

K-03-07

FED. SUP CLASS  
3110

REVIEW ACTIVITIES: ARMY-NAVY-AF-04  
USER ACTIVITIES: ARMY-NR: NAVY-MC, YD

This military standard is mandatory for use by all Departments and Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

MS DASH NUMBER	A BORE DIAMETER			B OUTSIDE DIAMETER			C WIDTH			RAD MAX	BASIC DYNAMIC LOAD RATING LB (1)	BASIC STATIC LOAD RATING LB (2)	APPROX LIMITING SPEED RPM (3)
	NOM MM	MIN IN.	MAX IN.	NOM MM	MIN IN.	MAX IN.	NOM MM	MIN IN.	MAX IN.				
-1	40	1.5743	1.5748	90	3.5427	3.5433	33	1.2942	1.2992	.06	18800	16100	4500
-2	45	1.7712	1.7717	100	3.9364	3.9370	35	1.4123	1.4173	.06	25000	20700	4000
-3	50	1.9680	1.9685	110	4.3301	4.3307	40	1.5698	1.5748	.08	30700	26600	3700
-4	55	2.1648	2.1654	120	4.7238	4.7244	43	1.6879	1.6929	.08	31400	31800	3300
-5	60	2.3616	2.3622	130	5.1173	5.1181	46	1.8060	1.8110	.08	42700	38700	3100
-6	65	2.5585	2.5591	140	5.5110	5.5118	48	1.8848	1.8898	.08	47500	42200	2800
-7	70	2.7553	2.7559	150	5.9047	5.9055	51	2.0029	2.0079	.08	50000	49600	2600
-8	75	2.9522	2.9528	160	6.2982	6.2992	55	2.1604	2.1654	.08	62600	56300	2500
-9	80	3.1490	3.1496	170	6.6919	6.6929	58	2.2785	2.2835	.08	70000	64700	2300
-10	80	3.1490	3.1496	170	6.6919	6.6929	58	2.2785	2.2835	.08	70000	64700	2300
-11	85	3.3457	3.3463	180	7.0856	7.0866	60	2.3572	2.3622	.10	75500	68300	2100
-12	85	3.3457	3.3463	180	7.0856	7.0866	60	2.3572	2.3622	.10	75500	68300	2100
-13	90	3.5425	3.5433	190	7.4791	7.4803	64	2.5147	2.5197	.10	89500	85400	2000
-14	90	3.5425	3.5433	190	7.4791	7.4803	64	2.5147	2.5197	.10	89500	85400	2000
-15	95	3.7394	3.7402	200	7.8728	7.8740	67	2.6328	2.6378	.10	92300	92500	1900
-16	95	3.7394	3.7402	200	7.8728	7.8740	67	2.6328	2.6378	.10	92300	92500	1900
-17	100	3.9362	3.9370	215	8.4634	8.4646	73	2.8690	2.8740	.10	110000	104000	1800
-18	100	3.9362	3.9370	215	8.4634	8.4646	73	2.8690	2.8740	.10	110000	104000	1800
-19	110	4.3299	4.3307	240	9.4476	9.4488	80	3.1446	3.1496	.10	132200	133000	1600
-20	110	4.3299	4.3307	240	9.4476	9.4488	80	3.1446	3.1496	.10	132200	133000	1600
-21	120	4.7236	4.7244	260	10.2348	10.2362	86	3.3808	3.3858	.10	152700	156000	1500
-22	120	4.7236	4.7244	260	10.2348	10.2362	86	3.3808	3.3858	.10	152700	156000	1500
-23	120	4.7236	4.7244	260	10.2348	10.2362	86	3.3808	3.3858	.10	152700	156000	1500
-24	130	5.1171	5.1181	280	11.0222	11.0236	93	3.6564	3.6614	.12	177800	182000	1400
-25	130	5.1171	5.1181	280	11.0222	11.0236	93	3.6564	3.6614	.12	177800	182000	1400
-26	130	5.1171	5.1181	280	11.0222	11.0236	93	3.6564	3.6614	.12	177800	182000	1400
-27	140	5.5108	5.5118	300	11.8110	11.8120	100	3.9364	3.9370	.12	207000	207000	1300
-28	140	5.5108	5.5118	300	11.8110	11.8120	100	3.9364	3.9370	.12	207000	207000	1300

(B) ENTIRE STANDARD REVISED

P.A. ARMY-AI	TITLE	MILITARY STANDARD
Other Code	BEARING, ROLLER, SELF-ALIGNING:	
AF-11	DOUBLE ROW	MS17133
PROCUREMENT SPECIFICATION FF-B-185	SUPERSEDES:	SHEET 1 OF 3

DD FORM 672-1 (Coordinate)

APPROVED JANUARY 1960 REVISED (A) 27 OCTOBER 1964 (B) 8 MARCH 1968

FED. SUP CLASS  
3110

MS DASH NUMBER	A BORE DIAMETER			B OUTSIDE DIAMETER			C WIDTH			RAD MAX ②	BASIC DYNAMIC LOAD RATING LB ①	BASIC STATIC LOAD RATING LB ④	APPROX LIMITING SPEED RPM ③
	NOM MM	MIN IN.	MAX IN.	NOM MM	MIN IN.	MAX IN.	NOM MM	MIN IN.	MAX IN.				
-40	140	5.5108	5.5118	225	8.8571	8.8583	68	2.6722	2.6772	.08	95200	114000	1400
-28	140	5.5108	5.5118	250	9.8413	9.8425	68	2.6722	2.6772	.10	116000	118000	1400
-41	140	5.5108	5.5118	250	9.8413	9.8425	88	3.4596	3.4646	.12	142200	163000	1300
-29	140	5.5108	5.5118	300	11.8096	11.8110	102	4.0107	4.0157	.12	208000	214000	1200
-30	150	5.9045	5.9055	225	8.8571	8.8583	56	2.1997	2.2047	.08	83100	95000	1500
-42	150	5.9045	5.9055	250	9.8413	9.8425	60	3.1446	3.1496	.08	132700	154000	1300
-31	150	5.9045	5.9055	270	10.6285	10.6299	73	2.8690	2.8740	.10	132000	144000	1300
-43	150	5.9045	5.9055	270	10.6285	10.6299	96	3.7745	3.7795	.12	168000	191000	1200
-32	150	5.9045	5.9055	320	12.5968	12.5984	108	4.2470	4.2520	.12	230000	245000	1100
-44	160	6.2982	6.2992	240	9.4476	9.4488	60	2.3572	2.3622	.08	90200	106000	1400
-45	160	6.2982	6.2992	270	10.6285	10.6299	86	3.3808	3.3858	.08	151500	179000	1200
-46	160	6.2982	6.2992	290	11.4159	11.4173	80	3.1446	3.1496	.10	161000	171000	1200
-47	160	6.2982	6.2992	290	11.4159	11.4173	104	4.0895	4.0945	.12	192500	220000	1100
-48	160	6.2982	6.2992	340	13.3842	13.3858	114	4.4832	4.4882	.12	257300	268000	1100
-49	170	6.6919	6.6929	260	10.2348	10.2362	67	2.6328	2.6378	.08	115000	136000	1300
-50	170	6.6919	6.6929	280	11.0222	11.0236	88	3.4596	3.4646	.08	159000	188000	1100
-51	170	6.6919	6.6929	310	12.2033	12.2047	86	3.3808	3.3858	.12	172000	192000	1100
-52	170	6.6919	6.6929	310	12.2033	12.2047	110	4.3257	4.3307	.12	211000	255000	1000
-53	170	6.6919	6.6929	360	14.1716	14.1732	120	4.7194	4.7244	.12	264400	292000	1000
-54	180	7.0856	7.0866	280	11.0222	11.0236	74	2.9084	2.9134	.08	136700	159000	1200
-55	180	7.0856	7.0866	300	11.8096	11.8110	96	3.7745	3.7795	.10	184700	222000	1000
-56	180	7.0856	7.0866	320	12.5968	12.5984	86	3.3808	3.3858	.12	177000	207000	1100
-57	180	7.0856	7.0866	320	12.5968	12.5984	112	4.4044	4.4094	.12	219800	275000	1000
-58	180	7.0856	7.0866	380	14.9590	14.9606	126	4.9556	4.9606	.12	317500	339000	930
-59	190	7.4791	7.4803	290	11.4159	11.4173	75	2.9428	2.9528	.08	142000	169000	1100
-60	190	7.4791	7.4803	320	12.5968	12.5984	104	4.0845	4.0945	.10	225000	266000	1000
-61	190	7.4791	7.4803	340	13.3842	13.3858	92	3.6120	3.6220	.12	206000	224000	1000
-62	190	7.4791	7.4803	340	13.3842	13.3858	120	4.7144	4.7244	.12	265800	314000	920
-63	190	7.4791	7.4803	400	15.7464	15.7480	132	5.1668	5.1668	.16	313700	350000	870
-64	200	7.8728	7.8740	310	12.2033	12.2047	82	3.2183	3.2283	.08	163000	195000	1000
-65	200	7.8728	7.8740	340	13.3842	13.3858	112	4.3994	4.4094	.10	234700	293000	900
-66	200	7.8728	7.8740	360	14.1716	14.1732	98	3.8483	3.8583	.12	227800	256000	930
-67	200	7.8728	7.8740	360	14.1716	14.1732	128	5.0294	5.0394	.12	294600	351000	860
-68	200	7.8728	7.8740	420	16.5336	16.5354	138	5.4231	5.4331	.16	384000	404000	820
-69	220	8.6602	8.6614	340	13.3842	13.3858	90	3.5333	3.5433	.10	198000	236000	900
-70	220	8.6602	8.6614	370	14.5653	14.5669	120	4.7144	4.7244	.12	287000	344000	810*
-71	220	8.6602	8.6614	400	15.7464	15.7480	108	4.2420	4.2520	.12	283000	311000	820
-72	220	8.6602	8.6614	400	15.7464	15.7480	144	5.6593	5.6693	.12	385000	452000	760
-73	220	8.6602	8.6614	460	18.1084	18.1102	145	5.6987	5.7087	.16	426000	449000	720
-74	240	9.4476	9.4488	360	14.1716	14.1732	92	3.6120	3.6220	.10	209000	260000	850
-75	240	9.4476	9.4488	400	15.7464	15.7480	128	5.0294	5.0394	.12	333000	400000	730
-76	240	9.4476	9.4488	440	17.3210	17.3228	160	6.2892	6.2992	.12	425000	491000	670
-77	260	10.2348	10.2362	400	15.7464	15.7480	104	4.0845	4.0945	.12	263000	322000	750
-78	260	10.2348	10.2362	440	17.3210	17.3228	144	5.6593	5.6693	.12	398000	479000	650
-79	260	10.2348	10.2362	480	18.8958	18.8976	174	6.8404	6.8504	.16	494000	574000	600
-80	280	11.0222	11.0236	420	16.5336	16.5354	106	4.1632	4.1732	.12	282000	357000	700
-81	280	11.0222	11.0236	460	18.1084	18.1102	146	5.7380	5.7480	.16	408000	498000	610
-92	280	11.0222	11.0236	500	19.6832	19.6850	176	6.9191	6.9291	.16	520000	618000	560
-83	300	11.8096	11.8110	460	18.1084	18.1102	118	4.6357	4.6457	.12	348000	441000	630
-84	300	11.8096	11.8110	500	19.6832	19.6850	160	6.2892	6.2992	.16	477000	582000	550
-85	300	11.8096	11.8110	540	21.2578	21.2598	192	7.5491	7.5591	.16	616000	741000	500
-86	320	12.5968	12.5984	480	18.8958	18.8976	121	4.7478	4.7638	.12	358000	461000	590
-87	320	12.5968	12.5984	540	21.2578	21.2598	176	6.9191	6.9291	.16	556000	687000	500
-88	320	12.5968	12.5984	580	22.8326	22.8346	208	8.1730	8.1890	.16	700000	864000	450

APPROVED 7 JANUARY 1960 REVISED (A) 27 OCTOBER 1964 (B) ENTIRE STANDARD REVISED

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REVIEW ACTIVITIES: ARMY-NEWC, AF-84  
USER ACTIVITIES: ARMY-MR, NAVY-MC, YD

P.A. ARMY-AF		TITLE		MILITARY STANDARD	
Other Cst		BEARING, ROLLER, SELF-ALIGNING; DOUBLE ROW		MS17133	
AF-11		SUPERSEDES		SHEET 2	
PROCUREMENT SPECIFICATION FF-B-185					

DD FORM 672-1 (10-60) (Unchanged)

FED. SUP CLASS  
3110

## NOTES:

1. THESE BEARINGS SHALL BE IN ACCORDANCE WITH CLASS 6, TYPE 264, OF PROCUREMENT SPECIFICATION.
2. MATERIAL FOR ROLLERS AND RACES: STEEL, ALLOY, HIGH CARBON CHROMIUM, TYPE AISI E51100 OR TYPE AISI E52100, FEDERAL STANDARD NO. 66.
3. MATERIAL FOR RETAINERS: STEEL, BRASS, BRONZE, ALUMINUM, OR MANUFACTURERS STANDARD COMMERCIAL PRACTICE.
4. HEAT TREAT: ROLLERS AND RACES; THROUGH HARDENED TO ROCKWELL C58 MINIMUM.
5. SURFACE FINISH: SURFACES MARKED  $20\sqrt{\phantom{x}}$  SHALL HAVE MAXIMUM ROUGHNESS AS INDICATED BY USAS B46.1.
6. PROTECTIVE FINISH: COATING OF RUST PREVENTIVE FILM APPLIED BY MANUFACTURER.
7. BEARINGS SHALL BE SUPPLIED WITHOUT LUBRICATION.
8. NOMINAL DIMENSIONS ARE IN MILLIMETERS; MAXIMUM AND MINIMUM DIMENSIONS ARE IN INCHES.
9. BEARINGS DEPICTED CONFORM TO STANDARDS OF THE ANTI-FRICTION BEARING MANUFACTURERS ASSOCIATION.
10. BEARING MUST CLEAR MAX HOUSING OR SHAFT FILLET RADIUS SHOWN IN "RAD" COLUMN.
11. THE BASIC DYNAMIC LOAD RATING IS THAT CONSTANT STATIONARY RADIAL LOAD WHICH A GROUP OF APPARENTLY IDENTICAL ROLLER BEARINGS WITH STATIONARY OUTER RING CAN ENDURE FOR A RATING LIFE OF 1,000,000 REVOLUTIONS OF THE INNER RING. THE RATING LIFE OF A GROUP OF APPARENTLY IDENTICAL ROLLER BEARINGS IS DEFINED AS THE NUMBER OF REVOLUTIONS (OR HOURS AT SOME GIVEN CONSTANT SPEED) THAT 90% OF A GROUP OF BEARINGS WILL COMPLETE OR EXCEED BEFORE THE FIRST EVIDENCE OF FATIGUE DEVELOPES.
12. FOR RATING LIVES AT LOADS OTHER THAN THE BASIC DYNAMIC LOAD RATING AT OPERATING CONDITIONS OF INNER RING ROTATING, OUTER RING STATIONARY, STEADY LOAD, UNIFORM RPM, THROUGH LUBRICATION, 300° MAXIMUM BEARING TEMPERATURE, SHAFT MISALIGNMENT NOT EXCEEDING  $\pm 1-1/2^\circ$ :

$$L = \left(\frac{C}{P}\right)^{10/3}, \text{ WHERE}$$

L = RATING LIFE, MILLIONS OF REVOLUTIONS.

C = BASIC DYNAMIC LOAD RATING, LB.

P = EQUIVALENT RADIAL LOAD TO WHICH BEARING IS SUBJECTED.

13. MEDIAN LIFE, THE LIFE WHICH 50% OF A GROUP OF BEARINGS WILL COMPLETE BEFORE EVIDENCE OF FATIGUE DEVELOPES IS APPROXIMATELY FIVE (5) TIMES THE RATING LIFE.
14. THE BASIC STATIC LOAD RATING IS THAT STATIONARY RADIAL LOAD APPLIED TO A NON-ROTATING BEARING WHICH WILL PRODUCE A PERMANENT DEFORMATION IN RACE AND/OR ROLLERS COMBINED AT ANY ONE POINT, OF .0001 OF THE ROLLER DIAMETER.
15. THE LIMITING SPEEDS ARE BASED ON OIL LUBRICATION; WITH GREASE LUBRICATION THE LIMITING SPEEDS ARE 50% OF THE VALUES SHOWN IN THIS TABLE.
16. FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER DOCUMENTS REFERENCED HEREIN.
17. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATIONS FOR BID.
18. THE MS PART NUMBER SHALL CONSIST OF THE MS NUMBER PLUS THE DASH NUMBER. EXAMPLE: MS17133-14.
19. MARKING SHALL CONSIST OF THE MS PART NUMBER AND THE MANUFACTURER'S IDENTIFICATION IN ACCORDANCE WITH MIL-STD-130.

REVIEW ACTIVITIES: ARMY-ME, WC, AF-B4  
USER ACTIVITIES: ARMY-MR, NAVY-MC, YD

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APPROVED 7 JAN 1960 REVISED (A) 27 OCTOBER 1964 (B) ENTIRE STANDARD REVISED

P.A. ARMY-AT Other Cust  AF-11	TITLE  BEARING, ROLLER, SELF-ALIGNING: DOUBLE ROW	MILITARY STANDARD  MS 17133
PROCUREMENT SPECIFICATION FF-B-185	SUPERSEDES:	SHEET 3

DD FORM 672-1 (Coordinated)