Genuine Aircraft Hardware Co.

MS27640
Bearing, Ball, Airframe, Antifriction, Heavy Duty

NOTES:
(a) DIMENSIONS TO BE MET AFTER PLATING.
(b) OUT-OF-ROUND TOLERANCES: +0.002...-0.007; OUTER DIA: +0.005...-0.010.
(c) 45° CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.
(d) 45° CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.
(e) CASE I = LOAD FIXED WITH RESPECT TO OUTER RACE.
   CASE II = LOAD FIXED WITH RESPECT TO INNER RACE
(f) THESE RATINGS ARE FOR OPERATION UP TO 250°F. FOR OPERATION UP TO 350°F, THE RATINGS SHALL BE REDUCED BY 20%.

   BALLS: STEEL, FED-STD-66, E51100 OR E52100
2. SEALS: POLYTETRAFLUOROETHYLENE PER AMS3652 OR POLYTETRAFLUOROETHYLENE SHEET, GLASS FABRIC REINFORCED PER AMS3666.
3. SEAL RETAINERS: STEEL, CORROSION RESISTANT.
4. LUBRICANT: MIL-G-81322 OR MIL-G-23827. MIL-G-81322 SHALL BE USED FOR OPERATION ABOVE 250°F. ALL BEARINGS SHALL BE PRE PACKED WITH GREASE CONFORMING TO MIL-G-81322 UNLESS OTHERWISE SPECIFIED. IF MIL-G-23827 IS REQUIRED, ADD THE LETTER "G" AFTER THE MS PART NUMBER. BEARINGS SHALL BE FILLED 80% MIN.
5. HARDNESS: HEAT TREAT RINGS ND BALLS TO ROCKWELL "C" 60 TO 66 AND STABILIZE FOR OPERATION AT 250°F.
7. PLATING: ALL EXTERNAL SURFACES EXCEPT BORE, SEALS AND SEAL RETAINERS, CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 2.
8. RADIAL PLAY: WITHOUT SUFFIX R: .0004 TO .0010
   WITH SUFFIX R: .0002 TO .0005
9. RADIAL ECCENTRICITY: INNER RING: .0010 MAX, OUTER RING: .0016 MAX
10. FACE RUNOUT: INNER RING: .0010 MAX, OUTER RING: .0016 MAX
11. PART NUMBER = MS NUMBER AND DASH NUMBER WITH SUFFIX AS APPLICABLE. EXAMPLE MS27640-3, MS27640-3G
12. MS -3A METAL SHIELDS ARE ACCEPTABLE.

ADDITIONAL NOTES:
- PROCUREMENT SPECIFICATION: MIL-B-7949
- SUPERSEDES: NONE
- THIS INFORMATION FROM MILITARY STANDARD MS27640 PAGE 1 OF 1, REVISED APRIL 9, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY
- THE PARTS COVERED BY MS20200 ARE CANCELLED BY MS27640. USE MS20200 PARTS UNTIL EXISTING STOCK IS DEPLETED.
- USE MS27640 FOR NEW DESIGN AND REPLACEMENT.

# MS27641

**Bearing, Ball, Airframe, Antifriction, Intermediate Duty**

**NOTES:**

(a) DIMENSIONS TO BE MET AFTER PLATING.

(b) OUT-OF-ROUND TOLERANCES: BORE: +.0002, -.0007; OUTER DIA: +.0005, -.0010.

(c) 45° CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.

(d) 45° CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.

(e) CASE I = LOAD FIXED WITH RESPECT TO INNER RACE.

(f) CASE II = LOAD FIXED WITH RESPECT TO OUTER RACE.

(f) THESE RATINGS ARE FOR OPERATION UP TO 250°F. FOR OPERATION UP TO 350°F, THE RATINGS SHALL BE REDUCED BY 20%.

   
   BALLS: STEEL, FED-STD-66, E51100 OR E52100

2. SEALS: POLYTETRAFLUOROETHYLENE PER AMS3652 OR POLYTETRAFLUOROETHYLENE SHEET, GLASS FABRIC REINFORCED PER AMS3666.

3. SEAL RETAINERS: STEEL, CORROSION RESISTANT.

4. LUBRICANT: MIL-G-81322 OR MIL-G-23827. MIL-G-81322 SHALL BE USED FOR OPERATION ABOVE 250°F. ALL BEARINGS SHALL BE PRE PACKED WITH GREASE CONFORMING TO MIL-G-81322 UNLESS OTHERWISE SPECIFIED. IF MIL-G-23827 IS REQUIRED, ADD THE LETTER “G” AFTER THE MS PART NUMBER. BEARINGS SHALL BE FILLED 80% MIN.

5. HARDNESS: HEAT TREAT RINGS AND BALLS TO ROCKWELL “C” 60 TO 66 AND STABILIZE FOR OPERATION AT 250°F.


7. PLATING: ALL EXTERNAL SURFACES EXCEPT BORE, SEALS AND SEAL RETAINERS, CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 2.

8. RADIAL PLAY: WITHOUT SUFFIX R: .0004 TO .0010  
   WITH SUFFIX R: .0002 TO .0005

9. RADIAL ECCENTRICITY: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

10. FACE RUNOUT: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

11. PART NUMBER = MS NUMBER AND DASH NUMBER WITH SUFFIX AS APPLICABLE. EXAMPLES: MS27641-3, MS27641-3R, MS27641-3RG.

12. MS -3A METAL SHIELDS ARE ACCEPTABLE.

**ADDITIONAL NOTES:**

- PROCUREMENT SPECIFICATION: MIL-B-7949
- SUPERSEDES: NONE
- THIS INFORMATION FROM MILITARY STANDARD MS27641 PAGE 1 OF 1, REVISED APRIL 9, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.
- THE PARTS COVERED BY MS20201 ARE CANCELLED BY MS27641. USE MS20201 PARTS UNTIL EXISTING STOCK IS DEPLETED.
- USE MS27641 FOR NEW DESIGN AND REPLACEMENT.

### Dimensions in Inches

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<th>WIDTH WTH OUTER RING (c)</th>
<th>SHOULDER DIAMETER (d)</th>
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<th>RADIUS OF RING CHAMFER ID</th>
<th>RADIAL LIMIT LOAD RATING (lbs)</th>
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**DIMENSIONS IN INCHES**
### MS27642

**Bearing, Ball, Airframe, Extra Light Duty**

#### Dimensions in Inches

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**NOTES:**

(a) DIMENSIONS TO BE MET AFTER PLATING.
(b) OUT-OF-ROUND TOLERANCES: BORE: -16 THRU -49 +.0003, -.0013; -52 THRU -96 +.0005 -.0015. OUTER DIA: +.0010, -.0021.
(c) A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.
(d) A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.
(e) CASE I = LOAD FIXED WITH RESPECT TO OUTER RACE.
(f) THESE RATINGS ARE FOR OPERATION UP TO 250°F. FOR OPERATION UP TO 350°F, THE RATINGS SHALL BE REDUCED BY 20%.

**ADDITIONAL NOTES:**

- PROCUREMENT SPECIFICATION: MIL-B-7949
- SUPERSEDES: 20202
- THIS INFORMATION FROM MILITARY STANDARD MS27642 PAGE 1 OF 1, REVISED APRIL 9, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.
- THE PARTS COVERED BY MS20202 ARE CANCELLED BY MS27642. USE MS20202 PARTS UNTIL EXISTING STOCK IS DEPLETED.
- USE MS27642 FOR NEW DESIGN AND REPLACEMENT.
Genuine Aircraft Hardware Co.

**MS27643**

Bearing, Ball, Airframe, Antifriction, Self-Aligning, Double Row, Heavy Duty

**NOTES:**

(a) DIMENSIONS TO BE MET AFTER PLATING.

(b) OUT-OF-ROUND TOLERANCES: BORE: +.0002, -.0007; OUTER DIA: +.0005, -.0010.

(c) 45° CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.

(d) 45° CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.

(e) CASE I = LOAD FIXED WITH RESPECT TO OUTER RACE.

CASE II = LOAD FIXED WITH RESPECT TO INNER RACE

(f) THESE RATINGS ARE FOR OPERATION UP TO 250°F. FOR OPERATION UP TO 350°F, THE RATINGS SHALL BE REDUCED BY 20%.

1. MATERIALS:
   - SEALS: POLYTETRAFLUOROETHYLENE PER AMS3652 OR POLYTETRAFLUOROETHYLENE SHEET, GLASS FABRIC REINFORCED PER AMS3666.
   - SEAL RETAINERS: STEEL, CORROSION RESISTANT.

2. HARDNESS: HEAT TREAT RINGS AND BALLS TO ROCKWELL “C” 60 TO 66 AND STABILIZE FOR OPERATION AT 250°F.


4. PLATING: ALL EXTERNAL SURFACES EXCEPT BORE, SEALS AND SEAL RETAINERS; CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 2.

5. RADIAL PLAY: WITHOUT SUFFIX R: .0000 TO .0010; WITH SUFFIX R: .0002 TO .0005

6. RADIAL ECCENTRICITY: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

7. FACE RUNOUT: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

8. PART NUMBER = MS NUMBER AND DASH NUMBER WITH SUFFIX AS Applicable. EXAMPLES: MS27643-3, MS27643-3R, MS27643-3RG.

9. MS -3A METAL SHIELDS ARE ACCEPTABLE.

ADDITIONAL NOTES:

- PROCUREMENT SPECIFICATION: MIL-B-7949
- SUPERSEDES: NONE
- THIS INFORMATION FROM MILITARY STANDARD MS27643 PAGE 1 OF 1, REVISED APRIL 9, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.
- THE PARTS COVERED BY MS20206 ARE CANCELLED BY MS27643. USE MS20206 PARTS UNTIL EXISTING STOCK IS DEPLETED.
**MS27644**

**Bearing, Ball, Airframe, Antifriction, Double Row, Heavy Duty**

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**NOTES:**

(a) DIMENSIONS TO BE MET AFTER PLATING.

(b) OUT-OF-ROUND TOLERANCES: BORE: +.0002, -.0007; OUTER DIA: +.0005, -.0010.

(c) 45º CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.

(d) 45º CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.

(e) CASE I = LOAD FIXED WITH RESPECT TO OUTER RACE.

CASE II = LOAD FIXED WITH RESPECT TO INNER RACE

(f) THESE RATINGS ARE FOR OPERATION UP TO 250ºF. FOR OPERATION UP TO 350ºF, THE RATINGS SHALL BE REDUCED BY 20%.

(g) BOLTS OF 180,000 PSI TENSILE STRENGTH ARE REQUIRED TO DEVELOP THE RADIAL LIMIT LOAD SHOWN.

(h) BOLTS OF 160,000 PSI TENSILE STRENGTH ARE REQUIRED TO DEVELOP THE RADIAL LIMIT LOAD SHOWN.

1. MATERIALS:
   - **RINGS:** STEEL, FED-STD-66, E52100.
   - **BALLS:** STEEL, FED-STD-66, E51100 OR E52100
   - **SEALS:** POLYTETRAFLUOROETHYLENE PER AMS3652 OR POLYTETRAFLUOROETHYLENE SHEET, GLASS FABRIC REINFORCED PER AMS3666.
   - **SEAL RETAINERS:** STEEL, CORROSION RESISTANT.
   - **LUBRICANT:** MIL-G-81322 OR MIL-G-23827. MIL-G-81322 SHALL BE USED FOR OPERATION ABOVE 250ºF. ALL BEARINGS SHALL BE PRE PACKED WITH GREASE CONFORMING TO MIL-G-81322 UNLESS OTHERWISE SPECIFIED. IF MIL-G-23827 IS REQUIRED, ADD THE LETTER "G" AFTER THE MS PART NUMBER. BEARINGS SHALL BE FILLED 80% MIN.

2. HARDNESS: HEAT TREAT RINGS AND BALLS TO ROCKWELL "C" 60 TO 66 AND STABILIZE FOR OPERATION AT 250ºF.


4. PLATING: ALL EXTERNAL SURFACES EXCEPT BORE AND SEAL RETAINERS, CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 2.

5. RADIAL PLAY: .0004 TO .0010
   - WITH SUFFIX R: .0002 TO .0005

6. RADIAL ECCENTRICITY: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

7. FACE RUNOUT: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

8. PART NUMBER = MS NUMBER AND DASH NUMBER. EXAMPLES: MS27644-3, MS27644-3C.

9. REMOVABLE SEALS ARE REQUIRED.

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### Dimensions in Inches

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<th>AXIAL PLAY (h)</th>
<th>RADIAL LIMIT LOAD (i)</th>
<th>THRUST LIMIT LOAD (j)</th>
<th>RADIAL LOAD RATING (lbs) FOR AVERAGE LIFE OF 10,000 COMPLETE 90 DEGREE CYCLES</th>
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**DIMENSIONS IN INCHES**

**ADDITIONAL NOTES:**

- PROCUREMENT SPECIFICATION: MIL-9-7949
- SUPERSEDES: MS20207
- THIS INFORMATION FROM MILITARY STANDARD MS27644 PAGE 1 OF 1, REVISED APRIL 9, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.
- THE PARTS COVERED BY MS20207 ARE CANCELLED BY MS27644. USE MS20207 PARTS UNTIL EXISTING STOCK IS DEPLETED.
- USE MS27644 FOR NEW DESIGN AND REPLACEMENT

---

**Genuine Aircraft Hardware Co.**

**MS27645**

Bearing, Ball, Airframe, Antifriction, Self-Aligning, Light and Heavy Duty

---

### Dimensions in Inches

<table>
<thead>
<tr>
<th>MS DASH NO.</th>
<th>REF PIN</th>
<th>BORE (a)</th>
<th>OUTSIDE DIAMETER (a) (b)</th>
<th>WIDTH INNER RING (a)</th>
<th>WIDTH OUTER RING (a)</th>
<th>SHOULDER INNER RING APPROX.</th>
<th>INNER (b) RING</th>
<th>OUTER (b) RING</th>
<th>LIMIT LOAD RATING LBS.</th>
<th>LIMIT LOAD RATING LBS.</th>
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<th>CASE II</th>
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**NOTES:**

(a) DIMENSIONS TO BE MET AFTER PLATING.

(b) OUT-OF-ROUND TOLERANCES: BORE: +0.0002, -.0007; OUTER DIA: +0.0005, -.0010.

(c) 45° CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.

(d) 45° CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.

(e) CASE I = LOAD FIXED WITH RESPECT TO OUTER RACE.

CASE II = LOAD FIXED WITH RESPECT TO INNER RACE

(f) THESE RATINGS ARE FOR OPERATION UP TO 250°F. FOR OPERATION UP TO 350°F, THE RATINGS SHALL BE REDUCED BY 20%.

(g) THESE BEARINGS ARE SELF-ALIGNING FOR 10° IN EITHER DIRECTION EXCEPT MS-4A, -5A, AND -6A WHICH ARE SELF-ALIGNING FOR 8° IN EITHER DIRECTION.

1. MATERIALS:
   - SEALS: POLYTETRAFLUOROETHYLENE PER AMS3662 OR POLYTETRAFLUOROETHYLENE SHEET, GLASS FABRIC REINFORCED PER AMS3666.
   - SEAL RETAINERS: STEEL, CORROSION RESISTANT.

ADD

2. HARDNESS: HEAT TREAT RINGS AND BALLS TO ROCKWELL "C" 60 TO 66 AND STABILIZE FOR OPERATION AT 250°F.


4. PLATING: ALL EXTERNAL SURFACES EXCEPT BORE, SEALS AND SEAL RETAINERS, CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 2.

5. RADIAL PLAY:
   - WITHOUT SUFFIX R: .0000 TO .0010
   - WITH SUFFIX R: .0002 TO .0005

6. RADIAL ECCENTRICITY: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

7. FACE RUNOUT: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

8. PART NUMBER = MS NUMBER AND DASH NUMBER WITH SUFFIX AS APPLICABLE. EXAMPLES: MS27645-3, MS27645-3R, MS27645-3RG

**ADDITIONAL NOTES:**

- PROCUREMENT SPECIFICATION: MIL-B-7949
- SUPERSEDES: MS2761
- THIS INFORMATION FROM MILITARY STANDARD MS27645 PAGE 1 OF 1, REVISED APRIL 9, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.
- THE PARTS COVERED BY MS27261 ARE CANCELLED BY MS27645. USE MS27261 PARTS UNTIL EXISTING STOCK IS DEPLETED.
- USE MS27645 FOR NEW DESIGN AND REPLACEMENT.

---

**NOTES:**

(a) DIMENSIONS TO BE MET AFTER PLATING.

(b) A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.

(c) A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.

(d) CASE I = LOAD FIXED WITH RESPECT TO OUTER RACE.

CASE II = LOAD FIXED WITH RESPECT TO INNER RACE

(e) THESE RATINGS ARE FOR OPERATION UP TO 250ºF. FOR OPERATION UP TO 350ºF, THE RATINGS SHALL BE REDUCED BY 20%.

(f) OUT-OF-ROUND TOLERANCES: BORE: -.0010 " - .0005, -.0005; -.0010; -.0005; -.0005; -.0010; -.0005; -.0010

(g) OUTSIDE DIAMETER: -.0005 "  -.0015; -.0015; -.0005; -.0015; -.0005; -.0015; -.0005; -.0015

(h) FOR DASH NUMBER SIZES -44, -45 AND -46, THE OUTSIDE DIAMETER TOLERANCE SHALL BE -.0015 TO -.0005

(i) FOR DASH NUMBER SIZES -44, -45, AND -46 THE BORE TOLERANCE SHALL BE -.0010 TO -.0010 INCHES.

(j) DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

**REQUIREMENTS:**


   BALLS: STEEL, FED-STD-66, ES1100 OR ES2100

2. SEALS: POLYETHERETRAFLUOROETHYLENE PER AMS6351 OR POLYETHERETRAFLUOROETHYLENE SHEET, GLASS FABRIC REINFORCED PER AMS6366.

3. LUBRICANT: MIL-G-81322 OR MIL-G-23827. MIL-G-81322 SHALL BE USED FOR OPERATION ABOVE 250ºF. ALL BEARINGS SHALL BE PRE PACKED WITH GREASE CONFORMING TO MIL-G-81322 UNLESS OTHERWISE SPECIFIED. IF MIL-G-23827 IS REQUIRED, ADD THE LETTER "G" AFTER THE MS PART NUMBER. BEARINGS SHALL BE FILLED 80% MIN.

4. HARDNESS: HEAT TREAT RINGS AND BALLS TO ROCKWELL "C" 60 TO 66 AND STABILIZE FOR OPERATION AT 250ºF.

5. SURFACE ROUGHNESS: RACEWAYS AND BALLS - 8 MICRONCHES AA PER ANSI 846.1

6. PLATING: ALL EXTERNAL SURFACES EXCEPT BORE, SEALS AND SEAL RETAINERS, CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 2.

7. INTERNAL RADIAL CLEARANCE: -.0008 TO -.0018

8. RADIAL AND LATERAL ECCENTRICITY: INNER RING: -.0020 INCH MAX., OUTER RING: -.0016 INCH MAX.

9. PART NUMBER = MS NUMBER AND DASH NUMBER. EXAMPLES: MS27646-38, MS27646-38G.

10. REMOVABLE SHIELDS ARE OPTIONAL.

**ADDITIONAL NOTES:**

- PROCUREMENT SPECIFICATION: MIL-B-7949
- SUPERSEDES: NONE
- THIS INFORMATION FROM MILITARY STANDARD MS27646 PAGE 1 OF 1, REVISED, JUNE 21, 1995, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.
### MS27647

**Bearings, Ball, Airframe, Antifriction, Extra Wide, Double Row, Intermediate Duty**

---

**NOTES:**

(a) DIMENSIONS TO BE MET AFTER PLATING.

(b) OUT-OF-ROUND TOLERANCES: BORE: +.0002, -.0007; OUTER DIA: +.0005, -.0010.

(c) 45º CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.

(d) A 45º CHAMFER OR A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.

(e) CASE I = LOAD FIXED WITH RESPECT TO OUTER RACE.

CASE II = LOAD FIXED WITH RESPECT TO INNER RACE

(f) THESE RATINGS ARE FOR OPERATION UP TO 250ºF. FOR OPERATION UP TO 350ºF, THE RATINGS SHALL BE REDUCED BY 20%.

   BALLS: STEEL, FED-STD-66, E51100 OR E52100
   SEALS: POLYTETRAFLUOROETHYLENE PER AMS3652 OR POLYTETRAFLUOROETHYLENE SHEET, GLASS FABRIC REINFORCED PER AMS3666.
   SEAL RETAINERS: STEEL, CORROSION RESISTANT.
   LUBRICANT: MIL-G-81322 OR MIL-G-23827. MIL-G-81322 SHALL BE USED FOR OPERATION ABOVE 250ºF. ALL BEARINGS SHALL BE PRE PACKED WITH GREASE CONFORMING TO MIL-G-81322 UNLESS OTHERWISE SPECIFIED. IF MIL-G-23827 IS REQUIRED, ADD THE LETTER "G" AFTER THE MS PART NUMBER. BEARINGS SHALL BE FILLED 80% MIN.

2. HARDNESS: HEAT TREAT RINGS AND BALLS TO ROCKWELL "C" 60 TO 66 AND STABILIZE FOR OPERATION AT 250ºF.


4. PLATING: ALL EXTERNAL SURFACES EXCEPT BORE, SEALS AND SEAL RETAINERS; CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 1.

5. RADIAL PLAY:
   - WITHOUT SUFFIX R: .0004 TO .0010
   - WITH SUFFIX R: .0002 TO .0005

6. RADIAL ECCENTRICITY: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

7. FACE RUNOUT: INNER RING: .0010 MAX, OUTER RING: .0016 MAX

8. PART NUMBER = MS NUMBER AND DASH NUMBER WITH SUFFIX AS APPLICABLE. SUFFIX "G" INDICATES LUBRICANT GROOVE. SUFFIX "R" INDICATES CLOSE TOLERANCE. EXAMPLES: MS27647-4, MS27647-4G, MS27647-4R, MS27647-4GR, MS27647-4AR, MS27647-4AR, MS27647-4CL, MS27647-4CL, MS27647-4RCL.

9. REMOVABLE SEALS ARE REQUIRED.

**ADDITIONAL NOTES:**

- PROCUREMENT SPECIFICATION: MIL-B-7949
- SUPERSEDES: NONE
- THIS INFORMATION FROM MILITARY STANDARD MS27647 PAGE 1 OF 1, REVISED APRIL 9, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.

---

### Table: Dimensions in Inches

<table>
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<th>MS DASH NO.</th>
<th>REF. PIN</th>
<th>BORE (a)</th>
<th>OUTSIDE DIAMETER (b)</th>
<th>WIDTH (c)</th>
<th>WIDTH (d)</th>
<th>SHOULDER DIAMETER (e)</th>
<th>INNER RING CHAMFER BORE (f)</th>
<th>OUTER (g) RING CHAMFER OD</th>
<th>INNER RING APPROX.</th>
<th>RATING LIMIT LOAD (lbs)</th>
<th>THRUST LIMIT LOAD RATING (lbs)</th>
<th>WEIGHT (lbs) APPROX.</th>
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**Diagram:**

The diagram illustrates the dimensions and tolerances for the MS27647 bearing, including the dimensions without a lubrication groove (DW) and with a lubrication groove (GM).

**Dimensions in Inches:**

- A
- B
- C
- D
- E
- F
- G

**Notes on Dimensions:**

- All dimensions are to be met after plating.
- Out-of-round tolerances for bores and outer diameters are specified.
- Chamfer or radius dimensions are given for the inner and outer rings.

Genuine Aircraft Hardware Co.

MS27648

Bearing, Ball, Airframe, Antifriction, External Self-Aligning, Extra Light Duty

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<th>REF. PART NO.</th>
<th>BORE</th>
<th>OUTSIDE DIAMETER (A) (B)</th>
<th>WIDTH INNER RING (C)</th>
<th>WIDTH OUTER RING (D)</th>
<th>A</th>
<th>E AND C INNER &amp; OUTER RING CORNER CHAMFER X 45 DEGREES</th>
<th>K</th>
<th>BRG SPHERE Q.D.</th>
<th>PERMISSIBLE MISALIGNMENT EITHER DIRECTION</th>
<th>RADIAL LIMIT LOAD RATING LBS.</th>
<th>THRUST LIMIT LOAD RATING LBS.</th>
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NOTES:
(a) ALL DIMENSIONS TO BE MET AFTER PLATING.
(b) OUT-OF-ROUND TOLERANCES: BORE: +.0010, -.0020
OUTSIDE DIAMETER: +.0010, -.0020
(c) A RADIUS GIVING APPROXIMATELY THE SAME GRIP FOR STAKING THE BEARING IN THE HOUSING WILL BE ACCEPTABLE.
(d) A RADIUS GIVING APPROXIMATELY THE SAME FILLET CLEARANCE WILL BE ACCEPTABLE.
(e) CASE I = LOAD FIXED WITH RESPECT TO OUTER RACE.
CASE II = LOAD FIXED WITH RESPECT TO INNER RACE
(f) THESE RATINGS ARE FOR OPERATION UP TO 250°F. FOR OPERATION UP TO 350°F, THE RATINGS SHALL BE REDUCED BY 20%.

Balls: STEEL, FED-STD-66, E51100 OR E52100
2. SEALS: POLYTETRAFLUOROETHYLENE PER AMS3652 OR POLYTETRAFLUOROETHYLENE SHEET, GLASS FABRIC REINFORCED PER AMS3666.
3. SEAL RETAINERS: STEEL, CORROSION RESISTANT
4. LUBRICANT: MIL-G-81322 OR MIL-G-23827. MIL-G-81322 SHALL BE USED FOR OPERATION ABOVE 250°F. ALL BEARINGS SHALL BE PRE PACKED WITH GREASE CONFORMING TO MIL-G-81322 UNLESS OTHERWISE SPECIFIED. IF MIL-G-23827 IS REQUIRED, ADD THE LETTER "G" AFTER THE MS PART NUMBER. BEARINGS SHALL BE FILLED 80% MIN.
5. HARDNESS: HEAT TREAT RINGS AND BALLS TO ROCKWELL "C" 60 TO 66 AND STABILIZE FOR OPERATION AT 250°F.
7. PLATING: ALL EXTERNAL SURFACES EXCEPT BORE, ID OF SELF-ALIGNING OUTER RING AND OD OF OUTER RACE SEALS AND SEAL RETAINERS, CADMIUM PLATED PER QQ-P-416, TYPE 1, CLASS 2.
8. INTERNAL RADIAL CLEARANCE: .0003 TO .0010 (DOES NOT INCLUDE RADIAL LOOSENESS BETWEEN BEARING OUTER RING AND SELF-ALIGNING RING.)
9. PART NUMBER = MS NUMBER AND DASH NUMBER. EXAMPLES: MS27648-16, MS27648-16C.
10. REMOVABLE SHIELDS ARE REQUIRED.
ADDITIONAL NOTES:
- PROCUREMENT SPECIFICATION: MIL-B-7949
- SUPERSEDES: NONE
- THIS INFORMATION FROM MILITARY STANDARD MS27648 PAGE 1 OF 1, REVISED APRIL 9, 1981, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.
## Dimensions in Inches

<table>
<thead>
<tr>
<th>Bore Diameter (a)</th>
<th>Outside Diameter (b)</th>
<th>Width Inner Ring (c)</th>
<th>Width Outer Ring (d)</th>
<th>Shoulder Diameter (e)</th>
<th>Case I Load Rating (lbs)</th>
<th>Case II Load Rating (lbs)</th>
<th>WT. LBS. (APPX)</th>
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</table>

**NOTES:**
- **(a)** Out-of-round tolerances: Bore: +.0002, -.0007; Outer Dia: +.0005, -.0010.
- **(b)** A radius giving approximately the same grip for staking the bearing in the housing will be acceptable.
- **(c)** A radius giving approximately the same fillet clearance will be acceptable.
- **(d)** Case I = load fixed with respect to outer race, Case II = load fixed with respect to inner race.
- **(e)** These ratings are for operation up to 250°F for operation up to 350°F, the ratings shall be reduced by 20%.

1. **MATERIALS:** Rings: ANSI 440C, corrosion resistant steel; Balls: ANSI 440C, corrosion resistant steel.
2. **SEALS:** Polytetrafluoroethylene per AMS3652 or polytetrafluoroethylene sheet, glass fabric reinforced per AMS3666.
3. **SEAL RETAINERS:** Steel, corrosion resistant.
4. **LUBRICANT:** MIL-G-81322 or MIL-G-23827. MIL-G-81322 shall be used for operation above 250°F. All bearings shall be pre-packed with grease conforming to MIL-G-81322 unless otherwise specified. If MIL-G-23827 is required, add the letter “G” after the MS part number. Bearings shall be filled 80% min.
5. **HARDNESS:** Heat treat rings and balls to Rockwell “C” 57 to 63 and stabilized for operation at 250°F.
6. **SURFACE ROUGHNESS:** Raceways and balls - 8 microinches AA per ANSI 846.1.
7. **RADIAl PLAY:** .0003 to .0009
8. **RADIal ECCENTRICITY:** Inner ring: .0010 maximum, outer ring: .0016 maximum.
9. **FACE RUNOUT:** Inner ring: .0010 maximum, outer ring: .0016 maximum.
10. **PART NUMBER:** MS number and dash number. Examples: MS27649-3, MS27649-3G.
11. **REMOVABLE SEALS ARE REQUIRED.**

**ADDITIONAL NOTES:**
- **PROCUREMENT SPECIFICATION:** MIL-B-7949
- **SUPERSEDES:** None
- **THIS INFORMATION FROM MILITARY STANDARD MS27649 PAGE 1 OF 1, REVISED MAY 28, 1982, SOME DETAILS MAY HAVE BEEN OMITTED FOR CLARITY.