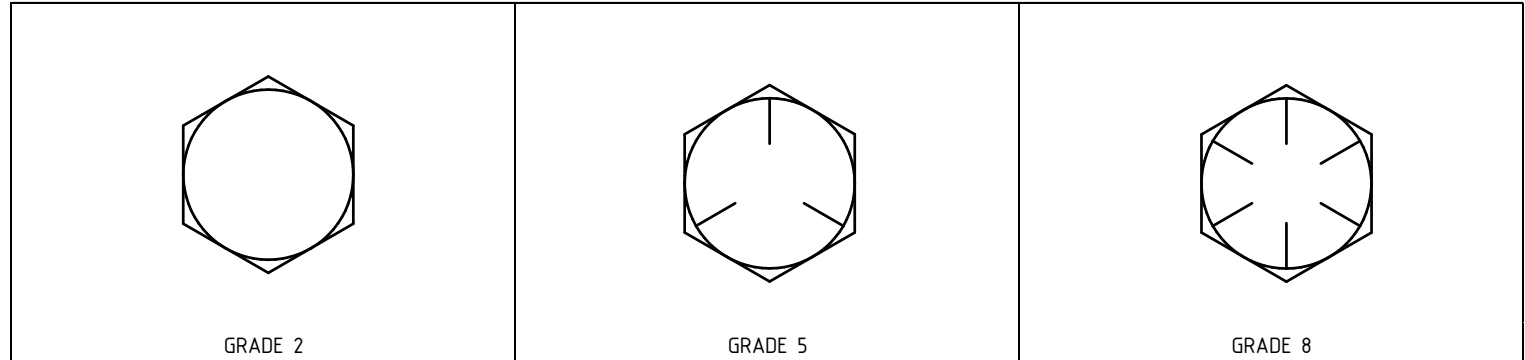
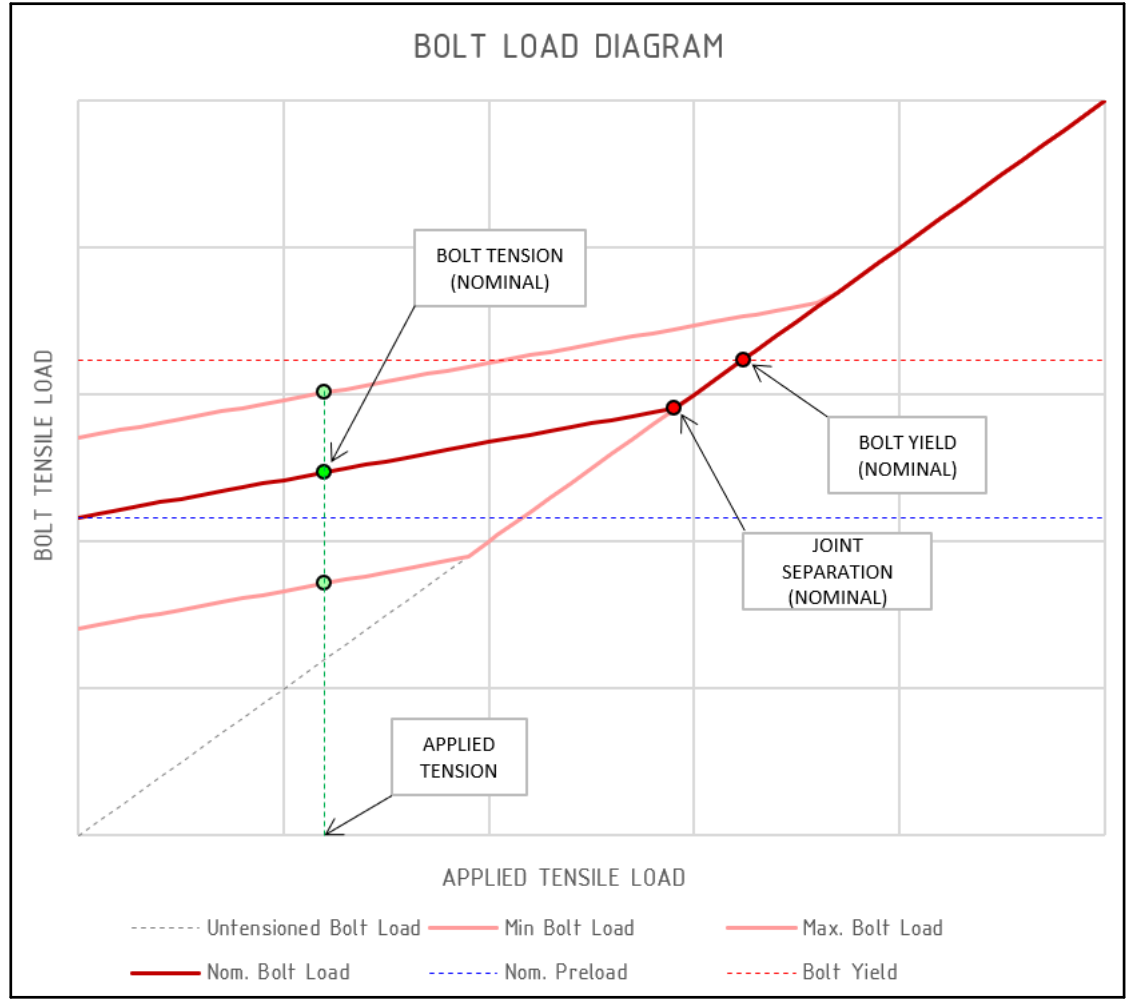


	PROPERTY CLASS 4.6			PROPERTY CLASS 8.8			PROPERTY CLASS 10.9		
	PRE-LOAD (kN) (@67% YIELD)	TORQUE (Nm) (K=0.20)	TORQUE (Nm) (K=0.15)	PRE-LOAD (kN) (@67% YIELD)	TORQUE (Nm) (K=0.20)	TORQUE (Nm) (K=0.15)	PRE-LOAD (kN) (@67% YIELD)	TORQUE (Nm) (K=0.20)	TORQUE (Nm) (K=0.15)
M12	14	33	24	36	87	65	53	127	96
M16	25	81	60	69	222	166	99	316	237
M20	39	157	118	108	433	325	154	617	463
M24	57	272	204	156	748	561	222	1066	799
M30	90	541	406	248	1487	1116	353	2118	1589



	GRADE 2			GRADE 5			GRADE 8		
	PRE-LOAD (kN) (@67% YIELD)	TORQUE (Nm) (K=0.20)	TORQUE (Nm) (K=0.15)	PRE-LOAD (kN) (@67% YIELD)	TORQUE (Nm) (K=0.20)	TORQUE (Nm) (K=0.15)	PRE-LOAD (kN) (@67% YIELD)	TORQUE (Nm) (K=0.20)	TORQUE (Nm) (K=0.15)
1/2" UNC	24	62	47	39	100	75	56	141	106
5/8" UNC	39	123	93	63	199	149	89	281	211
3/4" UNC	36	138	104	93	353	265	131	499	374
1" UNC	66	334	250	148	751	563	237	1205	903
1-1/4" UNC	105	666	500	236	1499	1125	379	2406	1805



TENSIONING METHOD	TYPICAL ACCURACY
TORQUE WRENCH	±25%
TURN-OF-NUT	±15%
LOAD INDICATING WASHER	±10%
BOLT ELONGATION - MICROMETER	±5%
BOLT ELONGATION - ULTRASONIC	±1%
STRAIN GAUGE	±1%

- NOTES**
- VALUES SHOWN ARE FOR A PRE-LOAD EQUATING TO 67% BOLT YIELD STRENGTH UTILISATION.
 - BOLT PRE-LOAD VALUES SHALL BE SELECTED APPROPRIATELY BASED ON THE APPLICATION LOADS TO PREVENT BOLT YIELD, FRACTURE OR JOINT SEPARATION.
 - ACCURACY OF THE TENSIONING METHOD SHALL BE CONSIDERED WHEN SELECTING BOLT PRE-LOAD.
 - BOLT LOAD LINE GRADIENT IS DEPENDENT ON THE OVERALL JOINT STIFFNESS (TYPICALLY EXPRESSED AS A JOINT CONSTANT "C").
 - TORQUE COEFFICIENTS REPRESENT TYPICAL INDUSTRY VALUES FOR A PLAIN BLACK BOLT IN THE "DRY" (K=0.20) AND "LIGHTLY LUBRICATED" (K=0.15) CONDITION. ACTUAL K VALUES SHALL BE VERIFIED BY MANUFACTURER OR APPROPRIATE TESTING.
 - CALCULATION OF INDIVIDUAL BOLT LOADS MUST CONSIDER THE GEOMETRICAL PROPERTIES OF THE BOLT GROUP AS WELL AS ANY ADDITIONAL FORCES DUE TO PRYING ACTION. BOLTED CONNECTIONS SHALL BE DESIGNED BY A SUITABLY QUALIFIED ENGINEER.
 - CORRECT INTERPRETATION AND USE OF THIS INFORMATION IS THE RESPONSIBILITY OF THE USER. TRANG TAKES NO RESPONSIBILITY FOR THE OUTCOMES OF THE USE OF THIS INFORMATION.
 - FOR DESIGN OF YOUR TENSION-CONTROLLED CONNECTIONS CONTACT TRANG IMAGINEERING ON 13 000 87264 OR EMAIL info@trang.com.au

DESIGNED AND ENGINEERED FOR:			DESIGNED AND ENGINEERED BY:			TRANG Imagineering			TRANG TECHNICAL REFERENCE DATA STANDARD BOLT TORQUE TABLE DRAWING No. TRANG-TRD-003			A3
A	04/09/23	INITIAL RELEASE	SB	GH	SB	TRANG IMAGINEERING 74 ASTILL DRIVE ORANGE NSW 2800 PHONE: 13 000 TRANG info@trang.com.au			ALL DIMENSIONS IN MM DO NOT SCALE THIRD ANGLE PROJECTION SHEET: 1 OF 1			
REV	DATE	DETAIL	BY	CHK	DES							