FEDERAL SUPPLY CLASS
3110

RATIONALE

THIS STANDARD DEFINES A CORROSION RESISTANT NITROGEN (CREN) STEEL VERSION OF THE AS27645 (KSP) AIRFRAME BEARING SERIES.

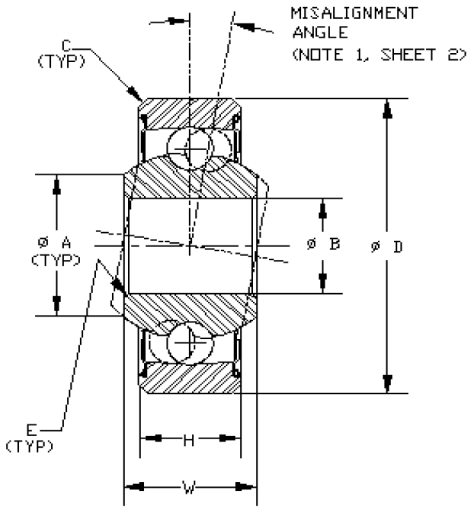


FIGURE 1 – CREN AIRFRAME BEARING

GENERAL NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.

2. THIS SPECIFICATION TAKES PRECEDENCE OVER ANY OTHER DOCUMENTS REFERENCED HEREIN.

3. UNLESS OTHERWISE SPECIFIED, REFERENCED DOCUMENTS ARE THE ISSUES IN EFFECT AT THE DATE OF INVITATION FOR BID.

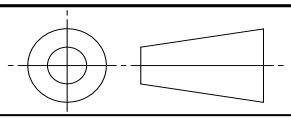
   DEPARTMENT OF DEFENSE (DoD) SOLICITATIONS: THE APPLICABLE REVISION OF THE DEPARTMENT OF DEFENSE INDEX OF SPECIFICATIONS AND STANDARDS (DoDISS) SPECIFIED IN THE SOLICITATION SHALL INDICATE THE GOVERNING REVISION OF ANCILLARY DOCUMENTS SPECIFIED HEREIN.

4. A CHANGE BAR (|) LOCATED IN THE LEFT MARGIN IS FOR THE CONVENIENCE OF THE USER IN LOCATING AREAS WHERE TECHNICAL REVISIONS, NOT EDITORIAL CHANGES, HAVE BEEN MADE TO THE PREVIOUS ISSUE OF THIS DOCUMENT. AN (R) SYMBOL TO THE LEFT OF THE DOCUMENT TITLE INDICATES A COMPLETE REVISION OF THE DOCUMENT, INCLUDING TECHNICAL REVISIONS. CHANGE BARS AND (R) ARE NOT USED IN ORIGINAL PUBLICATIONS, NOR IN DOCUMENTS THAT CONTAIN EDITORIAL CHANGES ONLY.

5. THIS DOCUMENT INCLUDES CADMIUM AS A PLATING MATERIAL. THE USE OF CADMIUM HAS BEEN RESTRICTED AND/OR BANNED FOR USE IN MANY COUNTRIES DUE TO ENVIRONMENTAL AND HEALTH CONCERNS. THE USER SHOULD CONSULT WITH LOCAL OFFICIALS ON APPLICABLE HEALTH AND ENVIRONMENTAL REGULATIONS REGARDING ITS USE.

6. BEARINGS CONFORMING TO THIS STANDARD SHALL MEET THE MANUFACTURING, PERFORMANCE, AND QUALIFICATION REQUIREMENTS OF AEROSPACE STANDARD AS7949.

THIRD ANGLE PROJECTION



ISSUED 2011-03

CUSTODIAN: AIRFRAME CONTROL BEARINGS GROUP

PROCUREMENT SPECIFICATION: AS7949

SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

BEARING, BALL, AIRFRAME, ANTI-FRICTION, SELF-ALIGNING, LIGHT AND HEAVY DUTY, CORROSION RESISTANT NITROGEN STEEL (CREN)

SAE AS27645/1

TABLE 1 - DIMENSIONS, LOAD RATINGS, AXIAL PLAY, WEIGHT, AND TORQUE

AS DASH NO.	DIAMETER				WIDTH		SHOULDER DIAMETER	CORNER CHAMFER X 45 DEG		STATIC LIMIT LOAD RATING		DYNAMIC RADIAL LOAD RATING		MAX. AXIAL PLAY	APPROX. WEIGHT	MAX. STARTING TORQUE	MIN. TORQUE TO DISLODGE SEALS
	INNER		OUTER		INNER RING	OUTER RING	INNER RING	INNER RING	OUTER RING	RADIAL	THRUST	CASE I	CASE II				
	(2) Ø B		(2) (3) Ø D		(3) W	(3) H	(3) Ø A	(3)(4) E	(3)(5) C			(6)(7)(9)	(6)(8)(9)	(10)		(11)	
	NOMINAL DIM.	TOL.	NOMINAL DIM.	TOL.	+.000 -.005	+.000 -.005	(REF)	+.015 -.000	+.015 -.000	[LBS]	[LBS]	[LBS]	[LBS]		[LBS]	[IN-OZ]	[IN-LB]
-3A	.1900	+.0000 -.0005	.6250	+.0000 -.0005	.245	.203	.253	.005	.016	550	100	550	480	.023	.01	1.0	4
-4A	.2500		.7500		.281	.219	.321			900	200	900	770	.025		1.0	6
-5A	.3125		.8125		.297	.234	.381	.015		1000		950	815	.028	.02	2.0	10
-6A	.3750		.8750		.313	.250	.453	.016		1120		1120	990	.030		3.0	8
-3	.1900	+.0000 -.0005	.7774	+.0000 -.0005	.297	.270	.290	.005	.022	900	200	900	770	.023	.03	1.0	6
-4	.2500		.9014		.484	.335	.390		.032	1410	300	1230	1230	.025	.04	1.0	5
-5	.3125		1.2500		.558	.375	.561	.015		2190		2190	1890	.028	.10	2.0	16
-6	.3750		1.4375		.620	.469	.607			2980	400	2980	2580	.030	.15	3.0	18
-8	.5000		1.6875		.620	.500	.791		.044	3670	500	3670	3290	.032	.23	4.0	20
-10	.625		1.9375		.813	.625	.916			5320	600	4980	4360	.034	.37	6.0	25

(1) MISALIGNMENT ANGLE:
APPLICATION GUIDELINE: FOR DESIGN PURPOSES, MISALIGNMENT ANGLE NOT TO EXCEED 8 DEGREES (-4A, -5A, -6A) OR 10 DEGREES (ALL OTHER SIZES) IN EITHER DIRECTION.
(SEAL RUBBING AND/OR DISPLACEMENT MAY OCCUR FOR LARGER ANGLES.)
PERFORMANCE REQUIREMENT: THE BEARING SHALL ACCOMMODATE A MINIMUM OF 8 DEGREES (-4A, -5A, -6A) OR 10 DEGREES (ALL OTHER SIZES) MISALIGNMENT IN EITHER DIRECTION.

(2) OUT-OF-ROUND TOLERANCES:

ID	OD
+.0002 TO -.0007	+.0005 TO -.0010

(3) IF APPLICABLE, ALL DIMENSIONS TO BE MET AFTER PLATING.

(4) A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE AND MAINTAINING DIMENSION "E" IS ACCEPTABLE IN LIEU OF THE 45 DEGREE FLAT CHAMFER SURFACE.

(5) A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING AND MAINTAINING DIMENSION "C" IS ACCEPTABLE IN LIEU OF THE 45 DEGREE FLAT SURFACE CHAMFER.

(6) LOAD RATINGS ARE FOR OPERATION UP TO 250 °F. REDUCE LOAD RATING BY 20% FOR OPERATION IN THE 250 °F TO 350 °F RANGE.

(7) CASE I: LOAD IS FIXED WITH RESPECT TO THE OUTER RING.

(8) CASE II: LOAD IS FIXED WITH RESPECT TO THE INNER RING.

(9) DYNAMIC RADIAL LOAD RATINGS FOR AN AVERAGE LIFE OF 10,000 COMPLETE 90 DEGREE CYCLES.

(10) SAME AS "AXIAL INTERNAL CLEARANCE"

(11) SPECIFIED LIMITS ARE FOR BEARINGS LUBRICATED WITH MIL-PRF-81322 GREASE. FOR BEARINGS LUBRICATED WITH AEROSHELL® 33 GREASE OR EQUIVALENT, MULTIPLY THE SPECIFIED TORQUE VALUE BY 1.2.

REQUIREMENTS

1. MATERIAL

   RINGS: CORROSION RESISTANT NITROGEN STEEL (CREN) PER AMS5898 OR AMS5925.

   BALLS: CORROSION RESISTANT NITROGEN STEEL (CREN) PER AMS5898 OR AMS5925.

   SEALS: POLYTETRAFLUOROETHYLENE (PTFE) PER AMS3652 OR GLASS FABRIC REINFORCED PTFE SHEET PER AMS3666.

   SEAL RETAINERS: ANY CORROSION RESISTANT STEEL.

2. HARDNESS

   RINGS AND BALLS, ROCKWELL "C" 58 MINIMUM.

3. STABILITY

   RINGS AND BALLS SHALL BE STABILIZED FOR OPERATION UP TO 350 °F.

4. LUBRICANT

   NO LUBRICANT SUFFIX CODE — MIL-PRF-81322 GREASE, 80 % MINIMUM FULL

   OR

   SUFFIX CODE "G" — AEROSHELL® GREASE 33 0R EQUIVALENT, 80 % MINIMUM FULL. BEARINGS LUBRICATED WITH AEROSHELL® GREASE 33 SHALL BE MARKED WITH LUBRICANT SUFFIX CODE “G”.

   AEROSHELL® GREASE 33 IS A REGISTERED TRADEMARK OF THE SHELL OIL PRODUCTS COMPANY, ONE SHELL PLAZA. P.O. BOX 2463, HOUSTON, TX 77001.

   CAUTION: AEROSHELL® GREASE 33 0R EQUIVALENT SHALL NOT BE USED FOR OPERATIONAL TEMPERATURES IN EXCESS OF 250 °F.

5. SURFACE TEXTURE

   RACEWAYS AND BALLS, 8 µ - INCH Ra MAX. PER ANSI/ABMA B46.1.

6. SURFACE TREATMENT

   NO SURFACE TREATMENT SUFFIX CODE — ALL EXTERNAL SURFACES EXCEPT BORE AND SEALS SHALL BE PLATED WITH ONE OF THE FOLLOWING MATERIALS:

   a. ZINC NICKEL PER AMS2417, TYPE 2, .0003 TO .0006 THICK.

   b. CADMIUM PER AMS-QQ-P-416, TYPE I, CLASS 2, .0003 TO .0006 THICK.

   OR

   SUFFIX CODE “P” — ALL SURFACES SHALL BE PASSIVATED IN ACCORDANCE WITH AMS2700, METHOD 2 (CITRIC ACID), OR ASTM A 967, CITRIC I, II, OR III. PASSIVATED BEARINGS SHALL BE MARKED WITH SURFACE TREATMENT SUFFIX CODE "P".

   CAUTION: INNER AND OUTER RING COMPONENTS SHALL HAVE THE SAME TYPE OF SURFACE TREATMENT.

7. RADIAL INTERNAL CLEARANCE

   NO CLEARANCE SUFFIX CODE — .0000 TO .0010

   OR

   REDUCED CLEARANCE SUFFIX CODE "R" — .0001 TO .0005

8. ECCENTRICITIES

   RADIAL

   INNER RING: .0010 MAXIMUM
   OUTER RING: .0016 MAXIMUM