

Submitted for recognition as an American National Standard

COMPANION FLANGES, TYPE A (EXTERNAL PILOT) AND TYPE S (INTERNAL PILOT)

1. SCOPE:

This SAE Standard specifies the nominal dimensions and tolerances which affect the interchangeability between companion flanges and mating parts. The flanges covered by this document are designated type A and type S.

The type A flanges are equivalent to type A ISO/DIS 7646. The type S flanges are equivalent to the type S ISO/DIS 7647. Type A is an external (male) pilot construction and type S is an internal (female) pilot construction. These flanges are not interchangeable. Dimensions not specified are left to the discretion of the component manufacturer.

2. REFERENCES:

2.1 Applicable Documents:

ISO 286, ISO System of Limits and Fits

ISO 1101, Technical Drawings - Geometrical Tolerancing - Tolerancing of Form, Orientation, Location and Run-Out - Generalities, Definitions, Symbols, Indications on Drawings

ISO 7646, Road Vehicles - Gearbox Flanges for Commercial Vehicles and Buses - Type A

3. DIMENSIONS AND TOLERANCES:

Nominal dimensions, tolerances and bolt hole locations of type A companion flanges are shown in Figures 1 to 5, and given in Table 1. Nominal dimensions, tolerances and bolt hole locations of type S companion flanges are shown in Figures 6 to 9, and given in Table 2.

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4. DESIGNATION:

Companion flanges meeting the requirements of this document shall be identified by the following details in the order specified:

- a. Reference to this document
- b. The flange type
- c. The diameter of the flange, D_1 ; (Type A only - See Table 1)
- d. The size code; (Type S only - See Table 2)
- e. The number of bolts
- f. The size of bolts

4.1 Examples:

4.1.1 Designation of a companion flange type A with $D_1 = 150$ mm and eight 12 mm bolts:

- a. Flange SAE J1946 Type A -- 150 x 8 x 12

4.1.2 Designation of a companion flange type S with size code one 500 and four 14 mm bolts:

- a. Flange SAE J1946 Type S -- one 500 x 4 x 14

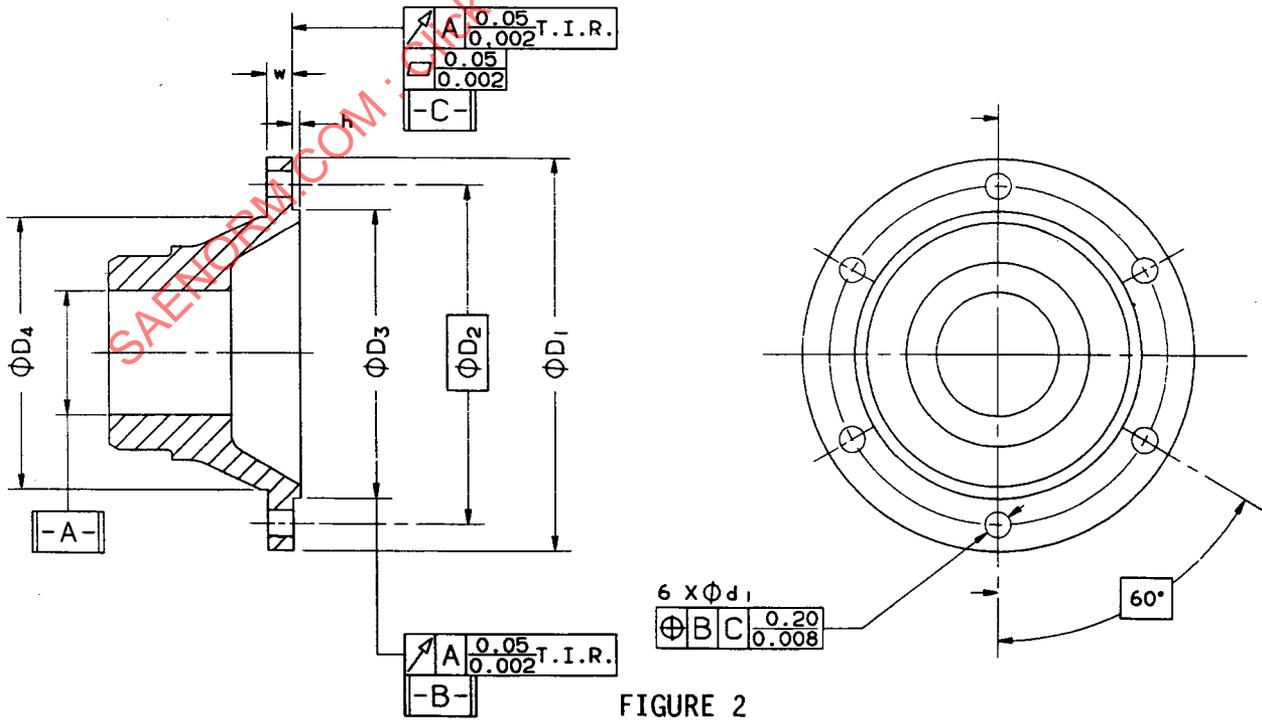
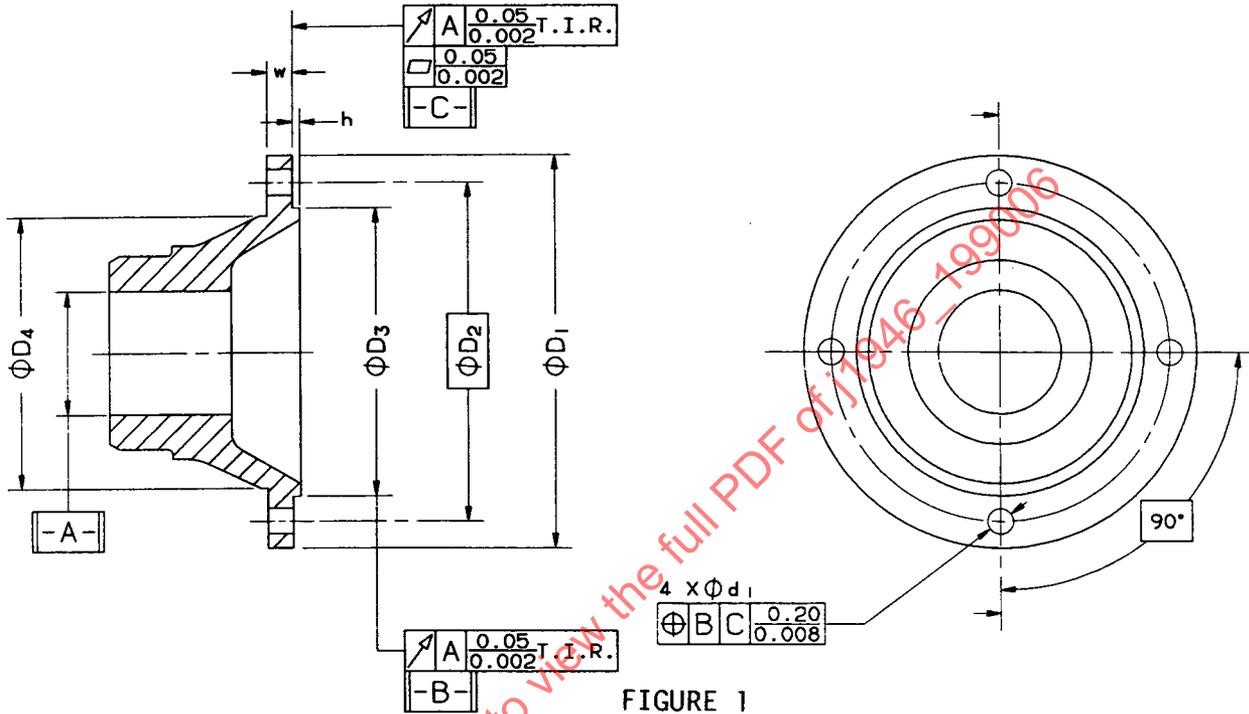
4.1.3 Designation of a companion flange type S with size code one 710 and eight 0.375 inch bolts:

- a. Flange SAE J1946 Type S -- one 710 x 8 x 0.375

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TYPE A COMPANION FLANGES
 TRUE POSITION, FLATNESS & RUNOUT TOLERANCES
 (FIGURES 1-5)

MM
 INCHES



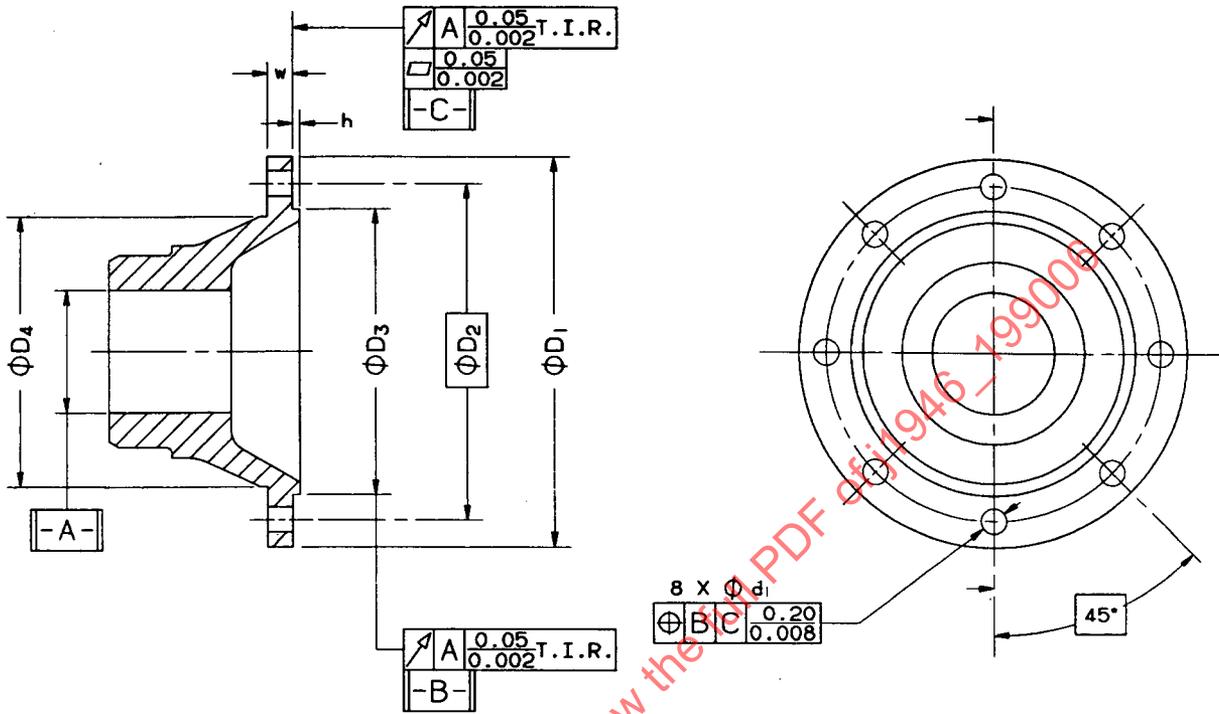


FIGURE 3

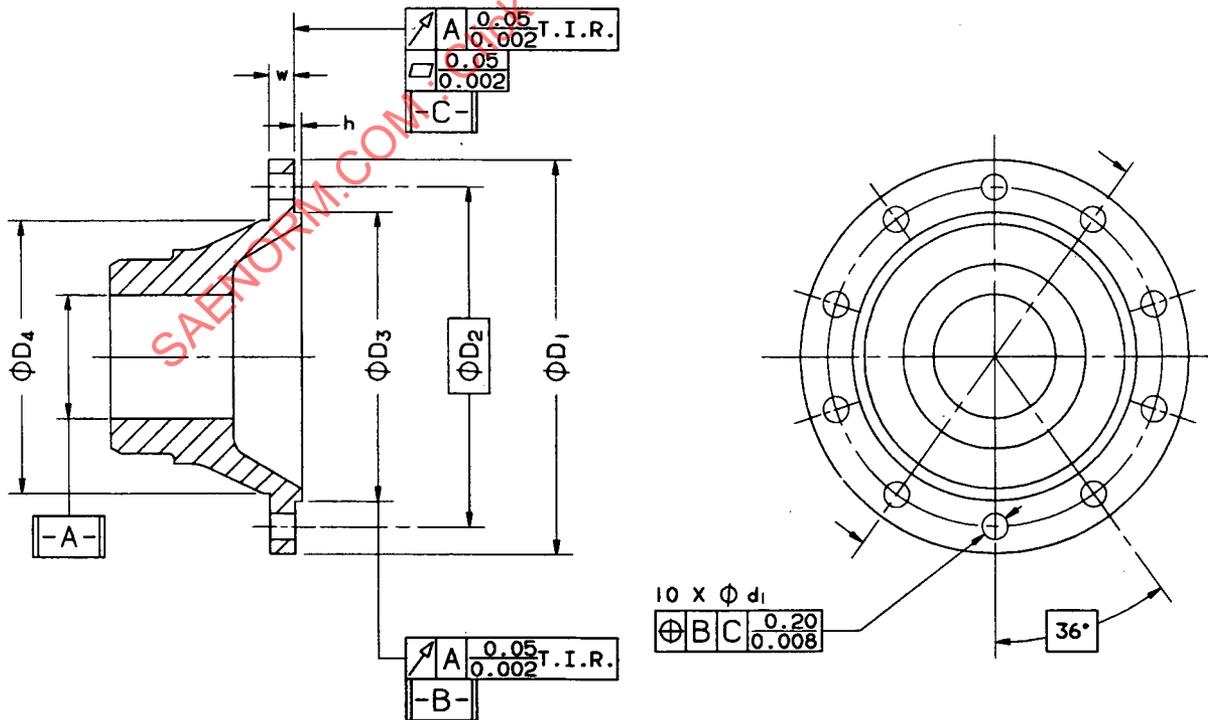


FIGURE 4

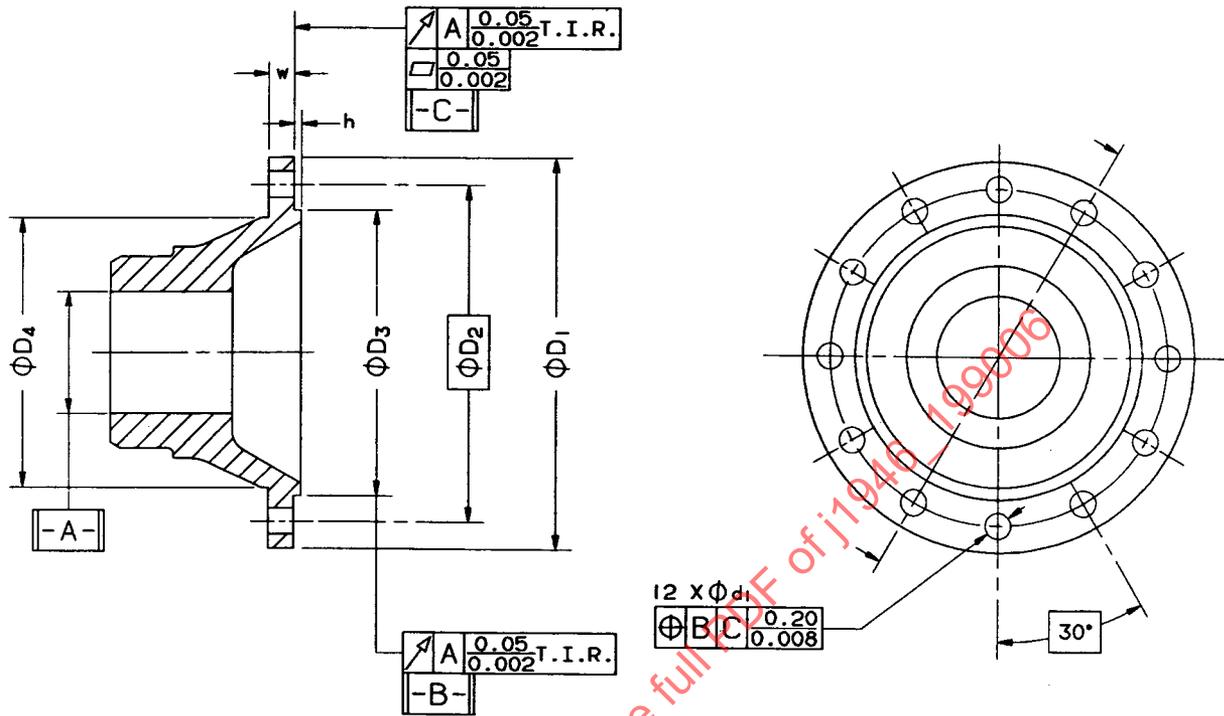


FIGURE 5

TABLE 1 - Dimensions and Tolerances
(Applicable to Figures 1 to 5)

D_1	Figure Number	Number of holes	d_1 +0.2 0	D_2	D_3 0 ³ -0.05	D_4^a -0.2	w 0 -0.5	h 0 -0.2
75	2	6	6.1	62	42	51.6	5.5	1.8
90	1	4	8.1	74.5	47	61	6	2.3
	2	6						
100	2	6	8.1	84	57	70.5	7	2.3
120	3	8	10.1	101.5	75	84.3	8	2.3
	3	8						
150	5	12	12.1	130	90	110.7	10	2.3
165	3	8	16.1	140	95	115	12	2.3
180	4	10	16.1	155.5	110	130.5	12	2.3
225	5	12	16.1	196	140	171	15	4

Dimensions and tolerances in millimeters.

^aThis dimension shall be used when required to prevent bolt heads from rotating.

TYPE S COMPANION FLANGES
TRUE POSITION, FLATNESS & RUNOUT TOLERANCES
 (FIGURES 6-9)

MM
 INCHES

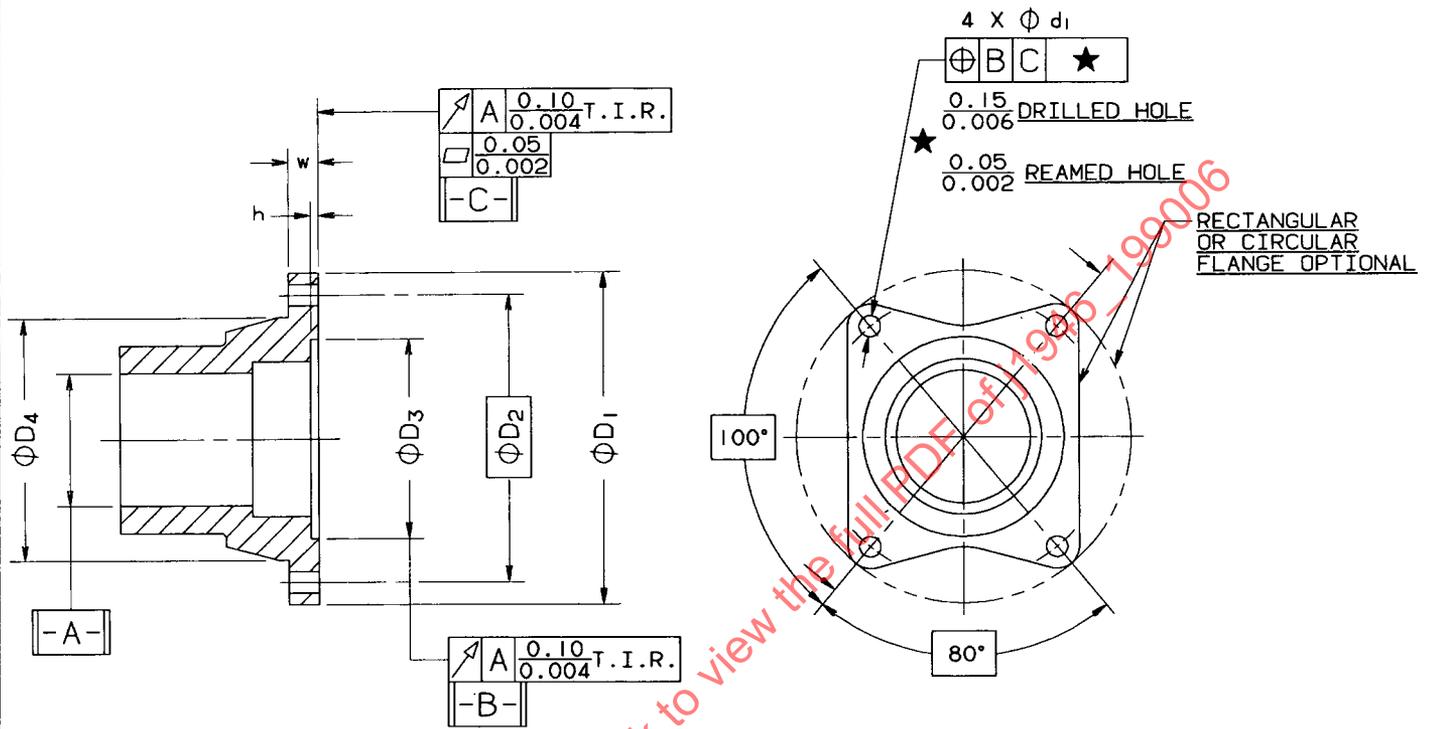


FIGURE 6

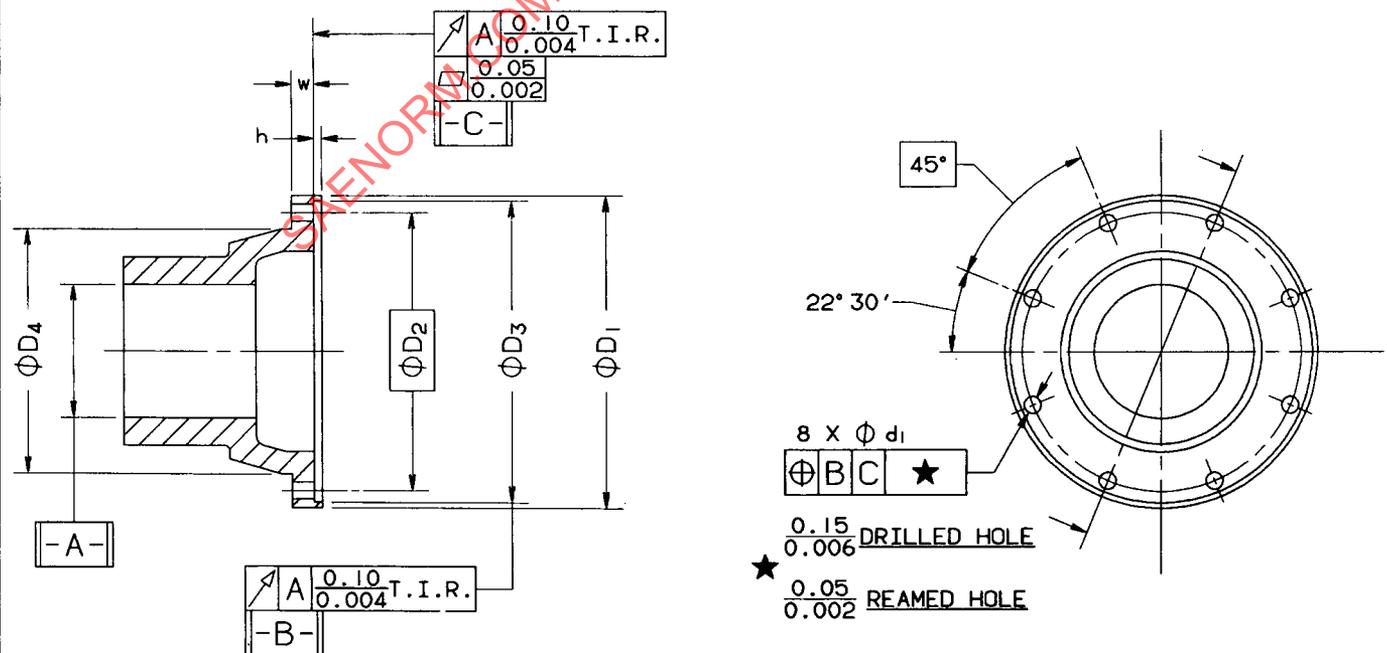


FIGURE 7

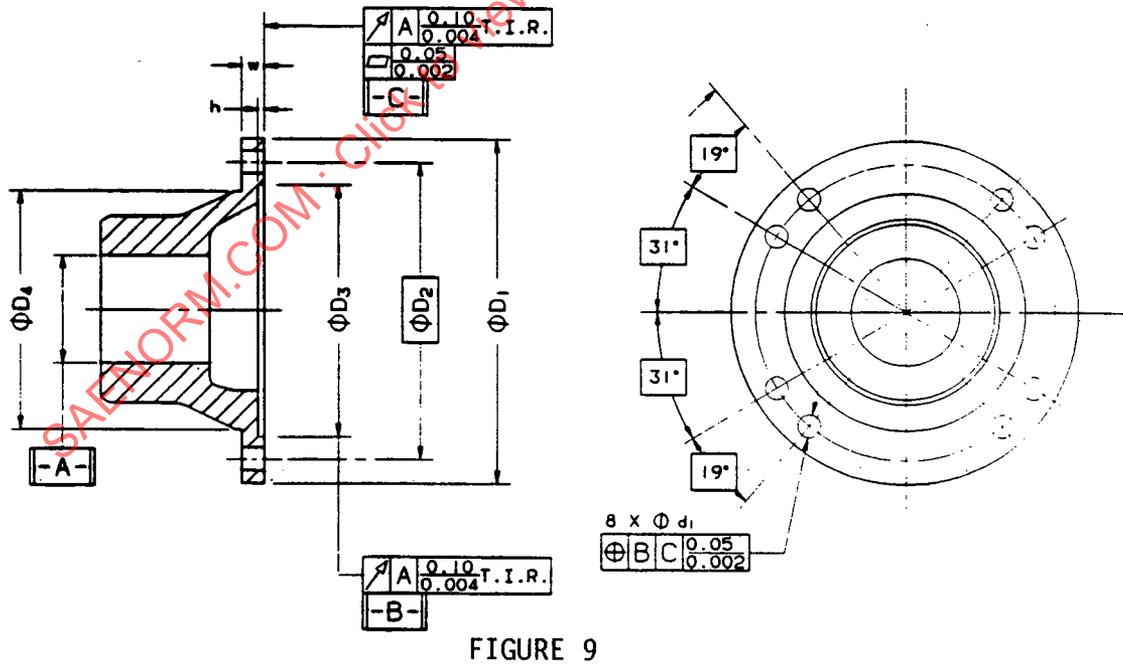
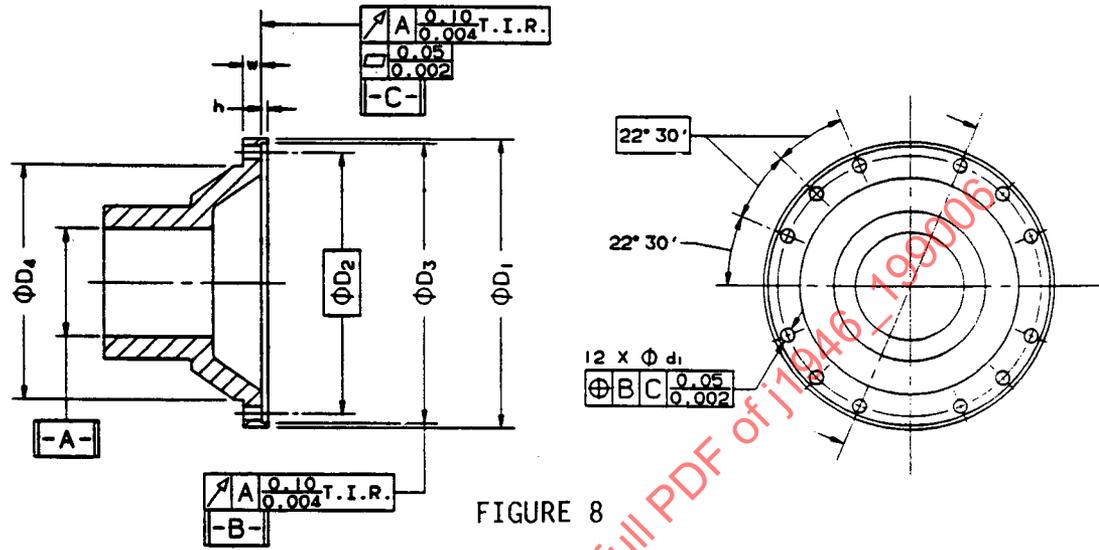


TABLE 2 - Dimensions and Tolerances
(Applicable to Figures 6 to 9)

SAE - ORIGINAL INCH STANDARD

Size Code	Figure Number	D ₁	Number of holes	d ₁ ^a +0.007(a) 0	D ₂	D ₃ +0.002 0	D ₄ ^b 0 -0.005	w 0 -0.020	h +0.010 0
1 000	6	3.438	4	0.318	2.750	2.248	2.240	0.260	0.080
1 100	6	3.438	4	0.318	2.750	2.248	2.240	0.260	0.080
1 310	6	3.875	4	0.381	3.125	2.375	2.550	0.290	0.080
1 350	6	4.625	4	0.441/0.439	3.750	2.750	3.115	0.320	0.080
1 410	6	4.625	4	0.441/0.439	3.750	2.750	3.115	0.320	0.080
1 480	6	5.875	4	0.506	4.750	3.750	3.990	0.390	0.080
1 550	6	5.875	4	0.506	4.750	3.750	3.990	0.390	0.080
1 610	7	6.875	8	0.381	6.125	6.625	5.550	0.390	0.050
1 710	7	8.000	8	0.379/0.377	7.250	7.750	6.677	0.390	0.050
1 760	8	8.000	12	0.441/0.439	7.250	7.750	6.615	0.390	0.050
1 810	8	8.000	12	0.441/0.439	7.250	7.750	6.615	0.390	0.050
1 880	9	9.500	8	0.629/0.627	8.250	7.000	7.300	0.620	0.125
1 910	9	9.500	8	0.629/0.627	8.250	7.000	7.300	0.620	0.125

Dimensions and tolerances in inches

NOTE: Basic differences between the ISO and SAE companion flange standards are in bolt hole diameters (d₁) and bolt head locking diameters (D₄). These two diameters correspond to the use of metric or inch mounting bolts.

ISO - METRIC CONVERSION STANDARD

Size Code	Figure Number	D ₁	Number of holes	d ₁ +0.2 0	D ₂	D ₃ 0 +0.05	D ₄ (b) 0 -0.2	w 0 -0.5	h +0.2 0
1 100	6	87	4	8.1	69.85	57.10	56.4	8	2.0
1 300	6	97	4	10.1	79.37	60.32	62.2	8	2.3
1 400	6	116	4	12.1	95.25	69.85	76	8	2.3
1 500	6	151	4	14.1	120.65	95.25	96.4	10	2.3
1 510	6	146	4	12.1	120.65	95.25	101.4	10	2.3
1 600	7	175	8	10.1	155.57	168.28	138.4	11	1.5
1 700	7	203	8	10.1	184.15	196.86	167	11	1.5
1 800	8	203	12	10.1	184.15	196.86	167	11	1.5

Dimensions and tolerances in millimeters

^a+0.007 applies to dimensions without tolerance specified.

^bThis dimension shall be used when required to prevent bolt heads from rotating.