-6	.3750	.8325
-7	.4375	.9575
-8	.5000	1.0200
-9	.5625	1.1450
-10	.6250	1.2075
-12	.7500	1.3950
-14	.8750	1.6450
-16	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.

REQUIREMENTS:

1. MATERIAL: BALL: PH13-8 Mo STEEL ALLOY PER AMS-5629, CONDITION H1000.
   OUTER RING: 17-4 PH STEEL ALLOY PER AMS-5643.
   LINER: POLYTETRAFLUOROETHYLENE (PTFE) SHALL BE INCLUDED IN THE LINER.

2. SURFACE TEXTURE: BALL DIA. Ra 8; BALL FACES, Ra 16; OUTER RACE DIA Ra 32; ALL OTHER METALLIC SURFACES Ra 125. LINER SURFACES ARE EXEMPT FROM SURFACE TEXTURE MEASUREMENTS.

3. SURFACE FINISH:

Ⓐ OUTER RACE: PLATING, WHEN SPECIFIED, SHALL BE ZINC-NICKEL PLATING PER AMS-2417, TYPE 2 OR CADMIUM PLATING PER QQ-P-416, TYPE II, CLASS 2 WITH A THICKNESS RANGE OF 0.0003 TO 0.0006 INCHES.

PLATE ON THE OUTSIDE DIAMETER SURFACE AND ON THE CHAMFER.

PLATING RUNOUT SHALL OCCUR IN THE SIDE FACE AREA BETWEEN THE CHAMFER AND THE BALL.

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

BALL: PASSIVATE PER MIL-S-5002.

4. HARDNESS: BALL: Rc 43 MIN; OUTER RING: Rc 28 MIN, Rc 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 I. IF THE MEASURED TORQUE OF A " K " TYPE BEARING IS LESS THAN 0.1 INCH-POUND, THE INTERNAL RADIAL CLEARANCE SHALL BE MEASURED AND SHALL NOT EXCEED THE VALUES IN TABLE III. THESE REQUIREMENTS APPLY TO THE TORQUE AND INTERNAL PLAY BETWEEN THE SPHERICAL BALL AND THE OUTER RING. THIS STANDARD DOES NOT DEFINE REQUIREMENTS FOR TORQUE OR INTERNAL PLAY BETWEEN THE BEARING BORE AND SHAFT.

Ⓐ TABLE III. INTERNAL CLEARANCE

DASH NO.	MAXIMUM RADIAL PLAY	MAXIMUM AXIAL PLAY
-5K THRU -12K	0.0007 INCH	0.0021 INCH
-14K THRU -16K	0.0010 INCH	0.0030 INCH

6. BREAK SHARP EDGES AND CORNERS AND REMOVE ALL BURRS AND SLIVERS.

7. DIMENSIONS ARE IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE; DECIMALS ±.010 AND ANGLES ±0.5°.

FORM APPROVED
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NOTES:

1. WHEN TESTED TO THE FLUID CONTAMINATION AND SUB-ZERO TEMPERATURE REQUIREMENTS OF THE PROCUREMENT SPECIFICATION, THE OSCILLATING LOAD SHALL BE DECREASED TO 75% OF THE SPECIFIED LOAD.
2. WHEN FLUIDS AND ELEVATED TEMPERATURES (ABOVE 200° F) ARE BOTH PRESENT IN AN APPLICATION, THEN REDUCTIONS IN OPERATING LOADS OR BEARING LIFE MAY BE REQUIRED.
3. DASH NUMBER DESIGNATES NOMINAL BORE DIA IN SIXTEENTHS OF AN INCH.
4. DIMENSION " øD " TO BE MET AFTER PLATING.
5. (A) EXAMPLE OF PART NO.

MS1820/2 -6 P K T = .375 NOMINAL BORE DIA, PH13-8Mo BALL MATERIAL, ZINC-NICKEL PLATED, LOW TORQUE, .010 INCH OVERSIZE O.D., (DIMENSION øD).

- ABSENCE OF THE LETTERS " T " AND " U " INDICATE STANDARD OUTER DIAMETER (øD), (SEE TABLE I).
- T = .010 OVERSIZE øD (FOR REPAIR ONLY, SEE TABLE II).
- U = .020 OVERSIZE øD (FOR REPAIR ONLY, SEE TABLE II).
- ABSENCE OF THE LETTER " K " INDICATES STANDARD BREAKAWAY TORQUE (SEE TABLE I).
- LETTER " K " INDICATES LOW BREAKAWAY TORQUE (SEE TABLE I).
- ABSENCE OF THE LETTER " P " INDICATES NO PLATING.
- LETTER " P " INDICATES ZINC-NICKEL OR CADMIUM PLATING (SEE REQUIREMENT 3).
- SIZE - BORE DIAMETER (DASH NO. FROM TABLE I).
- BASIC PART NUMBER.

6. IN THE EVENT OF A CONFLICT BETWEEN THE TEXT OF THIS STANDARD AND THE REFERENCES CITED HEREIN, THE TEXT OF THIS STANDARD SHALL TAKE PRECEDENCE.
7. REFERENCED GOVERNMENT (OR NON-GOVERNMENT) DOCUMENTS OF THE ISSUE LISTED IN THAT ISSUE OF THE DEPARTMENT OF DEFENSE INDEX OF SPECIFICATIONS AND STANDARDS DODISS SPECIFIED IN THE SOLICITATION FORM A PART OF THIS STANDARD TO THE EXTENT SPECIFIED HEREIN.

PREPARING ACTIVITY: NAVY - AS CUSTODIANS: ARMY-AV NAVY- AIR FORCE-99 DLA- REVIEW: DLA-AS, ARMY-MI PROJECT NUMBER: 3120-0742-02	MILITARY SPECIFICATION SHEET TITLE BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, WIDE, CHAMFERED OUTER RING, -65° TO 325° F	SPECIFCATION SHEET NUMBER MIL-B-81820/2 REV A 5 DEC 94 SUPERSEDING MIL-B-81820/2 31 JAN 90 AMSC - N/A FSC 3120

DD FORM 1 MAY 88 672

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

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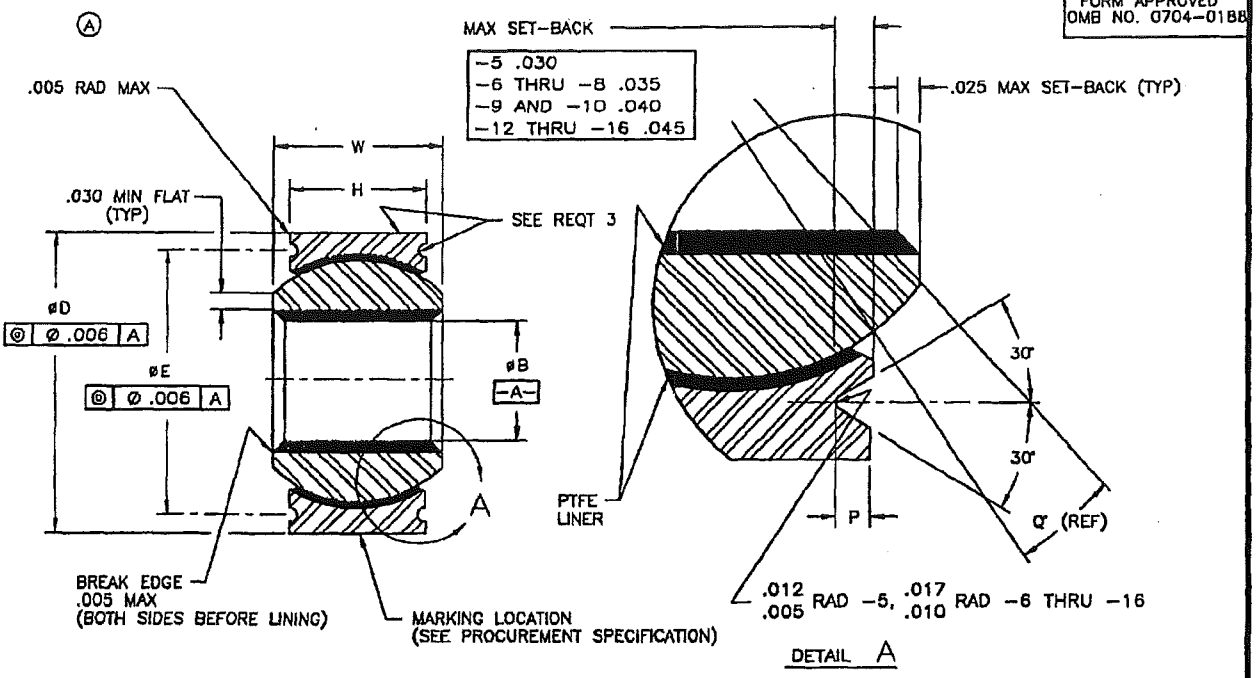
OMB NO. 0704-0188



Ⓐ TABLE I. DIMENSIONS AND STRENGTHS

DASH NO.	øB +.0000 −.0010	øD +.0000 −.0005	H ±.005	P +.000 −.010	Q° (REF)	W +.000 −.002	øE +.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)
-5	.3135	.6875	.317	.025	14	.437	.625	9300	1640	4450	1.0-15.0	0-1.0	.035
-6	.3760	.8125	.406	.035	8	.500	.712	13000	2630	6200			.060
-7	.4385	.9375	.442		10	.562	.837	17300	3650	8250			.080
-7A	.4385	.9062	.442		10	.562	.806	17300	3650	8250			
-8	.5010	1.0000	.505		9	.625	.900	21400	4970	10600			.100
-9	.5635	1.1250	.536		10	.687	1.025	26600	5370	13200			.135
-10	.6260	1.1875	.567		12	.750	1.087	29000	6130	16150			.160
-12	.7510	1.3750	.630	.055	13	.875	1.251	37000	7730	24800			.240
-14	.8760	1.6250	.755		6	.875	1.501	56000	10800	26750	1.0-25.0	0-2.0	.350
-16	1.0010	2.1250	1.005		12	1.375	2.001	103000	19300	49300			.970

* SEE REQUIREMENT 5 "NO-LOAD TORQUE" AND NOTE 5.

Ⓐ DENOTES CHANGES

PREPARING ACTIVITY: NAVY - AS CUSTODIANS: ARMY-AV NAVY- AIR FORCE-99 DLA- REVIEW: DLA-IS, ARMY-MI PROJECT NUMBER: 3120-0742-03	MILITARY SPECIFICATION SHEET TITLE BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, WIDE, GROOVED OUTER RING, -65° TO 325° F	SPECIFCATION SHEET NUMBER MIL-B-81820/3 REV A 5 DEC 94 SUPERSEDING MIL-B-81820/3 31 JAN 90 AMSC - N/A FSC 3120

DD FORM 1 MAY 88 672

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

FORM APPROVED
OMB NO. 0704-0188

Ⓐ TABLE II. OVERSIZE BEARING DIMENSIONS 1/ 2/

RESTRICTED USAGE FOR REPAIR WORK ONLY

.010 AND .020 OVERSIZE OUTSIDE DIAMETER FOR REPLACEMENT OF BEARINGS SHOWN ON SHEET 1

DASH NO.	NOMINAL SIZE	1st OVERSIZE (.010) øD
-5	.3125	.6975
-6	.3750	.8225
-7	.4375	.9475
-7A	.4375	.9162
-8	.5000	1.0100
-9	.5625	1.1350
-10	.6250	1.1975
-12	.7500	1.3850
-14	.8750	1.6350
-16	1.0000	2.1350

DASH NO.	NOMINAL SIZE	2nd OVERSIZE (.020) øD
-5	.3125	.7075
-6	.3750	.8325
-7	.4375	.9575
-7A	.4375	.9262
-8	.5000	1.0200
-9	.5625	1.1450
-10	.6250	1.2075
-12	.7500	1.3950
-14	.8750	1.6450
-16	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.

REQUIREMENTS:

1. MATERIAL: BALL: PH13-8 Mo STEEL ALLOY PER AMS-5629, CONDITION H1000.
   OUTER RING: 17-4 PH STEEL ALLOY PER AMS-5643.
   LINER: POLYTETRAFLUOROETHYLENE (PTFE) SHALL BE INCLUDED IN THE LINER.

2. SURFACE TEXTURE: BALL DIA. Ra 8; BALL FACES, Ra 16; OUTER RACE DIA Ra 32; ALL OTHER METALLIC SURFACES Ra 125. LINER SURFACES ARE EXEMPT FROM SURFACE TEXTURE MEASUREMENTS.

Ⓐ 3. SURFACE FINISH:

   OUTER RACE: PLATING, WHEN SPECIFIED, SHALL BE ZINC-NICKEL PLATING PER AMS-2417, TYPE 2 OR CADMIUM PLATE PER QQ-P-416, TYPE II, CLASS 2 WITH A THICKNESS RANGE OF 0.0003 TO 0.0006 INCHES.

   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.

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

   BALL: PASSIVATE PER MIL-S-5002.

4. HARDNESS: BALL: Rc 43 MIN; OUTER RING: Rc 28 MIN, Rc 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 I. IF THE MEASURED TORQUE OF A " K " TYPE BEARING IS LESS THAN 0.1 INCH-POUND, THE INTERNAL RADIAL CLEARANCE SHALL BE MEASURED AND SHALL NOT EXCEED THE VALUES IN TABLE III. THESE REQUIREMENTS APPLY TO THE TORQUE AND INTERNAL PLAY BETWEEN THE SPHERICAL BALL AND THE OUTER RING. THIS STANDARD DOES NOT DEFINE REQUIREMENTS FOR TORQUE OR INTERNAL PLAY BETWEEN THE BEARING BORE AND SHAFT.

Ⓐ TABLE III. INTERNAL CLEARANCE

DASH NO.	MAXIMUM RADIAL PLAY	MAXIMUM AXIAL PLAY
-5K THRU -12K	0.0007 INCH	0.0021 INCH
-14K THRU -16K	0.0010 INCH	0.0030 INCH

6. BREAK SHARP EDGES AND CORNERS AND REMOVE ALL BURRS AND SLIVERS.

7. DIMENSIONS ARE IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE; DECIMALS ±.010 AND ANGLES ±0.5°.

PREPARING ACTIVITY: NAVY - AS
CUSTODIANS: ARMY-AV NAVY-
AIR FORCE-99 DLA-
REVIEW: DLA-IS, ARMY-MI
PROJECT NUMBER: 3120-0742-03

MILITARY SPECIFICATION SHEET

TITLE
BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, WIDE, GROOVED OUTER RING, -65° TO 325° F

SPECIFICATION SHEET NUMBER
MIL-B-81820/3 REV A 5 DEC 94
SUPERSEDING
MIL-B-81820/3 31 JAN 90
AMSC - N/A FSC 3120

DD FORM 1 MAY 88 672 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

NOTES:

1. WHEN TESTED TO THE FLUID CONTAMINATION AND SUB-ZERO TEMPERATURE REQUIREMENTS OF THE PROCUREMENT SPECIFICATION, THE OSCILLATING LOAD SHALL BE DECREASED TO 75% OF THE SPECIFIED LOAD.
2. WHEN FLUIDS AND ELEVATED TEMPERATURES (ABOVE 200° F) ARE BOTH PRESENT IN AN APPLICATION, THEN REDUCTIONS IN OPERATING LOADS OR BEARING LIFE MAY BE REQUIRED.
3. DASH NUMBER DESIGNATES NOMINAL BORE DIA IN SIXTEENTHS OF AN INCH.
4. DIMENSION " øD " TO BE MET AFTER PLATING.
5. (A) EXAMPLE OF PART NO.

MB1820/3 -6 P K T = .375 NOMINAL BORE DIA, PH13-8Mo BALL MATERIAL, ZINC-NICKEL PLATED, LOW TORQUE, .010 INCH OVERSIZE O.D., (DIMENSION øD).

- ABSENCE OF THE LETTERS " T " AND " U " INDICATE STANDARD OUTER DIAMETER (øD), (SEE TABLE I).
  - T = .010 OVERSIZE øD (FOR REPAIR ONLY, SEE TABLE II).
  - U = .020 OVERSIZE øD (FOR REPAIR ONLY, SEE TABLE II).
- ABSENCE OF THE LETTER " K " INDICATES STANDARD BREAKAWAY TORQUE (SEE TABLE I).
  - LETTER " K " INDICATES LOW BREAKAWAY TORQUE (SEE TABLE I).
- ABSENCE OF THE LETTER " P " INDICATES NO PLATING.
  - LETTER " P " INDICATES ZINC-NICKEL OR CADMIUM PLATING (SEE REQUIREMENT 3).
- SIZE - BORE DIAMETER (DASH NO. FROM TABLE I).
- BASIC PART NUMBER.

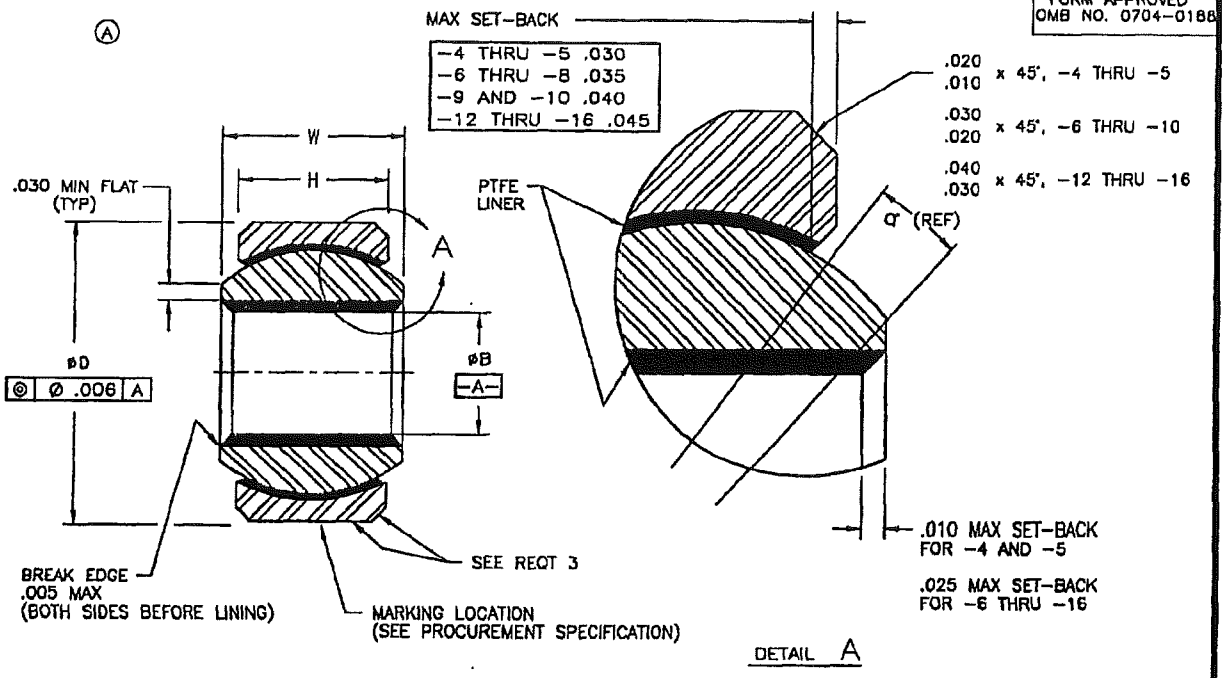
6. IN THE EVENT OF A CONFLICT BETWEEN THE TEXT OF THIS STANDARD AND THE REFERENCES CITED HEREIN, THE TEXT OF THIS STANDARD SHALL TAKE PRECEDENCE.
7. REFERENCED GOVERNMENT (OR NON-GOVERNMENT) DOCUMENTS OF THE ISSUE LISTED IN THAT ISSUE OF THE DEPARTMENT OF DEFENSE INDEX OF SPECIFICATIONS AND STANDARDS DODISS SPECIFIED IN THE SOLICITATION FORM A PART OF THIS STANDARD TO THE EXTENT SPECIFIED HEREIN.

PREPARING ACTIVITY: NAVY - AS CUSTODIANS: ARMY-AV NAVY- AIR FORCE-99 DLA- REVIEW: DLA-IS, ARMY-MI PROJECT NUMBER: 3120-0742-03	MILITARY SPECIFICATION SHEET TITLE BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, WIDE, GROOVED OUTER RING, -65° TO 325° F	SPECIFCATION SHEET NUMBER MIL-B-81820/3 REV A 5 DEC 94 SUPERSEDING MIL-B-81820/3 31 JAN 90 AMSC - N/A FSC 3120

DD FORM 1 MAY 88 672

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

FORM APPROVED
OMB NO. 0704-0188



DETAIL A

Ⓐ TABLE I. DIMENSIONS AND STRENGTHS

DASH NO.	øB +.0000 −.0010	øD +.0000 −.0005	H ±.005	α (REF)	W +.000 −.002	STATIC LIMIT LOAD		OSCILLATING LOAD LB	NO-LOAD ROTATIONAL BREAKAWAY TORQUE IN-LB		WT LB MAX (REF)
						RADIAL LB	AXIAL LB		STANDARD	"K" * TYPE	
-4	.2510	.6562	.250	10	.343	5550	430	2650	1.0-5.0	0-0.5	.020
-5	.3135	.7500	.281	10	.375	7700	700	3700			.030
-6	.3760	.8125	.312	9	.406	10200	1100	4900			.040
-7	.4385	.9062	.343	8	.437	12950	1400	6700			.050
-8	.5010	1.0000	.390	8	.500	17250	2100	8250	1.0-15.0	0-1.0	.070
-9	.5635	1.0937	.437	8	.562	22150	3680	10600			.090
-10	.6260	1.1875	.500	8	.625	27700	4720	13250			.120
-12	.7510	1.4375	.593	8	.750	40600	6750	19400			.210
-14	.8760	1.5625	.703	8	.875	55950	9350	26750	1.0-25.0	0-2.0	.270
-16	1.0010	1.7500	.797	9	1.000	73800	12160	35250			.390

* SEE REQUIREMENT 5 "NO-LOAD TORQUE" AND NOTE 5.

Ⓐ DENOTES CHANGES

PREPARING ACTIVITY: NAVY - AS CUSTODIANS: ARMY-AV NAVY- AIR FORCE-99 DLA- REVIEW: DLA-IS, ARMY-MI PROJECT NUMBER: 3120-0742-04	MILITARY SPECIFICATION SHEET TITLE BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, NARROW, CHAMFERED OUTER RING, -65° TO 325° F	SPECIFCATION SHEET NUMBER MIL-B-81820/4 REV A 5 DEC 94 SUPERSEDING MIL-B-81820/4 31 JAN 90 AMSC - N/A FSC 3120

DD FORM 1 MAY 88 672

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FORM APPROVED
OMB NO. 0704-018

Ⓐ TABLE II. OVERSIZE BEARING DIMENSIONS 1/ 2/

RESTRICTED USAGE FOR REPAIR WORK ONLY

.010 AND .020 OVERSIZE OUTSIDE DIAMETER FOR REPLACEMENT OF BEARINGS SHOWN ON SHEET 1

DASH NO.	NOMINAL SIZE	1st OVERSIZE (.010) ØD
-4	.2500	.6662
-5	.3125	.7600
-6	.3750	.8225
-7	.4375	.9162
-8	.5000	1.0100
-9	.5625	1.1037
-10	.6250	1.1975
-12	.7500	1.4475
-14	.8750	1.5725
-16	1.0000	1.7600

DASH NO.	NOMINAL SIZE	2nd OVERSIZE (.020) ØD
-4	.2500	.6762
-5	.3125	.7700
-6	.3750	.8325
-7	.4375	.9262
-8	.5000	1.0200
-9	.5625	1.1137
-10	.6250	1.2075
-12	.7500	1.4575
-14	.8750	1.5825
-16	1.0000	1.7700

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.

REQUIREMENTS:

1. MATERIAL: BALL: PH13-8 Mo STEEL ALLOY PER AMS-5629, CONDITION H1000.
   OUTER RING: 17-4 PH STEEL ALLOY PER AMS-5643.
   LINER: POLYTETRAFLUOROETHYLENE (PTFE) SHALL BE INCLUDED IN THE LINER.

2. SURFACE TEXTURE: BALL DIA. Ra 8; BALL FACES, Ra 16; OUTER RACE DIA Ra 32; ALL OTHER METALLIC SURFACES Ra 125. LINER SURFACES ARE EXEMPT FROM SURFACE TEXTURE MEASUREMENTS.

Ⓐ 3. SURFACE FINISH:

   OUTER RACE: PLATING, WHEN SPECIFIED, SHALL BE ZINC-NICKEL PLATING PER AMS-2417, TYPE 2 OR CADMIUM PLATING PER QQ-P-416, TYPE II, CLASS 2 WITH A THICKNESS RANGE OF 0.0003 TO 0.0006 INCHES.

   PLATE ON THE OUTSIDE DIAMETER SURFACE AND ON THE CHAMFER.

   PLATING RUNOUT SHALL OCCUR IN THE SIDE FACE AREA BETWEEN THE CHAMFER AND THE BALL.

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

   BALL: PASSIVATE PER MIL-S-5002.

4. HARDNESS: BALL: Rc 43 MIN; OUTER RING: Rc 28 MIN, Rc 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 I. IF THE MEASURED TORQUE OF A " K " TYPE BEARING IS LESS THAN 0.1 INCH-POUND, THE INTERNAL RADIAL CLEARANCE SHALL BE MEASURED AND SHALL NOT EXCEED THE VALUES IN TABLE III. THESE REQUIREMENTS APPLY TO THE TORQUE AND INTERNAL PLAY BETWEEN THE SPHERICAL BALL AND THE OUTER RING. THIS STANDARD DOES NOT DEFINE REQUIREMENTS FOR TORQUE OR INTERNAL PLAY BETWEEN THE BEARING BORE AND SHAFT.

Ⓐ TABLE III. INTERNAL CLEARANCE

DASH NO.	MAXIMUM RADIAL PLAY	MAXIMUM AXIAL PLAY
-4K THRU -12K	0.0007 INCH	0.0028 INCH
-14K THRU -16K	0.0010 INCH	0.0040 INCH

6. BREAK SHARP EDGES AND CORNERS AND REMOVE ALL BURRS AND SLIVERS.

7. DIMENSIONS ARE IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE; DECIMALS ±.010 AND ANGLES ±0.5'.

PREPARING ACTIVITY: NAVY - AS
CUSTODIANS: ARMY-AV NAVY-
AIR FORCE-99 DLA-
REVIEW: DLA-IS, ARMY-MI
PROJECT NUMBER: 3120-0742-04

MILITARY SPECIFICATION SHEET

TITLE
BEARING, PLAIN, SELF-ALIGNING, SELF-LUBRICATING, LINED BORE, LOW SPEED, NARROW, CHAMFERED OUTER RING, -65' TO 325' F

SPECIFCATION SHEET NUMBER
MIL-B-81820/4 REV A 5 DEC

SUPERSEDING
MIL-B-81820/4 31 JAN

AMSC - N/A FSC 3120

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