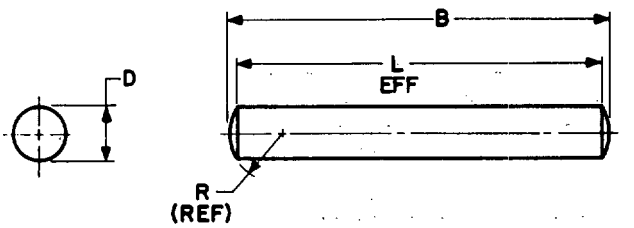
FED. SUP CLASS
3110



MS PART NO.	D ROLLER DIA. +.0000 -.0002	B ROLLER LENGTH +.000 -.020	ℓ_{eff} EFFECTIVE LENGTH
MS19065-1	.0312	.190	.182
MS19065-2	.0312	.250	.242
MS19065-3	.0312	.310	.302
MS19065-4	.0469	.250	.238
MS19065-5	.0469	.310	.298
MS19065-6	.0469	.380	.368
MS19065-7	.0469	.440	.428
MS19065-8	.0625	.380	.354
MS19065-9	.0625	.440	.424
MS19065-10	.0625	.500	.484
MS19065-11	.0625	.560	.544
MS19065-12	.0625	.620	.604
MS19065-13	.0781	.440	.421
MS19065-14	.0781	.500	.481
MS19065-15	.0781	.560	.541
MS19065-16	.0781	.620	.601
MS19065-17	.0781	.690	.671
MS19065-18	.0781	.750	.731
MS19065-19	.0938	.560	.537
MS19065-20	.0938	.620	.597
MS19065-21	.0938	.690	.667
MS19065-22	.0938	.750	.727
MS19065-23	.0938	.810	.787
MS19065-24	.0938	.880	.857

MS PART NO.	D ROLLER DIA. +.0000 -.0002	B ROLLER LENGTH +.000 -.020	ℓ_{eff} EFFECTIVE LENGTH
MS19065-25	.1094	.620	.593
MS19065-26	.1094	.750	.723
MS19065-27	.1094	.880	.853
MS19065-28	.1094	1.000	.973
MS19065-29	.1250	.750	.719
MS19065-30	.1250	.880	.849
MS19065-31	.1250	1.000	.969
MS19065-32	.1250	1.120	1.089
MS19065-33	.1250	1.250	1.219
MS19065-34	.1562	1.000	.961
MS19065-35	.1562	1.250	1.211
MS19065-36	.1562	1.500	1.461
MS19065-37	.1875	1.000	.953
MS19065-38	.1875	1.250	1.203
MS19065-39	.1875	1.500	1.453
MS19065-40	.2188	1.000	.945
MS19065-41	.2188	1.250	1.195
MS19065-42	.2188	1.500	1.445
MS19065-43	.2500	.500	.437
MS19065-44	.2500	.750	.687
MS19065-45	.2500	1.000	.937
MS19065-46	.2500	1.250	1.187
MS19065-47	.2500	1.500	1.437
MS19065-48	.2500	1.750	1.687

1. MATERIAL: CHROME ALLOY STEEL, NUMBER E50100, E51100, or E52100 of FED-STD-66

2. SURFACE ROUGHNESS: EFFECTIVE ROLLER SURFACE ROUGHNESS, 8 MICROINCHES RHR OR LESS, IN ACCORDANCE WITH ANSI B-46.1 SURFACE TEXTURE (SURFACE ROUGHNESS, WAVINESS AND LAY)

3. HARDNESS: ROLLERS 1/8 INCH DIA. AND BELOW, ROCKWELL "A" SCALE 81.2 TO 83.4
ROLLERS ABOVE 1/8 INCH DIA., ROCKWELL "C" SCALE 60 TO 64
IN ACCORDANCE WITH ASTM E 18 Test for Rockwell Hardness of Metallic Materials
NOTE: Tests should be made on flats of sufficient width to give a true reading.

4. WORKMANSHIP: Cylindrical surface of the roller shall be free from scratches, pits, rust, indications of soft spots, and other surface imperfections.

5. DIMENSIONING AND TOLERANCING: Dimensioning and Tolerancing shall be in conformance with ANSI Y-14.5 (Dimensioning and Tolerancing for Engineering Drawings).

6. NOTE: "R(REF)." The radius "R" equals the roller diameter "D" approximately.
"ℓ_{eff}." Dimension is to be used for calculating capacities only.

SEE SHEET 2 FOR RECOMMENDED LOAD-LIFE DATA

For design feature purposes, this standard takes precedence over procurement documents referenced herein.

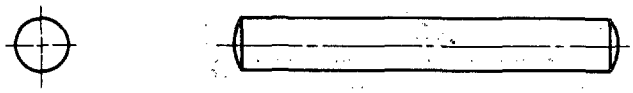
Referenced documents shall be of the issue in effect on date of invitations for bid.

(A) REDRAWN

APPROVED 23 OCT 1957 REVISED (A) 4 MARCH 1973

P.A. NAVY - OS Other Cust ARMY - AT AIR FORCE - 11	TITLE ROLLER, BEARING, FERROUS, SOLID, SPHERICAL END	MILITARY STANDARD MS 19065
PROCUREMENT SPECIFICATION MIL-R-22440	SUPERSEDES:	SHEET 1 OF 2

DD FORM 1 SEP 67 672-1 (Coordinated) PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. PLATE NO. 15320



RECOMMENDED LOAD-LIFE DATA

The "rating life," L_{10}, of a group of apparently identical roller bearings is the life in millions of revolutions that 90 percent of the group will complete or exceed. For a single bearing, L_{10} also refers to the life associated with 90 percent reliability. As presently determined, the life which 50 percent of the group of roller bearings will complete or exceed ("median life," L_{50}) is usually not greater than five times the RATING LIFE.

The "basic load rating," C, for a radial roller bearing is that calculated, constant, radial load which a group of apparently identical bearings with stationary outer raceway can theoretically endure for a rating life of one million revolutions of the inner raceway. The basic load rating is a reference value only, the base value of one million revolutions rating life having been chosen for ease of calculation. Since applied loading as great as the basic load rating tends to cause local plastic deformation of the rolling surfaces, it is not anticipated that such heavy loading would normally be applied.

The basic load rating formula is intended as a guide in selecting the proper roller complement. The specific basic load rating for a group of needle rollers assembled in a full complement (cage-less) needle roller bearing can be calculated by the following formula:

$$\text{Basic Load Rating, } C = AD^{29/27}\,\ell_{eff}^{7/9}$$

where

A = A function of the number of rollers per path and is obtained from the table below

D = Roller diameter in inches

ℓ_{eff} = Effective length of roller contact in inches

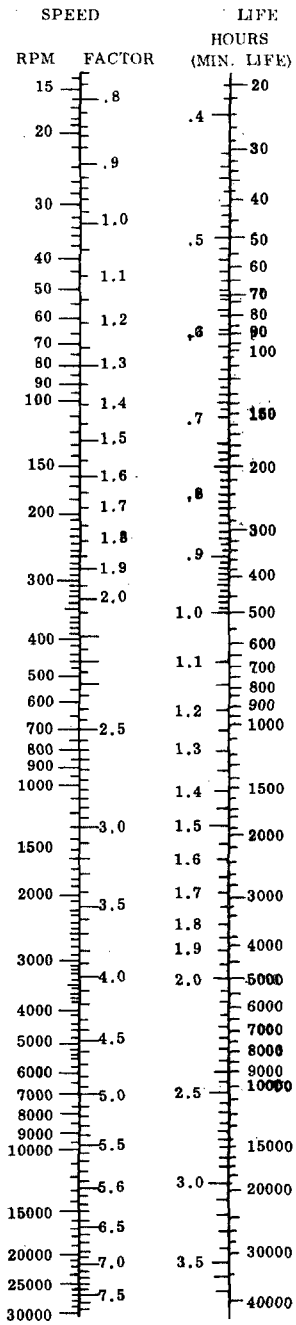
The allowable bearing load for a given bearing speed and a required rating life can be calculated by use of the following formula:

$$\text{BEARING RADIAL LOAD CAPACITY AT GIVEN CONDITIONS} = \frac{\text{BASIC LOAD RATING}}{\text{SPEED FACTOR} \times \text{LIFE FACTOR}}$$

The speed and life factors are obtained from the line graphs for a given bearing RPM and a given bearing life.

Table I

Number rollers	A	Number rollers	A	Number rollers	A	Number rollers	A
6	15,400	19	53,200	33	75,700	47	92,400
7	19,800	20	55,200	34	77,000	48	93,500
8	23,700	21	57,100	35	78,300	49	94,600
9	27,300	22	58,900	36	79,600	50	95,700
10	30,700	23	60,700	37	80,900	51	96,800
11	33,700	24	62,300	38	82,200	52	97,900
12	36,700	25	63,900	39	83,500	53	99,000
13	39,300	26	65,500	40	84,700	54	100,000
14	41,800	27	67,100	41	85,800	55	101,100
15	44,300	28	68,600	42	86,900	56	102,100
16	46,700	29	70,100	43	88,000	57	103,200
17	48,900	30	71,600	44	89,100	58	104,300
18	51,100	31	73,000	45	90,200	59	105,400
		32	74,400	46	91,300	60	106,400



FOR CHANGES SEE SHEET 1

REVISED (A)

APPROVED 23 OCT 1957

P.A. NAVY - OS Other Cust ARMY - AT AIR FORCE - 11	TITLE ROLLER, BEARING, FERROUS, SOLID, SPHERICAL END	MILITARY STANDARD MS 19065
PROCUREMENT SPECIFICATION MIL-R-22440	SUPERSEDES:	SHEET 2 OF 2