SAE International

SURFACE VEHICLE STANDARD

SAE J744 FEB2013

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Superseding J744 JUN1996

Hydraulic Pump and Motor Mounting and Drive Dimensions

RATIONALE

This SAE Standard is revised to clarify dimensions on Taper Shaft to help improve mounting of Hydraulic Pump and Motor.

1. SCOPE

This SAE Standard applies to hydraulic pumps and motors used on off-road self-propelled work machines as described in SAE J1116.

1.1 Purpose

To provide a progression of standard mounting flanges and shafts that are dimensionally compatible.

2. REFERENCES

2.1 Applicable Publications

The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

SAE J390	Dual Dimensioning Engineering Drawings
SAE J1116	Categories of Off-Road Self-Propelled Work Machines
SAE TSB 003	Rules for SAE Use of SI (Metric) Units

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
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SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/J744_201302

2.2 ANSI Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ANSI B1.1 Screw Threads

ANSI B92.1-1996 Involute Splines and Inspection

3. UNITS

3.1 The International System of Units (SI) is used herein in accordance with Reference 7.1.

3.2 Customary U.S. units are given for information purposes, and these appear in parentheses next to their SI counterpart.

4. IDENTIFICATION CODE

4.1 Flange identification codes are found in Table 1.

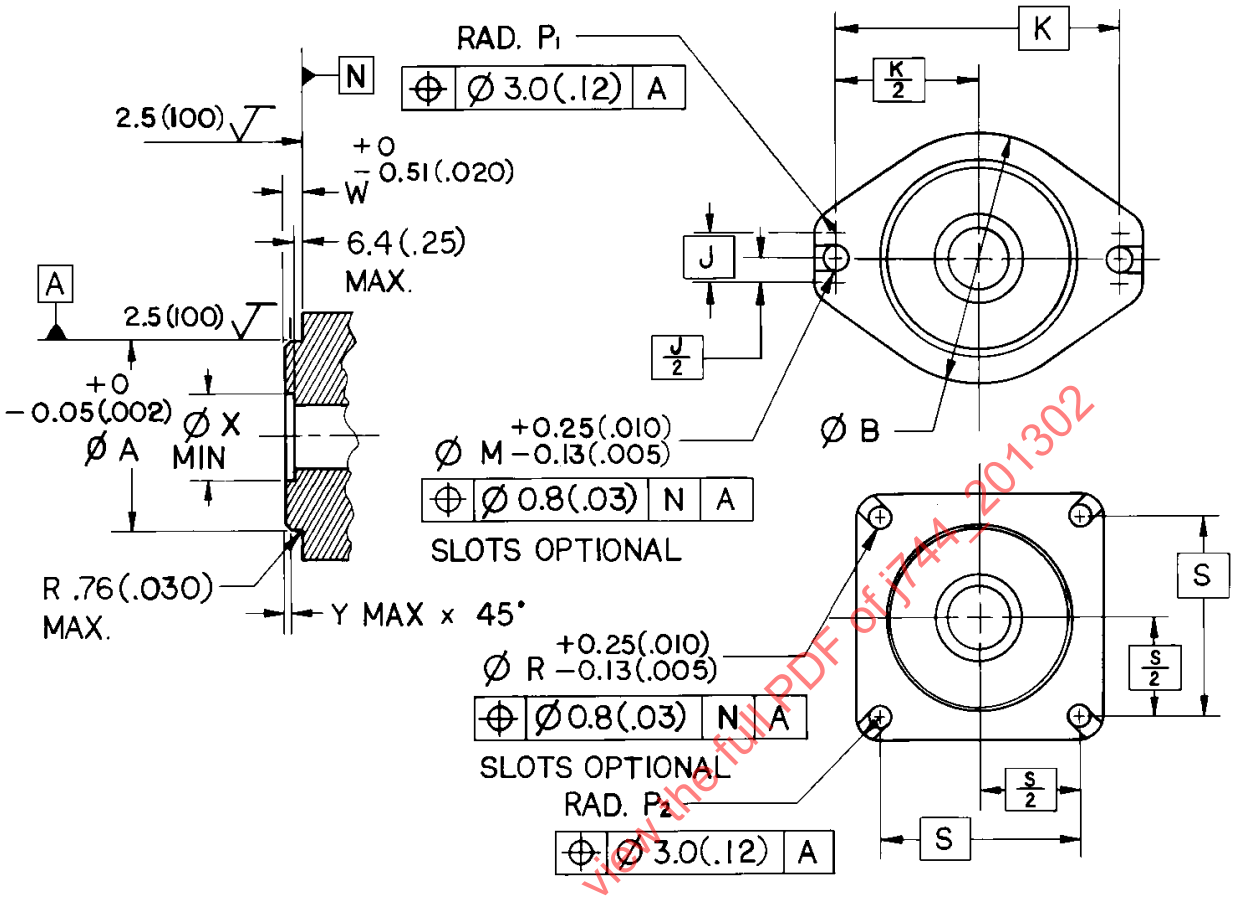
4.1.1 The number preceding the dash (—) is an approximation, in millimeters, of the mounting flange pilot diameter.

4.1.2 The number following the dash (—) states the number of mounting holes in the flange.

TABLE 1 - DIMENSIONS OF 2 AND 4 BOLT PUMP AND MOTOR MOUNTING FLANGES

Identification Code	Pilot Dimensions A Noted	Pilot Dimensions W Noted	Pilot Dimensions X Min	Pilot Dimensions Y Max	2 Bolt Type B Cast Dim.	2 Bolt Type J	2 Bolt Type K	2 Bolt Type M Noted	2 Bolt Type P_1 Cast Dim.	4 Bolt Type S	4 Bolt Type R Noted	4 Bolt Type P_2 Cast Dim.
50—[1]	50.80	6.4	—	0.8	64	14	82.6	10.3	10	—	—	—
(A—A)	(2.000)	(0.250)	—	(0.03)	(2.50)	(0.56)	(3.250)	(0.406)	(0.38)	—	—	—
82—[1]	82.55	6.4	—	0.8	95	18	106.4	11.1	12	—	—	—
(A)	(3.250)	(0.250)	—	(0.03)	(3.75)	(0.72)	(4.188)	(0.438)	(0.47)	—	—	—
101—[1]	101.60	9.7	51	1.5	120	25	146.0	14.3	14	89.8	14.3	14
(B)	(4.000)	(0.380)	(2.00)	(0.06)	(4.75)	(0.99)	(5.750)	(0.562)	(0.56)	(3.536)	(0.562)	(0.56)
127—[1]	127.00	12.7	64	1.5	148	31	181.0	17.5	16	114.5	14.3	16
(C)	(5.000)	(0.500)	(2.50)	(0.06)	(5.81)	(1.22)	(7.125)	(0.688)	(0.62)	(4.508)	(0.562)	(0.62)
152—[1]	152.40	12.7	70	1.5	200	40	228.6	20.6	19	161.6	20.6	19
(D)	(6.000)	(0.500)	(2.75)	(0.06)	(7.88)	(1.55)	(9.000)	(0.812)	(0.75)	(6.364)	(0.812)	(0.75)
165—[1]	165.10	15.9	70	2.3	270	55	317.5	27.0	25	224.5	20.6	19
(E)	(6.500)	(0.625)	(2.75)	(0.09)	(10.62)	(2.15)	(12.500)	(1.062)	(1.00)	(8.839)	(0.812)	(0.75)
177—[1]	177.80	15.9	70	2.3	300	60	350.0	27.0	25	247.5	27.0	25
(F)	(7.000)	(0.625)	(2.75)	(0.09)	(11.75)	(2.37)	(13.781)	(1.062)	(1.00)	(9.745)	(1.062)	(1.00)

1. —2 2 Bolt, —4 4 Bolt Flange



Unspecified tolerances:
mm diam. - 1 place ±0.5; 2 place ±0.25
(inch dim. - 2 place ±0.02; 3 place ±0.010)
micrometer (micro inch)

Dimensions in mm (in)

FIGURE 1 - DIMENSIONS OF 2 AND 4 BOLT PUMP AND MOTOR MOUNTING FLANGES

4.2 Shaft identification codes are found in Tables 2, 3, and 4 and Figures 2, 3, and 4.

4.2.1 The number preceding the dash (—) is an approximation, in millimeters, of the shaft major diameter.

4.2.2 The number following the dash (—) is arbitrarily assigned as follows:

Straight Shaft without Thread—1
Straight Shaft with Thread—2
Tapered Shaft with Thread—3
30 degrees Involute Spline—4

TABLE 2 - DIMENSIONS OF STRAIGHT SHAFTS - WITHOUT AND WITH THREAD

Identification Code	Straight Shaft D_{S1} Max	Straight Shaft D_{S1} Min	Straight Shaft L_S	Straight Shaft F Noted	No Thread —1 E Noted	No Thread —1 L_L Optional	With Thread —2 D_T ANSI B1.1	With Thread —2 C Noted	With Thread —2 L_C	With Thread —2 L_T
13—[1]	12.70	12.67	19	14.07	3.18	—	3/8—24	2.4	29	14.25
(A—A)	(0.500)	(0.499)	(0.750)	(0.554)	(0.125)	—	UNF 2A	(0.094)	(1.125)	(0.562)
16—[1]	15.88	15.85	24	17.60	3.97	51	1/2—20	3.2	34	18.25
(A)	(0.625)	(0.624)	(0.938)	(0.693)	(0.1563)	(2.00)	UNF 2A	(0.125)	(1.344)	(0.719)
19—[1]	19.05	19.02	24	21.10	4.78	51	1/2—20	3.2	34	18.25
	(0.750)	(0.749)	(0.938)	(0.831)	(0.188)	(2.00)	UNF 2A	(0.125)	(1.344)	(0.719)
22—[1]	22.22	22.20	33	24.90	6.35	63	5/8—18	4.0	48	23.00
(B)	(0.875)	(0.874)	(1.312)	(0.982)	(0.250)	(2.50)	UNF 2A	(0.156)	(1.875)	(0.906)
25—[1]	25.40	25.35	38	28.10	6.35	70	3/4—16	4.0	52	27.00
(B—B)	(1.000)	(0.998)	(1.500)	(1.106)	(0.250)	(2.75)	UNF 2A	(0.156)	(2.062)	(1.062)
32—[1]	31.75	31.70	48	35.20	7.94	76	1—12	4.0	67	31.00
(C)	(1.250)	(1.248)	(1.875)	(1.386)	(0.3125)	(3.00)	UNF 2A	(0.156)	(2.625)	(1.219)
38—[1]	38.10	38.05	54	42.27	9.52	83	1-1/8—12	4.0	73	34.90
(C—C)	(1.500)	(1.498)	(2.125)	(1.664)	(0.375)	(3.25)	UNF 2A	(0.156)	(2.875)	(1.375)
44—[1]	44.45	44.40	67	49.30	11.11	92	1-1/4—12	4.0	89	39.70
(D & E)	(1.750)	(1.748)	(2.625)	(1.941)	(0.4375)	(3.62)	UNF 2A	(0.156)	(3.500)	(1.562)

1. —1 without thread, —2 with thread

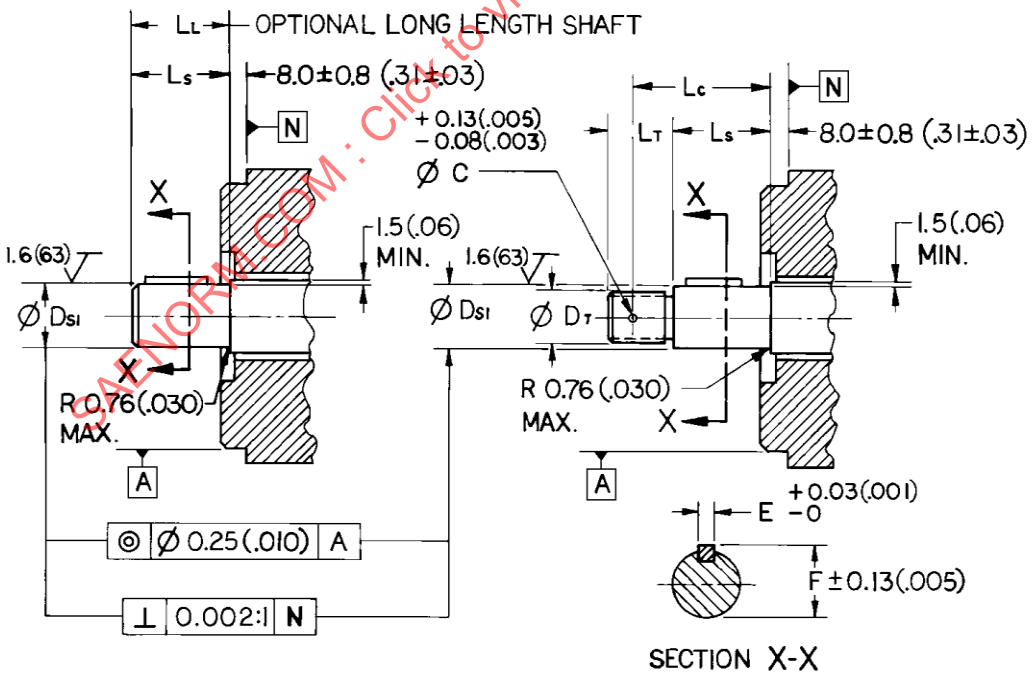


FIGURE 2 - DIMENSIONS OF STRAIGHT SHAFTS - WITHOUT AND WITH THREAD

TABLE 3 - DIMENSIONS OF TAPER SHAFT ENDS WITH THREAD—3

Identification Code	D_{S3}	D_T ANSI B1.1	D_G Gauge Diameter	C Noted	L_{CT}	L_{ST}	L_T	L_G Gauge Length	E Noted	Z Max	Z Min
13—3	12.70	5/16—32	12.00	2.0	25	17.48	12.70	11.88	3.18	1.63	1.37
(A—A)	(0.500)	UNF 2A	(0.472)	(0.078)	(0.984)	(0.688)	(0.500)	(0.468)	(0.125)	(0.064)	(0.054)
16—3	15.88	1/2—20	15.00	3.2	28	17.48	18.26	10.44	3.97	2.13	1.88
(A)	(0.625)	UNF 2A	(0.591)	(0.125)	(1.094)	(0.688)	(0.719)	(0.412)	(0.1563)	(0.084)	(0.074)
19—3	19.05	1/2—20	18.00	3.2	34	23.83	18.26	15.43	4.78	2.54	2.29
	(0.750)	UNF 2A	(0.709)	(0.125)	(1.344)	(0.938)	(0.719)	(0.607)	(0.188)	(0.100)	(0.090)
22—3	22.22	5/8—18	20.00	4.0	43	28.58	23.01	10.82	6.35	3.33	3.07
(B)	(0.875)	UNF 2A	(0.787)	(0.156)	(1.688)	(1.125)	(0.906)	(0.424)	(0.250)	(0.131)	(0.121)
25—3	25.40	3/4—16	23.00	4.0	49	34.92	26.97	15.72	6.35	3.33	3.07
(B—B)	(1.00)	UNF 2A	(0.906)	(0.156)	(1.938)	(1.375)	(1.062)	(0.619)	(0.250)	(0.131)	(0.121)
32—3	31.75	1—12	30.00	4.0	49	34.92	30.96	20.92	7.94	4.11	3.86
(C)	(1.25)	UNF 2A	(1.181)	(0.156)	(1.938)	(1.375)	(1.219)	(0.824)	(0.3125)	(0.162)	(0.152)
38—3	38.10	1-1/8—12	35.00	4.0	62	47.62	34.92	22.82	9.52	4.93	4.67
(C—C)	(1.50)	UNF 2A	(1.378)	(0.156)	(2.438)	(1.875)	(1.375)	(0.899)	(0.375)	(0.194)	(0.184)
44—3	44.45	1-1/4—12	41.00	4.0	71	53.98	39.67	26.38	11.11	5.72	5.46
(D & E)	(1.75)	UNF 2A	(1.614)	(0.156)	(2.812)	(2.125)	(1.562)	(1.038)	(0.4375)	(0.225)	(0.215)
50—3	50.80	1-1/4—12	46.00	4.0	90	73.02	39.67	34.62	12.70	6.50	6.25
(F)	(2.00)	UNF 2A	(1.811)	(0.156)	(3.562)	(2.875)	(1.562)	(1.363)	(0.500)	(0.256)	(0.246)

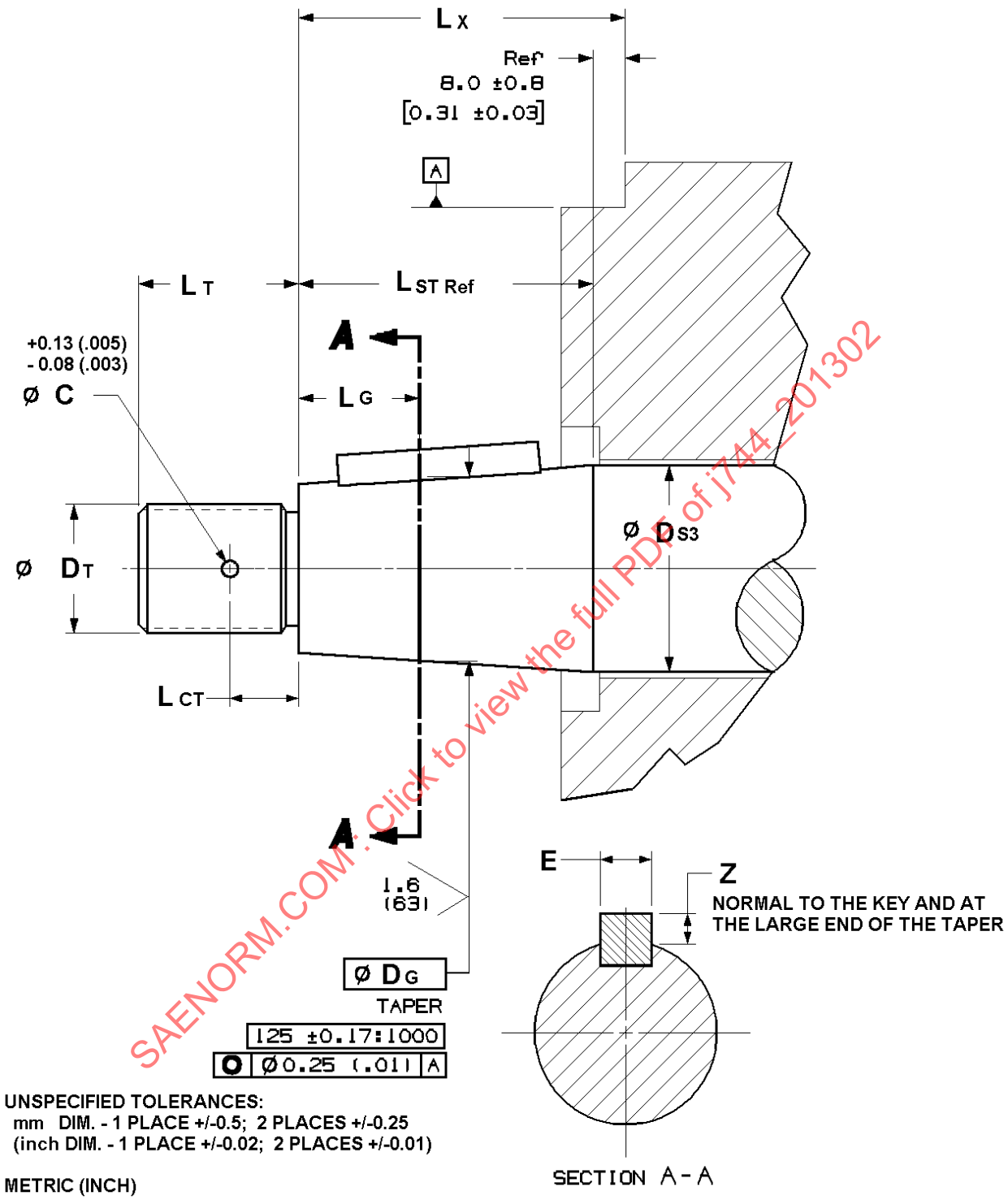


FIGURE 3 - DIMENSIONS OF TAPER SHAFT ENDS WITH THREAD - 3