

Diaphragm Seal Fastener Table						
Bolt Size	Bolt Material Code	Material Desc.	Initial Stage	1st Stage	2nd Stage	Final Torque
1/4-28unf	8	A354 Gr. BD (Grade 8 Steel)	Hand Tight (2)	60 [in/lbs] (2)	-	125 [in/lbs] (2)
5/16-18unc	8	A354 Gr. BD (Grade 8 Steel)	Hand Tight (2)	60 [in/lbs] (2)	-	225 [in/lbs] (2)
5/16-18unc	N	A193 Gr. B7M (Steel NACE)	Hand Tight (2)	60 [in/lbs] (2)	-	195 [in/lbs] (2)
5/16-18unc	S,T	A193 Gr. B8M CL1, B8 (316SS, 18-8 304SS)	Hand Tight (2)	60 [in/lbs] (2)	-	120 [in/lbs] (2)
5/16-18unc	7	A193 B8M CL. 2 SH (316 Strain Hardened)	Hand Tight (2)	60 [in/lbs] (2)	-	195 [in/lbs] (2)
5/16-24unf	8	A354 Gr. BD (Grade 8 Steel)	Hand Tight (2)	60 [in/lbs] (2)	-	250 [in/lbs] (2)
5/16-24unf	N	A193 Gr. B7M (Steel NACE)	Hand Tight (2)	60 [in/lbs] (2)	-	215 [in/lbs] (2)
5/16-24unf	S,T	A193 Gr. B8M CL1, B8 (316SS, 18-8 304SS)	Hand Tight (2)	60 [in/lbs] (2)	-	135 [in/lbs] (2)
5/16-24unf	7	A193 B8M CL. 2 SH (316 Strain Hardened)	Hand Tight (2)	60 [in/lbs] (2)	-	215 [in/lbs] (2)
3/8-16unc	8	A354 Gr. BD (Grade 8 Steel)	Hand Tight (2)	10 [Ft/lbs] (2)	20 [Ft/lbs]	35 [Ft/lbs]
3/8-16unc	N	A193 Gr. B7M (Steel NACE)	Hand Tight (2)	10 [Ft/lbs] (2)	-	30 [Ft/lbs]
3/8-16unc (3)	S,T	A193 Gr. B8M CL1, B8 (316SS, 18-8 304SS)	Hand Tight (2)	10 [Ft/lbs] (2)	-	18 [Ft/lbs]
3/8-16unc	7	A193 B8M CL. 2 SH (316 Strain Hardened)	Hand Tight (2)	10 [Ft/lbs] (2)	-	30 [Ft/lbs]
3/8-24unf	8	A354 Gr. BD (Grade 8 Steel)	Hand Tight (2)	10 [Ft/lbs] (2)	20 [Ft/lbs]	40 [Ft/lbs]
3/8-24unf	N	A193 Gr. B7M (Steel NACE)	Hand Tight (2)	10 [Ft/lbs] (2)	20 [Ft/lbs]	35 [Ft/lbs]
3/8-24unf	S,T	A193 Gr. B8M CL1, B8 (316SS, 18-8 304SS)	Hand Tight (2)	10 [Ft/lbs] (2)	-	20 [Ft/lbs]
3/8-24unf	7	A193 B8M CL. 2 SH (316 Strain Hardened)	Hand Tight (2)	10 [Ft/lbs] (2)	20 [Ft/lbs]	35 [Ft/lbs]
1/2-13unc	8	A354 Gr. BD (Grade 8 Steel)	Hand Tight (2)	10 [Ft/lbs] (2)	40 [Ft/lbs]	80 [Ft/lbs]
1/2-13unc	N	A193 Gr. B7M (Steel NACE)	Hand Tight (2)	10 [Ft/lbs] (2)	35 [Ft/lbs]	70 [Ft/lbs]
1/2-13unc	S,T	A193 Gr. B8M CL1, B8 (316SS, 18-8 304SS)	Hand Tight (2)	10 [Ft/lbs] (2)	25 [Ft/lbs]	45 [Ft/lbs]
1/2-13unc	7	A193 B8M CL. 2 SH (316 Strain Hardened)	Hand Tight (2)	10 [Ft/lbs] (2)	35 [Ft/lbs]	70 [Ft/lbs]
9/16-18unf	8	A354 Gr. BD (Grade 8 Steel)	Hand Tight (2)	10 [Ft/lbs] (2)	65 [Ft/lbs]	130 [Ft/lbs]
9/16-18unf	N	A193 Gr. B7M (Steel NACE)	Hand Tight (2)	10 [Ft/lbs] (2)	55 [Ft/lbs]	115 [Ft/lbs]
9/16-18unf	S,T	A193 Gr. B8M CL1, B8 (316SS, 18-8 304SS)	Hand Tight (2)	10 [Ft/lbs] (2)	35 [Ft/lbs]	70 [Ft/lbs]
9/16-18unf	7	A193 B8M CL. 2 SH (316 Strain Hardened)	Hand Tight (2)	10 [Ft/lbs] (2)	55 [Ft/lbs]	115 [Ft/lbs]
5/8-11unc	8	A354 Gr. BD (Grade 8 Steel)	Hand Tight (2)	10 [Ft/lbs] (2)	80 [Ft/lbs]	160 [Ft/lbs]
5/8-11unc	N	A193 Gr. B7M (Steel NACE)	Hand Tight (2)	10 [Ft/lbs] (2)	70 [Ft/lbs]	140 [Ft/lbs]
5/8-11unc	S,T	A193 Gr. B8M CL1, B8 (316SS, 18-8 304SS)	Hand Tight (2)	10 [Ft/lbs] (2)	45 [Ft/lbs]	90 [Ft/lbs]
5/8-11unc	7	A193 B8M CL. 2 SH (316 Strain Hardened)	Hand Tight (2)	10 [Ft/lbs] (2)	70 [Ft/lbs]	140 [Ft/lbs]

Notes

1. Anti-Seize should be used on all threads regardless of fastener material.
2. The Initial Torque Stage is intended for even loading of the gasket. After all fasteners are hand tight, each bolt should be rotated a 1/4 turn in a star pattern (pictured below) until the "1st Stage" torque is achieved for each fastener before proceeding to the "2nd Stage" or "Final Torque".
3. For all Non-Metallic lower designs, the torque should follow the specs of a 3/8-16unc bolt in material codes S,T regardless of fastener material and size. This will result in a final torque value of 18 [Ft/lbs].

