

HYTORC

TORQUE GUIDE FOR ASTM A320 CLASS L7 GRADE M					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) K=.300	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	
1 x 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	
2-3/4 x 8	4-1/4"	5.422	80,000	173,516	4,334	3,976	4,971	5,567	5,965	6,243	7,953	11,929	5,965	1789	3579	5965	
3 x 8	4-5/8"	6.503	80,000	208,097	5,671	5,202	6,503	7,283	7,804	8,168	10,405	15,607	7,804	2341	4682	7804	
3-1/4 x 8	5"	7.682	80,000	245,817	7,257	6,658	8,322	9,321	9,986	10,452	13,315	19,973	9,986	2996	5992	9986	
3-1/2 x 8	5-3/8"	8.959	80,000	286,677	9,114	8,361	10,452	11,706	12,542	13,127	16,723	25,084	12,542	3763	7525	12542	

Southwest Texas	West Texas	Main Office	Southeast Texas	Central & East Texas
4802 Baldwin Blvd.	3508 S County Rd 1290	12420 Texaco Rd	2484 W Cardinal #4	7900 Rodeo Trl. #500
Corpus Christi 78408	Odessa, TX 78765	Houston, TX 77013	Beaumont, TX 77705	Mansfield, TX 76063
361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
NOTICE: Spread sheet is active and unprotected. Any alterations to cells other than those shown in yellow could produce incorrect results.

HYTORC

TORQUE GUIDE FOR ASTM A320 CLASS L7 GRADE M					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN				
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) K=.300	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		
1 x 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		
2-3/4 x 8	4-1/4"	5.422	80,000	216,896	5,418	4,971	6,213	6,959	7,456	7,804	9,941	14,912	7,456	2237	4473	7456		
3 x 8	4-5/8"	6.503	80,000	260,121	7,088	6,503	8,129	9,104	9,755	10,210	13,006	19,509	9,755	2926	5853	9755		
3-1/4 x 8	5"	7.682	80,000	307,271	9,071	8,322	10,402	11,651	12,483	13,065	16,644	24,966	12,483	3745	7490	12483		
3-1/2 x 8	5-3/8"	8.959	80,000	358,347	11,392	10,452	13,065	14,632	15,678	16,409	20,904	31,355	15,678	4703	9407	15678		

Southwest Texas	West Texas	Main Office	Southeast Texas	Central & East Texas
4802 Baldwin Blvd.	3508 S County Rd 1290	12420 Texaco Rd	2484 W Cardinal #4	7900 Rodeo Trl. #500
Corpus Christi 78408	Odessa, TX 78765	Houston, TX 77013	Beaumont, TX 77705	Mansfield, TX 76063
361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
NOTICE: Spread sheet is active and unprotected. Any alterations to cells other than those shown in yellow could produce incorrect results.

HYTORC

TORQUE GUIDE FOR ASTM A320 CLASS L7 GRADE M					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
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) K=.300	First Pass	Second Pass	All Subsequent Passes	
													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	
1 x 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	
2-3/4 x 8	4-1/4"	5.422	80,000	260,275	6,501	5,965	7,456	8,350	8,947	9,364	11,929	17,894	8,947	2684	5368	8947	
3 x 8	4-5/8"	6.503	80,000	312,145	8,506	7,804	9,755	10,925	11,705	12,252	15,607	23,411	11,705	3512	7023	11705	
3-1/4 x 8	5"	7.682	80,000	368,726	10,885	9,986	12,483	13,981	14,979	15,679	19,973	29,959	14,979	4494	8988	14979	
3-1/2 x 8	5-3/8"	8.959	80,000	430,016	13,671	12,542	15,678	17,559	18,813	19,691	25,084	37,626	18,813	5644	11288	18813	

Southwest Texas	West Texas	Main Office	Southeast Texas	Central & East Texas
4802 Baldwin Blvd.	3508 S County Rd 1290	12420 Texaco Rd	2484 W Cardinal #4	7900 Rodeo Trl. #500
Corpus Christi 78408	Odessa, TX 78765	Houston, TX 77013	Beaumont, TX 77705	Mansfield, TX 76063
361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
NOTICE: Spread sheet is active and unprotected. Any alterations to cells other than those shown in yellow could produce incorrect results.

HYTORC

TORQUE GUIDE FOR ASTM A320 CLASS L7 GRADE M					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
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) K=.300	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	1,187	
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	1,566	
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	1,211	2,018	
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	1,530	2,549	
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	1,900	3,167	
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	1,163	2,326	3,877	
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	1,406	2,811	4,686	
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	1,680	3,360	5,600	
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	1,988	3,975	6,626	
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	2,331	4,662	7,770	
2-3/4 x 8	4-1/4"	5.422	80,000	303,654	7,585	6,959	8,698	9,742	10,438	10,925	13,917	20,876	10,438	3,131	6,263	10,438	
3 x 8	4-5/8"	6.503	80,000	364,169	9,924	9,104	11,380	12,746	13,656	14,294	18,208	27,313	13,656	4,097	8,194	13,656	
3-1/4 x 8	5"	7.682	80,000	430,180	12,699	11,651	14,563	16,311	17,476	18,292	23,301	34,952	17,476	5,243	10,486	17,476	
3-1/2 x 8	5-3/8"	8.959	80,000	501,686	15,949	14,632	18,291	20,485	21,949	22,973	29,265	43,897	21,949	6,585	13,169	21,949	

Southwest Texas	West Texas	Main Office	Southeast Texas	Central & East Texas
4802 Baldwin Blvd.	3508 S County Rd 1290	12420 Texaco Rd	2484 W Cardinal #4	7900 Rodeo Trl. #500
Corpus Christi 78408	Odessa, TX 78765	Houston, TX 77013	Beaumont, TX 77705	Mansfield, TX 76063
361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
NOTICE: Spread sheet is active and unprotected. Any alterations to cells other than those shown in yellow could produce incorrect results.

HYTORC

TORQUE GUIDE FOR ASTM A320 CLASS L7 GRADE M					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
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) K=.300	First Pass	Second Pass	All Subsequent Passes	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	80,000	21,395	146	134	167	187	201	210	267	401	201	60	120	201	
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	
2-3/4 x 8	4-1/4"	5.422	80,000	347,033	8,669	7,953	9,941	11,134	11,929	12,486	15,906	23,859	11,929	3579	7158	11929	
3 x 8	4-5/8"	6.503	80,000	416,194	11,341	10,405	13,006	14,567	15,607	16,336	20,810	31,215	15,607	4682	9364	15607	
3-1/4 x 8	5"	7.682	80,000	491,634	14,513	13,315	16,644	18,641	19,973	20,905	26,630	39,945	19,973	5992	11984	19973	
3-1/2 x 8	5-3/8"	8.959	80,000	573,355	18,228	16,723	20,904	23,412	25,084	26,255	33,446	50,169	25,084	7525	15051	25084	

Southwest Texas	West Texas	Main Office	Southeast Texas	Central & East Texas
4802 Baldwin Blvd.	3508 S County Rd 1290	12420 Texaco Rd	2484 W Cardinal #4	7900 Rodeo Trl. #500
Corpus Christi 78408	Odessa, TX 78765	Houston, TX 77013	Beaumont, TX 77705	Mansfield, TX 76063
361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
NOTICE: Spread sheet is active and unprotected. Any alterations to cells other than those shown in yellow could produce incorrect results.

HYTORC

TORQUE GUIDE FOR ASTM A320 CLASS L7 GRADE M					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON			90	% 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) K=.300	First Pass	Second Pass	All Subsequent Passes	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	80,000	24,069	164	150	188	211	226	236	301	451	226	68	135	226	
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	
2-3/4 x 8	4-1/4"	5.422	80,000	390,412	9,752	8,947	11,184	12,526	13,420	14,047	17,894	26,841	13,420	4026	8052	13420	
3 x 8	4-5/8"	6.503	80,000	468,218	12,759	11,705	14,632	16,388	17,558	18,378	23,411	35,116	17,558	5267	10535	17558	
3-1/4 x 8	5"	7.682	80,000	553,089	16,328	14,979	18,724	20,971	22,469	23,518	29,959	44,938	22,469	6741	13482	22469	
3-1/2 x 8	5-3/8"	8.959	80,000	645,024	20,506	18,813	23,517	26,338	28,220	29,537	37,626	56,440	28,220	8466	16932	28220	

Southwest Texas	West Texas	Main Office	Southeast Texas	Central & East Texas
4802 Baldwin Blvd.	3508 S County Rd 1290	12420 Texaco Rd	2484 W Cardinal #4	7900 Rodeo Trl. #500
Corpus Christi 78408	Odessa, TX 78765	Houston, TX 77013	Beaumont, TX 77705	Mansfield, TX 76063
361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
NOTICE: Spread sheet is active and unprotected. Any alterations to cells other than those shown in yellow could produce incorrect results.

HYTORC

TORQUE GUIDE FOR ASTM A320 CLASS L7 GRADE M					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) K=.300	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	
1 x 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	
2-3/4 x 8	4-1/4"	5.422	80,000	429,453	10,727	9,842	12,302	13,778	14,762	15,451	19,683	29,525	14,762	4429	8857	14762	
3 x 8	4-5/8"	6.503	80,000	515,040	14,035	12,876	16,095	18,026	19,314	20,215	25,752	38,628	19,314	5794	11588	19314	
3-1/4 x 8	5"	7.682	80,000	608,397	17,960	16,477	20,597	23,068	24,716	25,870	32,955	49,432	24,716	7415	14830	24716	
3-1/2 x 8	5-3/8"	8.959	80,000	709,527	22,557	20,695	25,868	28,972	31,042	32,490	41,389	62,084	31,042	9313	18625	31042	

Southwest Texas	West Texas	Main Office	Southeast Texas	Central & East Texas
4802 Baldwin Blvd.	3508 S County Rd 1290	12420 Texaco Rd	2484 W Cardinal #4	7900 Rodeo Trl. #500
Corpus Christi 78408	Odessa, TX 78765	Houston, TX 77013	Beaumont, TX 77705	Mansfield, TX 76063
361-888-5080	432-561-8481	713-453-6677	409-840-9699	682-334-2679

REV 7.31.09

This spread sheet is to be used as a guide. all results should be analyzed against actual field results to establish their validity.
 To use spread sheet click desired tab for B7 or B16 material
 Enter the desired percent yield in yellow field at top of form
 If 'K' factor is not listed, Enter appropriate value under Custom (insert K) , in yellow field only
 as always- after entering any value, click outside the field or hit enter to update calculations.
NOTICE: Spread sheet is active and unprotected. Any alterations to cells other than those shown in yellow could produce incorrect results.