Torque-Tension Relationship for ASTM A193 B7 Bolts and Studs

Nominal Dia. (in.)	Threads Per Inch	Minimum Tensile Strength (lbs.)	Minimum Yield Strength (lbs.)	Est. Shear Strength (lbs.)	Clamp Load (lbs)	Tightening Torque		
						K = 0.12 (ft-lbs)	K = 0.15 (ft-lbs)	K = 0.20 (ft-lbs)
1/4	20	3978	3341	2016	2506	6	8	10
1/4	28	4547	3819	2441	2864	7	9	12
5/16	18	6554	5505	3401	4129	13	16	22
5/16	24	7258	6097	3931	4573	14	18	24
3/8	16	9686	8136	5083	6102	23	29	38
3/8	24	10979	9222	6063	6916	26	32	43
7/16	14	13289	11162	6997	8372	37	46	61
7/16	20	14840	12465	8173	9349	41	51	68
1/2	13	17737	14899	9425	11175	56	70	93
1/2	20	19994	16795	11146	12596	63	79	105
9/16	12	22743	19104	12150	14328	81	101	134
9/16	18	25373	21313	14159	15985	90	112	150
5/8	11	28250	23730	15131	17798	111	139	185
5/8	18	31995	26876	17999	20157	126	157	210
3/4	10	41808	35118	22643	26339	198	247	329
3/4	16	46620	39161	26344	29371	220	275	367
7/8	9	57717	48482	31438	36362	318	398	530
7/8	14	63684	53495	36035	40121	351	439	585
1	8	75718	63603	41316	47702	477	596	795
1	14	84986	71388	48473	53541	535	669	892
1 1/8	7	95409	80144	51969	60108	676	845	1127
1 1/8	8	98807	82998	54570	62248	700	875	1167
1 1/4	7	121139	101757	66722	76318	954	1192	1590
1 1/4	8	124963	104969	69664	78727	984	1230	1640
1 1/2	8	186480	156644	105376	117483	1762	2203	2937
1 1/2	6	175657	147551	97013	110664	1660	2075	2767
1 5/8	8	221841	186346	125992	139760	2271	2839	3785
1 3/4	8	260269	218626	148450	163970	2869	3587	4782
1 7/8	8	301766	253483	172748	190112	3565	4456	5941
2	8	346330	290917	198887	218188	4364	5455	7273
2 1/4	8	444663	373517	256688	280138	6303	7879	10505
2 1/2	8	555267	466425	321851	349819	8745	10932	14576

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.
Clamp load calculated as 75% of the yield strength for the B7 specified in ASTM A193.
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 even lower.
K = 0.15 for "lubricated" conditions and K = 0.20 for "dry" conditions
D = Nominal Diameter
F = Clamp Load
Tensile and Yield strengths in accordance with ASTM A193
Minimum ultimate tensile strength: 125,000 PSI (up through 2-1/2") and 115,000 PSI (over 2-1/2 through 4)
Minimum yield strength: 105,000 PSI (up through 2-1/2") and 95,000 PSI (over 2-1/2 through 4)
Estimated Shear Strength based off of 60% of minimum tensile strength using the thread root area. It is not part of the ASTM A193 specification.