

INCH-POUND

A-A-59655B
8 September 2011
SUPERSEDING
A-A-59655A
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COMMERCIAL ITEM DESCRIPTION

BEARINGS, ROLLER, TAPERED, DOUBLE ROW, STEEP ANGLE,
TWO SINGLE CONES, ONE DOUBLE CUP (TYPE TDOS)

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. SCOPE. This commercial item description (CID) covers government acquisition requirements for complete (cone with rollers and cup) double row, tapered, roller bearings with steep angle, two single cones, and one double cup (type TDOS), for general purpose use. These bearings are not intended for use in special precision applications such as on aircraft, precision ordnance, or submarine equipment.
2. CLASSIFICATION. The roller bearings shall be of one type (TDOS) and classified by the size codes listed in [table I](#). The column headings in [table I](#) refer to bearing characteristics defined in [figure 1](#).

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: STDZNMGT@dla.mil or DLA Aviation VEB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5616. Since contact information can change, you may want to verify the currency of this address information using the ASSIST database at <https://assist.daps.dla.mil/>.

A-A-59655B

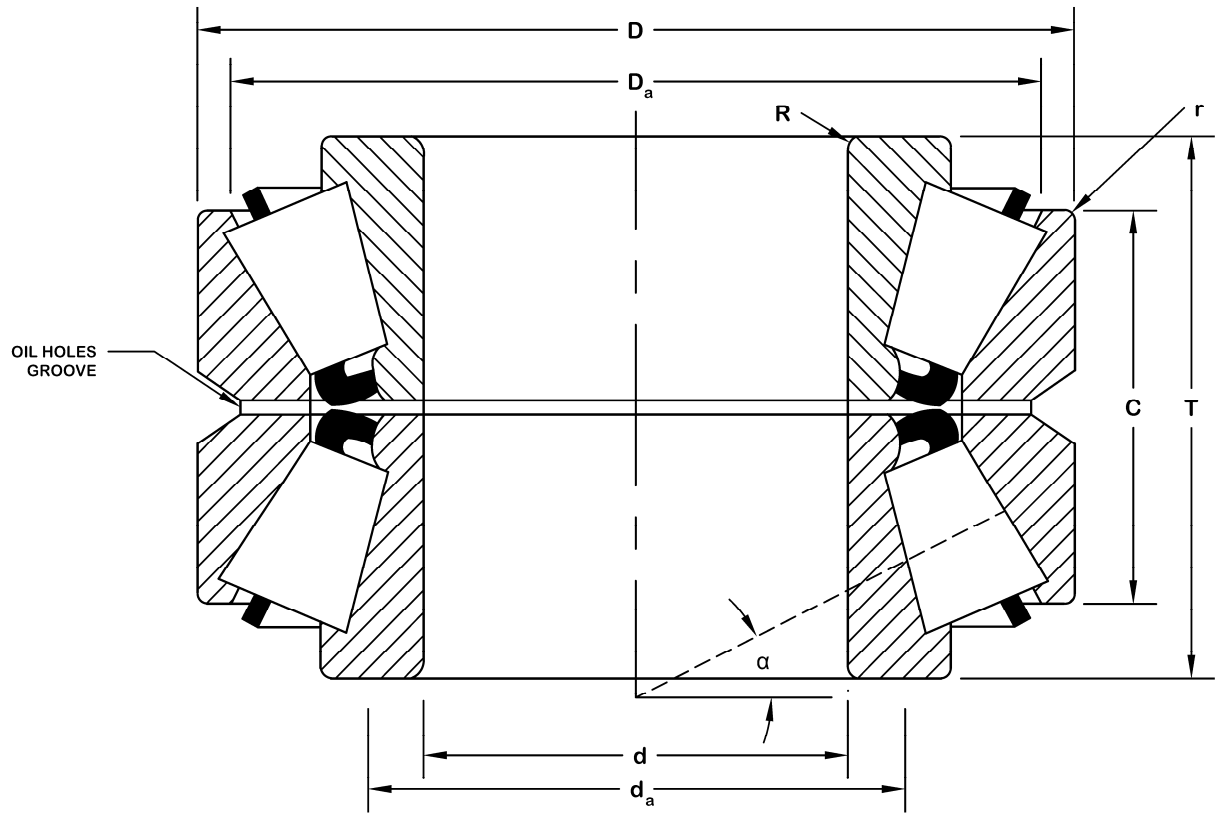


FIGURE 1. Bearing characteristics.

TABLE I. Size codes and dimensions.

Size code	Part number ¹	d	D	C	T	R ²	r ²	d _a	D _a	K factor	Basic dynamic load ratings (lb.)
		Bore	Outside diameter	Bearing width over cup	Cones width	Max. shaft fillet radius	Max. housing fillet radius	Recommended shoulder diameter			Two row radial
	Cone-cup							Shaft	Housing		
001	21063 - 21226D	0.6250	2.2500	1.4375	1.9375	0.03	0.03	1.41	2.01	.99	12800
002	21075 - 21226D	0.7500	2.2500	1.4375	1.9375	0.06	0.03	1.24	2.01	.99	12800
003	43112 - 43319D	1.1250	3.1875	1.5625	2.1875	0.03	0.06	1.67	2.91	.87	21500
004	43125 - 43319D	1.2500	3.1875	1.5625	2.1875	0.06	0.06	1.73	2.91	.87	21500
005	43131 - 43319D	1.3125	3.1875	1.5625	2.1875	0.14	0.06	2.01	2.91	.87	21500
006	43132 - 43319D	1.3125	3.1875	1.5625	2.1875	0.08	0.06	1.89	2.91	.87	21500
007	44131 - 44363D	1.3125	3.6250	1.5625	2.1875	0.08	0.06	2.01	3.35	.75	23300
008	44143 - 44363D	1.4375	3.6250	1.5625	2.1875	0.09	0.06	2.13	3.35	.75	23300
009	44150 - 44363D	1.5000	3.6250	1.5625	2.1875	0.09	0.06	2.28	3.35	.75	23300
010	53150 - 53376D	1.5000	3.7500	1.7500	2.5626	0.06	0.03	2.17	3.50	.79	27700
011	44158 - 44363D	1.5625	3.6250	1.5625	2.1875	0.14	0.06	2.28	3.35	.75	23300
012	44162 - 44363D	1.6250	3.6250	1.5625	2.1875	0.09	0.06	2.24	3.35	.75	23300
013	53162 - 53376D	1.6250	3.7500	1.7500	2.5626	0.06	0.03	2.24	3.50	.79	27700
014	53176 - 53376D	1.7500	3.7500	1.7500	2.5626	0.05	0.03	2.32	3.50	.79	27700
015	53177 - 53376D	1.7500	3.7500	1.7500	2.5626	0.14	0.03	2.48	3.50	.79	27700
016	53178 - 53376D	1.7500	3.7500	1.7500	2.5626	0.08	0.03	2.36	3.50	.79	27700
017	53176 - 53390D	1.7500	3.8750	1.7500	2.5626	0.05	0.06	2.32	3.56	.79	27700
018	55175 - 55433D	1.7500	4.3300	1.6876	2.5000	0.14	0.02	2.64	4.13	.66	29500
019	55187 - 55433D	1.8750	4.3300	1.6876	2.5000	0.14	0.02	2.72	4.13	.66	29500
020	72188C - 72488D	1.8750	4.8750	2.1875	3.0625	0.03	0.06	2.72	4.53	.79	50000
021	55200 - 55433D	2.0000	4.3300	1.6876	2.5000	0.14	0.02	2.80	4.13	.66	29500
022	55200 - 55444D	2.0000	4.4375	1.8125	2.5625	0.14	0.06	2.80	4.13	.66	29400

¹ Part numbers are for reference only. Part numbers reflect the cup and cone numbers used by industry and the ABMA. Some cones and cups may be used in multiple configurations and are not limited to one bearing assembly.

² These maximum fillet radii shall be cleared by the bearing corners.

³ Minus value indicates load center inside cone backface.

TABLE I. Size codes and dimensions.

Size code	Part number ¹	d	D	C	T	R ²	r ²	d _a	D _a	K factor	Basic dynamic load ratings (lb.)
		Bore	Outside diameter	Bearing width over cup	Cones width	Max. shaft fillet radius	Max. housing fillet radius	Recommended shoulder diameter			Two row radial
	Cone-cup							Shaft	Housing		
023	66200 - 66462D	2.0000	4.6250	2.1250	2.8750	0.14	0.03	2.80	4.37	.93	41200
024	72200 - 72488D	2.0000	4.8750	2.1875	3.0625	0.14	0.06	2.91	4.53	.79	50000
025	72200C - 72488D	2.0000	4.8750	2.1875	3.0625	0.14	0.06	3.03	4.53	.79	50000
026	72201C - 72488D	2.0000	4.8750	2.1875	3.0625	0.03	0.06	3.03	4.53	.79	50000
027	55206 - 55444D	2.0625	4.4375	1.8125	2.5625	0.14	0.06	2.83	4.13	.66	29400
028	66212 - 66462D	2.1250	4.6250	2.1250	2.8750	0.14	0.03	2.87	4.37	.93	41200
029	72212C - 72488D	2.1250	4.8750	2.1875	3.0625	0.14	0.06	3.11	4.53	.79	50000
030	66584 - 66522D	2.1250	5.1174	1.8750	2.7500	0.14	0.03	2.95	4.65	.88	42800
031	72218C - 72488D	2.1875	4.8750	2.1875	3.0625	0.14	0.06	3.15	4.53	.79	50000
032	66225 - 66462D	2.2500	4.6250	2.1250	2.8750	0.14	0.03	2.99	4.37	.93	41200
033	72225C - 72488D	2.2500	4.8750	2.1875	3.0625	0.14	0.06	3.19	4.53	.79	50000
034	78225 - 78549D	2.2500	5.5000	2.0395	3.0625	0.14	0.06	3.27	5.16	.67	55200
035	66585 - 66522D	2.3622	5.1174	1.8750	2.7500	0.14	0.03	3.11	4.65	.88	42800
036	78250 - 78549D	2.5000	5.5000	2.0395	3.0625	0.09	0.06	3.35	5.16	.67	55200
037	9285 - 9220D	3.0000	6.3750	2.7810	4.1560	0.14	0.03	4.06	6.03	.82	81700
038	9378 - 9320D	3.0000	7.0000	2.9375	4.3125	0.14	0.09	4.13	6.46	.76	84200
039	9380 - 9320D	3.0000	7.0000	2.9375	4.3125	0.14	0.09	4.13	6.46	.76	49100
040	9385 - 9320D	3.3125	7.0000	2.9375	4.3125	0.14	0.09	4.37	6.46	.76	84200
041	9386H - 9320D	3.3125	7.0000	2.9375	4.3125	0.14	0.09	4.37	6.46	.76	84200

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TABLE I. Size codes and dimensions.

Size code	Part number ¹	d	D	C	T	R ²	r ²	d _a	D _a	K factor	Basic dynamic load ratings (lb.)
		Bore	Outside diameter	Bearing width over cup	Cones width	Max. shaft fillet radius	Max. housing fillet radius	Recommended shoulder diameter			Two row radial
	Shaft							Housing			
042	98350 - 98789D	3.5000	7.8750	3.1581	4.5625	0.14	0.09	4.65	7.40	.92	111700
043	HM921343 - HM921310D	3.5400	7.4790	2.1300	3.3800	0.14	0.06	4.61	7.13	.67	79600
044	M919048 - M919010D	3.5425	6.3740	1.7500	2.7500	0.14	0.06	4.29	6.06	.80	56700
045	HM821547 - HM821511D	3.9362	7.7500	2.9300	4.0700	0.14	0.06	4.84	7.36	.96	103700
046	98400 - 98789D	4.0000	7.8750	3.1581	4.5625	0.14	0.09	5.04	7.40	.92	111700
047	37425 - 37626D	4.2500	6.2500	1.5625	2.1251	0.14	0.03	4.80	5.98	.96	32400
048	37431 - 37626D	4.3125	6.2500	1.5625	2.1251	0.14	0.03	4.84	5.98	.96	32400
049	H924045 - H924010D	4.3750	8.4375	3.3125	4.5625	0.14	0.06	5.47	8.07	.87	129100
050	HH924349 - HH924310D	4.3750	9.5000	4.2500	6.2500	0.25	0.06	6.18	8.90	.80	184000
051	HM926740 - HM926710D	4.5000	9.0000	3.3125	4.5625	0.14	0.09	5.75	8.63	.79	136100
052	97500 - 97901D	5.0000	9.0000	3.3125	4.5625	0.14	0.09	5.94	8.38	.79	102600

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A-A-59655B

3. SALIENT CHARACTERISTICS

3.1 Dimensions. Bearing dimensions (and dynamic load ratings, see 3.4) shall conform to the requirements specified in table I for each of the bearing part numbers. The listed dimensions conform to the requirements specified in American Bearing Manufacturers Association (ABMA) Standard 19.2, "Tapered Roller Bearings - Radial Inch Design". The bearing size shall be specified in the acquisition order (see 7.3(b)). For any unlisted bearing size codes, the associated dimensional and dynamic load rating requirements should also be specified in the acquisition order.

3.2 Materials.

3.2.1 Cones (inner rings), cups (outer rings), and rollers. The bearing cones, cups, and rollers shall be made of case carburized or through-hardened steel produced in accordance with the ASTM International (ASTM) A295/A295M, "Standard Specification for High-Carbon Anti-Friction Bearing Steel", or ASTM A534, "Standard Specification for Carburizing Steels for Anti-Friction Bearings". The steel shall show a fine fracture grain size in accordance with ASTM E112, "Standard Test Methods for Determining Average Grain Size". Material hardness shall be no less than Rockwell hardness number of 58 on Rockwell C scale (HRC) and no more than 64 HRC as defined in ASTM E18, "Standard Test Methods for Rockwell Hardness of Metallic Materials".

3.2.2 Cage. The bearing cage material shall be impervious to deterioration from any lubricant, preservative, solvent, or other chemical substance expected to contact the bearing during normal use or storage. Similarly, the material shall not cause any chemical deterioration of any other bearing component. The cages shall be made from carbon steel (one piece stamped). Materials shall operate from -65 to 230 °F (-53.9 to 110 °C).

3.3 Tolerance class. The tolerance limits for bearings shall conform to tolerance class 4 as tabulated in ABMA Standard 19.2. Allowable tolerances for bearing components and assembled bearings are listed in tables II through V.

TABLE II. Cone bore tolerance.

Cone bore (d)			
Size range		Tolerance	
Over	Inclusive	Plus	Minus
0.0000	3.0000	5	0
3.0000	8.0000	10	0

Note: Allowable tolerances are in 0.0001 inch.

A-A-59655B

TABLE III. Cup diameter tolerance.

Cup diameter (D)			
Size range		Tolerance	
Over	Inclusive	Plus	Minus
0.0000	12.0000	10	0
12.0000	24.0000	20	0

Note: Allowable tolerances are in 0.0001 inch.

TABLE IV. Bearing width tolerance.

Bearing width (T)			
Bore size range		Tolerance	
Over	Inclusive	Plus	Minus
0.0000	4.0000	160	0
4.0000	12.0000	280	200

Note: Allowable tolerances are in 0.0001 inch.

TABLE V. Assembled bearing tolerance.

Assembled bearing maximum radial runout		
Cup outside diameter (D)		Tolerance
Over	Inclusive	
0.0000	24.0000	20

Note: Allowable tolerances are in 0.0001 inch.

3.4 Dynamic load rating. The bearing dynamic load rating shall conform to the requirements specified in [table I](#) for each bearing size code. The listed ratings conform to the requirements specified in ABMA Standard 11, "Load Ratings and Fatigue Life for Roller Bearings".

3.5 Lubrication. The bearings shall be furnished without lubrication.

3.6 Contact angle. All bearings are steep angle bearings having a contact angle between 22 and 31 degrees. The contact angle is the angle between the line of action of the roller load and a plane perpendicular to the bearing axis.

A-A-59655B

7.2 Sources of documents.

7.2.1 DFARS and FAR. Copies of DFARS and FAR may be obtained from the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Electronic copies of DFARS may be obtained from <http://www.acq.osd.mil/dpap/dars/dfarspgi/current/index.html>. Electronic copies of FAR may be obtained from <https://www.acquisition.gov/far/>.

7.2.2 Military specifications. Copies of military specifications may be obtained from Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. Electronic copies may be obtained from <https://assist.daps.dla.mil/>.

7.2.3 ABMA standards. Copies of ABMA standards may be obtained from the American Bearing Manufacturers Association, 2025 M Street NW, Suite 800, Washington, DC 20036. Electronic copies may be obtained from <http://www.abma-dc.org/>.

7.2.4 ASTM standards. Copies of ASTM standards may be obtained from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. Electronic copies may be obtained from <http://www.astm.org/>.

7.3 Ordering data. The acquisition order should specify the following information:

- a. CID document number, revision, and CID PIN.
- b. Bearing size (with dimension/load requirements if size is unlisted) (see 3.1).
- c. Preservation, packaging, and marking requirements (see 6.1).

7.4 Cross-reference information. Table VI relates the original specification slant sheets to the replacement CIDs.

TABLE VI. Federal specification to CID cross-reference.

FF-B-187B specification sheets	Replacement CID numbers	ABMA types
1	A-A-59649	TS
2	A-A-59650	TSF
3	A-A-59651	TSS
4	A-A-59652	TSSF
5	A-A-59653	TDI and TDIS
6	A-A-59654	TDO
7	A-A-59655	TDOS
8	A-A-59656	TNA (normal angle)
9	A-A-59657	TNAS (steep angle)
10	A-A-59658	TNASW
11	A-A-59659	TNASWE

A-A-59655B

7.5 Subject term (key word) listing.

Bore
Cone
Cup
Load
Width

MILITARY INTERESTS:

Custodians:

Army - AR
Navy - MC
Air Force - 99
DLA - GS

Review Activities:

Navy - OS
Air Force - 84

CIVIL AGENCY
COORDINATING ACTIVITY:

GSA - FAS

Preparing Activity:

DLA - GS4

(Project 3110-2011-024)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST database at <https://assist.daps.dla.mil/>.