FEDERAL SUPPLY CLASS
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ISSUED 1998-04 REVISED 1999-12

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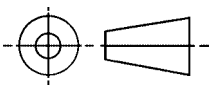

PREPARED BY AIRFRAME CONTROL BEARINGS GROUP

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
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# AEROSPACE STANDARD

BEARING, ROLLER, NEEDLE, SINGLE ROW, HEAVY DUTY, TYPE I, ANTIFRICTION, INCH

**AS24461**
SHEET 1 OF 5

**REV. B**



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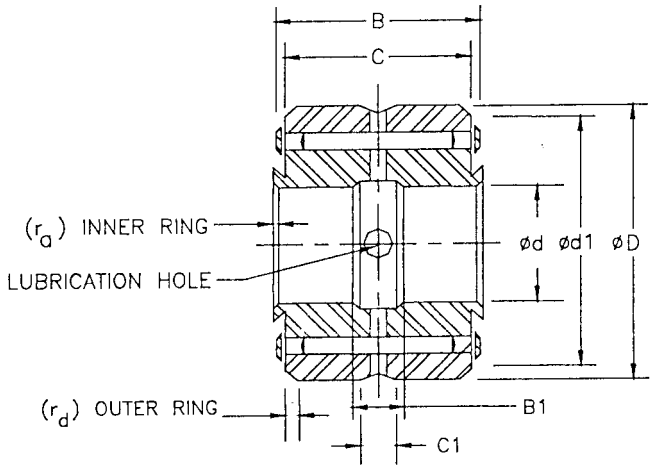


TABLE I

Dimensions in inches

| Dash No. | Ød Bore | ØD Outer Ring Outer Dia. | ØB Overall Width | C Outer Ring Width | $Ød_1$ Washer Outside Dia. | $B_1$ Lubri-cation Groove Width | $C_1$ Lubri-cation Groove Width | $R_a$ 1/ Fillet Max. | Total Radial Internal Clearance Max. | Clamp-Ing Dia. Min. | Limits Load Rating Ibf | Mass (approx) ib |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -3 | 0.1900 | 0.6875 | 0.312 | 0.218 | 0.625 | None | 0.062 | 0.022 | 0.0017 | 0.438 | 1800 | 0.028 |
| -4 | 0.2500 | 0.7500 | 0.375 | 0.281 | 0.687 | None | 0.093 | 0.022 | 0.0017 | 0.516 | 2870 | 0.040 |
| -5 | 0.3125 | 0.8125 | 0.437 | 0.344 | 0.750 | None | 0.093 | 0.022 | 0.0017 | 0.578 | 4080 | 0.057 |
| -6 | 0.3750 | 0.8750 | 0.562 | 0.469 | 0.812 | 0.188 | 0.125 | 0.022 | 0.0018 | 0.641 | 6330 | 0.075 |
| -7 | 0.4375 | 0.9375 | 0.625 | 0.531 | 0.875 | 0.188 | 0.125 | 0.032 | 0.0018 | 0.703 | 8000 | 0.097 |
| -8 | 0.5000 | 1.1250 | 0.750 | 0.781 | 1.031 | 0.188 | 0.125 | 0.032 | 0.0018 | 0.844 | 11600 | 0.165 |
| -9 | 0.5625 | 1.1875 | 0.875 | 0.906 | 1.094 | 0.188 | 0.156 | 0.032 | 0.0019 | 0.891 | 15000 | 0.207 |
| -10 | 0.6250 | 1.2500 | 1.000 | 1.000 | 1.156 | 0.250 | 0.156 | 0.032 | 0.0019 | 0.953 | 18900 | 0.252 |
| -12 | 0.7500 | 1.3750 | 1.125 | 1.125 | 1.281 | 0.250 | 0.156 | 0.032 | 0.0019 | 1.078 | 23900 | 0.336 |
| -14 | 0.8750 | 1.6250 | 1.250 | 1.125 | 1.500 | 0.375 | 0.156 | 0.032 | 0.0022 | 1.250 | 30500 | 0.423 |
| -16 | 1.0000 | 1.7500 | 1.250 | 1.049 | 1.625 | 0.375 | 0.156 | 0.032 | 0.0026 | 1.375 | 33900 | 0.51 |
| -20 | 1.2500 | 2.0000 | 1.250 | 1.049 | 1.906 | 0.375 | 0.156 | 0.032 | 0.0026 | 1.625 | 37900 | 0.60 |
| -24 | 1.5000 | 2.2500 | 1.250 | 1.049 | 2.156 | 0.375 | 0.156 | 0.032 | 0.0026 | 1.875 | 44200 | 0.71 |
| -28 | 1.7500 | 2.5000 | 1.250 | 1.049 | 2.406 | 0.375 | 0.156 | 0.032 | 0.0027 | 2.125 | 50500 | 0.78 |
| -32 | 2.0000 | 2.7500 | 1.250 | 1.049 | 2.656 | 0.375 | 0.156 | 0.032 | 0.0028 | 2.375 | 56800 | 0.88 |
| -36 | 2.2500 | 3.0000 | 1.250 | 1.049 | 2.906 | 0.375 | 0.156 | 0.032 | 0.0032 | 2.625 | 3100 | 0.98 |
| -40 | 2.5000 | 3.2500 | 1.250 | 1.049 | 3.156 | 0.375 | 0.156 | 0.032 | 0.0037 | 2.875 | 69400 | 1.06 |
| -44 | 2.7500 | 3.5000 | 1.250 | 1.049 | 3.406 | 0.375 | 0.156 | 0.032 | 0.0039 | 3.125 | 75700 | 1.15 |
| -48 | 3.0000 | 3.7500 | 1.250 | 1.049 | 3.656 | 0.375 | 0.156 | 0.032 | 0.0039 | 3.375 | 82000 | 1.24 |
| -52 | 3.2500 | 4.0000 | 1.250 | 1.049 | 3.906 | 0.375 | 0.156 | 0.032 | 0.0039 | 3.641 | 88300 | 1.34 |
| -56 | 3.7500 | 4.3750 | 1.250 | 1.049 | 4.219 | 0.375 | 0.156 | 0.044 | 0.0041 | 3.969 | 96700 | 1.73 |
| -60 | 3.7500 | 4.6250 | 1.250 | 1.049 | 4.469 | 0.375 | 0.156 | 0.044 | 0.0041 | 4.218 | 103000 | 1.84 |
| -64 | 4.0000 | 4.8750 | 1.250 | 1.049 | 4.719 | 0.375 | 0.156 | 0.044 | 0.0045 | 4.469 | 109000 | 1.99 |
| -80 | 5.0000 | 5.8750 | 1.250 | 1.049 | 5.688 | 0.375 | 0.156 | 0.044 | 0.0045 | 5.438 | 135000 | 2.75 |

TABLE II

Dimensions in Millimeters

| Dash No. | Ød Bore | ØD Outer Ring Outer Dia. | ØB Overall Width | C Outer Ring Width | Ød$_1$ Washer Outside Dia. | B$_1$ Lubri-cation Groove Width | C$_1$ Lubri-cation Groove Width | R$_a$ 1/ Fillet Max. | Total Radial Internal Clearance Max. | Clamp-ing Dia. Min. | Limits Load Rating lbf | Mass (approx) lb |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -3 | 4.826 | 17.462 | 7.92 | 5.54 | 15.88 | None | 1.52 | 0.6 | 0.043 | 11.13 | 8700 | 0.013 |
| -4 | 6.350 | 19.050 | 9.52 | 7.14 | 17.45 | None | 2.36 | 0.6 | 0.043 | 13.11 | 12700 | 0.018 |
| -5 | 7.935 | 20.638 | 11.10 | 8.74 | 19.05 | None | 3.18 | 0.6 | 0.043 | 14.68 | 18100 | 0.026 |
| -6 | 9.525 | 22.225 | 14.27 | 11.91 | 20.62 | 4.78 | 3.18 | 0.6 | 0.046 | 16.28 | 28100 | 0.034 |
| -7 | 11.112 | 23.812 | 15.88 | 13.49 | 22.22 | 4.78 | 3.18 | 0.8 | 0.046 | 17.86 | 35600 | 0.044 |
| -8 | 12.700 | 28.575 | 19.05 | 16.66 | 26.19 | 4.78 | 3.96 | 0.8 | 0.046 | 21.44 | 51600 | 0.075 |
| -9 | 14.288 | 30.162 | 22.22 | 19.84 | 27.79 | 6.35 | 3.96 | 0.8 | 0.048 | 22.63 | 66700 | 0.094 |
| -10 | 15.875 | 31.750 | 25.40 | 23.01 | 29.36 | 6.35 | 3.96 | 0.8 | 0.048 | 24.21 | 84000 | 0.115 |
| -12 | 19.050 | 34.925 | 28.58 | 25.40 | 32.54 | 9.52 | 3.96 | 0.8 | 0.048 | 27.38 | 106000 | 0.153 |
| -14 | 22.225 | 41.275 | 31.75 | 28.57 | 38.10 | 9.52 | 3.96 | 0.8 | 0.056 | 31.75 | 136000 | 0.192 |
| -16 | 25.400 | 44.450 | 31.75 | 26.64 | 41.28 | 9.52 | 3.96 | 0.8 | 0.066 | 34.92 | 151000 | 0.23 |
| -20 | 31.750 | 50.800 | 31.75 | 26.64 | 48.41 | 9.52 | 3.96 | 0.8 | 0.066 | 41.28 | 169000 | 0.27 |
| -24 | 38.100 | 57.150 | 31.75 | 26.64 | 54.76 | 9.52 | 3.96 | 0.8 | 0.066 | 47.62 | 197000 | 0.32 |
| -28 | 44.450 | 63.500 | 31.75 | 26.64 | 61.11 | 9.52 | 3.96 | 0.8 | 0.069 | 53.98 | 225000 | 0.35 |
| -32 | 50.800 | 69.850 | 31.75 | 26.64 | 67.46 | 9.52 | 3.96 | 0.8 | 0.071 | 60.32 | 253000 | 0.40 |
| -36 | 57.150 | 76.200 | 31.75 | 26.64 | 73.81 | 9.52 | 3.96 | 0.8 | 0.081 | 66.66 | 280000 | 0.45 |
| -40 | 63.500 | 82.550 | 31.75 | 26.64 | 80.16 | 9.52 | 3.96 | 0.8 | 0.094 | 73.02 | 309000 | 0.48 |
| -44 | 68.850 | 88.900 | 31.75 | 26.64 | 86.51 | 9.52 | 3.96 | 0.8 | 0.099 | 79.38 | 337000 | 0.52 |
| -48 | 76.200 | 95.250 | 31.75 | 26.64 | 92.86 | 9.52 | 3.96 | 0.8 | 0.099 | 85.72 | 365000 | 0.56 |
| -52 | 82.550 | 101.600 | 31.75 | 26.64 | 99.21 | 9.52 | 3.96 | 0.8 | 0.099 | 92.48 | 393000 | 0.61 |
| -56 | 88.900 | 111.125 | 31.75 | 26.64 | 107.16 | 9.52 | 3.96 | 1.1 | 0.104 | 100.81 | 430000 | 0.79 |
| -60 | 92.250 | 117.475 | 31.75 | 26.64 | 113.51 | 9.52 | 3.96 | 1.1 | 0.104 | 107.14 | 458000 | 0.84 |
| -64 | 101.600 | 123.825 | 31.75 | 26.64 | 119.86 | 9.52 | 3.96 | 1.1 | 0.114 | 113.51 | 487000 | 0.90 |
| -80 | 127.000 | 149.225 | 31.75 | 26.52 | 144.45 | 9.52 | 3.96 | 1.1 | 0.114 | 138.10 | 600000 | 1.25 |

1/ The chamfer on bearings must clear the maximum fillet radius given in the table. This specification does not control bearing chamfer contours.

TABLE III - TOLERANCE LIMITS

| Ød Basic Bore | | Allowable Deviation From d of Single Mean Dia., $d_{mp}$ | | Allowable Deviation From overall Width B | | Allowable Deviation From Washer outside dia. dl | | Allowable Deviation From Lubrication Groove Width, B1 | |
|---|---|---|---|---|---|---|---|---|---|
| Over | Incl | High | Low | High | Low | High | Low | High | Low |
| 0.1250 | 3.0000 | +0 | -0.0007 | +0 | -0.005 | +0.010 | -0.010 | +0 | -0.062 |
| 3.0000 | 4.0000 | +0 | -0.0008 | +0 | -0.005 | +0.010 | -0.010 | +0 | -0.062 |
| 4.0000 | 5.0000 | +0 | -0.0010 | +0 | -0.005 | +0.010 | -0.010 | +0 | -0.062 |

| D Basic Outside Dia. | | Allowable Deviation From D of Single Mean Dia., $D_{ap}$ | | Allowable Deviation From outside Ring Width C | | Allowable Deviation From Lubrication Groove Width, C1 | |
|---|---|---|---|---|---|---|---|
| Over | Incl | High | Low | High | Low | High | Low |
| 0.5000 | 1.7500 | +0 | -0.0005 | +0 | -0.005 | +0.031 | -0.031 |
| 1.7500 | 3.0000 | +0 | -0.0006 | +0 | -0.005 | +0.031 | -0.031 |
| 3.0000 | 4.6250 | +0 | -0.0008 | +0 | -0.005 | +0.031 | -0.031 |
| 4.6250 | 5.8750 | +0 | -0.0010 | +0 | -0.005 | +0.031 | -0.031 |

TABLE IV

| Ød Basic Bore | | Allowable Deviation From d of Single Mean Dia., $d_{mp}$ | | Allowable Deviation From overall Width B | | Allowable Deviation From Washer outside dia. dl | | Allowable Deviation From Lubrication Groove Width, B1 | |
|---|---|---|---|---|---|---|---|---|---|
| Over | Incl | High | Low | High | Low | High | Low | High | Low |
| 3.18 | 76.20 | +0 | -0.0007 | +0 | -0.005 | +0.010 | -0.010 | +0 | -1.60 |
| 76.20 | 101.60 | +0 | -0.0008 | +0 | -0.005 | +0.010 | -0.010 | +0 | -1.60 |
| 101.60 | 127.0 | +0 | 0.0010 | +0 | -0.005 | +0.010 | -0.010 | +0 | -1.60 |

| D Basic Outside Dia. | | Allowable Deviation From D of Single Mean Dia., $D_{mp}$ | | Allowable Deviation From outside Ring Width C | | Allowable Deviation From Lubrication Groove Width, C1 | |
|---|---|---|---|---|---|---|---|
| Over | Incl | High | Low | High | Low | High | Low |
| 0.5000 | 1.7500 | +0 | -0.0005 | +0 | -0.005 | +0.031 | -0.031 |
| 1.7500 | 3.0000 | +0 | -0.0006 | +0 | -0.005 | +0.031 | -0.031 |
| 3.0000 | 4.6250 | +0 | -0.0008 | +0 | -0.005 | +0.031 | -0.031 |
| 4.6250 | 5.8750 | +0 | -0.0010 | +0 | -0.005 | +0.031 | -0.031 |

TABLE II - OIL HOLE DATA

| Bore-Dash No. | | Number of Holes | |
|---|---|---|---|
| Over | Incl | Inner Ring | Outer Ring |
| 2 | 5 | None | 2 |
| 5 | 10 | 2 | 4 |
| 10 | 80 | 4 | 4 |

REQUIREMENTS:

1. MATERIAL: STEEL, MIL-S-8690, QQ-S-624, QQ-S-631, QQ-S-700, FED STD NO. 66. AISI/SAE STEEL NO. 50100, 51100, 52100

2. PLATING: ZINC-NICKEL IN ACCORDANCE WITH AMS 2417 TYPE 2, OR CADMIUM PLATED IN ACCORDANCE WITH QQ-P-416, TYPE I, CLASS 2, TO A THICKNESS OF .0003 INCHES, TO .0006 INCHES.

3. MACHINE FINISH: ANSI/ASME B46.1. SEE PROCUREMENT SPECIFICATION.

4. LUBRICATION: GREASE CONFORMING TO MIL-G-81322 OR MIL-C-23827 AT SUPPLIERS OPTION UNLESS EITHER SPECIFIED ON ORDER.

5. THE LIMIT LOAD RATING LISTED CAN BE DEFINED AS THE MAXIMUM RADIAL LOAD WHICH CAN BE APPLIED TO A BEARING WITHOUT IMPAIRING THE SUBSEQUENT FUNCTIONING OF THE BEARING IN AIRFRAME APPLICATIONS. THE ULTIMATE OR STATIC FRACTURE LOAD RATING IS NOT LESS THAN 1.5 TIMES THE LIMIT LOAD RATING.

6. REMOVE ALL BURRS AND SHARP CORNERS.

7. DIMENSIONS TO MET AFTER PLATING.