

HYTORC

TORQUE GUIDE FOR ISO R898 GRADE 12.9 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON				40	% YIELD										First Pass	Second Pass	All Subsequent Passes
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=.15	MACHINE OIL K=.200	DRY STEEL K=.440 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	160,000	21,395	146	134	167	187	201	210	267	401	201	60	120	201	
7/8 x 9	1-7/16"	0.461	160,000	29,536	235	215	269	302	323	338	431	646	323	97	194	323	
1 x 8	1-5/8"	0.605	160,000	38,748	352	323	404	452	484	507	646	969	484	145	291	484	
1-1/8 x 8	1-13/16"	0.790	160,000	50,563	517	474	593	664	711	744	948	1,422	711	213	427	711	
1-1/4 x 8	2"	0.999	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	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	160,000	573,355	18,228	16,723	20,904	23,412	25,084	26,255	33,446	50,169	25,084	7525	15051	25084	
3-3/4 x 8	5-3/4"	10.334	160,000	661,356	22,527	20,667	25,834	28,934	31,001	32,448	41,335	62,002	31,001	9300	18601	31001	
4 x 8	6-1/8"	11.807	160,000	755,636	27,455	25,188	31,485	35,263	37,782	39,545	50,376	75,564	37,782	11335	22669	37782	
4-1/4 x 8	6-1/2"	13.378	160,000	856,197	33,053	30,324	37,905	42,453	45,485	47,608	60,647	90,971	45,485	13646	27291	45485	
4-1/2 x 8	6-7/8"	15.047	160,000	963,038	39,364	36,114	45,142	50,559	54,171	56,699	72,228	108,342	54,171	16251	32503	54171	
4-3/4 x 8	7-1/4"	16.815	160,000	1,076,158	46,432	42,598	53,247	59,637	63,897	66,879	85,196	127,794	63,897	19169	38338	63897	
5 x 8	7-5/8"	18.681	160,000	1,195,559	54,298	49,815	62,269	69,741	74,722	78,209	99,630	149,445	74,722	22417	44833	74722	
5-1/4 x 8	8"	20.644	160,000	1,321,240	63,007	57,804	72,255	80,926	86,706	90,753	115,608	173,413	86,706	26012	52024	86706	
5-1/2 x 8	8-3/8"	22.706	160,000	1,453,201	72,599	66,605	83,256	93,247	99,908	104,570	133,210	199,815	99,908	29972	59945	99908	
5-3/4 x 8	8-3/4"	24.866	160,000	1,591,441	83,120	76,257	95,321	106,759	114,385	119,723	152,513	228,770	114,385	34315	68631	114385	
6 x 8	9-1/8"	27.124	160,000	1,735,962	94,610	86,798	108,498	121,517	130,197	136,273	173,596	260,394	130,197	39059	78118	130197	

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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
 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.
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TORQUE GUIDE FOR ISO R898 GRADE 12.9 STUD					REQUIRED TORQUE (FtLbs)										THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON				50	% YIELD											First Pass	Second Pass	All Subsequent Passes
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=.15	MACHINE OIL K=.200	DRY STEEL K=.440 K=.300	CUSTOM (INSERT K) K=.300					
													0.15	30%	60%	100%		
3/4 x 10	1-1/4"	0.334	160,000	26,743	182	167	209	234	251	262	334	501	251	75	150	251		
7/8 x 9	1-7/16"	0.461	160,000	36,920	293	269	337	377	404	423	538	808	404	121	242	404		
1 x 8	1-5/8"	0.605	160,000	48,435	440	404	505	565	605	634	807	1,211	605	182	363	605		
1-1/8 x 8	1-13/16"	0.790	160,000	63,204	646	593	741	830	889	930	1,185	1,778	889	267	533	889		
1-1/4 x 8	2"	0.999	160,000	79,936	908	833	1,041	1,166	1,249	1,307	1,665	2,498	1,249	375	749	1249		
1-3/8 x 8	2-3/16"	1.233	160,000	98,630	1,232	1,130	1,413	1,582	1,695	1,774	2,260	3,390	1,695	509	1017	1695		
1-1/2 x 8	2-3/8"	1.491	160,000	119,287	1,625	1,491	1,864	2,088	2,237	2,341	2,982	4,473	2,237	671	1342	2237		
1-5/8 x 8	2-9/16"	1.774	160,000	141,906	2,095	1,922	2,402	2,690	2,882	3,017	3,843	5,765	2,882	865	1729	2882		
1-3/4 x 8	2-3/4"	2.081	160,000	166,488	2,646	2,428	3,035	3,399	3,642	3,812	4,856	7,284	3,642	1093	2185	3642		
1-7/8 x 8	2-15/16"	2.413	160,000	193,032	3,288	3,016	3,770	4,223	4,524	4,735	6,032	9,048	4,524	1357	2715	4524		
2 x 8	3-1/8"	2.769	160,000	221,538	4,025	3,692	4,615	5,169	5,538	5,797	7,385	11,077	5,538	1662	3323	5538		
2-1/8 x 8	3-5/16"	3.150	160,000	252,008	4,864	4,463	5,578	6,248	6,694	7,006	8,925	13,388	6,694	2008	4016	6694		
2-1/4 x 8	3-1/2"	3.555	160,000	284,439	5,813	5,333	6,667	7,467	8,000	8,373	10,666	16,000	8,000	2400	4800	8000		
2-3/8 x 8	3-11/16"	3.985	160,000	318,834	6,878	6,310	7,888	8,834	9,465	9,907	12,620	18,931	9,465	2840	5679	9465		
2-1/2 x 8	3-7/8"	4.440	160,000	355,190	8,066	7,400	9,250	10,360	11,100	11,618	14,800	22,199	11,100	3330	6660	11100		
2-3/4 x 8	4-1/4"	5.422	160,000	433,791	10,836	9,941	12,426	13,917	14,912	15,607	19,882	29,823	14,912	4473	8947	14912		
3 x 8	4-5/8"	6.503	160,000	520,242	14,177	13,006	16,258	18,208	19,509	20,419	26,012	39,018	19,509	5853	11705	19509		
3-1/4 x 8	5"	7.682	160,000	614,543	18,142	16,644	20,805	23,301	24,966	26,131	33,288	49,932	24,966	7490	14979	24966		
3-1/2 x 8	5-3/8"	8.959	160,000	716,694	22,785	20,904	26,129	29,265	31,355	32,819	41,807	62,711	31,355	9407	18813	31355		
3-3/4 x 8	5-3/4"	10.334	160,000	826,695	28,159	25,834	32,293	36,168	38,751	40,560	51,668	77,503	38,751	11625	23251	38751		
4 x 8	6-1/8"	11.807	160,000	944,545	34,318	31,485	39,356	44,079	47,227	49,431	62,970	94,455	47,227	14168	28336	47227		
4-1/4 x 8	6-1/2"	13.378	160,000	1,070,246	41,316	37,905	47,381	53,066	56,857	59,510	75,809	113,714	56,857	17057	34114	56857		
4-1/2 x 8	6-7/8"	15.047	160,000	1,203,797	49,205	45,142	56,428	63,199	67,714	70,874	90,285	135,427	67,714	20314	40628	67714		
4-3/4 x 8	7-1/4"	16.815	160,000	1,345,198	58,040	53,247	66,559	74,546	79,871	83,598	106,495	159,742	79,871	23961	47923	79871		
5 x 8	7-5/8"	18.681	160,000	1,494,449	67,873	62,269	77,836	87,176	93,403	97,762	124,537	186,806	93,403	28021	56042	93403		
5-1/4 x 8	8"	20.644	160,000	1,651,550	78,758	72,255	90,319	101,157	108,383	113,441	144,511	216,766	108,383	32515	65030	108383		
5-1/2 x 8	8-3/8"	22.706	160,000	1,816,501	90,749	83,256	104,070	116,559	124,884	130,712	166,513	249,769	124,884	37465	74931	124884		
5-3/4 x 8	8-3/4"	24.866	160,000	1,989,302	103,900	95,321	119,151	133,449	142,981	149,653	190,641	285,962	142,981	42894	85789	142981		
6 x 8	9-1/8"	27.124	160,000	2,169,952	118,262	108,498	135,622	151,897	162,746	170,341	216,995	325,493	162,746	48824	97648	162746		

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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=.15	MACHINE OIL K=.200	DRY STEEL K=.440 K=.300	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	160,000	32,092	219	201	251	281	301	315	401	602	301	90	181	301		
7/8 x 9	1-7/16"	0.461	160,000	44,304	352	323	404	452	485	507	646	969	485	145	291	485		
1 x 8	1-5/8"	0.605	160,000	58,122	528	484	605	678	727	760	969	1,453	727	218	436	727		
1-1/8 x 8	1-13/16"	0.790	160,000	75,845	775	711	889	995	1,067	1,116	1,422	2,133	1,067	320	640	1067		
1-1/4 x 8	2"	0.999	160,000	95,923	1,089	999	1,249	1,399	1,499	1,569	1,998	2,998	1,499	450	899	1499		
1-3/8 x 8	2-3/16"	1.233	160,000	118,356	1,478	1,356	1,695	1,899	2,034	2,129	2,712	4,068	2,034	610	1221	2034		
1-1/2 x 8	2-3/8"	1.491	160,000	143,144	1,950	1,789	2,237	2,505	2,684	2,809	3,579	5,368	2,684	805	1610	2684		
1-5/8 x 8	2-9/16"	1.774	160,000	170,287	2,514	2,306	2,882	3,228	3,459	3,620	4,612	6,918	3,459	1038	2075	3459		
1-3/4 x 8	2-3/4"	2.081	160,000	199,785	3,176	2,914	3,642	4,079	4,370	4,574	5,827	8,741	4,370	1311	2622	4370		
1-7/8 x 8	2-15/16"	2.413	160,000	231,638	3,945	3,619	4,524	5,067	5,429	5,682	7,239	10,858	5,429	1629	3257	5429		
2 x 8	3-1/8"	2.769	160,000	265,846	4,830	4,431	5,538	6,203	6,646	6,956	8,862	13,292	6,646	1994	3988	6646		
2-1/8 x 8	3-5/16"	3.150	160,000	302,409	5,837	5,355	6,694	7,497	8,033	8,408	10,710	16,065	8,033	2410	4820	8033		
2-1/4 x 8	3-1/2"	3.555	160,000	341,327	6,976	6,400	8,000	8,960	9,600	10,048	12,800	19,200	9,600	2880	5760	9600		
2-3/8 x 8	3-11/16"	3.985	160,000	382,600	8,254	7,572	9,465	10,601	11,358	11,889	15,145	22,717	11,358	3408	6815	11358		
2-1/2 x 8	3-7/8"	4.440	160,000	426,228	9,679	8,880	11,100	12,432	13,320	13,941	17,760	26,639	13,320	3996	7992	13320		
2-3/4 x 8	4-1/4"	5.422	160,000	520,549	13,003	11,929	14,912	16,701	17,894	18,729	23,859	35,788	17,894	5368	10736	17894		
3 x 8	4-5/8"	6.503	160,000	624,290	17,012	15,607	19,509	21,850	23,411	24,503	31,215	46,822	23,411	7023	14047	23411		
3-1/4 x 8	5"	7.682	160,000	737,451	21,770	19,973	24,966	27,962	29,959	31,357	39,945	59,918	29,959	8988	17975	29959		
3-1/2 x 8	5-3/8"	8.959	160,000	860,032	27,342	25,084	31,355	35,118	37,626	39,382	50,169	75,253	37,626	11288	22576	37626		
3-3/4 x 8	5-3/4"	10.334	160,000	992,033	33,791	31,001	38,751	43,401	46,502	48,672	62,002	93,003	46,502	13950	27901	46502		
4 x 8	6-1/8"	11.807	160,000	1,133,455	41,182	37,782	47,227	52,895	56,673	59,317	75,564	113,345	56,673	17002	34004	56673		
4-1/4 x 8	6-1/2"	13.378	160,000	1,284,296	49,579	45,485	56,857	63,680	68,228	71,412	90,971	136,456	68,228	20468	40937	68228		
4-1/2 x 8	6-7/8"	15.047	160,000	1,444,557	59,046	54,171	67,714	75,839	81,256	85,048	108,342	162,513	81,256	24377	48754	81256		
4-3/4 x 8	7-1/4"	16.815	160,000	1,614,238	69,648	63,897	79,871	89,456	95,845	100,318	127,794	191,691	95,845	28754	57507	95845		
5 x 8	7-5/8"	18.681	160,000	1,793,339	81,447	74,722	93,403	104,611	112,084	117,314	149,445	224,167	112,084	33625	67250	112084		
5-1/4 x 8	8"	20.644	160,000	1,981,860	94,510	86,706	108,383	121,389	130,060	136,129	173,413	260,119	130,060	39018	78036	130060		
5-1/2 x 8	8-3/8"	22.706	160,000	2,179,801	108,899	99,908	124,884	139,871	149,861	156,855	199,815	299,723	149,861	44958	89917	149861		
5-3/4 x 8	8-3/4"	24.866	160,000	2,387,162	124,679	114,385	142,981	160,139	171,577	179,584	228,770	343,155	171,577	51473	102946	171577		
6 x 8	9-1/8"	27.124	160,000	2,603,943	141,915	130,197	162,746	182,276	195,296	204,410	260,394	390,591	195,296	58589	117177	195296		

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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=.15	MACHINE OIL K=.200	DRY STEEL K=.440 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	160,000	37,441	255	234	293	328	351	367	468	702	351	105	211	351	
7/8 x 9	1-7/16"	0.461	160,000	51,688	411	377	471	528	565	592	754	1,131	565	170	339	565	
1 x 8	1-5/8"	0.605	160,000	67,809	616	565	706	791	848	887	1,130	1,695	848	254	509	848	
1-1/8 x 8	1-13/16"	0.790	160,000	88,486	904	830	1,037	1,161	1,244	1,302	1,659	2,489	1,244	373	747	1244	
1-1/4 x 8	2"	0.999	160,000	111,910	1,271	1,166	1,457	1,632	1,749	1,830	2,331	3,497	1,749	525	1049	1749	
1-3/8 x 8	2-3/16"	1.233	160,000	138,082	1,725	1,582	1,978	2,215	2,373	2,484	3,164	4,747	2,373	712	1424	2373	
1-1/2 x 8	2-3/8"	1.491	160,000	167,001	2,275	2,088	2,609	2,923	3,131	3,277	4,175	6,263	3,131	939	1879	3131	
1-5/8 x 8	2-9/16"	1.774	160,000	198,668	2,932	2,690	3,363	3,766	4,035	4,224	5,381	8,071	4,035	1211	2421	4035	
1-3/4 x 8	2-3/4"	2.081	160,000	233,083	3,705	3,399	4,249	4,759	5,099	5,337	6,798	10,197	5,099	1530	3059	5099	
1-7/8 x 8	2-15/16"	2.413	160,000	270,244	4,603	4,223	5,278	5,912	6,334	6,629	8,445	12,668	6,334	1900	3800	6334	
2 x 8	3-1/8"	2.769	160,000	310,154	5,634	5,169	6,462	7,237	7,754	8,116	10,338	15,508	7,754	2326	4652	7754	
2-1/8 x 8	3-5/16"	3.150	160,000	352,811	6,810	6,248	7,810	8,747	9,372	9,809	12,495	18,743	9,372	2811	5623	9372	
2-1/4 x 8	3-1/2"	3.555	160,000	398,215	8,139	7,467	9,333	10,453	11,200	11,722	14,933	22,400	11,200	3360	6720	11200	
2-3/8 x 8	3-11/16"	3.985	160,000	446,367	9,629	8,834	11,043	12,368	13,252	13,870	17,669	26,503	13,252	3975	7951	13252	
2-1/2 x 8	3-7/8"	4.440	160,000	497,266	11,292	10,360	12,950	14,504	15,540	16,265	20,719	31,079	15,540	4662	9324	15540	
2-3/4 x 8	4-1/4"	5.422	160,000	607,307	15,170	13,917	17,397	19,484	20,876	21,850	27,835	41,752	20,876	6263	12526	20876	
3 x 8	4-5/8"	6.503	160,000	728,339	19,847	18,208	22,761	25,492	27,313	28,587	36,417	54,625	27,313	8194	16388	27313	
3-1/4 x 8	5"	7.682	160,000	860,360	25,399	23,301	29,127	32,622	34,952	36,583	46,603	69,904	34,952	10486	20971	34952	
3-1/2 x 8	5-3/8"	8.959	160,000	1,003,371	31,899	29,265	36,581	40,971	43,897	45,946	58,530	87,795	43,897	13169	26338	43897	
3-3/4 x 8	5-3/4"	10.334	160,000	1,157,372	39,423	36,168	45,210	50,635	54,252	56,784	72,336	108,504	54,252	16276	32551	54252	
4 x 8	6-1/8"	11.807	160,000	1,322,364	48,046	44,079	55,098	61,710	66,118	69,204	88,158	132,236	66,118	19835	39671	66118	
4-1/4 x 8	6-1/2"	13.378	160,000	1,498,345	57,842	53,066	66,333	74,293	79,600	83,314	106,133	159,199	79,600	23880	47760	79600	
4-1/2 x 8	6-7/8"	15.047	160,000	1,685,316	68,887	63,199	78,999	88,479	94,799	99,223	126,399	189,598	94,799	28440	56879	94799	
4-3/4 x 8	7-1/4"	16.815	160,000	1,883,277	81,256	74,546	93,183	104,365	111,820	117,038	149,093	223,639	111,820	33546	67092	111820	
5 x 8	7-5/8"	18.681	160,000	2,092,228	95,022	87,176	108,970	122,047	130,764	136,867	174,352	261,529	130,764	39229	78459	130764	
5-1/4 x 8	8"	20.644	160,000	2,312,170	110,262	101,157	126,447	141,620	151,736	158,817	202,315	303,472	151,736	45521	91042	151736	
5-1/2 x 8	8-3/8"	22.706	160,000	2,543,101	127,049	116,559	145,698	163,182	174,838	182,997	233,118	349,676	174,838	52451	104903	174838	
5-3/4 x 8	8-3/4"	24.866	160,000	2,785,022	145,459	133,449	166,811	186,829	200,173	209,515	266,898	400,347	200,173	60052	120104	200173	
6 x 8	9-1/8"	27.124	160,000	3,037,933	165,567	151,897	189,871	212,655	227,845	238,478	303,793	455,690	227,845	68354	136707	227845	

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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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HYTORC

TORQUE GUIDE FOR ISO R898 GRADE 12.9 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON				80	% YIELD										First Pass	Second Pass	All Subsequent Passes
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=.15	MACHINE OIL K=.200	DRY STEEL K=.440 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	160,000	42,789	292	267	334	374	401	420	535	802	401	120	241	401	
7/8 x 9	1-7/16"	0.461	160,000	59,072	469	431	538	603	646	676	861	1,292	646	194	388	646	
1 x 8	1-5/8"	0.605	160,000	77,496	704	646	807	904	969	1,014	1,292	1,937	969	291	581	969	
1-1/8 x 8	1-13/16"	0.790	160,000	101,127	1,033	948	1,185	1,327	1,422	1,488	1,896	2,844	1,422	427	853	1,422	
1-1/4 x 8	2"	0.999	160,000	127,897	1,452	1,332	1,665	1,865	1,998	2,092	2,665	3,997	1,998	600	1,199	1,998	
1-3/8 x 8	2-3/16"	1.233	160,000	157,808	1,971	1,808	2,260	2,532	2,712	2,839	3,616	5,425	2,712	814	1,627	2,712	
1-1/2 x 8	2-3/8"	1.491	160,000	190,859	2,600	2,386	2,982	3,340	3,579	3,746	4,771	7,157	3,579	1,074	2,147	3,579	
1-5/8 x 8	2-9/16"	1.774	160,000	227,049	3,351	3,075	3,843	4,304	4,612	4,827	6,149	9,224	4,612	1,384	2,767	4,612	
1-3/4 x 8	2-3/4"	2.081	160,000	266,380	4,234	3,885	4,856	5,439	5,827	6,099	7,769	11,654	5,827	1,748	3,496	5,827	
1-7/8 x 8	2-15/16"	2.413	160,000	308,851	5,260	4,826	6,032	6,756	7,239	7,576	9,652	14,477	7,239	2,172	4,343	7,239	
2 x 8	3-1/8"	2.769	160,000	354,462	6,439	5,908	7,385	8,271	8,862	9,275	11,815	17,723	8,862	2,658	5,317	8,862	
2-1/8 x 8	3-5/16"	3.150	160,000	403,212	7,783	7,140	8,925	9,996	10,710	11,210	14,280	21,421	10,710	3,213	6,426	10,710	
2-1/4 x 8	3-1/2"	3.555	160,000	455,103	9,301	8,533	10,666	11,946	12,800	13,397	17,066	25,600	12,800	3,840	7,680	12,800	
2-3/8 x 8	3-11/16"	3.985	160,000	510,134	11,005	10,096	12,620	14,135	15,145	15,851	20,193	30,289	15,145	4,543	9,087	15,145	
2-1/2 x 8	3-7/8"	4.440	160,000	568,304	12,905	11,840	14,800	16,576	17,760	18,588	23,679	35,519	17,760	5,328	10,656	17,760	
2-3/4 x 8	4-1/4"	5.422	160,000	694,066	17,337	15,906	19,882	22,268	23,859	24,972	31,811	47,717	23,859	7,158	14,315	23,859	
3 x 8	4-5/8"	6.503	160,000	832,387	22,683	20,810	26,012	29,134	31,215	32,671	41,619	62,429	31,215	9,364	18,729	31,215	
3-1/4 x 8	5"	7.682	160,000	983,268	29,027	26,630	33,288	37,282	39,945	41,809	53,260	79,891	39,945	11,984	23,967	39,945	
3-1/2 x 8	5-3/8"	8.959	160,000	1,146,710	36,456	33,446	41,807	46,824	50,169	52,510	66,891	100,337	50,169	15,051	30,101	50,169	
3-3/4 x 8	5-3/4"	10.334	160,000	1,322,711	45,055	41,335	51,668	57,869	62,002	64,896	82,669	124,004	62,002	18,601	37,201	62,002	
4 x 8	6-1/8"	11.807	160,000	1,511,273	54,910	50,376	62,970	70,526	75,564	79,090	100,752	151,127	75,564	22,669	45,338	75,564	
4-1/4 x 8	6-1/2"	13.378	160,000	1,712,394	66,106	60,647	75,809	84,906	90,971	95,216	121,295	181,942	90,971	27,291	54,583	90,971	
4-1/2 x 8	6-7/8"	15.047	160,000	1,926,075	78,728	72,228	90,285	101,119	108,342	113,398	144,456	216,683	108,342	32,503	65,005	108,342	
4-3/4 x 8	7-1/4"	16.815	160,000	2,152,317	92,864	85,196	106,495	119,274	127,794	133,758	170,392	255,588	127,794	38,338	76,676	127,794	
5 x 8	7-5/8"	18.681	160,000	2,391,118	108,597	99,630	124,537	139,482	149,445	156,419	199,260	298,890	149,445	44,833	89,667	149,445	
5-1/4 x 8	8"	20.644	160,000	2,642,480	126,013	115,608	144,511	161,852	173,413	181,505	231,217	346,825	173,413	52,024	104,048	173,413	
5-1/2 x 8	8-3/8"	22.706	160,000	2,906,401	145,199	133,210	166,513	186,494	199,815	209,140	266,420	399,630	199,815	59,945	119,889	199,815	
5-3/4 x 8	8-3/4"	24.866	160,000	3,182,882	166,239	152,513	190,641	213,518	228,770	239,446	305,026	457,539	228,770	68,631	137,262	228,770	
6 x 8	9-1/8"	27.124	160,000	3,471,924	189,220	173,596	216,995	243,035	260,394	272,546	347,192	520,789	260,394	78,118	156,237	260,394	

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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 ISO R898 GRADE 12.9 STUD					REQUIRED TORQUE (FtLbs)									THESE TORQUE VALUES ARE BASED ON FRICTION FACTOR IN "CUSTOM" COLUMN			
BOLT TENSION BASED ON				90	% YIELD										First Pass	Second Pass	All Subsequent Passes
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=.15	MACHINE OIL K=.200	DRY STEEL K=.440 K=.300	CUSTOM (INSERT K) K=.300	30%	60%	100%	
													0.15	30%	60%	100%	
3/4 x 10	1-1/4"	0.334	160,000	48,138	328	301	376	421	451	472	602	903	451	135	271	451	
7/8 x 9	1-7/16"	0.461	160,000	66,456	528	485	606	678	727	761	969	1,454	727	218	436	727	
1x 8	1-5/8"	0.605	160,000	87,183	792	727	908	1,017	1,090	1,141	1,453	2,180	1,090	327	654	1090	
1-1/8 x 8	1-13/16"	0.790	160,000	113,767	1,163	1,067	1,333	1,493	1,600	1,675	2,133	3,200	1,600	480	960	1600	
1-1/4 x 8	2"	0.999	160,000	143,884	1,634	1,499	1,873	2,098	2,248	2,353	2,998	4,496	2,248	674	1349	2248	
1-3/8 x 8	2-3/16"	1.233	160,000	177,534	2,217	2,034	2,543	2,848	3,051	3,194	4,068	6,103	3,051	915	1831	3051	
1-1/2 x 8	2-3/8"	1.491	160,000	214,716	2,926	2,684	3,355	3,758	4,026	4,214	5,368	8,052	4,026	1208	2416	4026	
1-5/8 x 8	2-9/16"	1.774	160,000	255,431	3,770	3,459	4,324	4,843	5,188	5,431	6,918	10,377	5,188	1557	3113	5188	
1-3/4 x 8	2-3/4"	2.081	160,000	299,678	4,764	4,370	5,463	6,118	6,555	6,861	8,741	13,111	6,555	1967	3933	6555	
1-7/8 x 8	2-15/16"	2.413	160,000	347,457	5,918	5,429	6,786	7,601	8,144	8,524	10,858	16,287	8,144	2443	4886	8144	
2 x 8	3-1/8"	2.769	160,000	398,769	7,244	6,646	8,308	9,305	9,969	10,434	13,292	19,938	9,969	2991	5982	9969	
2-1/8 x 8	3-5/16"	3.150	160,000	453,614	8,756	8,033	10,041	11,246	12,049	12,611	16,065	24,098	12,049	3615	7229	12049	
2-1/4 x 8	3-1/2"	3.555	160,000	511,991	10,464	9,600	12,000	13,440	14,400	15,072	19,200	28,799	14,400	4320	8640	14400	
2-3/8 x 8	3-11/16"	3.985	160,000	573,900	12,381	11,358	14,198	15,902	17,038	17,833	22,717	34,075	17,038	5111	10223	17038	
2-1/2 x 8	3-7/8"	4.440	160,000	639,342	14,518	13,320	16,650	18,647	19,979	20,912	26,639	39,959	19,979	5994	11988	19979	
2-3/4 x 8	4-1/4"	5.422	160,000	780,824	19,504	17,894	22,367	25,051	26,841	28,093	35,788	53,682	26,841	8052	16104	26841	
3 x 8	4-5/8"	6.503	160,000	936,435	25,518	23,411	29,264	32,775	35,116	36,755	46,822	70,233	35,116	10535	21070	35116	
3-1/4 x 8	5"	7.682	160,000	1,106,177	32,655	29,959	37,449	41,943	44,938	47,036	59,918	89,877	44,938	13482	26963	44938	
3-1/2 x 8	5-3/8"	8.959	160,000	1,290,049	41,013	37,626	47,033	52,677	56,440	59,073	75,253	112,879	56,440	16932	33864	56440	
3-3/4 x 8	5-3/4"	10.334	160,000	1,488,050	50,687	46,502	58,127	65,102	69,752	73,007	93,003	139,505	69,752	20926	41851	69752	
4 x 8	6-1/8"	11.807	160,000	1,700,182	61,773	56,673	70,841	79,342	85,009	88,976	113,345	170,018	85,009	25503	51005	85009	
4-1/4 x 8	6-1/2"	13.378	160,000	1,926,443	74,369	68,228	85,285	95,519	102,342	107,118	136,456	204,685	102,342	30703	61405	102342	
4-1/2 x 8	6-7/8"	15.047	160,000	2,166,835	88,569	81,256	101,570	113,759	121,884	127,572	162,513	243,769	121,884	36565	73131	121884	
4-3/4 x 8	7-1/4"	16.815	160,000	2,421,356	104,471	95,845	119,807	134,184	143,768	150,477	191,691	287,536	143,768	43130	86261	143768	
5 x 8	7-5/8"	18.681	160,000	2,690,008	122,171	112,084	140,105	156,917	168,126	175,971	224,167	336,251	168,126	50438	100875	168126	
5-1/4 x 8	8"	20.644	160,000	2,972,790	141,765	130,060	162,574	182,083	195,089	204,193	260,119	390,179	195,089	58527	117054	195089	
5-1/2 x 8	8-3/8"	22.706	160,000	3,269,701	163,349	149,861	187,327	209,806	224,792	235,282	299,723	449,584	224,792	67438	134875	224792	
5-3/4 x 8	8-3/4"	24.866	160,000	3,580,743	187,019	171,577	214,472	240,208	257,366	269,376	343,155	514,732	257,366	77210	154420	257366	
6 x 8	9-1/8"	27.124	160,000	3,905,914	212,872	195,296	244,120	273,414	292,944	306,614	390,591	585,887	292,944	87883	175766	292944	

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TORQUE GUIDE FOR ISO R898 GRADE 12.9 STUD					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=.15	MACHINE OIL K=.200	DRY STEEL K=.440 K=.300	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	160,000	52,952	361	331	414	463	496	520	662	993	496	149	298	496		
7/8 x 9	1-7/16"	0.461	160,000	73,101	581	533	666	746	800	837	1,066	1,599	800	240	480	800		
1 x 8	1-5/8"	0.605	160,000	95,901	871	799	999	1,119	1,199	1,255	1,598	2,398	1,199	360	719	1199		
1-1/8 x 8	1-13/16"	0.790	160,000	125,144	1,279	1,173	1,467	1,643	1,760	1,842	2,346	3,520	1,760	528	1056	1760		
1-1/4 x 8	2"	0.999	160,000	158,273	1,797	1,649	2,061	2,308	2,473	2,588	3,297	4,946	2,473	742	1484	2473		
1-3/8 x 8	2-3/16"	1.233	160,000	195,287	2,439	2,238	2,797	3,133	3,357	3,513	4,475	6,713	3,357	1007	2014	3357		
1-1/2 x 8	2-3/8"	1.491	160,000	236,188	3,218	2,952	3,690	4,133	4,429	4,635	5,905	8,857	4,429	1329	2657	4429		
1-5/8 x 8	2-9/16"	1.774	160,000	280,974	4,147	3,805	4,756	5,327	5,707	5,974	7,610	11,415	5,707	1712	3424	5707		
1-3/4 x 8	2-3/4"	2.081	160,000	329,645	5,240	4,807	6,009	6,730	7,211	7,548	9,615	14,422	7,211	2163	4327	7211		
1-7/8 x 8	2-15/16"	2.413	160,000	382,203	6,509	5,972	7,465	8,361	8,958	9,376	11,944	17,916	8,958	2687	5375	8958		
2 x 8	3-1/8"	2.769	160,000	438,646	7,969	7,311	9,138	10,235	10,966	11,478	14,622	21,932	10,966	3290	6580	10966		
2-1/8 x 8	3-5/16"	3.150	160,000	498,975	9,631	8,836	11,045	12,370	13,254	13,873	17,672	26,508	13,254	3976	7952	13254		
2-1/4 x 8	3-1/2"	3.555	160,000	563,190	11,510	10,560	13,200	14,784	15,840	16,579	21,120	31,679	15,840	4752	9504	15840		
2-3/8 x 8	3-11/16"	3.985	160,000	631,290	13,619	12,494	15,618	17,492	18,741	19,616	24,989	37,483	18,741	5622	11245	18741		
2-1/2 x 8	3-7/8"	4.440	160,000	703,277	15,970	14,652	18,314	20,512	21,977	23,003	29,303	43,955	21,977	6593	13186	21977		
2-3/4 x 8	4-1/4"	5.422	160,000	858,906	21,455	19,683	24,604	27,557	29,525	30,903	39,367	59,050	29,525	8857	17715	29525		
3 x 8	4-5/8"	6.503	160,000	1,030,079	28,070	25,752	32,190	36,053	38,628	40,431	51,504	77,256	38,628	11588	23177	38628		
3-1/4 x 8	5"	7.682	160,000	1,216,795	35,921	32,955	41,194	46,137	49,432	51,739	65,910	98,865	49,432	14830	29659	49432		
3-1/2 x 8	5-3/8"	8.959	160,000	1,419,053	45,114	41,389	51,736	57,945	62,084	64,981	82,778	124,167	62,084	18625	37250	62084		
3-3/4 x 8	5-3/4"	10.334	160,000	1,636,855	55,755	51,152	63,940	71,612	76,728	80,308	102,303	153,455	76,728	23018	46037	76728		
4 x 8	6-1/8"	11.807	160,000	1,870,200	67,951	62,340	77,925	87,276	93,510	97,874	124,680	187,020	93,510	28053	56106	93510		
4-1/4 x 8	6-1/2"	13.378	160,000	2,119,088	81,806	75,051	93,814	105,071	112,577	117,830	150,102	225,153	112,577	33773	67546	112577		
4-1/2 x 8	6-7/8"	15.047	160,000	2,383,518	97,426	89,382	111,727	125,135	134,073	140,330	178,764	268,146	134,073	40222	80444	134073		
4-3/4 x 8	7-1/4"	16.815	160,000	2,663,492	114,919	105,430	131,787	147,602	158,145	165,525	210,860	316,290	158,145	47443	94887	158145		
5 x 8	7-5/8"	18.681	160,000	2,959,009	134,388	123,292	154,115	172,609	184,938	193,568	246,584	369,876	184,938	55481	110963	184938		
5-1/4 x 8	8"	20.644	160,000	3,270,069	155,941	143,066	178,832	200,292	214,598	224,613	286,131	429,197	214,598	64379	128759	214598		
5-1/2 x 8	8-3/8"	22.706	160,000	3,596,671	179,684	164,847	206,059	230,786	247,271	258,810	329,695	494,542	247,271	74181	148363	247271		
5-3/4 x 8	8-3/4"	24.866	160,000	3,938,817	205,721	188,735	235,919	264,229	283,102	296,314	377,470	566,205	283,102	84931	169861	283102		
6 x 8	9-1/8"	27.124	160,000	4,296,506	234,160	214,825	268,532	300,755	322,238	337,276	429,651	644,476	322,238	96671	193343	322238		

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.