

Fluid Power Design Data Sheet



REVISED SHEET 76 - EVOLUTION DESIGN DATA FILE

NFPA MOUNTING FLANGES AND SHAFTS FOR HYDRAULIC PUMPS AND MOTORS

For many years, the only standardization on pump and motor shafts and mounting flanges had been the SAE (Society of Automotive Engineers) Standard J744a. It was widely accepted by the automotive and other industries and is still a valid standard. The NFPA (National Fluid Power Association) started work in 1962 on a set of standards that would more directly apply to industrial fluid power pumps and motors and be more complete. This set of standards was unanimously approved by the NFPA Board of Directors and issued in 1965 as NFPA Recommended Standard T3.9.6S.I. In 1966, it was also adopted by the ANSI (American National Standards Institute) and issued as B93.6-1966. It has since been revised and now carries the numbers ANSI B93.6-1972, and NFPA T3.9.2 RI. Copies are available from the NFPA.

No performance specifications exist although recommended methods of testing pumps and motors and the manner of presenting test data are given in NFPA Recommended Standard T3.9.17-1971.

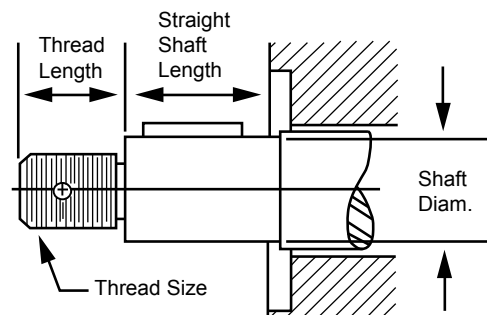
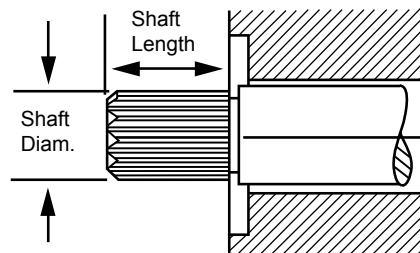
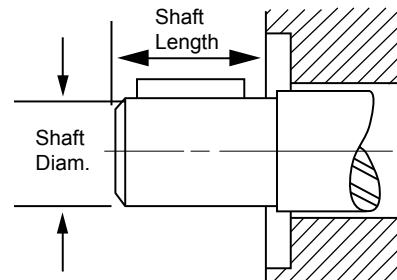
The purpose of the standard is to encourage manufacturers to use interchangeable dimensions on both mounting flanges and shafts as far as possible to simplify dimensional interchangeability. No standards presently exist for foot mounting dimensions. No performance specifications exist although recommended methods of testing pumps and motors and the manner of presenting test data are given in NFPA Recommended Standard T3.9.17-1971.

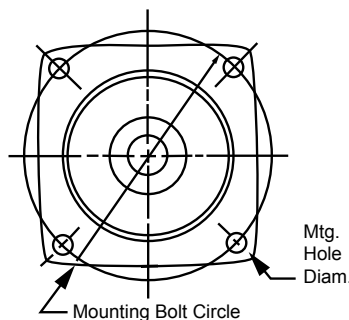
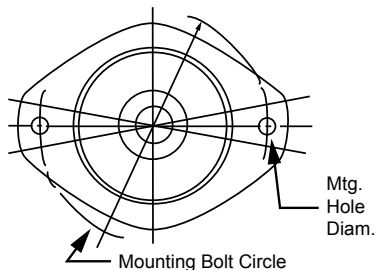
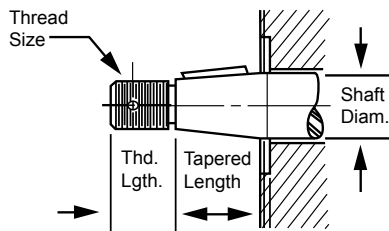
The new NFPA and ANSI standards are similar to the SAE standards but differ in these respects: Additional shaft diameters and an alternative long length shaft have been added to the straight-shaft-without-thread listings. Additional mounting flange sizes have been added to provide a wider selection for the designer. NFPA has not assigned any horsepower ratings, making it the responsibility of the pump designer. However, the SAE horsepower ratings are shown for mounting flanges.

STRAIGHT SHAFT WITHOUT THREAD					
Shaft Ident. Code	Shaft Diam.	Short Shaft Lgth.	Long Shaft Lgth.	Key Width Inches	SAE Flange Size*
13-1	1/2"	3/4"	----	1/8"	----
16-1	5/8	15/16	2"	5/32	A
22-1	7/8	1-5/16	2-1/2	1/4	B
25-1	1	1-1/2	2-3/4	1/4	----
31-1	1-1/4	1-7/8	3	5/16	C
38-1	1-1/2	2-1/8	3-1/4	3/8	----
44-1	1-3/4	2-5/8	3-5/8	7/16	D,E

30-DEGREE INVOLUTE SPLINE				
Shaft Ident. Code	Shaft Diam.	Shaft Lgth.	Spline Specifications	SAE* Flange
13-4	1/2"	3/4"	9T, 20/40 DP	----
16-4	5/8	15/16	9T, 16/32 DP	A
22-4	7/8	1-5/16	13T, 16/32 DP	B
25-4	1	1-1/2	15T, 16/32 DP	----
32-4	1-1/4	1-7/8	14T, 12/24 DP	C
38-4	1-1/2	2-1/8	17T, 12/24 DP	----
44-4	1-3/4	2-5/8	13T, 8/16 DP	D,E
50-4	2	3-1/8	15T, 8/16 DP	----

STRAIGHT SHAFT WITH THREAD					
Shaft Ident. Code	Shaft Diam.	Str. Shaft	Th'd Size	Th'd Lgth.	Key Width
13-2	1/2"	3/4"	3/8 - 24	9/16"	1/8"
16-2	5/8	15/16	1/2 - 20	23/32	5/32
22-2	7/8	1-5/16	5/8 - 18	29/32	1/4
25-2	1	1-1/2	3/4 - 16	1-1/16	1/4
32-2	1-1/4	1-7/8	1 - 12	1-7/32	5/16
38-2	1-1/2	2-1/8	1-1/8 - 12	1-3/8	3/8
44-2	1-3/4	2-5/8	1-1/4 - 12	1-9/16	7/16





TAPERED SHAFT WITH THREAD					
Shaft Ident. Code	Shaft Diam.	Tprd. Shaft Lgth.	Thd'd Shaft Lgth.	Th'd Size	Key Width
13-3	1/2"	11/16"	1/2"	5/16-32	1/8"
16-3	5/8	11/16	23/32	1/2-20	5/32
22-3	7/8	1-1/8	29/32	5/8-18	1/4
25-3	1	1-3/8	1-1/16	3/4-16	1/4
32-3	1-1/4	1-3/8	1-7/32	1-12	5/16
38-3	1-1/2	1-7/8	1-3/8	1-1/8-12	3/8
44-3	1-3/4	2-1/8	1-9/16	1-1/4-12	7/16

TWO-BOLT MOUNTING FLANGES						
Flange Code	SAE No.	SAE HP Rating	M'tg. Bolt Circle	M'tg. Hole Diam.	Pilot Diam.	Pilot Hgt.
50-2	----	----	3-1/4"	13/32"	2"	1/4"
82-2	A	10	4-3/16	7/16	3-1/4	1/4
101-2	B	25	5-3/4	9/16	4	3/8
127-2	C	50	7-1/8	11/16	5	1/2
152-2	D	100	9	13/16	6	1/2
165-2	E	200	12-1/2	1-1/16	6-1/2	5/8

FOUR-BOLT MOUNTING FLANGES						
Flange Code	SAE No.	SAE HP Rating	M'tg. Bolt Circle	M'tg. Hole Diam.	Pilot Diam.	Pilot Hgt.
101-4	B	25	5"	9/16"	4"	3/8"
127-4	C	50	6-3/8	9/16	5	1/2
152-4	D	100	9	13/16	6	1/2
165-4	E	200	12-1/2	13/16	6-1/2	5/8
177-4	F	300	13-25/32	1-1/16	7	5/8

HYDRAULIC FLANGES FOR SAE PORTS

STANDARD (LOW PRESSURE) CONNECTION FLANGES

Connects dryseal (NPTF) pipe threads, through an O-ring seal, to a mounting surface with rectangular bolt spacing.

Nominal Size	Rated PSI	Dim. A, Inches	Dim. B, Inches	Mtg. Bolt Size	O-Ring Size
3/4"	5000	1.875"	0.875"	3/8-16 x 1 1/2	-214
1	5000	2.062	1.031	3/8-16 x 1 3/4	-219
1 1/4	4000	2.312	1.188	7/16-14 x 1 3/4	-222
1 1/2	3000	2.750	1.406	1/2-13 x 2	-225
2	3000	3.062	1.688	1/2-13 x 2	-228
2 1/2	2500	3.500	2.000	1/2-13 x 2 1/2	-232
3	2000	4.188	2.438	5/8-11 x 2 3/4	-237

HIGH PRESSURE (6000 PSI) CONNECTION FLANGES

Connects welded pipe through O-ring seal to a 4-bolt mounting surface or to another flange to make a union.

Nominal Size	Dim. A, Inches	Dim. B, Inches	Mtg. Bolt Size	Pipe O.D.
3/4"	2.000"	0.937"	3/8-16 x 1 1/2	1.063"
1	2.250	1.093	7/16-14 x 1 3/4	1.328
1 1/4	2.625	1.250	1/2-13 x 2 1/4	1.672
1 1/2	3.125	1.437	5/8-11 x 2 3/4	1.923
2	3.812	1.750	3/4-10 x 3	2.406
2 1/2	4.875	2.312	7/8-9 x 3 1/2	2.906
3	6.000	2.812	1-1/8-7 x 4 1/2	3.547

Rectangular, 4-bolt connection flanges for pumps, motors, valves, and other components. Per SAE J518.

