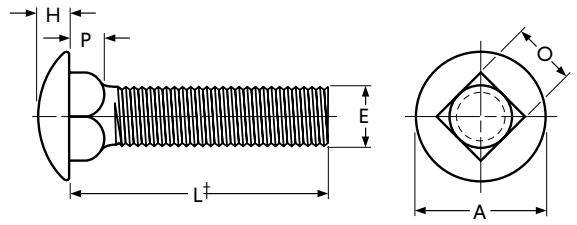
CONQUEST
CONQUER THE JOB

CAP SCREWS & BOLTS
CARRIAGE BOLTS, SQUARE NECK

LOW CARBON & HOT-DIP GALVANIZED



CARRIAGE BOLTS - SQUARE NECK

ASME B18.5-1990

Basic Bolt Diameter		E		A		H		O		P	
		Body Diameter		Head Diameter		Head Height		Square Width		Square Depth	
		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
•8	0.1640	0.173	0.157	0.328	0.298	0.102	0.083	0.169	0.155	0.108	0.078
10	0.1900	0.199	0.182	0.469	0.436	0.114	0.094	0 .199	0.185	0.125	0.094
•12	0.2160	0.225	0.206	0.500	0.468	0.149	0.125	0.215	0.197	0.135	0.105
1/4	0.2500	0.260	0.237	0.594	0.563	0.145	0.125	0.260	0.245	0.156	0.125
5/16	0.3125	0.324	0.298	0.719	0.688	0.176	0.156	0.324	0.307	0.187	0.156
3/8	0.3750	0.388	0.360	0.844	0.782	0.208	0.188	0.388	0.368	0.219	0.188
7/16	0.4375	0.452	0.421	0.969	0.907	0.239	0.219	0.452	0.431	0.250	0.219
1/2	0.5000	0.515	0.483	1.094	1.032	0.270	0.250	0.515	0.492	0.281	0.250
5/8	0.6250	0.642	0.605	1.344	1.219	0.344	0.313	0.642	0.616	0.344	0.313
3/4	0.7500	0.768	0.729	1.594	1.469	0.406	0.375	0.768	0.741	0.406	0.375

Tolerance on Length	Nominal Bolt Size	Nominal Bolt Length				
		Up to 1 in., incl.	Over 1 in. to 2-1/2 in., incl.	Over 2-1/2 in. to 4 in., incl.	Over 4 in. to 6 in., incl.	Over 6 in.
	No. 8 thru 3/8	+0.02 -0.03	+0.02 -0.04	+0.04 -0.06	+0.06 -0.10	+0.10 -0.18
	7/16 and 1/2	+0.02 -0.03	+0.04 -0.05	+0.06 -0.08	+0.08 -0.10	+0.12 -0.18
	9/16 thru 3/4	+0.02 -0.03	+0.06 -0.08	+0.08 -0.10	+0.10 -0.10	+0.14 -0.18

‡ Length of a carriage bolt is measured from the underhead bearing surface to the extreme end of the bolt.
• ASME B18.5-1990 does not specify dimensions for the #8 or #12 diameters. Data listed for these sizes is independent of the ASME specification.

LOW CARBON & HOT-DIP GALVANIZED CARRIAGE BOLT

X**

Description	Low Carbon Steel Carriage: Round head bolt with a square neck under the head, and a unified thread pitch. Made from low or medium carbon steel. Hot-Dip Galvanized Steel Carriage: Carriage bolt made from low or medium carbon steel with a galvanic zinc finish applied.
Applications/ Advantages	Low Carbon Steel Carriage: The square neck is designed to keep the bolt from turning as a nut is tightened. Hot-Dip Galvanized Steel Carriage: Same design advantages as a low carbon carriage bolt but with a thicker protective coating for outdoor use. Often used in outdoor furniture.
Material	Low Carbon Steel & Hot-Dip Galvanized Steel Carriage: AISI 1006 - 1050 or equivalent steel.
Core Hardness	Low Carbon Steel & Hot-Dip Galvanized Steel Carriage: Rockwell B70 - B100
Proof Load	Low Carbon Steel Carriage: 33,000 psi.
Yield Strength*	Low Carbon Steel Carriage: 36,000 psi. minimum
Tensile Strength	Low Carbon Steel Carriage: 60,000 psi. minimum
Elongation*	Low Carbon Steel Carriage: 18% minimum
Reduction of Area*	Low Carbon Steel Carriage: 35% minimum (all sizes)
Minimum Thread Length	The minimum length of thread shall be equal to twice the basic bolt diameter plus 0.25 in. for bolts 6 in. or shorter, and twice the diameter plus 0.50 in. for bolts longer than 6 in..
Plating	See Appendix-A for information on the plating of steel carriage bolts.

*These properties are tested only on machined specimens when the testing machine cannot provide for full testing of the parts.
**Product standards require the manufacturer's head marking to appear on the top of all bolts 1/4" diameter and larger. "X" represents one location such a marking may appear.

CONQUEST
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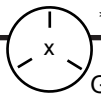
GRADE- 5& 8
1808 STAINLESS

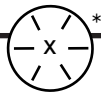
CARRIAGE BOLTS, SQUARE NECK

BOLTS &
CAP SCREWS

NOTE: Dimensions for Grade-5, Grade-8 & 18-8 Stainless Steel Carriage Bolts are listed on previous page.



GRADE-5 & GRADE 8 CARRIAGE BOLTS



	Grade-5	Grade-8
	Carriage bolt made from medium carbon steel and heat-treated.	Carriage bolt made from medium carbon alloy steel and heat-treated.
Applications/ Advantages	Same design advantages as a low carbon carriage bolt but with significantly greater load carrying capacity.	Same design advantages as a Grade-5 carriage bolt but with greater load carrying capacity.
Material	AISI 1030 - 1050 or equivalent steel.	Medium carbon alloy steel
Heat Treatment	Bolts shall be heat-treated, oil or water-quenched, at the option of the manufacturer, and tempered at a minimum temperature of 800° F.	Grade 8 carriage bolts shall be heat-treated, oil-quenched and tempered at a minimum temperature of 800° F.
Core Hardness	1/4 through 1 in. diameters: Rockwell C25 - C34	1/4 through 1 in. diameters: Rockwell C33 - C39
Surface Hardness	1/4 through 1 in. diameters: Rockwell 30N54 maximum	1/4 through 1 in. diameters: Rockwell 30N 58.6 maximum
Proof Load	1/4 through 1 in. diameters: 85,000 psi.	1/4 through 1 in. diameters: 120,000 psi.
Yield Strength	1/4 through 1 in. diameters: 92,000 psi. minimum	1/4 through 1 in. diameters: 130,000 psi. minimum
Tensile Strength	1/4 through 1 in. diameters: 120,000 psi. minimum	1/4 through 1 in. diameters: 150,000 psi. minimum
Elongation	14% minimum	12% minimum (all diameters)
Reduction of Area	35% minimum (all sizes)	35% minimum (all sizes)
Minimum Thread Length	The minimum length of thread shall be equal to twice the basic bolt diameter plus 0.25 in. for bolts 6 in. or shorter, and twice the diameter plus 0.50 in. for bolts longer than 6 in.	
Plating	See Appendix-A for information on the plating of steel carriage bolts.	Grade-8 carriage bolts are typically provided with a zinc yellow finish.

CARRIAGE BOLTS - STAINLESS STEEL, 18-8

Description	Round head bolt with a square neck under the head, and a unified thread pitch, made from austenitic alloy stainless steel.
Applications/ Advantages	Same design advantages as a low carbon carriage bolt but for use in environments which require general atmospheric corrosion resistance.
Material	18-8 stainless steel carriage bolts are made from one of the following austenitic alloys: 302 HQ, 303, 303Se, 304, XM7, all of which are characterized as having a chromium content of 17-19% and nickel content of 8-10%.
Heat Treatment	The austenitic alloys develop their strength through work hardening during the fastener manufacturing process, as seen from the hardness properties below. The only heat treatment normally available on austenitic stainless alloys is annealing, which is done at approximately 1900° F to a dead soft condition and is not normally thermally reversible.
Hardness	1/4 through 1/2 in. diameter: Rockwell B95 - C32.
Yield Strength	1/4 through 1/2 in. diameter, 2.25D and longer: 65,000 psi. minimum
Tensile Strength	1/4 through 1/2 in. diameter, 2.25D and longer: 100,000 - 150,000 psi. minimum
Elongation in 4D	1/4 through 1/2 in. diameter: 20% minimum
Minimum Thread Length	The minimum length of thread shall be equal to twice the basic bolt diameter plus 0.25 in. for bolts 6 in. or shorter.

*These properties are tested only on machined specimens when the testing machine cannot provide for full testing of the parts.
**Product standards require the manufacturer's head marking to appear on the top of all bolts 1/4" diameter and larger. "X" represents one location such a marking may appear.