

This military standard is approved 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.

REVIEWER ACTIVITIES:
Air Force — 99
Navy — SH, MC
DLA — IS
Other — NS

USER ACTIVITIES:
Army — AV

Dash No.	AFBMA bearing number (See Note 11) Cone-Cup	A	B	C	D	R	Y	Recommended shoulder diameter ^(A)		^(A) K factor	Basic dynamic load ratings ^(1b) ^(A)	
								Shaft	Housing		Radial	Thrust
1	05075-05185D	0.7500	1.8504	0.9926	1.2500	0.05	0.03	0.98	1.67	1.64	1940	620
42	07087-07196D	0.8750	1.9687	1.000	1.3126	0.05	0.03	1.12	1.83	1.45	2150	780
* 2	07100-07196D	1.0000	1.9687	1.000	1.3126	0.04	0.03	1.20	1.83	1.45	2150	780
* 3	15102-15251D	1.0000	2.5000	1.4375	1.8125	0.06	0.03	1.34	2.32	1.67	3790	1190
43	17119-17245D	1.1875	2.4409	1.4275	1.5625	0.06	0.03	1.46	2.24	1.53	3090	1060
44	15118-15251D	1.1895	2.5000	1.4375	1.8125	0.14	0.03	1.63	2.32	1.67	3790	1190
45	08125-08231D	1.2500	2.3125	0.9688	1.2812	0.04	0.02	1.48	2.17	1.23	2440	1040
* 4	15126-15251D	1.2500	2.5000	1.4375	1.8125	0.03	0.03	1.46	2.32	1.67	3790	1190
* 5	2580-2523D	1.2500	2.7500	2.2500	2.6250	0.03	0.03	1.52	2.52	2.14	6250	1530
* 6	3476-3423D	1.2500	3.2500	2.1875	2.6251	0.05	0.03	1.69	2.95	1.60	7900	2590
46	26126-26284D	1.2600	2.8338	1.4375	1.6835	0.06	0.03	1.56	2.56	1.62	4200	1370
47	2581-2523D	1.3125	2.7500	2.2500	2.6250	0.03	0.03	1.56	2.52	2.14	6250	1530

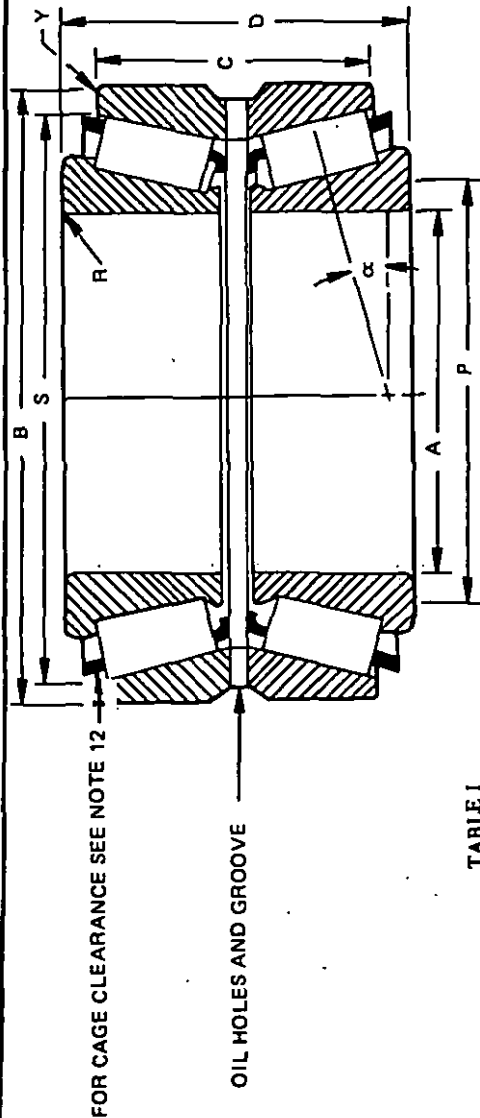


TABLE I

FED. SUP CLASS
3110

^(A) denotes changes. For NOTES see sheets 7 and 8.

APPROVED 30 Apr 59 REVISED ^(A) 13 Jan 82

P. A. OS Other Cost AT 11	INTERNATIONAL INTEREST	TITLE BEARING, ROLLER, TAPERED, DOUBLE ROW OF ROLLERS, NORMAL ANGLE, TWO SINGLE CONES, ONE DOUBLE CUP, ADJUSTABLE, TYPE 761 (TDO)	MILITARY STANDARD MS 19086
PROCUREMENT SPECIFICATION FF-B-187	SUPERSEDES:	SHEET 1 OF 9	

DD FORM 672-1 (COORDINATED)

3110-0517

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Other — NS

USER ACTIVITIES:
Army — AV

Dash No.	AFBMA (A) bearing number (See Note 11) Cone-Cup	A	B	C	D	R	Y	Recommended shoulder (A) diameter		K factor	Basic dynamic load ratings (lb) (A)	
								Shaft	Housing		Radial	Thrust
48	26131-26282D	1.3125	2.8125	1.4375	1.6875	0.14	0.02	1.75	2.56	1.62	4200	1370
49	02877-02823D	1.3750	3.0000	1.5000	1.8750	0.14	0.03	1.91	2.76	1.29	5000	2030
50	14139-142760	1.3770	2.7170	1.5000	1.8126	0.05	0.03	1.63	2.48	1.53	4150	1420
51	13682-13621D	1.4375	2.7170	1.5000	1.8124	0.14	0.03	1.89	2.56	1.45	4250	1540
* 7	13687-13621D	1.5000	2.7170	1.5000	1.8124	0.08	0.03	1.83	2.56	1.45	4250	1540
52	27880-27820D	1.5000	3.1510	1.7700	2.2500	0.03	0.03	1.89	2.95	1.04	5850	2960
* 8	3490-3423D	1.5000	3.2500	2.1875	2.6251	0.14	0.03	2.05	2.95	1.60	7900	2590
* 9	542-533D	1.5000	4.3750	2.5000	3.1250	0.14	0.06	2.17	3.94	1.97	13100	3500
53	28158-28318D	1.5748	3.1510	1.3750	1.8126	0.06	0.03	1.87	2.87	1.45	4650	1680
54	24780-24720D	1.6250	3.0000	1.5625	1.9375	0.14	0.03	2.13	2.83	1.49	5800	2040
10	25580-25520D	1.7500	3.2650	1.8750	2.2500	0.14	0.03	2.24	3.03	1.74	7000	2110
* 11	535-533D	1.7500	4.3750	2.5000	3.1250	0.14	0.06	2.36	3.94	1.97	13100	3500
55	18610-18620D	1.8125	3.7500	2.0000	2.4376	0.11	0.03	2.18	2.93	1.56	9400	2410
56	359A-353D	1.8125	3.5480	1.7500	2.0000	0.14	0.03	2.24	3.23	1.91	6000	1640
57	436-432D	1.8125	3.7500	2.0000	2.4376	0.14	0.03	2.32	3.43	2.05	9400	2410
12	368A-363D	2.0000	3.5433	1.6563	1.9689	0.14	0.03	2.44	3.31	1.83	6300	1810
13	3780-3729D	2.0000	3.6718	2.0625	2.5625	0.14	0.03	2.52	3.46	1.73	9500	2890
58	537-533D	2.0000	4.3750	2.5000	3.1250	0.14	0.06	2.56	3.94	1.97	13100	3500
* 14	555-552D	2.0000	4.8750	2.5000	3.1250	0.09	0.06	2.60	4.53	1.69	15100	4700
59	368S-363D	2.0312	3.5433	1.6563	1.9689	0.08	0.03	2.32	3.31	1.83	6300	1810
60	33895-33821D	2.1250	3.7500	2.0624	2.5000	0.06	0.03	2.48	3.54	1.77	9950	2960
61	389A-384ED	2.1250	3.9370	1.5620	1.9370	0.03	0.03	2.40	3.66	1.65	6850	2180
62	387A-384D	2.2500	3.9370	1.6875	2.0625	0.14	0.03	2.72	3.66	1.65	6850	2180
63	462-452D	2.2500	4.2500	2.1250	2.5626	0.09	0.03	2.64	3.94	1.74	10200	3090
* 15	390-394D	2.2500	4.3307	1.8125	2.0625	0.09	0.03	2.76	4.11	1.45	7650	2770
* 16	555S-552D	2.2500	4.8750	2.5000	3.1250	0.14	0.06	2.87	4.53	1.69	15100	4700
* 17	635-632D	2.2500	5.3750	3.0000	3.7500	0.14	0.06	2.95	4.92	1.61	18300	5950
64	28995-28921D	2.4700	3.9370	1.7500	2.1874	0.14	0.03	2.95	3.78	1.37	8650	3310
* 18	390A-394D	2.5000	4.3307	1.8125	2.0625	0.06	0.03	2.87	4.11	1.45	7650	2770
* 19	559-552D	2.5000	4.8750	2.5000	3.1250	0.14	0.06	3.07	4.53	1.69	15100	4700

FED. SUP CLASS
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DD FORM 672-1 (COORDINATED)

3110-0517

APPROVED 30 Apr 59 REVISED (A) For changes see sheets 1 thru 9.

P. A. OS Other Cus: AT 11	INTERNATIONAL INTEREST	TITLE BEARING, ROLLER, TAPERED, DOUBLE ROW OF ROLLERS, NORMAL ANGLE, TWO SINGLE CONES, ONE DOUBLE CUP, ADJUSTABLE, TYPE 761 (TDO)	MILITARY STANDARD MS 19086
PROCUREMENT SPECIFICATION FF-B-187	SUPERSEDES:		SHEET 2 OF 9

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REVIEWER ACTIVITIES:

Air Force — 99
Navy — SH, MC
DLA — IS
Other — NS

USER ACTIVITIES:

Army — AV

Dash No.	AFBMA (A) bearing number (See Note 11) Cone-Cup	A	B	C	D	R	Y	Recommended shoulder diameter (A)		K factor	Basic dynamic load ratings (lb) (A)	
								Max. housing fillet radius	Max. shaft fillet radius		Radial	Thrust
*20	639-632D	2.5000	5.3750	3.0000	3.7500	0.14	0.06	3.19	4.92	1.61	18300	5950
*21	745S-742D	2.5000	6.1250	3.3750	4.0000	0.14	0.06	3.31	5.63	1.80	25100	7350
65	399A-394D	2.6875	4.3307	1.8125	2.0625	0.09	0.03	3.07	4.11	1.45	7650	2770
66	480-472D	2.6875	4.7244	2.1250	2.5626	0.14	0.03	3.23	4.49	1.52	11300	3900
67	560S-552D	2.6875	4.8750	2.5000	3.1250	0.14	0.06	3.27	4.53	1.69	15100	4700
68	34274-34478D	2.7540	4.7812	1.5000	2.0626	0.08	0.03	3.19	4.57	1.30	8100	3270
69	33281-33462D	2.8125	4.6250	1.2500	2.6250	0.14	0.03	3.35	4.41	1.34	11400	4450
70	47490-47420D	2.8125	4.7244	2.3125	2.8125	0.14	0.03	3.39	4.49	1.62	14500	4700
71	644-632D	2.8125	5.3750	3.0000	3.7500	0.14	0.06	3.43	4.92	1.61	18300	5950
72	659-654D	2.8750	5.0000	2.5625	3.1875	0.14	0.06	3.46	4.69	1.61	15700	5100
73	29688-29622D	2.9062	4.4995	1.8125	2.3125	0.06	0.03	3.27	4.29	1.20	9350	4100
*22	575-572D	3.0000	5.5115	2.6250	3.2500	0.14	0.03	3.62	5.24	1.45	16800	6100
*23	590A-592D	3.0000	6.0000	2.5000	3.2500	0.14	0.06	3.74	5.67	1.43	19500	7150
*24	837-834D	3.0000	6.7500	3.9375	4.9375	0.03	0.03	3.54	6.10	1.95	32300	8700
*25	HH221430- HH221410D	3.0000	7.500	4.1250	5.0000	0.14	0.06	3.98	7.05	1.74	42000	12600
74	740-742D	3.1875	6.1250	3.3750	4.0000	0.20	0.06	3.98	5.63	1.80	25100	7350
75	580-572D	3.2500	5.5115	2.6250	3.2500	0.14	0.03	3.86	5.24	1.45	16800	6100
76	663-654D	3.2500	6.0000	3.0000	3.7500	0.14	0.06	3.90	5.55	1.43	19500	7150
77	497-493D	3.3750	5.3750	2.1250	2.7500	0.14	0.03	3.90	5.12	1.31	12500	5000
78	L217849- L217810D	3.5000	4.8750	1.6875	1.9999	0.06	0.03	3.82	4.69	1.77	8200	2430
*26	759-752D	3.5000	6.3750	3.3750	4.1250	0.14	0.06	4.17	5.91	1.71	26200	8050
*27	855-854D	3.5000	7.5000	4.0000	5.0000	0.31	0.06	4.65	6.85	1.74	36900	11100
79	760-752D	3.5625	6.3750	3.3750	4.1250	0.14	0.06	4.21	5.91	1.71	26200	8050
80	42368-42587D	3.6875	5.8750	2.0625	2.6249	0.12	0.03	4.21	5.63	1.19	13600	6000
81	L319249- L319210D	3.7500	5.1250	1.5625	1.8749	0.06	0.03	4.06	4.92	1.67	8500	2670
82	594-592D	3.7500	6.0000	2.5000	3.2500	0.14	0.03	4.33	5.67	1.32	17900	7100
83	52400-52637D	4.0000	6.3750	2.4375	3.2499	0.14	0.03	4.61	6.06	1.23	18800	8050

FED. SUP CLASS
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MILITARY STANDARD
MS 19086

PROCUREMENT SPECIFICATION
FF-B-187

SUPERSEDES:

SHEET 3 OF 9

USER ACTIVITIES:
Army — AYREVIEWER ACTIVITIES:
Air Force — 99
Navy — SH, MC
DLA — IS
Other — NS

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FED. SUP CLASS 3110													
Dash No.	AFBMA (A) bearing number (See Note 11) Cone-Cup	A	B	C	D	R	Y	P	S		K factor	Basic dynamic load ratings (lb) (A)	
									Recommended shoulder (A) diameter	Housing		Radial	Thrust
84	687-672D	4.0000	6.6250	2.7500	3.6250	0.14	0.03	4.65	6.30	6.30	1.24	21900	9250
28	780-774D	4.0000	7.1250	3.3750	4.1250	0.14	0.06	4.69	6.61	6.61	1.51	28300	9850
29	861-854D	4.0000	7.5000	4.0000	5.0000	0.31	0.06	5.08	6.85	6.85	1.74	36900	11100
85	HH221449- HH221410D	4.0000	7.5000	4.1250	5.0000	0.31	0.06	5.16	7.05	7.05	1.74	42000	12600
*30	941-932D	4.0000	8.3750	4.6250	5.6250	0.28	0.06	5.12	7.60	7.60	1.79	46500	13600
86	782-773D	4.1250	7.0866	3.3750	4.1250	0.14	0.03	4.80	6.61	6.61	1.51	28300	9850
87	L521949- L521910D	4.2500	5.7500	1.5625	1.9375	0.06	0.03	4.57	5.55	5.55	1.49	8900	3140
88	LM522546- LM522510D	4.2500	6.2987	2.3125	2.9375	0.14	0.03	4.80	6.06	6.06	1.45	17800	6450
89	56425-56650D	4.2500	6.5000	2.5000	3.2500	0.14	0.03	4.84	6.26	6.26	1.18	19300	8600
90	64450-64700D	4.5000	7.0000	2.7500	3.6250	0.14	0.03	5.16	6.77	6.77	1.13	23100	10700
*31	71450-71751D	4.5000	7.5000	3.1875	4.1875	0.14	0.06	5.20	7.13	7.13	1.40	30200	11300
91	938-932D	4.5000	8.3750	4.6250	5.6250	0.28	0.06	5.55	7.60	7.60	1.79	46500	13600
32	HH224346- HH224310D	4.5000	8.3750	4.6250	5.6250	0.28	0.06	5.63	7.94	7.94	1.79	54000	15800
92	71453-71751D	4.5310	7.5000	3.1875	4.1875	0.14	0.06	5.24	7.13	7.13	1.40	30200	11300
93	L624549- -L624514D	4.7500	6.3750	2.1250	2.5000	0.06	0.03	5.08	6.14	6.14	1.34	9750	3830
94	M224749- M224710D	4.7500	6.8750	2.4375	3.0625	0.14	0.03	5.31	6.61	6.61	1.76	21400	6400
95	48290-48220D	5.0000	7.1875	2.8750	3.3750	0.14	0.03	5.55	6.93	6.93	1.91	24600	6750
33	67388-67322D	5.0000	7.7500	3.3750	4.0000	0.14	0.03	5.67	7.48	7.48	1.70	32200	9950
*34	95500-95927D	5.0000	9.2500	4.5000	5.6250	0.25	0.06	6.06	8.54	8.54	1.58	52000	17300
96	799-792D	5.0625	8.1250	3.2500	4.2500	0.13	0.03	5.75	7.80	7.80	1.27	32000	13200
97	L327249- L327210D	5.2500	6.9688	1.8750	2.2500	0.06	0.03	5.59	6.73	6.73	1.68	13800	4300
98	67390-67323D	5.2500	7.7500	3.6250	4.2500	0.14	0.03	5.87	7.48	7.48	1.70	32200	9950
99	67390-67325D	5.2500	7.8750	3.3750	4.0000	0.14	0.03	5.87	7.52	7.52	1.70	32200	9950

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PROCUREMENT SPECIFICATION FF-B-187	SUPERSEDES:		SHEET 4 OF 9

APPROVED 30 Apr 59 REVISED (A) For changes see sheets 1 thru 9.

FED. SUP CLASS
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MILITARY STANDARD

MS 19086

SHEET 4

OF 9

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USER ACTIVITIES:
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Dash No.	AFBMA (A) bearing number (See Note 11) Cone-Cup	A	B	C	D	R	Y	P	S		K factor	Basic dynamic load ratings (lb) (A)	
									Recommended shoulder diameter	Thrust		Radial	
100	95525-95927D	5.2500	9.2500	4.5000	5.6250	0.38	0.06	6.54	8.54	1.58	52000	17300	
101	48393-48320D	5.3750	7.5000	2.8750	3.3750	0.14	0.03	5.94	7.24	1.82	26100	7500	
102	74550-74851D	5.5000	8.5000	3.1875	4.1875	0.14	0.06	6.22	8.19	1.20	32800	14300	
103	73551-73876D	5.5000	8.7500	2.1250	2.9800	0.14	0.09	6.14	8.15	1.34	19400	7600	
104	898-892D	5.5000	9.0000	3.8750	4.8750	0.14	0.06	6.30	8.50	1.39	44000	16500	
*35	99550-99102D	5.5000	10.0000	4.3750	5.8750	0.28	0.06	6.69	9.37	1.43	55500	20400	
*36	HH234031 - HH234011D	5.5000	12.1250	6.1250	7.8750	0.38	0.09	7.09	11.24	1.79	94500	27800	
105	48684-48620D	5.6250	7.8750	2.8750	3.4376	0.31	0.03	6.54	7.60	1.74	26600	8000	
106	36690-36620D	5.7500	7.6250	2.1250	2.5624	0.06	0.03	6.10	7.40	1.59	18500	6100	
107	82576-82951D	5.7500	9.5000	4.1875	5.1875	0.14	0.06	6.54	8.90	1.32	44000	17400	
108	99575-99101D	5.7500	10.0000	4.5000	6.0000	0.28	0.06	6.89	9.37	1.43	55500	20400	
109	HM231149 - HM231111D	5.8750	9.3125	4.1875	5.1875	0.14	0.06	6.57	8.82	1.83	50000	14400	
110	HM231149 - HM231116D	5.8750	9.5000	4.1875	5.1875	0.14	0.06	6.57	8.82	1.83	50000	14400	
111	99587-99102D	5.8750	10.0000	4.3750	5.8750	0.28	0.06	7.01	9.37	1.43	55500	20400	
112	M231649 - M231610D	6.0000	8.7500	3.0000	3.9374	0.14	0.03	6.65	8.39	1.76	33200	9900	
*37	99600-99101D	6.0000	10.0000	4.5000	6.0000	0.28	0.06	7.13	9.37	1.43	55500	20400	
.113	EE107060 - 107105D	6.0000	10.5625	4.9375	6.3125	0.25	0.06	7.13	9.82	1.51	65500	22800	
114	EE450601 - 451215D	6.0000	12.1250	5.7500	7.8750	0.38	0.09	7.44	10.82	1.79	84000	24600	
38	HH234048 - HH234011D	6.0000	12.1250	6.1250	7.8750	0.38	0.09	7.52	11.24	1.79	94500	27800	
115	46790-46720D	6.5000	8.8750	2.7500	3.3750	0.14	0.03	7.13	8.58	1.52	28800	9950	
116	M235145 - M235113D	6.5000	10.0000	3.0000	4.0000	0.19	0.06	7.28	9.45	1.83	39400	11300	
117	94687-94114D	6.8750	11.3750	4.3750	5.6250	0.28	0.06	8.03	10.71	1.25	57000	24000	

P. A. OS Other Coss: AT 11		INTERNATIONAL INTEREST	TITLE BEARING, ROLLER, TAPERED, DOUBLE ROW OF ROLLERS, NORMAL ANGLE, TWO SINGLE CONES, ONE DOUBLE CUP, ADJUSTABLE, TYPE 761 (TDO)	MILITARY STANDARD MS 19086
PROCUREMENT SPECIFICATION FF-B-187		SUPERSEDES:	SHEET 5 OF 9	

FED. SUP CLASS
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APPROVED 30 Apr 59
REVISED
For changes see sheets 1 thru 9.

FED. SUP CLASS
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DD FORM 672-1 (COORDINATED)

REPLACES DD FORM 672-1, 1 APR 59, WHICH IS OBSOLETE.

3110-0517

APPROVED 30 Apr 59 REVISED ^(A) For changes see sheets 1 thru 9.

P. A.: OS Other Cust: AT 11	INTERNATIONAL INTEREST	TITLE BEARING, ROLLER, TAPERED, DOUBLE ROW OF ROLLERS, NORMAL ANGLE, TWO SINGLE CONES, ONE DOUBLE CUP, ADJUSTABLE, TYPE 761 (TDO)	MILITARY STANDARD MS 19086
PROCUREMENT SPECIFICATION FF-B-187	SUPERSEDES:		SHEET 5 OF 9

This military standard is approved 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.

REVIEWER ACTIVITIES:
Air Force — 99
Navy — SH, MC
DLA — IS
Other — NS

USER ACTIVITIES:
Army — AV

Dash No.	AFBMA bearing number (See Note 11) Cone-Cup	A	B	C	D	R	Y	P		S	K factor	Basic dynamic load ratings (lb) (A)	
								Max. shaft fillet radius	Max. housing fillet radius			Radial	Thrust
118	67790-67720D	7.0000	9.7500	3.3125	4.0625	0.14	0.03	7.64	9.45	1.33	1.33	37100	14700
39	HM237545- HM237510D	7.0000	11.3750	4.3750	5.6250	0.28	0.06	8.07	10.68	1.83	1.83	67500	19400
119	94700-94118D	7.0000	11.7500	4.3750	5.6250	0.28	0.06	8.15	10.71	1.25	1.25	57000	24000
*40	EE420701- 421451D	7.0000	14.5000	5.3750	7.6250	0.5	0.06	9.09	13.16	1.45	1.45	97000	33500
120	M238849- M238810D	7.3750	10.6250	3.6875	4.6875	0.14	0.06	8.07	10.08	1.76	1.76	48400	13700
121	H239649- H239612D	7.3750	12.6250	5.4375	7.3125	0.22	0.06	8.43	11.73	1.83	1.83	89000	24300
122	67885-67820D	7.5000	10.5000	3.3125	4.0625	0.14	0.03	8.23	10.20	1.22	1.22	38400	15800
123	87750-87112D	7.5000	11.1250	3.1250	4.2500	0.14	0.06	8.23	10.50	1.41	1.41	34400	12200
124	EE420751- 421451D	7.5000	14.5000	5.3750	7.6250	0.25	0.06	8.94	13.16	1.45	1.45	97000	33500
125	LS40049- LS40010D	7.7500	10.0000	1.8750	2.4374	0.06	0.03	8.15	9.72	1.47	1.47	17800	6050
126	LM739749- LM739710D	7.7500	10.1250	2.6250	3.3750	0.14	0.03	8.39	9.88	1.31	1.31	31200	11900
127	LM241149- LM241110D	8.0000	10.8750	2.8750	3.5624	0.14	0.03	8.62	10.51	1.83	1.83	38200	10400
128	M241547- M241510D	8.0000	11.5000	4.0000	4.9376	0.14	0.06	8.70	10.98	1.76	1.76	57000	16200
*41	EE420801- 421451D	8.0000	14.5000	5.3750	7.6250	0.13	0.06	9.06	13.16	1.45	1.45	97000	33500

*Inactive for new design after 13 Jan 82.

FED. SUP CLASS
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DD FORM 672-1 (COORDINATED)

REPLACES THE PREVIOUS EDITIONS

3110-0520

P. A. OS Other Cast AT 11	INTERNATIONAL INTEREST	TITLE BEARING, ROLLER, TAPERED, DOUBLE ROW OF ROLLERS, NORMAL ANGLE, TWO SINGLE CONES, ONE DOUBLE CUP, ADJUSTABLE, TYPE 761 (TDO)	MILITARY STANDARD MS 19086
PROCUREMENT SPECIFICATION FF-B-187	SUPERSEDES:		SHEET 6 OF 9

APPROVED 30 APR 59 REVISED (A) For changes see sheets 1 thru 9.

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Other — NS

USER ACTIVITIES:

Army — AV

NOTES:

- ① **MATERIAL:** Cones, cups, and rollers: bearing quality - carburizing grade alloy or through-hardening grade alloy steel in accordance with FED-STD-66. Cage; carbon steel (stamped). Powdered process steel, e.g., Sinta Forge may be used.
- ② **HARDNESS:** Cones, cups and rollers: 58 to 64 Rockwell C.
- ③ **TOLERANCES:** Standard grade (AFBMA Class 4) (allowable tolerances are in 0.0001 inch).

Cone bore (A) ①				Cup diameter (B)				Bearing width (C) ①				Assembled bearing maximum radial runout			
Size range		Tolerance		Size range		Tolerance		Bore size range		Tolerance		Cup O.D. (B)		Tolerance	
Over	Incl.	Plus	Minus	Over	Incl.	Plus	Minus	Over	Incl.	Plus	Minus	Over	Incl.	Over	Incl.
0	3.0000	5	0	0.0000	12.0000	10	0	0	4.0000	160	0				
3.0000	8.0000	10	0	12.0000	24.0000	20	0	4.0000	12.0000	280	200	0	24.0	0	20

- ④ **DIMENSIONS:** All dimensions are in inches. Dimensions P and S are recommended shaft and housing shoulder diameters. Dimensions R and Y are the maximum fillet radii on the shaft and the housing respectively, which will be cleared by the bearing corners.

- ⑤ **OPERATING TEMPERATURE:** Recommended operating temperature not to exceed 121° Celsius (250° Fahrenheit).

- ⑥ **LUBRICATION:** Bearings shall be furnished without lubrication. Bearings shall be furnished with preservative per MIL-C-11796, Class 3.

- ⑦ **BASIC DYNAMIC LOAD RATING:** Basic dynamic load rating is that constant stationary load which a group of apparently identical bearings with stationary cups (outer rings) can endure for a rating life of 90 million revolutions of the cone (inner ring). The basic dynamic load ratings listed herein are based on a rated life of 90 million revolutions or 3000 hours at 500 r/min.

To compare the load ratings on this document with others whose basis for rating are other than 90 million revolutions or 3000 hours at 500 r/min use the following formula:

$$C = \text{Other Bearing Rating} \times \left(\frac{R_1}{500} \right)^{1/f} \times \left(\frac{H_1}{3000} \right)^{1/f}$$

where:

R_1 = r/min at which other bearing is rated

H_1 = Hours life at which other bearing is rated

f = Other bearing fatigue factor

P. A. OS Other Cost AT 11	INTERNATIONAL INTEREST	TITLE BEARING, ROLLER, TAPERED, DOUBLE ROW OF ROLLERS, NORMAL ANGLE, TWO SINGLE CONES, ONE DOUBLE CUP, ADJUSTABLE, TYPE 761 (TDO)	MILITARY STANDARD MS 19086
PROCUREMENT SPECIFICATION FF-B-187	SUPERSEDES:		SHEET 7 OF 9

This military standard is approved 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.

REVIEWER ACTIVITIES:

Air Force — 99
Navy — SH, MC
DLA — IS
Other — NS

USER ACTIVITIES:

Army — AV

P. A. OS Other Cust AT 11	INTERNATIONAL INTEREST	TITLE BEARING, ROLLER, TAPERED, DOUBLE ROW OF ROLLERS, NORMAL ANGLE, TWO SINGLE CONES, ONE DOUBLE CUP, ADJUSTABLE, TYPE 761 (TDO)	MILITARY STANDARD MS 19086
PROCUREMENT SPECIFICATION FF-B-187	SUPERSEDES:	SHEET 8 OF 9	

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8. **RATING LIFE (HOURS):** Rating life is the number of hours at some constant speed of the cone (inner ring) that 90 percent of a group of apparently identical bearings will complete or exceed before first evidence of fatigue develops. The magnitude of the rated life in hours is found from the following:

$$L_{10} = \frac{1.5 \times 10^6}{R} \left(\frac{C}{P} \right)^{10/3} \text{ hours}$$

where:

C = Basic dynamic load rating, lb.

P = Equivalent load (combined radial and thrust load), lb.

R = Revolutions per minute, r/min.

The average life is approximately four times the rating life.

9. **K FACTOR:** The K factor is the ratio of the basic radial dynamic load rating (for a one-row bearing) to basic thrust dynamic load rating.

10. **CONTACT ANGLE:** All bearings are normal angle bearings having a contact angle (α) between 10 and 19 degrees. The contact angle is the angle between the line of action of the roller load and a plane perpendicular to the bearing axis.

11. **PART NUMBER:** The MS part number consists of the MS number, plus the dash number. Example: MS19086-13. The AFBMA (Anti-Friction Bearing Manufacturers Association) cup and cone numbers are for reference only and are not to be used for ordering purposes.

12. **CAGE CLEARANCE:** Designers should provide a clearance of .125 inch minimum between the outside edge of the cage and the housing counterbore.

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

14. Referenced documents shall be of the issue in effect on the date of invitation for bids, or request for proposal.

15. **TABLE II** (see sheet 9), a numerical listing of dash numbers cross-referenced to bore size A, is included as information to assist in locating a known dash number in TABLE I.

APPROVED 30 Apr 59 REVISED A For changes see sheets 1 thru 9.

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USER ACTIVITIES:
Army — AV

REVIEWER ACTIVITIES:
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TABLE II

Dash No.	Bore A	Dash No.	Bore A	Dash No.	Bore A	Dash No.	Bore A
1	0.7500	33	5.0000	65	2.6875	97	5.2500
2	1.0000	34	5.0000	66	2.6875	98	5.2500
3	1.0000	35	5.5000	67	2.6875	99	5.2500
4	1.2500	36	5.5000	68	2.7540	100	5.2500
5	1.2500	37	6.0000	69	2.8125	101	5.3750
6	1.2500	38	6.0000	70	2.8125	102	5.5000
7	1.5000	39	7.0000	71	2.8125	103	5.5000
8	1.5000	40	7.0000	72	2.8750	104	5.5000
9	1.5000	41	8.0000	73	2.9062	105	5.6250
10	1.7500	42	0.8750	74	3.1875	106	5.7500
11	1.7500	43	1.1875	75	3.2500	107	5.7500
12	2.0000	44	1.1895	76	3.2500	108	5.7500
13	2.0000	45	1.2500	77	3.3750	109	5.8750
14	2.0000	46	1.2600	78	3.5000	110	5.8750
15	2.2500	47	1.3125	79	3.5625	111	5.8750
16	2.2500	48	1.3125	80	3.6875	112	6.0000
17	2.2500	49	1.3750	81	3.7500	113	6.0000
18	2.5000	50	1.3770	82	3.7500	114	6.0000
19	2.5000	51	1.4375	83	4.0000	115	6.5000
20	2.5000	52	1.5000	84	4.0000	116	6.5000
21	2.5000	53	1.5748	85	4.0000	117	6.8750
22	3.0000	54	1.6250	86	4.1250	118	7.0000
23	3.0000	55	1.8125	87	4.2500	119	7.0000
24	3.0000	56	1.8125	88	4.2500	120	7.3750
25	3.0000	57	1.8125	89	4.2500	121	7.3750
26	3.5000	58	2.0000	90	4.5000	122	7.5000
27	3.5000	59	2.0312	91	4.5000	123	7.5000
28	4.0000	60	2.1250	92	4.5310	124	7.5000
29	4.0000	61	2.1250	93	4.7500	125	7.7500
30	4.0000	62	2.2500	94	4.7500	126	7.7500
31	4.5000	63	2.2500	95	5.0000	127	8.0000
32	4.5000	64	2.4700	96	5.0625	128	8.0000

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P. A. OS
Other Cast
AT
11

INTERNATIONAL
INTEREST

TITLE

BEARING, ROLLER, TAPERED, DOUBLE ROW
OF ROLLERS, NORMAL ANGLE, TWO SINGLE CONES,
ONE DOUBLE CUP, ADJUSTABLE, TYPE 761 (TDO)

MILITARY STANDARD

MS19086

PROCUREMENT SPECIFICATION
FF-B-187

SUPERSEDES:

SHEET 9 OF 9

DD FORM 672-1 (COORDINATED)

REPLACES DD FORM 672-1, 1-64, WHICH IS OBSOLETE.

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APPROVED 30 Apr 59 REVISED For changes see sheets 1 thru 9.