

TIGHTENING TORQUE REFERENCE CHART FOR SAE AND METRIC BOLTS

NL = Not Lubricated

L = Lubricated

1 lbs ft = 1.356 N·m



HEX KEY INTERCHANGE

SAE

Metric

TIGHTENING TORQUE FOR SAE BOLTS (30% of yield strength S_y) in lbs ft

MATERIAL	UNC	1/4"-20	5/16"-18	3/8"-16	7/16"-14	1 1/2"-12	9/16"-12	5/8"-11	3/4"-10	1 1/8"-8	1 3/8"-7	1 5/8"-6	2"-5
GRADE 1	NL	4	8	14	22	34	45	68	100	194	291	492	581
	L	3	6	10	17	26	37	51	90	145	218	309	372
GRADE 2	NL	6	12	22	35	54	78	107	191	394	492	581	762
	L	5	9	17	27	40	58	81	143	145	218	309	372
GRADE 5/1.2	NL	10	20	36	57	87	126	173	308	496	743	1053	1486
	L	7	15	27	43	65	94	130	231	372	557	790	1081
GRADE 8	NL	14	28	50	81	123	177	245	435	700	1050	1488	2100
	L	10	21	38	60	92	133	184	326	525	787	1116	1575

MATERIAL	UNF	1/4"-28	5/16"-24	3/8"-24	7/16"-20	1 1/2"-20	9/16"-18	5/8"-16	3/4"-16	1 1/8"-14	1 3/8"-12	1 5/8"-12	2"-10
GRADE 1	NL	4	9	16	25	38	55	77	104	214	325	482	648
	L	3	7	12	19	29	41	58	101	160	245	347	483
GRADE 2	NL	7	14	25	39	61	87	122	213	214	326	482	648
	L	5	10	19	30	46	65	91	159	160	245	347	483
GRADE 5/1.2	NL	11	22	40	64	98	140	196	343	547	834	1181	1645
	L	8	17	30	48	74	105	147	257	410	625	886	1234
GRADE 8	NL	16	31	57	90	139	198	277	485	773	1178	1669	2325
	L	12	24	43	68	104	148	208	364	580	884	1251	1744

TIGHTENING TORQUE FOR METRIC BOLTS (30% of yield strength S_y) in lbs ft

MATERIAL	ST. PITCH	M6-1	M8-1.25	M10-1.5	M12-1.75	M14-2	M16-2	M18-2.5	M20-2.5	M22-2.5	M24-3	M27-3	M30-3.5	M33-3.5	M36-4
CLASS 4.6	NL	3	8	16	29	46	71	98	139	199	240	351	477	549	833
	L	3	6	12	21	34	53	74	104	142	180	263	357	486	625
CLASS 8.8	NL	8	22	44	76	122	190	262	370	509	640	896	1271	1730	2221
	L	7	17	33	57	91	142	197	278	378	480	702	953	1297	1655
CLASS 10.9	NL	15	32	64	112	179	279	385	544	739	940	1375	1867	2540	3263
	L	10	24	48	84	134	209	289	408	555	705	1031	1400	1905	2447
CLASS 12.9	NL	16	38	75	131	209	326	451	636	865	1100	1609	2195	2973	3878
	L	12	29	56	98	157	245	338	477	649	825	1207	1639	2230	2863
MATERIAL	FINE PITCH	M6-0.75	M8-1	M10-1	M12-1.25	M14-1.5	M16-1.5	M18-1.5	M20-1.5	M22-1.5	M24-1.5	M27-1.5	M30-1.5	M33-1.5	M36-1.5
CLASS 4.6	NL	4	9	18	31	50	76	110	154	207	273	393	545	733	958
	L	3	7	14	25	37	57	83	116	156	204	295	409	550	719
CLASS 8.8	NL	10	24	49	83	132	202	294	411	553	727	1048	1455	1954	2556
	L	7	16	37	63	99	151	220	308	415	545	799	1091	1466	1917
CLASS 10.9	NL	15	35	72	123	194	296	431	603	813	1068	1539	2136	2870	3754
	L	11	26	54	92	146	222	323	453	610	801	1155	1602	2152	2815
CLASS 12.9	NL	17	41	84	143	227	347	505	708	951	1249	1822	2500	3358	4393
	L	12	31	63	108	170	260	379	530	719	937	1361	1875	2519	3295

5/16"

2

3/32"

2.5

7/64"

3

1/8"

3.5

5/32"

4

3/16"

5

7/32"

6

1/4"

7

5/16"

8

3/8"

10

Bolt Torque Chart Metric 316

Lauren Gardner

A red circular graphic with a gradient, appearing as a semi-circle or a partial circle, located to the right of the name bar.

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