Bolt Torque Chart (SAE Grade 2, 5, 8)

Recommended tightening torque for inch bolts. Dry = clean plain steel threads. Lubed = oiled, greased or anti-seized threads. Dry zinc-plated bolts: about 15% below the dry value. Use the vehicle or equipment maker's spec when one exists.

Coarse thread (UNC), ft-lb

Size	Grade 2		Grade 5		Grade 8	
	Dry	Lubed	Dry	Lubed	Dry	Lubed
1/4"-20	5.5	4.1	8.5	6.3	12	8.9
5/16"-18	11	8.4	17	13	25	18
3/8"-16	20	15	31	23	44	33
7/16"-14	32	24	49	37	70	52
1/2"-13	49	37	75	57	106	80
9/16"-12	70	53	109	82	154	115
5/8"-11	97	73	150	113	212	159
3/4"-10	172	129	267	200	376	282
7/8"-9	167	125	429	322	606	455
1"-8	250	187	644	483	909	681

Fine thread (UNF), ft-lb

Size	Grade 2		Grade 5		Grade 8	
	Dry	Lubed	Dry	Lubed	Dry	Lubed
1/4"-28	6.3	4.7	9.7	7.2	14	10
5/16"-24	12	9.4	19	14	27	20
3/8"-24	23	17	35	26	49	37
7/16"-20	36	27	55	41	78	58
1/2"-20	55	41	85	64	120	90
9/16"-18	78	59	121	91	171	128
5/8"-18	110	82	170	127	240	180
3/4"-16	192	144	297	223	420	315
7/8"-14	184	138	474	355	669	502
1"-12	274	205	704	528	995	746

Coarse thread (UNC), N·m

Size	Grade 2		Grade 5		Grade 8	
	Dry	Lubed	Dry	Lubed	Dry	Lubed
1/4"-20	7.4	5.6	11	8.6	16	12
5/16"-18	15	11	24	18	33	25
3/8"-16	27	20	42	31	59	44
7/16"-14	43	33	67	50	95	71
1/2"-13	66	50	102	77	144	108
9/16"-12	95	72	147	111	208	156
5/8"-11	132	99	203	153	287	215
3/4"-10	234	175	361	271	510	383
7/8"-9	226	169	582	437	822	616
1"-8	339	254	873	654	1,232	924



Grade 2
No marks



Grade 5
3 radial lines



Grade 8
6 radial lines

Dry or lubed? Oil, grease and anti-seize cut friction, so the same torque clamps harder. Using a dry value on a lubricated bolt can stretch it past its limit.

Torque in steps. Clean the threads, snug every bolt, then bring them to full torque in two or three passes in a cross pattern. Check the final value with a click or beam wrench.

Not for: head bolts, connecting rods, torque-to-yield bolts, lug nuts or aluminum threads. Those have their own specs.

Convert: N·m = ft-lb x 1.356. in-lb = ft-lb x 12. Values above 10 rounded to the nearest whole number.

Clamp load = 75% of SAE J429 proof load; T = K x D x F, K 0.20 dry, 0.15 lubricated. Metric bolts: 33gears.com/metric-bolt-torque-chart/