The Engineering Society
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SAE J744 JUL88

Hydraulic Pump and Motor Mounting and Drive Dimensions

SAE Standard
Revised July 1988

Submitted for Recognition as an American National Standard

The Engineering Society For Advancing Mobility Land Sea Air and Space®
400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

OFF-HIGHWAY MACHINERY STANDARD

Submitted for recognition as an American National Standard

SAE J744

Issued January 1952
Revised July 1988

Superseding J744 OCT83

HYDRAULIC PUMP AND MOTOR MOUNTING AND DRIVE DIMENSIONS

1. PURPOSE:

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

2. SCOPE:

This SAE Standard applies to hydraulic pumps and motors used on off-road self propelled work machines as described in categories 1 through 5 of SAE J1116 JUN86.

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 2.

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 - Flange/Shaft End Combinations

Flange Series	Shaft End Series	SAE J744c Reference
50--	13--	(A--A)
82--	16--	(A)
82--	19--	--
101--	22--	(B)
101--	25--	(B--B)
127--	32--	(C)
127--	38--	(C--C)
152--	44--	(D)
165--	44--	(E)
177--	50--	(F)

Example: 127-2, 38-4 formerly was "C-C" mounting arrangement, that is, a 2 bolt "C" flange with a 1.50 in diameter 30 deg involute spline shaft.

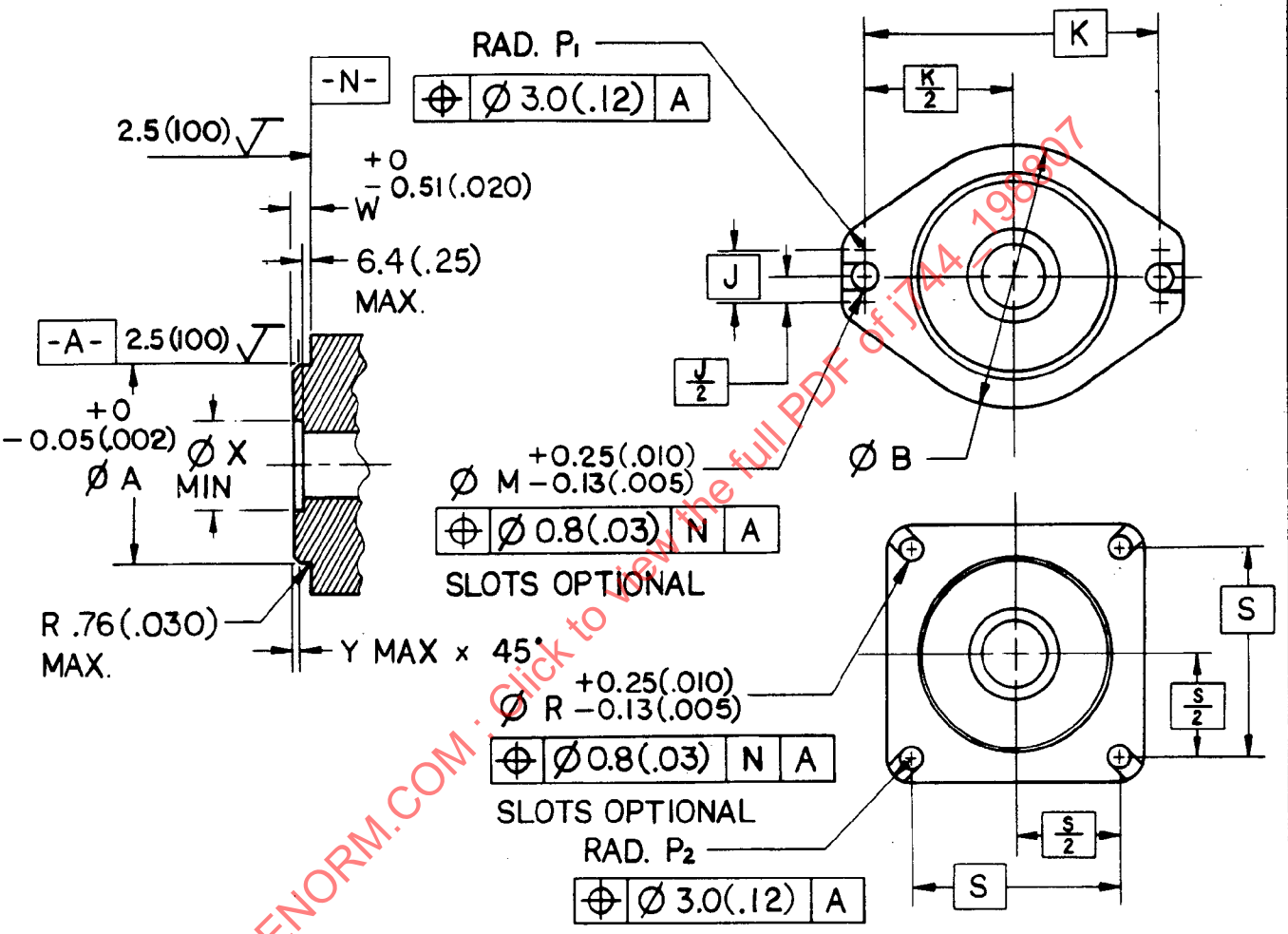
4.2 Shaft identification codes are found in Tables 3, 4, and 5.

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 deg Involute Spline	4

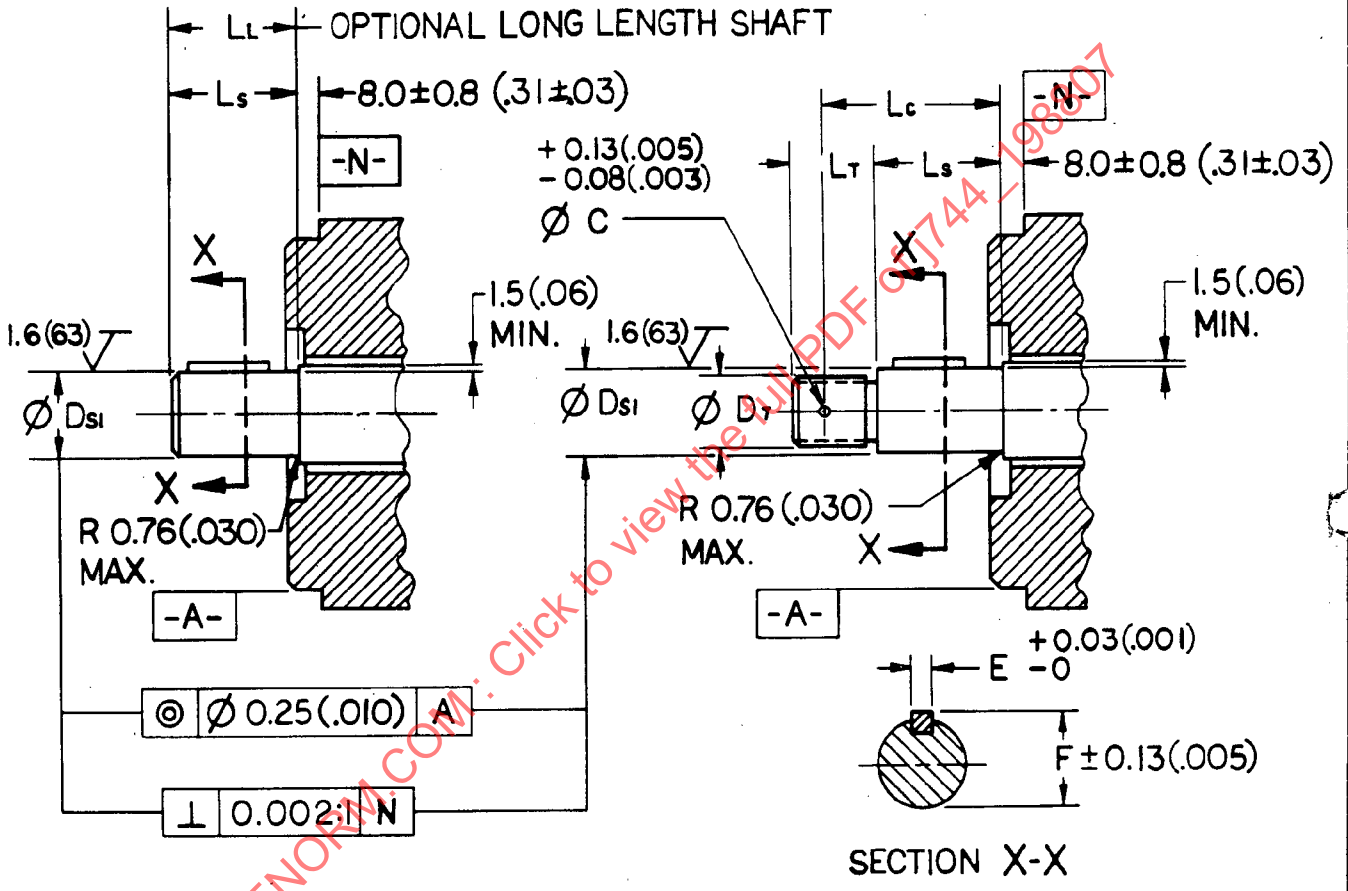
5. PREFERRED FLANGE/SHAFT END COMBINATIONS (see Table 1.)



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)

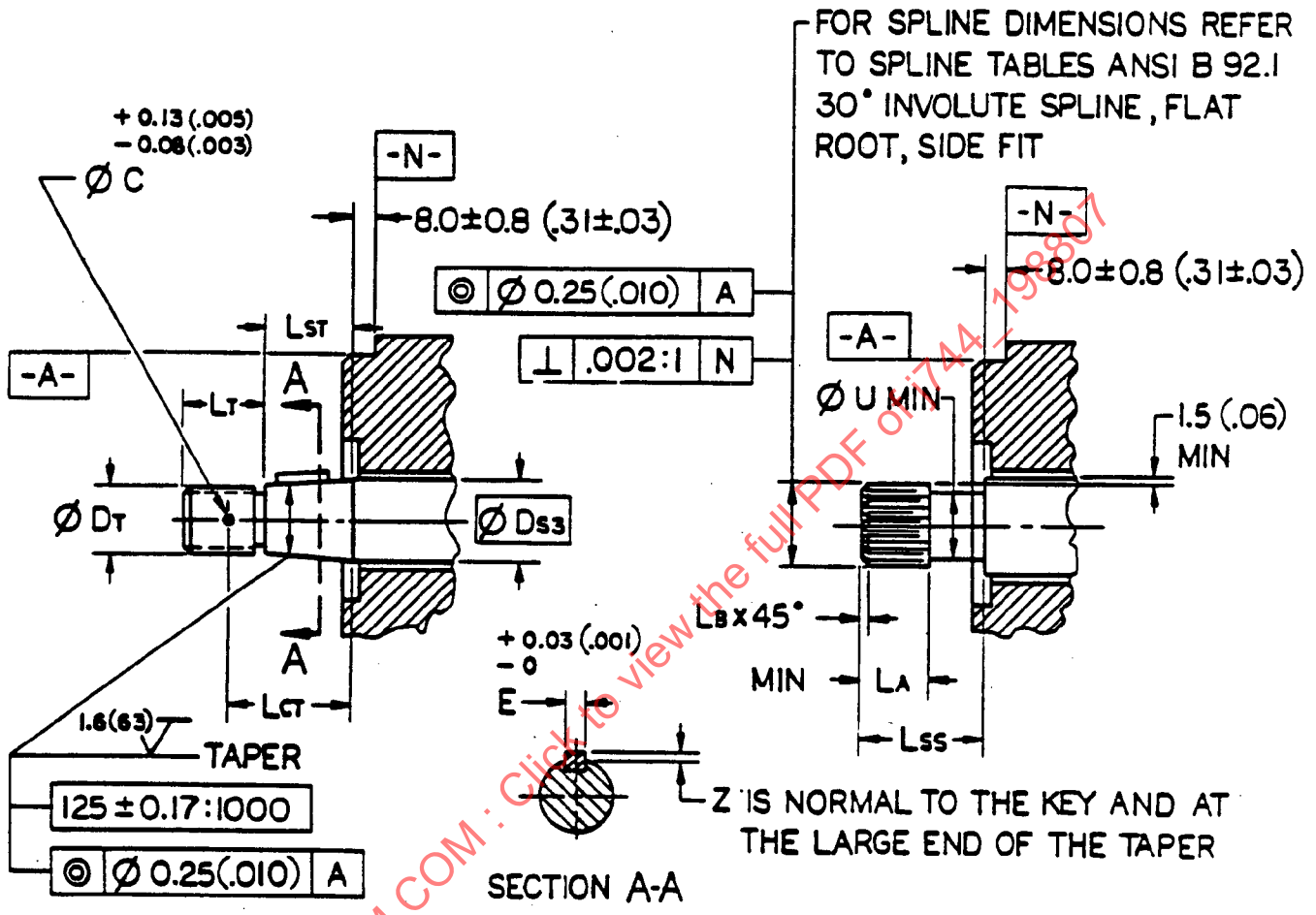


Unspecified tolerances:
mm diam. - 1 place ±0.5; 2 place ±0.25
(inch dim. - 2 place ±0.02; 3 place ±0.010)
micrometer (micro inch)

Dimensions in mm (in)

6. FLANGE/SHAFT CONCENTRICITY:

Maintain flange/shaft concentricity within 0.25 mm (0.010 in) in accordance with Tables 3, 4, and 5. (Rigid couplings may require closer tolerance.)



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)

7. REFERENCES:

7.1 SAE Dual Dimensioning Standard - SAE J390.

7.2 Rules for SAE Use of SI (Metric) Units - SAE J916 JUN82.

7.3 Categories of Off-Road Self-Propelled Work Machines - SAE J1116 JUN86.

7.4 American National Standard for Dimensioning and Tolerancing - ANSI Y14.5M.

7.5 Screw Threads - ANSI B1.1.

7.6 Involute Splines and Inspection - ANSI B92.1 - 1970.

TABLE 2 - Dimensions of 2 and 4 Bolt Pump and Motor Mounting Flanges

Identification Code	Pilot Dimensions				2 Bolt Type					4 Bolt Type		
	A Noted	W Noted	X Min.	Y Max.	B Cast Dim.	J	K	M Noted	P_1 Cast Dim.	S	R Noted	P_2 Cast Dim.
50--[a]	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--[a]	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--[a]	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--[a]	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--[a]	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--[a]	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--[a]	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)

[a]--2 2 Bolt, --4 4 Bolt Flange

TABLE 3 - Dimensions of Straight Shafts - Without and With Thread

Identification Code	Straight Shaft				No Thread--1			With Thread--2		
	D_{S1} Max	D_{S1} Min	L_S	F Noted	E Noted	L_L Optional	D_T ANSI B1.1	C Noted	L_C	L_T
13--[a]	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--[a]	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--[a]	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--[a]	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--[a]	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--[a]	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--[a]	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--[a]	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)

[a]-- 1 without thread, -- 2 with thread

TABLE 4 - Dimensions of Taper Shaft Ends With Thread--3

Identification Code	D_{S3}	D_T ANSI B1.1	C Noted	L_{CT}	L_{ST}	L_T	E Noted	Z Max	Z Min
13--3	12.70	5/16--32	2.0	25	17.48	12.70	3.18	1.63	1.37
(A--A)	(0.500)	UNF 2A	(0.078)	(0.984)	(0.688)	(0.500)	(0.125)	(0.064)	(0.054)
16--3	15.88	1/2--20	3.2	28	17.48	18.26	3.97	2.13	1.88
(A)	(0.625)	UNF 2A	(0.125)	(1.094)	(0.688)	(0.719)	(0.1563)	(0.084)	(0.074)
19--3	19.05	1/2--20	3.2	34	23.83	18.26	4.78	2.54	2.29
	(0.750)	UNF 2A	(0.125)	(1.344)	(0.938)	(0.719)	(0.188)	(0.100)	(0.090)
22--3	12.22	5/8--18	4.0	43	28.58	23.01	6.35	3.33	3.07
(B)	(0.875)	UNF 2A	(0.156)	(1.688)	(1.125)	(0.906)	(0.250)	(0.131)	(0.121)
25--3	25.40	3/4--16	4.0	49	34.92	26.97	6.35	3.33	3.07
(B--B)	(1.00)	UNF 2A	(0.156)	(1.938)	(1.375)	(1.062)	(0.250)	(0.131)	(0.121)
32--3	31.75	1--12	4.0	49	34.92	30.96	7.34	4.11	3.86
(C)	(1.25)	UNF 2A	(0.156)	(1.938)	(1.375)	(1.219)	(0.3125)	(0.162)	(0.152)
38--3	38.10	1-1/8--12	4.0	62	47.62	34.92	3.52	4.93	4.67
(C--C)	(1.50)	UNF 2A	(0.156)	(2.438)	(1.875)	(1.375)	(0.375)	(0.194)	(0.184)
44--3	44.45	1-1/4--12	4.0	71	53.98	39.67	11.11	5.72	5.46
(D & E)	(1.75)	UNF 2A	(0.156)	(2.812)	(2.125)	(1.562)	(0.4375)	(0.225)	(0.215)
50--3	50.80	1-1/4--12	4.0	90	73.02	39.67	12.70	6.50	6.25
(F)	(2.00)	UNF 2A	(0.156)	(3.562)	(2.875)	(1.562)	(0.500)	(0.256)	(0.246)

TABLE 5 - DIMENSIONS OF 30 DEG INVOLUTE SPLINE SHAFTS--4

Identification Code	Spline	U Min	L_A Min	L_{ss}[a]	L_B
13--4 (A--A)	9T 20/40 DP	9.40 (0.3700)	5.1 (0.20)	19 (0.750)	1.5 (0.06)
16--4 (A)	9T 16/32 DP	11.81 (0.4650)	7.6 (0.30)	24 (0.938)	1.5 (0.06)
19--4	11T 16/32 DP	14.99 (0.5900)	8.9 (0.35)	30 (1.180)	1.5 (0.06)
22--4 (B)	13T 16/32 DP	18.16 (0.7150)	10.2 (0.40)	33 (1.312)	1.5 (0.06)
25--4 (B--B)	15T 16/32 DP	21.34 (0.8400)	12.7 (0.50)	38 (1.500)	1.5 (0.06)
32--4 (C)	14T 12/24 DP	26.42 (1.0400)	15.2 (0.60)	48 (1.875)	2.3 (0.09)
38--4 (C--C)	17T 12/24 DP	32.77 (1.2900)	17.8 (0.70)	54 (2.125)	2.3 (0.09)
44--4 (D & E)	13T 8/16 DP	36.63 (1.4420)	20.3 (0.80)	67 (2.625)	3.0 (0.12)
50--4 (F)	15T 8/16 DP	42.95 (1.6910)	25.4 (1.00)	80 (3.125)	3.0 (0.12)

[a] L_{ss}--Defined as maximum coupler engagement.

The phi (Ø) symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.