

**FF-B-185**  
**AMENDMENT—4**  
 December 26, 1963

**SUPERSEDING**  
 Amendment—3  
 January 14, 1963

**FEDERAL SPECIFICATION**

**BEARINGS, ROLLER, CYLINDRICAL;  
 AND BEARINGS, ROLLER, SELF-ALIGNING**

*This amendment, which forms a part of Federal Specification FF-B-185, dated September 10, 1956, was approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.*

Page 3, paragraph 3.3, last sentence: Delete and substitute: "The surfaces shall be free from tool marks, chatter waves, grinding scratches, pits, rust, discoloration, soft spots, cracks, surface fractures, and other surface imperfections visible to the unaided eye, which would be detrimental to the satisfactory performance of the bearing."

Page 3, paragraph 3.4: Delete and substitute:

3.4 The rolls used in the same bearing shall be selected and graded so that the difference in maximum diameter between the largest and the smallest roller in an assembled bearing shall not exceed 0.0001 inch for roller diameters up to and including 3/8 inch; 0.00015 inch for roller diameters above 3/8 inch up to and including 1 inch; 0.0002 inch for roller diameters above 1 inch and up to and including 2 inches; and 0.00025 inch for roller diameters above 2 inches. No cylindrical roll shall show a variation of diameter greater than 0.0001 inch when measured at different positions axially. The variation in length of rolls used in the same bearing shall not exceed 0.005 inch.

Page 6, paragraph 4.1, lines 5 and 6: Delete "4.5 and 4.7" and substitute "4.5, 4.7 and 4.8".

Page 7, paragraph 4.4.2.2: Delete and substitute:

4.4.2.2 *Radial runout.* Radial runout shall be checked for conformance to the limits specified in table I. Radial runout shall be determined by mounting bearings on an arbor having a very slight taper (0.0001 to 0.0002 inch on the diameter per inch of length). For measuring outer ring radial runout, a calibrated (dial) indicator shall be set up against the center of the outer ring in a manner to register the runout, the arbor shall be stationary and the outer ring shall be rotated one revolution, and the difference between the minimum and maximum reading on the indicator is the outer ring radial runout. For measuring inner ring radial runout, the procedure shall be reversed, that is, the dial indicator shall be set up against the arbor, the outer ring shall be stationary, and the arbor shall be rotated one revolution to determine the inner ring radial runout. Neither the inner race runout nor the outer race runout shall exceed the maximum radial runout in table I.

Page 7: Add as paragraph 4.4.2.2.1:

4.4.2.2.1 The manufacturer shall not be required to measure radial runout as specified in 4.4.2.2, but shall be held to the tolerances of table I as measured by this method at a Government laboratory.

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Page 7, paragraph 4.5.1.1: Delete last sentence.

Page 8, paragraph 4.5.4: Delete and substitute new paragraph 4.5.4:

**4.5.4 Surface finish.** The sample bearing taken in accordance with 4.2.4 shall be examined to verify conformance to 3.3.

Page 8, paragraph 4.5.5.1, line 2: Delete "57 to 65" and substitute "58 to 66".

Page 8, paragraph 4.5.5.2: Delete and substitute:

**4.5.5.2 Ring hardness test.** The hardness of steel rings shall be determined in Rockwell testing machine with a 120-degree cone and 150-kilogram load. Rings made of alloy steel shall show hardness values of 58 to 66 Rockwell C. The hardness of all the rings representing one lot shall not vary more than 4 points on the Rockwell C scale. Rings made of corrosion-resisting steel shall have a hardness value of not less than 55 Rockwell C.

Page 8, paragraph 4.5.6: Delete.

Page 8, paragraph 4.5.7, line 4: Delete "Government".

Page 9, paragraph 4.7: Delete and substitute:

"4.7 Tests at a Government laboratory."

Page 9, paragraph 4.8: Delete and substitute:

**4.8 Life test.** The bearings shall be subjected to a life test to determine conformance to 3.19 and to insure that bearing life, under accelerated conditions with speed and load correction applied, shall be as specified in the appendix. The test machines shall utilize a four-bearing mounted system in which all four bearings are mounted on a single arbor. The two outboard bearings shall act as pedestal bearings to oppose the

load applied to the two central bearings, housed in a loading head. Lubrication shall be accomplished by supplying Military symbol 2190 TEP oil under pressure to the inner parts of the bearings. Sufficient oil shall be supplied to maintain the general outer race temperature at 150°F. The test shall be continuous in nature and test machine cutoff shall be controlled by vibro-switches. Criteria for rejection shall be failure to meet the fatigue life.

Page 9: Add as paragraph 4.10:

**4.10 Responsibility for inspection.** Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

Page 53, column 5, opposite "264-18023-0000": Delete "14.9696" and substitute "14.9606".

Page 57, paragraph 10.1, lines 6 and 7: Delete and substitute: "this appendix shall govern where applicable".

Page 71, Table XXVI: Delete and substitute new Table XXVI:

Page 74, table XXVIII, column "G": Delete "-0.005" and substitute "-0.020".

Page 74, table XXVIII: Under "Minor diameter", column "Minimum": Delete "2.0999" and substitute "2.0969".

Page 75, table XXIX: In column 2, line 22, delete "4.194" and substitute "4.192", and in column 6, delete "Tangent" and substitute "Tang".

TABLE XXVI.—Recommended shaft fits for general use

Bearing bore	Rotating shaft				Stationary shaft			
	Inches	Shaft diameter		Resulting fit	Shaft diameter		Resulting fit	
		Nominal		Theoretical shaft-fit	Nominal		Theoretical shaft-fit	
		Plus	Inch	Maximum loose	Maximum tight	Minus	Maximum loose	
	Tolerance							
	+0.0000							
	Minus							
	Inch							
4.....	0.0003	0.0002	0.0000	0.0000	0.0005	0.0003	0.0001	
5.....	.0003	.0002	.0000	.0000	.0005	.0003	.0001	
6.....	.0003	.0002	.0000	.0000	.0005	.0003	.0001	
7.....	.0003	.0002	-.0001	-.0001	.0005	.0006	.0001	
8.....	.0003	.0002	-.0001	-.0001	.0005	.0006	.0001	
9.....	.0003	.0002	-.0001	-.0001	.0005	.0006	.0001	
10.....	.0003	.0002	-.0001	-.0001	.0005	.0006	.0001	
12.....	.0003	.0002	-.0001	-.0001	.0005	.0007	.0001	
15.....	.0003	.0002	-.0001	-.0001	.0005	.0007	.0001	
17.....	.0003	.0002	-.0001	-.0001	.0005	.0007	.0001	
20.....	.0004	.0004	+.0001	+.0001	.0008	.0008	.0001	
25.....	.0004	.0004	+.0001	+.0001	.0008	.0008	.0001	
30.....	.0004	.0004	+.0001	+.0001	.0008	.0008	.0001	
35.....	.0005	.0005	+.0001	+.0001	.0010	.0010	.0001	
40.....	.0005	.0005	+.0001	+.0001	.0010	.0010	.0001	
46.....	.0005	.0005	+.0001	+.0001	.0010	.0010	.0001	
50.....	.0006	.0006	+.0001	+.0001	.0012	.0011	.0002	
55.....	.0006	.0006	+.0001	+.0001	.0012	.0011	.0002	
60.....	.0006	.0006	+.0001	+.0001	.0012	.0011	.0002	
65.....	.0006	.0006	+.0001	+.0001	.0012	.0011	.0002	
70.....	.0006	.0006	+.0001	+.0001	.0012	.0011	.0002	
75.....	.0006	.0006	+.0001	+.0001	.0012	.0011	.0002	
80.....	.0006	.0006	+.0001	+.0001	.0012	.0011	.0002	
85.....	.0008	.0007	+.0001	+.0001	.0015	.0013	.0003	
90.....	.0003	.0007	+.0001	+.0001	.0015	.0013	.0003	

TABLE XXVI.—Recommended shaft fits for general use (Cont'd)

Bearing bore		Rotating shaft				Stationary shaft				
		Shaft diameter		Resulting fit		Shaft diameter		Resulting fit		
		Nominal		Theoretical shaft-fit		Nominal		Theoretical shaft-fit		
Metric mm.	Inches	Tolerance		Plus	Inch	Maximum loose	Maximum tight	Inch	Maximum loose	Maximum tight
		+	-							
95	3.7402	0.0008	0.0007	0.0001	0.0015	0.0005	0.0013	0.0003	0.0013	0.0003
100	3.9370	.0008	.0007	+.0001	.0015	.0005	.0013	.0003	.0013	.0003
105	4.1339	.0008	.0007	+.0001	.0015	.0005	.0013	.0003	.0013	.0003
110	4.3307	.0008	.0007	+.0001	.0015	.0005	.0013	.0003	.0013	.0003
120	4.7244	.0008	.0007	+.0001	.0015	.0005	.0013	.0003	.0013	.0003
130	5.1181	.0010	.0008	+.0001	.0018	.0006	.0015	.0004	.0015	.0004
140	5.5118	.0010	.0008	+.0001	.0018	.0006	.0015	.0004	.0015	.0004
150	5.9055	.0010	.0008	+.0001	.0018	.0006	.0015	.0004	.0015	.0004
160	6.2992	.0010	.0008	+.0001	.0018	.0006	.0015	.0004	.0015	.0004
170	6.6929	.0010	.0008	+.0001	.0018	.0006	.0015	.0004	.0015	.0004
180	7.0866	.0010	.0008	+.0001	.0018	.0006	.0015	.0004	.0015	.0004
190	7.4803	.0012	.0010	+.0002	.0022	.0006	.0017	.0006	.0017	.0006
200	7.8740	.0012	.0010	+.0002	.0022	.0006	.0017	.0006	.0017	.0006
210	8.2677	.0012	.0010	+.0002	.0022	.0006	.0017	.0006	.0017	.0006
220	8.6614	.0012	.0010	+.0002	.0022	.0006	.0017	.0006	.0017	.0006
230	9.0551	.0012	.0010	+.0002	.0022	.0006	.0017	.0006	.0017	.0006
240	9.4488	.0012	.0010	+.0002	.0022	.0006	.0017	.0006	.0017	.0006
260	10.2362	.0014	.0011	+.0002	.0025	.0007	.0019	.0007	.0019	.0007
280	11.0236	.0014	.0011	+.0002	.0025	.0007	.0019	.0007	.0019	.0007
300	11.8110	.0014	.0011	+.0002	.0025	.0007	.0019	.0007	.0019	.0007

Page 78, table XXXI: In column 3, lines 2 through 6, delete ".0005" and substitute ".0004", and opposite metric "160" in column 3, delete ".0008" and substitute ".0010"; in column 6, delete ".0018" and substitute ".0020"; and in column 11, delete ".0008" and substitute ".0010".

**MILITARY CUSTODIANS:**

Army—WC

Navy—Sh

Air Force—ASD