



Southern Fasteners and Supply, Inc.
A 1st AMERICAN COMPANY

Suggested Torque Values

ASTM A307

Bolt Size	TPI	Proof Load (lbs)	Clamp Load (lbs)	Tightening Torque (ft lbs)		
				Lubricated	Zinc	Plain
1/4	20	1,150	862.5	2.7	3.1	3.6
5/16	18	1,880	1,410	5.5	6.2	7.3
3/8	16	2,790	2,093	9.8	11.1	13.1
7/16	14	3,825	2,869	15.7	17.8	20.9
1/2	13	5,100	3,825	23.9	27.1	31.9
9/16	12	6,550	4,913	34.5	39.1	46.1
5/8	11	8,130	6,098	47.6	54	63.5
3/4	10	12,025	9,019	84.6	95.8	112.7
7/8	9	15,200	11,400	124.7	141.3	166.3
1	8	20,000	15,000	187.5	212.5	250.0
1 1/8	7	25,200	18,900	265.8	301.2	354.4
1 1/4	7	32,000	24,000	375	425	500
1 3/8	6	38,000	28,500	489.8	555.2	653.1
1 1/2	6	46,400	34,800	652.5	740	870
1 3/4	5	68,400	51,300	1122.2	1,272	1,496
2	4 1/2	90,000	67,500	1,688	1,913	2,250
2 1/4	4 1/2	117,000	87,750	2,468	2,797	3,291
2 1/2	4	144,000	108,000	3,375	3,825	4,500
2 3/4	4	177,500	133,125	4,576	5,186	6,102
3	4	215,000	161,250	6,047	6,853	8,063
3 1/4	4	256,000	192,000	7,800	8,840	10,400
3 1/2	4	299,900	224,925	9,840	11,153	13,121
3 3/4	4	347,500	260,625	12,217	13,846	16,289
4	4	398,000	298,500	14,925	16,915	19,900



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Suggested Torque Values

SAE J429 Grade 2

Bolt Size	TPI	Proof Load (lbs)	Clamp Load (lbs)	Tightening Torque (ft lbs)		
				Lubricated	Zinc	Plain
1/4	20	1,150	862.5	2.7	3.1	3.6
5/16	18	1,880	1,410	5.5	6.2	7.3
3/8	16	2,790	2,093	9.8	11.1	13.1
7/16	14	3,825	2,869	15.7	17.8	20.9
1/2	13	5,100	3,825	23.9	27.1	31.9
9/16	12	6,550	4,913	34.5	39.1	46.1
5/8	11	8,130	6,098	47.6	54	63.5
3/4	10	12,025	9,019	84.6	95.8	112.7
7/8	9	15,200	11,400	124.7	141.3	166.3
1	8	20,000	15,000	187.5	212.5	250.0
1 1/8	7	25,200	18,900	265.8	301.2	354.4
1 1/4	7	32,000	24,000	375	425	500
1 3/8	6	38,000	28,500	489.8	555.2	653.1
1 1/2	6	46,400	34,800	652.5	740	870
1 3/4	5	68,400	51,300	1122.2	1,272	1,496
2	4 1/2	90,000	67,500	1,688	1,913	2,250
2 1/4	4 1/2	117,000	87,750	2,468	2,797	3,291
2 1/2	4	144,000	108,000	3,375	3,825	4,500
2 3/4	4	177,500	133,125	4,576	5,186	6,102
3	4	215,000	161,250	6,047	6,853	8,063
3 1/4	4	256,000	192,000	7,800	8,840	10,400
3 1/2	4	299,900	224,925	9,840	11,153	13,121
3 3/4	4	347,500	260,625	12,217	13,846	16,289
4	4	398,000	298,500	14,925	16,915	19,900



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Suggested Torque Values

SAE J429 Grade 5 – ASTM A449

Bolt Size	TPI	Proof Load (lbs)	Clamp Load (lbs)	Tightening Torque (ft lbs)		
				Lubricated	Zinc	Plain
1/4	20	2,700	2,025	6.3	7.2	8.4
5/16	18	4,450	3,338	13	14.8	17.4
3/8	16	6,600	4,950	23.2	26.3	30.9
7/16	14	9,050	6,788	37.1	42.1	49.5
1/2	13	12,050	9,038	56.5	64.0	75.3
9/16	12	15,450	11,588	81.5	92.3	108.6
5/8	11	19,200	14,400	113	127.5	150
3/4	10	28,400	21,300	200	226.3	266.3
7/8	9	39,250	29,438	322	364.9	429.3
1	8	51,500	38,625	482.8	547.2	643.8
1 1/8	7	56,450	42,338	595.4	674.8	793.8
1 1/4	7	71,700	53,775	840.2	952.3	1120.3
1 3/8	6	85,450	64,088	1101.5	1248.4	1468.7
1 1/2	6	104,000	78,000	1463	1657.5	1950
1 3/4	5	104,500	78,375	1714.5	1943	2285.9
2	4 1/2	137,500	103,125	2578.1	2921.9	3437.5
2 1/4	4 1/2	178,750	134,063	3770.5	4273.2	5027.3
2 1/2	4	220,000	165,000	5156	5843.8	6875
2 3/4	4	271,150	203,363	6990.6	7922.7	9320.8
3	4	328,350	246,263	9234.8	10466.2	12313.1



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Suggested Torque Values

SAE J429 Grade 8 – ASTM A354 Grade BD

Bolt Size	TPI	Proof Load (lbs)	Clamp Load (lbs)	Tightening Torque (ft lbs)		
				Waxed	Zinc	Dry
1/4	20	3,800	2,850	8.9	10.1	11.9
5/16	18	6,300	4,725	18.5	20.9	24.6
3/8	16	9,300	6,975	32.7	37.1	43.6
7/16	14	12,750	9,563	52.3	59.3	69.7
1/2	13	17,050	12,788	79.9	90.6	106.6
9/16	12	21,850	16,388	115.2	130.6	153.6
5/8	11	27,100	20,325	158.8	180	211.7
3/4	10	40,100	30,075	282	319.5	375.9
7/8	9	55,450	41,588	454.9	515.5	606.5
1	8	72,700	54,525	681.6	772.4	908.8
1 1/8	7	91,550	68,663	965.6	1094.3	1287.4
1 1/4	7	120,000	90,000	1406.3	1593.8	1875
1 3/8	6	138,600	103,950	1786.6	2024.9	2382.2
1 1/2	6	168,600	126,450	2370.9	2687.1	3161.3
1 3/4	5	228,000	171,000	3740.6	4239.4	4987.5
2	4 1/2	300,000	225,000	5625	6375	7500
2 1/4	4 1/2	390,000	292,500	8226.6	9323.4	10968.8
2 1/2	4	480,000	360,000	11250	12750	15000
2 3/4	4	517,650	388,238	13345.7	15125.1	17794.2
3	4	626,850	470,138	17630.2	19980.8	23506.9
3 1/4	4	745,500	559,125	22714.5	25743	30285.9
3 1/2	4	874,650	655,988	28699.5	32526	38265.9
3 3/4	4	1,014,300	760,725	35659	40413.5	47545.3
4	4	1,163,400	872,550	43627.5	49444.5	58170



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Suggested Torque Values

ASTM A193 Grade B7 – ASTM A354 Grade BC

Bolt Size	TPI	Proof Load (lbs)	Clamp Load (lbs)	Tightening Torque (ft lbs)			
				Waxed	Zinc	Plain	Teflon
1/4	20	3,350	2,513	7.9	8.9	10.5	3.9
5/16	18	5,500	4,125	16.1	18.3	21.5	8.1
3/8	16	8,150	6,113	28.7	32.5	38.2	14.3
7/16	14	11,150	8,363	45.7	51.8	61	22.9
1/2	13	14,900	11,175	69.8	79.2	93.1	34.9
9/16	12	19,100	14,325	100.7	114.2	134.3	50.4
5/8	11	23,750	17,813	139.2	157.7	185.5	69.6
3/4	10	35,050	26,288	246.4	279.3	328.6	123.2
7/8	9	48,500	36,375	397.9	450.9	530.5	198.9
1	8	63,650	47,738	596.7	676.3	795.6	298.4
1 1/8	7	80,100	60,075	844.8	957	1,126	422.4
1 1/4	7	101,750	76,313	1192.4	1,351	1,590	596.2
1 3/8	6	121,300	90,975	1,564	1,772	2,085	781.8
1 1/2	6	147,550	110,663	2,075	2,352	2,767	1037.5
1 3/4	5	199,500	149,625	3,273	3,709	4,364	1636.5
2	4 1/2	262,500	196,875	4,922	5,578	6,563	2460.9
2 1/4	4 1/2	341,250	255,938	7,198	8,158	9,598	3599.1
2 1/2	4	420,000	315,000	9,844	11,156	13,125	4921.9
2 3/4	4	468,500	351,375	12,079	13,689	16,105	6039.3
3	4	567,150	425,363	15,951	18,078	21,268	7975.5
3 1/4	4	674,500	505,875	20,551	23,291	27,402	10275.6
3 1/2	4	791,350	593,513	25,966	29,428	34,622	12983.1
3 3/4	4	917,700	688,275	32,263	36,565	43,017	16131.4
4	4	1,052,600	789,450	39,473	44,736	52,630	19736.3



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Suggested Torque Values

ASTM A325 (structural)

Bolt Size	TPI	Tension (lbs)		Tightening Torque Range (ft.lbs / min-max)	
		Min	Max	Lubricated	Plain
1/2	13	12,000	14,000	50 - 59	100 - 118
5/8	11	19,000	23,000	100 - 120	195 - 240
3/4	10	28,000	34,000	175 - 215	350 - 425
7/8	9	39,000	47,000	285 - 345	569 - 685
1	8	51,000	61,000	425 - 505	850 - 1,015
1 1/8	7	56,000	67,000	525 - 625	1,050 - 1,255
1 1/4	7	71,000	85,000	740 - 885	1,480 - 1,770
1 3/8	6	85,000	102,000	975 - 1,170	1,950 - 2,340
1 1/2	6	103,000	124,000	1,290 - 1,550	2,575 - 3,100



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Suggested Torque Values

ASTM A490 (structural)

Bolt Size	TPI	Tension (lbs)		Tightening Torque Range (ft.lbs / min-max)	
		Min	Max	Lubricated	Plain
1/2	13	15,000	18,000	62 - 75	125 - 150
5/8	11	24,000	29,000	125 - 150	250 - 302
3/4	10	35,000	42,000	219 - 263	438 - 525
7/8	9	49,000	59,000	357 - 430	715 - 860
1	8	64,000	77,000	533 - 642	1,067 - 1,283
1 1/8	7	80,000	96,000	750 - 900	1,500 - 1,800
1 1/4	7	102,000	122,000	1,063 - 1,270	2,125 - 2,540
1 3/8	6	121,000	145,000	1,386 - 1,660	2,773 - 3,323
1 1/2	6	148,000	178,000	1,850 - 2,225	3,700 - 4,450



Suggested Torque Values

ISO 898 Grd 8.8

Bolt Size	TPI	Proof Load (lbs)	Clamp Load (lbs)	Tightening Torque (ft.lbs)		
				Oil	Zinc	Plain
3mm	0.5	656	492	0.7	0.8	1.0
3.5mm	0.6	886	664	1.1	1.3	1.5
4mm	0.7	1146	860	1.7	1.9	2.3
5mm	0.8	1850	1388	3.4	3.9	4.6
6mm	1	2608	1956	5.8	6.5	7.7
7mm	1	3777	2832	9.8	11.1	13
8mm	1.25	4766	3574	14.1	15.9	18.8
10mm	1.5	7576	5682	28	31.7	37.3
12mm	1.75	10993	8245	48.7	55.2	64.9
14mm	2	14994	11246	77.5	87.8	103.3
16mm	2	20457	15343	120.8	136.9	161.1
18mm	2.5	25852	19389	171.7	194.6	229
20mm	2.5	33046	24784	243.9	276.5	325.3
22mm	2.5	40914	30685	332.2	376.5	442.9
24mm	3	47658	35743	422.1	478.4	562.8
27mm	3	61820	46365	616	698.2	821.4
30mm	3.5	75758	56818	838.8	950.7	1,118
33mm	3.5	93517	70138	1,139	1,291	1,519
36mm	4	110152	82614	1,464	1,659	1,951
39mm	4	131733	98800	1896.2	2149	2528.3



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Suggested Torque Values

ISO 898 Grd 10.9

Bolt Size	TPI	Proof Load (lbs)	Clamp Load (lbs)	Tightening Torque (ft.lbs)		
				Oil	Zinc	Plain
3mm	0.5	940	705	1.0	1.2	1.4
3.5mm	0.6	1266	949	1.6	1.9	2.2
4mm	0.7	1639	1229	2.4	2.7	3.2
5mm	0.8	2653	1989	4.9	5.5	6.5
6mm	1	3754	2816	8.3	9.4	11.1
7mm	1	5395	4046	13.9	15.8	18.6
8mm	1.25	6834	5125	20.2	22.9	26.9
10mm	1.5	10813	8110	39.9	45.2	53.2
12mm	1.75	15736	11802	69.7	79.0	92.9
14mm	2	21468	16101	110.9	125.7	147.9
16mm	2	29224	21918	172.6	195.6	230.1
18mm	2.5	35743	26807	237.4	269.1	316.6
20mm	2.5	45634	34226	336.9	381.8	449.2
22mm	2.5	56650	42487	460	521.3	613.3
24mm	3	65866	49400	583.4	661.2	777.9
27mm	3	85649	64237	853.5	967.3	1138
30mm	3.5	104757	78568	1160	1314.6	1546.6
33mm	3.5	129485	97114	1577.1	1787.4	2102.8
36mm	4	152414	114311	2025.2	2295.2	2700.2
39mm	4	182088	136566	2621	2970.5	3494.7



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Suggested Torque Values

ISO 898 Grd 12.9

Bolt Size	TPI	Proof Load (lbs)	Clamp Load (lbs)	Tightening Torque (ft.lbs)		
				Oil	Zinc	Plain
3mm	0.5	1097	823	1.2	1.4	1.6
3.5mm	0.6	1479	1109	1.9	2.2	2.5
4mm	0.7	1915	1436	2.8	3.2	3.8
5mm	0.8	3102	2327	5.7	6.5	7.6
6mm	1	4384	3288	9.7	11.0	12.9
7mm	1	6294	4721	16.3	18.4	21.7
8mm	1.25	7980	5985	23.6	26.7	31.4
10mm	1.5	12656	9492	46.7	52.9	62.3
12mm	1.75	18389	13791	81.4	92.3	108.6
14mm	2	25178	18883	130.1	147.5	173.5
16mm	2	34170	25627	201.8	228.7	269.0
18mm	2.5	41813	31360	277.8	314.8	370.4
20mm	2.5	53502	40127	394.9	447.6	526.6
22mm	2.5	66091	49568	536.6	608.2	715.5
24mm	3	76882	57661	681	771.8	908
27mm	3	100036	75027	996.8	1129.7	1329.1
30mm	3.5	122291	91718	1354.1	1534.7	1805.5
33mm	3.5	151290	113468	1842.7	2088.4	2457
36mm	4	178042	133531	2365.7	2681.1	3154.2
39mm	4	212886	159664	3064.4	3472.9	4085.8