FLANGE 12-POINT SCREWS

IFI Note:

1. IFI-115 is a standard developed through the procedures of Industrial Fasteners Institute. IFI-115 was first published in 1970 and modestly revised and reissued in 1986.

1. Dimensions.

All dimensions are in inches unless otherwise stated.

2. Top of Head.

Top of head may be full form or indented at option of the manufacturer. If full form, the top of head shall be chamfered or rounded with the diameter of chamfer circle or start of rounding being equal to the max width across flats, within a tolerance of minus 15 percent. If the top of head is indented, the periphery may be rounded.

3. Corner Fill.

The rounding due to lack of fill on all 12 corners of the head shall be reasonably uniform and the width across corners of the head shall be such that when a sharp ring having an inside diameter equal to the specified T dimension is placed on the top of the head and normal to the screw axis, the screw head may enter, but not protrude through the gage.

4. Wrenching Height, J.

Wrenching height is a distance measured from the top of the flange up the side of the head to the top of the head.

5. True Position of Head.

The axis of the head shall be located at true position with respect to the axis of the body (determined over a distance under the head equal to one diameter) within a tolerance zone whose diameter is equivalent to 6 percent of the maximum width across flats, regardless of feature size.

6. Bearing Surface.

Runout of the bearing surface with respect to the axis of the body shall be within the FIM limits specified. Measurement of FIM shall be made as close to the periphery of the bearing surface as possible while the screw is held in a collet or other gripping device at a distance of one screw diameter from the underside of the head.

7. Fillet.

For all lengths of screws, the form of the fillet shall be optional: provided it is tangent to the shank of the screw at a distance no greater than L_a max from the underside of head; provided it fairs into the bearing surface within the limits of basic major diameter of threads plus M max, and E min plus M min; and is a smooth and continuous curve having a bearing surface juncture radius no less than that specified in Table 1 for the respective screw size.

8. Threads.

Threads, when rolled, shall be Unified coarse or fine thread series UNRC or UNRF, Class 2A or 3A, in accordance with ANSI/ASME B1.1, page A-26. Threads produced by other means shall preferably be UNRC or UNRF, Class 2A or 3A, but at manufacturer's option may be Unified coarse or fine thread series UNC or UNF, Class 2A or 3A. Acceptability of screw threads shall be determined based on System 21, ANSI/ASME B1.3, page A-53.

9. Length of Thread.

The length of the thread (L_T) shall be measured from the extreme point to the last complete thread. The length of thread shall be controlled by max gaging length (L_G) specified

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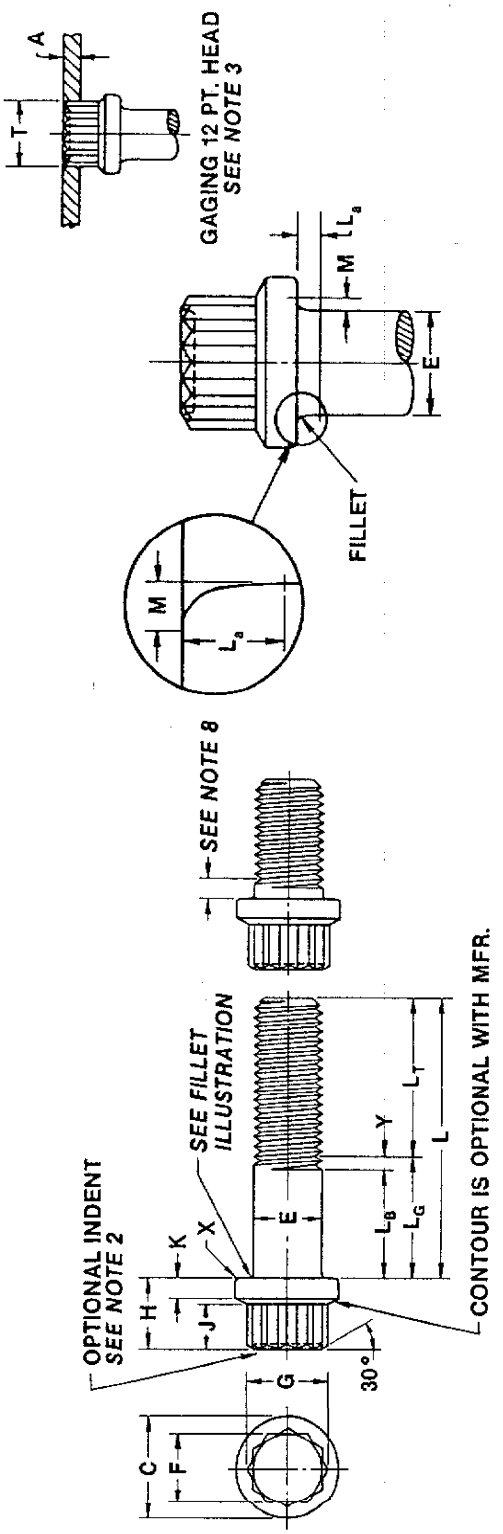

Table 1 Dimensions of Flange 12-Point Screws

Nominal Size or Basic Major Dia of Thread	E	C		F		G	H	J	K	Runout of Bearing Surface FIM	M		L_a	Bearing Surface Juncture Radius	X	A		T		L_T	Y
	Body Dia Min (Max Equal to Nom Size)	Flange Dia		Width Across Flats		Width Across Corners	Head Height	Wrenching Height	Flange Thickness		Fillet Extension		Fillet Length		Chamfer or Radius	Gaging Ring Thickness		Gaging Ring Dia		Thread Length	Transition Thread Length
		Max	Min	Max	Min	Min	Max	Min	Min	Max	Max	Min	Max	Min	Max	Max	Min	Max	Min	Basic	Max
1/4 0.2500	0.2435	0.375	0.365	0.252	0.244	0.278	0.260	0.15	0.058	0.007	0.014	0.009	0.087	0.007	0.020	0.0525	0.0522	0.2783	0.2780	1.000	0.25
5/16 0.3125	0.3053	0.469	0.457	0.315	0.306	0.348	0.312	0.18	0.074	0.008	0.017	0.012	0.087	0.009	0.020	0.0600	0.0597	0.3483	0.3480	1.125	0.28
3/8 0.3750	0.3678	0.562	0.550	0.377	0.368	0.420	0.375	0.21	0.095	0.010	0.020	0.015	0.087	0.012	0.020	0.0711	0.0708	0.4203	0.4200	1.250	0.31
7/16 0.4375	0.4294	0.656	0.642	0.438	0.429	0.489	0.438	0.26	0.109	0.011	0.023	0.018	0.087	0.014	0.030	0.0840	0.0837	0.4893	0.4890	1.375	0.36
1/2 0.5000	0.4919	0.750	0.735	0.502	0.493	0.562	0.500	0.29	0.129	0.013	0.026	0.020	0.087	0.016	0.030	0.0948	0.0945	0.5623	0.5620	1.500	0.38
9/16 0.5625	0.5538	0.844	0.828	0.564	0.555	0.633	0.563	0.33	0.145	0.015	0.029	0.022	0.157	0.018	0.030	0.1071	0.1068	0.6333	0.6330	1.625	0.42
5/8 0.6250	0.6163	0.938	0.921	0.627	0.618	0.705	0.625	0.36	0.166	0.016	0.032	0.024	0.157	0.021	0.040	0.1179	0.1176	0.7053	0.7050	1.750	0.46
3/4 0.7500	0.7406	1.125	1.107	0.752	0.743	0.847	0.750	0.44	0.200	0.020	0.039	0.030	0.157	0.025	0.040	0.1416	0.1413	0.8473	0.8470	2.000	0.50
7/8 0.8750	0.8647	1.312	1.293	0.877	0.866	0.987	0.875	0.51	0.234	0.023	0.044	0.034	0.227	0.031	0.040	0.1656	0.1653	0.9873	0.9870	2.250	0.56
1 1.0000	0.9886	1.500	1.479	1.003	0.991	1.130	1.000	0.60	0.268	0.026	0.050	0.040	0.332	0.034	0.040	0.1893	0.1890	1.1303	1.1300	2.500	0.62
1-1/8 1.1250	1.1086	1.688	1.665	1.128	1.115	1.271	1.125	0.66	0.310	0.029	0.055	0.045	0.332	0.039	0.050	0.2109	0.2106	1.2713	1.2710	2.750	0.71
1-1/4 1.2500	1.2336	1.875	1.852	1.253	1.240	1.414	1.250	0.73	0.350	0.033	0.060	0.050	0.332	0.044	0.050	0.2331	0.2328	1.4143	1.4140	3.000	0.71
1-3/8 1.3750	1.3568	2.062	2.038	1.378	1.365	1.556	1.375	0.80	0.392	0.036	0.065	0.055	0.332	0.048	0.050	0.2544	0.2541	1.5563	1.5560	3.250	0.83
1-1/2 1.5000	1.4818	2.250	2.224	1.503	1.489	1.697	1.500	0.87	0.433	0.039	0.070	0.060	0.332	0.052	0.050	0.2763	0.2760	1.6973	1.6970	3.500	0.83
See Notes 15				5				4		6			7					3		9, 10	

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Table 2 Maximum Gaging Lengths (L_G) for Flange 12-Point Screws

Nominal Length	Nominal Size													
	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2
1-1/2	0.500	—	—	—	—	—	—	—	—	—	—	—	—	—
1-3/4	0.500	0.625	0.500	—	—	—	—	—	—	—	—	—	—	—
2	1.000	0.625	0.500	0.625	—	—	—	—	—	—	—	—	—	—
2-1/4	1.000	1.125	1.000	0.625	0.750	0.750	—	—	—	—	—	—	—	—
2-1/2	1.500	1.125	1.000	1.125	0.750	0.750	0.750	—	—	—	—	—	—	—
2-3/4	1.500	1.625	1.500	1.125	0.750	0.750	0.750	—	—	—	—	—	—	—
3	2.000	1.625	1.500	1.625	1.500	1.500	0.750	1.000	—	—	—	—	—	—
3-1/4	2.000	2.125	2.000	1.625	1.500	1.500	1.500	1.000	1.000	—	—	—	—	—
3-1/2	2.500	2.125	2.000	2.125	1.500	1.500	1.500	1.000	1.000	1.000	—	—	—	—
3-3/4	2.500	2.625	2.500	2.125	2.250	2.250	1.500	1.000	1.000	1.000	1.000	—	—	—
4	3.000	2.625	2.500	2.625	2.250	2.250	2.250	2.000	1.000	1.000	1.000	1.000	—	—
4-1/4	3.000	3.125	3.000	2.625	2.250	2.250	2.250	2.000	2.000	1.000	1.000	1.000	1.000	—
4-1/2	3.500	3.125	3.000	3.125	3.000	3.000	2.250	2.000	2.000	2.000	1.000	1.000	1.000	1.000
4-3/4	3.500	3.625	3.500	3.125	3.000	3.000	3.000	2.000	2.000	2.000	2.000	1.000	1.000	1.000
5	4.000	3.625	3.500	3.625	3.000	3.000	3.000	3.000	2.000	2.000	2.000	2.000	1.000	1.000
5-1/4	—	4.125	4.000	3.625	3.750	3.750	3.000	3.000	3.000	2.000	2.000	2.000	2.000	1.000
5-1/2	—	4.125	4.000	4.125	3.750	3.750	3.750	3.000	3.000	3.000	2.000	2.000	2.000	2.000
5-3/4	—	4.625	4.500	4.125	3.750	3.750	3.750	3.000	3.000	3.000	3.000	2.000	2.000	2.000
6	—	4.625	4.500	4.625	4.500	4.500	3.750	4.000	3.000	3.000	3.000	3.000	2.000	2.000
6-1/4	—	5.125	5.000	4.625	4.500	4.500	4.500	4.000	4.000	3.000	3.000	3.000	3.000	2.000
6-1/2	—	5.125	5.000	5.125	4.500	4.500	4.500	4.000	4.000	4.000	3.000	3.000	3.000	3.000
6-3/4	—	—	5.500	5.125	5.250	5.250	4.500	4.000	4.000	4.000	4,000	3.000	3.000	3.000
7	—	—	5.500	5.625	5.250	5.250	5.250	5.000	4.000	4.000	4.000	4.000	3.000	3.000
7-1/4	—	—	6.000	5.625	5.250	5.250	5.250	5.000	5.000	4.000	4.000	4.000	4.000	3.000
7-1/2	—	—	—	6.125	6.000	6.000	5.250	5.000	5.000	5.000	4.000	4.000	4.000	4.000
7-3/4	—	—	—	6.125	6.000	6.000	6.000	5.000	5.000	5.000	5.000	4.000	4.000	4.000
8	—	—	—	6.625	6.000	6.750	6.000	6.000	5.000	5.000	5.000	5.000	4.000	4.000
8-1/2	—	—	—	7.125	7.000	6.750	6.750	6.000	6.000	6.000	5.000	5.000	5.000	4.000
9	—	—	—	7.625	7.000	7.750	6.750	7.000	6.000	6.000	6.000	5.000	5.000	5.000
9-1/2	—	—	—	—	8.000	7.750	7.750	7.000	7.000	7.000	6.000	6.000	5.000	5.000
10	—	—	—	—	8.000	9.25	7.750	8.000	7.000	7.000	7.000	6.000	6.000	5.000
11	—	—	—	—	—	10.25	9.25	9.000	8.000	8.000	7.000	7.000	6.000	6.000
12	—	—	—	—	—	—	10.25	10.000	9.000	9.000	8.000	7.000	7.000	6.000
13	—	—	—	—	—	—	—	11.000	10.000	10.000	9.000	8.000	7.000	7.000
14	—	—	—	—	—	—	—	12.000	11.000	11.000	10.000	9.000	8.000	7.000
15	—	—	—	—	—	—	—	13.000	12.000	12.000	11.000	10.000	9.000	8.000
16	—	—	—	—	—	—	—	—	13.000	13.000	12.000	11.000	10.000	9.000
17	—	—	—	—	—	—	—	—	14.000	14.000	13.000	12.000	11.000	10.000
18	—	—	—	—	—	—	—	—	15.000	15.000	14.000	13.000	12.000	11.000
19	—	—	—	—	—	—	—	—	—	16.000	15.000	14.000	13.000	12.000
20	—	—	—	—	—	—	—	—	—	17.000	16.000	15.000	14.000	13.000

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in Table 2. On short screws (those for which no gaging length is shown in the Table), the complete thread, as measured with a thread ring gage, shall extend to within two threads of the head for sizes up to 5/8 in., inclusive and shall extend as close to the head as practicable for sizes over 5/8 in. Min length of body (L_B, distance of underside of head to last scratch of thread) for all lengths tabulated in Table 2 shall be max gaging length minus max thread transition length (Y).

10. Long Screws.

Screws of longer lengths than those given in Table 2, shall have min thread length equal to specified basic thread, and total thread length (including incomplete threads) shall not exceed the basic thread length plus the max thread transition length.

11. Point.

Point shall be flat and chamfered from approximately 0.016 in. below the minor diameter, the length of point to be from ½ to 1½ threads.

12. Length of Screw, L.

The length of the screw shall be measured on a line parallel to the axis, from the plane of the bearing surface under the head, to the plane on the flat of the point. Tolerance on screw length shall be minus 0.031 in. for lengths up to and including 1 in.; minus 0.047 in. for lengths over 1 in. to and including 2 in.; minus 0.062 in. for lengths over 2 in. to and including 6 in.; and minus 0.125 in. for all lengths over 6 in.

13. Thread Runout and Screw Straightness.

The runout of the thread in relation to screw body and the shank straightness shall be such that the screw will meet the requirements given on page C-22.

14. Material.

Chemical and mechanical properties of steel screws normally conform to Grades 2, 5 or 8 of SAE J429, page B-50. Properties of several grades of nonferrous materials are covered in ASTM F468, page B-100, and of several stainless steels in ASTM F593, page B-92.

15. Nominal Size.

Where specifying nominal size in decimals, zero preceding decimal and in the fourth decimal place shall be omitted.