

HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B7M					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON			40	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.440	CUSTOM (INSERT K)	First Pass	Second Pass	All Subsequent Passes	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	80,000	10,697	73	67	84	94	100	105	134	201	100	30	60	100	
7/8 x 9	1-7/16"	0.461	80,000	14,768	117	108	135	151	162	169	215	323	162	48	97	162	
1x 8	1-5/8"	0.605	80,000	19,374	176	161	202	226	242	253	323	484	242	73	145	242	
1-1/8 x 8	1-13/16"	0.790	80,000	25,282	258	237	296	332	356	372	474	711	356	107	213	356	
1-1/4 x 8	2"	0.999	80,000	31,974	363	333	416	466	500	523	666	999	500	150	300	500	
1-3/8 x 8	2-3/16"	1.233	80,000	39,452	493	452	565	633	678	710	904	1,356	678	203	407	678	
1-1/2 x 8	2-3/8"	1.491	80,000	47,715	650	596	746	835	895	936	1,193	1,789	895	268	537	895	
1-5/8 x 8	2-9/16"	1.774	80,000	56,762	838	769	961	1,076	1,153	1,207	1,537	2,306	1,153	346	692	1153	
1-3/4 x 8	2-3/4"	2.081	80,000	66,595	1,059	971	1,214	1,360	1,457	1,525	1,942	2,914	1,457	437	874	1457	
1-7/8 x 8	2-15/16"	2.413	80,000	77,213	1,315	1,206	1,508	1,689	1,810	1,894	2,413	3,619	1,810	543	1086	1810	
2 x 8	3-1/8"	2.769	80,000	88,615	1,610	1,477	1,846	2,068	2,215	2,319	2,954	4,431	2,215	665	1329	2215	
2-1/8 x 8	3-5/16"	3.150	80,000	100,803	1,946	1,785	2,231	2,499	2,678	2,803	3,570	5,355	2,678	803	1607	2678	
2-1/4 x 8	3-1/2"	3.555	80,000	113,776	2,325	2,133	2,667	2,987	3,200	3,349	4,267	6,400	3,200	960	1920	3200	
2-3/8 x 8	3-11/16"	3.985	80,000	127,533	2,751	2,524	3,155	3,534	3,786	3,963	5,048	7,572	3,786	1136	2272	3786	
2-1/2 x 8	3-7/8"	4.440	80,000	142,076	3,226	2,960	3,700	4,144	4,440	4,647	5,920	8,880	4,440	1332	2664	4440	

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361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

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 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
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BOLT TENSION BASED ON			50	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.440	CUSTOM (INSERT K)	First Pass	Second Pass	All Subsequent Passes	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	80,000	13,372	91	84	104	117	125	131	167	251	125	38	75	125	
7/8 x 9	1-7/16"	0.461	80,000	18,460	147	135	168	188	202	211	269	404	202	61	121	202	
1x 8	1-5/8"	0.605	80,000	24,217	220	202	252	283	303	317	404	605	303	91	182	303	
1-1/8 x 8	1-13/16"	0.790	80,000	31,602	323	296	370	415	444	465	593	889	444	133	267	444	
1-1/4 x 8	2"	0.999	80,000	39,968	454	416	520	583	624	654	833	1,249	624	187	375	624	
1-3/8 x 8	2-3/16"	1.233	80,000	49,315	616	565	706	791	848	887	1,130	1,695	848	254	509	848	
1-1/2 x 8	2-3/8"	1.491	80,000	59,643	813	746	932	1,044	1,118	1,171	1,491	2,237	1,118	335	671	1118	
1-5/8 x 8	2-9/16"	1.774	80,000	70,953	1,047	961	1,201	1,345	1,441	1,508	1,922	2,882	1,441	432	865	1441	
1-3/4 x 8	2-3/4"	2.081	80,000	83,244	1,323	1,214	1,517	1,700	1,821	1,906	2,428	3,642	1,821	546	1093	1821	
1-7/8 x 8	2-15/16"	2.413	80,000	96,516	1,644	1,508	1,885	2,111	2,262	2,368	3,016	4,524	2,262	679	1357	2262	
2 x 8	3-1/8"	2.769	80,000	110,769	2,012	1,846	2,308	2,585	2,769	2,898	3,692	5,538	2,769	831	1662	2769	
2-1/8 x 8	3-5/16"	3.150	80,000	126,004	2,432	2,231	2,789	3,124	3,347	3,503	4,463	6,694	3,347	1004	2008	3347	
2-1/4 x 8	3-1/2"	3.555	80,000	142,220	2,907	2,667	3,333	3,733	4,000	4,187	5,333	8,000	4,000	1200	2400	4000	
2-3/8 x 8	3-11/16"	3.985	80,000	159,417	3,439	3,155	3,944	4,417	4,733	4,954	6,310	9,465	4,733	1420	2840	4733	
2-1/2 x 8	3-7/8"	4.440	80,000	177,595	4,033	3,700	4,625	5,180	5,550	5,809	7,400	11,100	5,550	1665	3330	5550	

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BOLT TENSION BASED ON			60	% YIELD														
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.440	CUSTOM (INSERT K)	First Pass	Second Pass	All Subsequent		
													0.15	30%	60%	100%		
3/4 x 10	1-1/4"	0.334	80,000	16,046	109	100	125	140	150	157	201	301	150	45	90	150		
7/8 x 9	1-7/16"	0.461	80,000	22,152	176	162	202	226	242	254	323	485	242	73	145	242		
1x 8	1-5/8"	0.605	80,000	29,061	264	242	303	339	363	380	484	727	363	109	218	363		
1-1/8 x 8	1-13/16"	0.790	80,000	37,922	388	356	444	498	533	558	711	1,067	533	160	320	533		
1-1/4 x 8	2"	0.999	80,000	47,961	545	500	624	699	749	784	999	1,499	749	225	450	749		
1-3/8 x 8	2-3/16"	1.233	80,000	59,178	739	678	848	949	1,017	1,065	1,356	2,034	1,017	305	610	1017		
1-1/2 x 8	2-3/8"	1.491	80,000	71,572	975	895	1,118	1,253	1,342	1,405	1,789	2,684	1,342	403	805	1342		
1-5/8 x 8	2-9/16"	1.774	80,000	85,144	1,257	1,153	1,441	1,614	1,729	1,810	2,306	3,459	1,729	519	1038	1729		
1-3/4 x 8	2-3/4"	2.081	80,000	99,893	1,588	1,457	1,821	2,039	2,185	2,287	2,914	4,370	2,185	656	1311	2185		
1-7/8 x 8	2-15/16"	2.413	80,000	115,819	1,973	1,810	2,262	2,534	2,715	2,841	3,619	5,429	2,715	814	1629	2715		
2 x 8	3-1/8"	2.769	80,000	132,923	2,415	2,215	2,769	3,102	3,323	3,478	4,431	6,646	3,323	997	1994	3323		
2-1/8 x 8	3-5/16"	3.150	80,000	151,205	2,919	2,678	3,347	3,749	4,016	4,204	5,355	8,033	4,016	1205	2410	4016		
2-1/4 x 8	3-1/2"	3.555	80,000	170,664	3,488	3,200	4,000	4,480	4,800	5,024	6,400	9,600	4,800	1440	2880	4800		
2-3/8 x 8	3-11/16"	3.985	80,000	191,300	4,127	3,786	4,733	5,301	5,679	5,944	7,572	11,358	5,679	1704	3408	5679		
2-1/2 x 8	3-7/8"	4.440	80,000	213,114	4,839	4,440	5,550	6,216	6,660	6,971	8,880	13,320	6,660	1998	3996	6660		

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BOLT TENSION BASED ON			70	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.440	CUSTOM (INSERT K)	First Pass	Second Pass	All Subsequent Passes	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	80,000	18,720	128	117	146	164	176	184	234	351	176	53	105	176	
7/8 x 9	1-7/16"	0.461	80,000	25,844	205	188	236	264	283	296	377	565	283	85	170	283	
1x 8	1-5/8"	0.605	80,000	33,904	308	283	353	396	424	444	565	848	424	127	254	424	
1-1/8 x 8	1-13/16"	0.790	80,000	44,243	452	415	518	581	622	651	830	1,244	622	187	373	622	
1-1/4 x 8	2"	0.999	80,000	55,955	635	583	729	816	874	915	1,166	1,749	874	262	525	874	
1-3/8 x 8	2-3/16"	1.233	80,000	69,041	862	791	989	1,108	1,187	1,242	1,582	2,373	1,187	356	712	1187	
1-1/2 x 8	2-3/8"	1.491	80,000	83,501	1,138	1,044	1,305	1,461	1,566	1,639	2,088	3,131	1,566	470	939	1566	
1-5/8 x 8	2-9/16"	1.774	80,000	99,334	1,466	1,345	1,681	1,883	2,018	2,112	2,690	4,035	2,018	605	1211	2018	
1-3/4 x 8	2-3/4"	2.081	80,000	116,541	1,853	1,700	2,124	2,379	2,549	2,668	3,399	5,099	2,549	765	1530	2549	
1-7/8 x 8	2-15/16"	2.413	80,000	135,122	2,301	2,111	2,639	2,956	3,167	3,315	4,223	6,334	3,167	950	1900	3167	
2 x 8	3-1/8"	2.769	80,000	155,077	2,817	2,585	3,231	3,618	3,877	4,058	5,169	7,754	3,877	1163	2326	3877	
2-1/8 x 8	3-5/16"	3.150	80,000	176,405	3,405	3,124	3,905	4,373	4,686	4,904	6,248	9,372	4,686	1406	2811	4686	
2-1/4 x 8	3-1/2"	3.555	80,000	199,108	4,069	3,733	4,667	5,227	5,600	5,861	7,467	11,200	5,600	1680	3360	5600	
2-3/8 x 8	3-11/16"	3.985	80,000	223,183	4,815	4,417	5,521	6,184	6,626	6,935	8,834	13,252	6,626	1988	3975	6626	
2-1/2 x 8	3-7/8"	4.440	80,000	248,633	5,646	5,180	6,475	7,252	7,770	8,132	10,360	15,540	7,770	2331	4662	7770	

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BOLT TENSION BASED ON			80	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.440	CUSTOM (INSERT K)	First Pass	Second Pass	All Subsequent Passes	
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7/8 x 9	1-7/16"	0.461	80,000	29,536	235	215	269	302	323	338	431	646	323	97	194	323	
1x 8	1-5/8"	0.605	80,000	38,748	352	323	404	452	484	507	646	969	484	145	291	484	
1-1/8 x 8	1-13/16"	0.790	80,000	50,563	517	474	593	664	711	744	948	1,422	711	213	427	711	
1-1/4 x 8	2"	0.999	80,000	63,949	726	666	833	933	999	1,046	1,332	1,998	999	300	600	999	
1-3/8 x 8	2-3/16"	1.233	80,000	78,904	985	904	1,130	1,266	1,356	1,419	1,808	2,712	1,356	407	814	1356	
1-1/2 x 8	2-3/8"	1.491	80,000	95,429	1,300	1,193	1,491	1,670	1,789	1,873	2,386	3,579	1,789	537	1074	1789	
1-5/8 x 8	2-9/16"	1.774	80,000	113,525	1,676	1,537	1,922	2,152	2,306	2,414	3,075	4,612	2,306	692	1384	2306	
1-3/4 x 8	2-3/4"	2.081	80,000	133,190	2,117	1,942	2,428	2,719	2,914	3,049	3,885	5,827	2,914	874	1748	2914	
1-7/8 x 8	2-15/16"	2.413	80,000	154,425	2,630	2,413	3,016	3,378	3,619	3,788	4,826	7,239	3,619	1086	2172	3619	
2 x 8	3-1/8"	2.769	80,000	177,231	3,220	2,954	3,692	4,135	4,431	4,638	5,908	8,862	4,431	1329	2658	4431	
2-1/8 x 8	3-5/16"	3.150	80,000	201,606	3,891	3,570	4,463	4,998	5,355	5,605	7,140	10,710	5,355	1607	3213	5355	
2-1/4 x 8	3-1/2"	3.555	80,000	227,551	4,651	4,267	5,333	5,973	6,400	6,699	8,533	12,800	6,400	1920	3840	6400	
2-3/8 x 8	3-11/16"	3.985	80,000	255,067	5,503	5,048	6,310	7,067	7,572	7,926	10,096	15,145	7,572	2272	4543	7572	
2-1/2 x 8	3-7/8"	4.440	80,000	284,152	6,453	5,920	7,400	8,288	8,880	9,294	11,840	17,760	8,880	2664	5328	8880	

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BOLT TENSION BASED ON			90	% YIELD													
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7/8 x 9	1-7/16"	0.461	80,000	33,228	264	242	303	339	363	380	485	727	363	109	218	363	
1x 8	1-5/8"	0.605	80,000	43,591	396	363	454	509	545	570	727	1,090	545	163	327	545	
1-1/8 x 8	1-13/16"	0.790	80,000	56,884	581	533	667	747	800	837	1,067	1,600	800	240	480	800	
1-1/4 x 8	2"	0.999	80,000	71,942	817	749	937	1,049	1,124	1,177	1,499	2,248	1,124	337	674	1124	
1-3/8 x 8	2-3/16"	1.233	80,000	88,767	1,109	1,017	1,271	1,424	1,526	1,597	2,034	3,051	1,526	458	915	1526	
1-1/2 x 8	2-3/8"	1.491	80,000	107,358	1,463	1,342	1,677	1,879	2,013	2,107	2,684	4,026	2,013	604	1208	2013	
1-5/8 x 8	2-9/16"	1.774	80,000	127,715	1,885	1,729	2,162	2,421	2,594	2,715	3,459	5,188	2,594	778	1557	2594	
1-3/4 x 8	2-3/4"	2.081	80,000	149,839	2,382	2,185	2,731	3,059	3,278	3,431	4,370	6,555	3,278	983	1967	3278	
1-7/8 x 8	2-15/16"	2.413	80,000	173,729	2,959	2,715	3,393	3,800	4,072	4,262	5,429	8,144	4,072	1222	2443	4072	
2 x 8	3-1/8"	2.769	80,000	199,385	3,622	3,323	4,154	4,652	4,985	5,217	6,646	9,969	4,985	1495	2991	4985	
2-1/8 x 8	3-5/16"	3.150	80,000	226,807	4,378	4,016	5,020	5,623	6,025	6,306	8,033	12,049	6,025	1807	3615	6025	
2-1/4 x 8	3-1/2"	3.555	80,000	255,995	5,232	4,800	6,000	6,720	7,200	7,536	9,600	14,400	7,200	2160	4320	7200	
2-3/8 x 8	3-11/16"	3.985	80,000	286,950	6,190	5,679	7,099	7,951	8,519	8,916	11,358	17,038	8,519	2556	5111	8519	
2-1/2 x 8	3-7/8"	4.440	80,000	319,671	7,259	6,660	8,325	9,324	9,990	10,456	13,320	19,979	9,990	2997	5994	9990	

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361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

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HYTORC

TORQUE GUIDE FOR ASTM A193 GRADE B7M					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON			99	% YIELD													
BOLT SIZE DIA. x TPI	HEX NUT ACROSS FLAT	STRESS AREA (IN ²)	MIN YIELD STRENGTH (PSI)	BOLT TENSION (LBS)	LoaDISC TS 801MOLY K=.109	MOLYBDENUM DISULFIDE K=.100	MOLY/LEAD OXIDE/GRAPHITE K=.125	COPPER & GRAPHITE K=.140	NICKEL & GRAPHITE K=.150	API SA2 K=.157	MACHINE OIL K=.200	DRY STEEL K=.440	CUSTOM (INSERT K)	First Pass	Second Pass	All Subsequent Passes	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	80,000	26,476	180	165	207	232	248	260	331	496	248	74	149	248	
7/8 x 9	1-7/16"	0.461	80,000	36,551	291	267	333	373	400	418	533	800	400	120	240	400	
1x 8	1-5/8"	0.605	80,000	47,951	436	400	499	559	599	627	799	1,199	599	180	360	599	
1-1/8 x 8	1-13/16"	0.790	80,000	62,572	639	587	733	821	880	921	1,173	1,760	880	264	528	880	
1-1/4 x 8	2"	0.999	80,000	79,136	899	824	1,030	1,154	1,237	1,294	1,649	2,473	1,237	371	742	1237	
1-3/8 x 8	2-3/16"	1.233	80,000	97,644	1,220	1,119	1,399	1,566	1,678	1,757	2,238	3,357	1,678	503	1007	1678	
1-1/2 x 8	2-3/8"	1.491	80,000	118,094	1,609	1,476	1,845	2,067	2,214	2,318	2,952	4,429	2,214	664	1329	2214	
1-5/8 x 8	2-9/16"	1.774	80,000	140,487	2,074	1,902	2,378	2,663	2,854	2,987	3,805	5,707	2,854	856	1712	2854	
1-3/4 x 8	2-3/4"	2.081	80,000	164,823	2,620	2,404	3,005	3,365	3,605	3,774	4,807	7,211	3,605	1082	2163	3605	
1-7/8 x 8	2-15/16"	2.413	80,000	191,101	3,255	2,986	3,732	4,180	4,479	4,688	5,972	8,958	4,479	1344	2687	4479	
2 x 8	3-1/8"	2.769	80,000	219,323	3,984	3,655	4,569	5,118	5,483	5,739	7,311	10,966	5,483	1645	3290	5483	
2-1/8 x 8	3-5/16"	3.150	80,000	249,488	4,816	4,418	5,523	6,185	6,627	6,936	8,836	13,254	6,627	1988	3976	6627	
2-1/4 x 8	3-1/2"	3.555	80,000	281,595	5,755	5,280	6,600	7,392	7,920	8,289	10,560	15,840	7,920	2376	4752	7920	
2-3/8 x 8	3-11/16"	3.985	80,000	315,645	6,809	6,247	7,809	8,746	9,371	9,808	12,494	18,741	9,371	2811	5622	9371	
2-1/2 x 8	3-7/8"	4.440	80,000	351,638	7,985	7,326	9,157	10,256	10,989	11,502	14,652	21,977	10,989	3297	6593	10989	

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