

**Bolt torque depends on:**

- Bolt size, type and grade
- Lubrication (a low friction factor must be considered with MoS2-based grease)

**The given bolt torques are based on the 90% of the bolt yield strength**

SIZE GRADE metric	Friction factor $\mu = 0.1$ (MoS2)			Friction factor $\mu = 0.14$		
	Torque Nm	Torque ft.lbs.	Pre Tension kN	Torque Nm	Torque ft.lbs.	Pre Tension kN
M8x1.25 8.8	20	15	17.9	25	18	16.5
10.9	30	22	26.3	37	27	24.3
12.9	35	26	30.8	43	32	28.4
M10x1.5 8.8	40	30	28.5	50	40	26.3
10.9	60	40	41.8	70	50	38.7
12.9	70	50	49.0	90	70	45.3
M12x1.75 8.8	70	50	41.5	90	70	38.4
10.9	100	70	61.0	130	100	56.4
12.9	120	90	71.4	150	110	66.0
M14x2 8.8	110	80	56.8	140	100	52.5
10.9	160	120	83.4	200	150	77.2
12.9	190	140	97.6	240	180	90.3
M16x2 8.8	170	130	78.5	220	160	72.7
10.9	250	180	115.3	320	240	106.8
12.9	300	220	134.9	370	270	125.0
M18x2.5 8.8	240	180	95.1	300	220	88.1
10.9	350	260	139.7	430	320	129.3
12.9	410	300	163.5	510	380	151.3
M20x2.5 8.8	340	250	122.5	420	310	113.6
10.9	500	370	180.0	620	460	166.8
12.9	580	430	210.6	720	530	195.2
M22x2.5 8.8	460	340	152.7	570	420	141.7
10.9	670	490	224.3	840	620	208.1
12.9	790	580	262.4	990	730	243.5
M24x3 8.8	580	430	176.5	730	540	163.6
10.9	860	630	259.2	1070	790	240.2
12.9	1000	740	303.3	1250	920	281.1
M27x 3 8.8	850	630	231.6	1070	790	214.9
10.9	1250	920	340.1	1570	1160	315.7
12.9	1460	1080	398.0	1830	1350	369.4
M30x3.5 8.8	1160	860	282.0	1450	1070	261.6
10.9	1700	1250	414.2	2120	1560	384.2
12.9	1990	1470	484.7	2480	1830	449.6
M36x4 8.8	2020	1490	412.2	2530	1870	382.6
10.9	2970	2190	605.4	3710	2740	561.9
12.9	3470	2560	708.5	4350	3210	657.5
M42x4.5 8.8	3230	2380	567.0	4050	2990	526.5
10.9	4750	3500	832.8	5950	4390	773.2
12.9	5560	4100	974.6	6960	5130	904.9

## General Bolt Torque

### Bolt torque depends on:

- Bolt size, type and grade
- Lubrication (a low friction factor must be considered with MoS2-based grease)

The given bolt torques are based on the 90% of the bolt yield strength

SIZE inch	GRADE	Torque Nm	Torque ft.lbs.	Pre Tension kips	Torque Nm	Torque ft.lbs.	Pre Tension kips
1/4	20	5	8	6	2.0	10	1.8
	20	8	12	9	2.8	14	2.6
5/16	18	5	17	13	3.3	21	3.1
	18	8	24	18	4.7	29	4.3
3/8	16	5	30	22	5.0	37	4.6
	16	8	43	31	7.0	52	6.5
7/16	14	5	48	36	6.9	59	6.3
	14	8	68	50	9.7	83	8.9
1/2	13	5	74	54	9.2	90	8.5
	13	8	104	77	13.0	128	12.0
9/16	12	5	106	78	11.9	131	11.0
	12	8	150	110	16.8	185	15.5
5/8	11	5	146	108	14.8	181	13.7
	11	8	207	152	20.9	255	19.3
11/16	11	5	200	148	18.6	248	17.2
	11	8	283	209	26.2	351	24.3
3/4	10	5	260	191	22.1	322	20.4
	10	8	366	270	31.1	454	28.8
7/8	9	5	418	308	30.6	519	28.3
	9	8	590	435	43.2	732	40.0
1	8	5	626	462	40.2	778	37.2
	8	8	884	652	56.7	1099	52.5
1-1/8	7	5	773	570	44.0	960	40.8
	7	8	1253	924	71.4	1557	66.1
1-1/4	7	5	1087	802	56.4	1358	52.3
	7	8	1763	1300	91.4	2202	84.7
1-3/8	6	5	1427	1053	66.9	1778	61.9
	6	8	2315	1707	108.4	2883	100.5
1-1/2	6	5	1891	1394	81.9	2364	76.0
	6	8	3066	2261	132.8	3834	123.2
1-5/8	5	5	2347	1731	92.9	2921	86.0
	5	8	3807	2807	150.6	4737	139.5
1-3/4	5	5	2984	2200	110.5	3726	102.4
	5	8	4838	3568	179.1	6043	166.1
2	4.5	5	4482	3305	145.6	5604	135.1
	4.5	8	7267	5359	236.1	9088	219.0