



**Torque-Tension Relationship for ASTM A193/A193M B7M & A320/A320M L7M Bolts and Studs**

**Clamp Load Specified per API 6A (50% of yield)**

**Caution:** All material included in this chart is advisory only, and its use by anyone is voluntary. In developing this information, Fastenal has made a determined effort to present its contents accurately. Extreme caution should be used when using a formula for torque/tension relationships. Torque is only an indirect indication of tension. Under/over tightening of fasteners can result in costly equipment failure or personal injury.

Nom Dia. (in)	Threads per Inch	Clamp Load (lbs)	Tightening Torque			Threads per Inch	Clamp Load (lbs)	Tightening Torque		
			K = 0.12 Typical Xylan or other PTFE	K = 0.15 Typical Plain with Anti-Seize	K = 0.20 Typical Plain & Dry			K = 0.12 Typical Xylan or other PTFE	K = 0.15 Typical Plain with Anti- Seize	K = 0.20 Typical Plain & Dry
<b>Coarse Thread Series</b>						<b>Fine Thread Series</b>				
1/4	20	1273	38 in-lbs	48 in-lbs	64 in-lbs	28	1455	44 in-lbs	55 in-lbs	73 in-lbs
5/16	18	2097	79	98	131	24	2323	87	109	145
3/8	16	3100	12 ft-lbs	15 ft-lbs	19 ft-lbs	24	3513	13 ft-lbs	16 ft-lbs	22 ft-lbs
7/16	14	4252	19	23	31	20	4749	21	26	35
1/2	13	5676	28	35	47	20	6398	32	40	53
9/16	12	7278	41	51	68	18	8119	46	57	76
5/8	11	9040	57	71	94	18	10238	64	80	107
3/4	10	13378	100	125	167	16	14918	112	140	186
7/8	9	18469	162	202	269	14	20379	178	223	297
1	8	24230	242	303	404	14	27195	272	340	453
1 1/4	7	38764	485	606	808	12	42918	536	671	894
1 3/8	6	46195	635	794	1059	12	52588	723	904	1205
1 1/2	6	56210	843	1054	1405	12	63241	949	1186	1581
<b>UN8 Thread Series</b>										
1 1/4	8	39988	500	625	833					
1 3/8	8	49340	678	848	1131					
1 1/2	8	59674	895	1119	1492					
1 5/8	8	70989	1154	1442	1923					
1 3/4	8	83286	1458	1822	2429					
1 7/8	8	96565	1811	2263	3018					
2	8	110826	2217	2771	3694					
2 1/4	8	142292	3202	4002	5336					
2 1/2	8	177686	4442	5553	7404					

The torque values can only be achieved if nut (or tapped hole) has a proof load greater than or equal to the bolt's minimum ultimate tensile strength.

As specified in API 6A, clamp load calculated as 50% of the yield strength for the B7M and L7M specified in ASTM A193/A193M and A320/A320M.

Torque values for 1/4 and 5/16-in series are in inch-pounds. All other torque values are in foot-pounds.

Torque values calculated from formula  $T=KDF$ , where

Coatings such as Teflon or Xylan offer extremely low coefficients of friction. Often we will experience K values around 0.12 or lower.

K = 0.15 for "lubricated" conditions and K = 0.20 for "dry" conditions

D = Nominal Diameter

F = Clamp Load