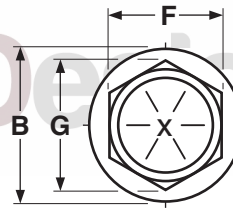
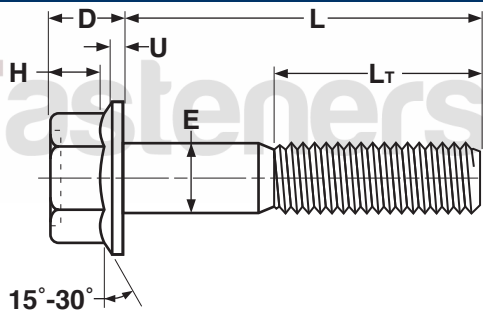


FRAME BOLTS, HEX WASHER Grade 8 & Stainless Steel



†Length of a frame bolt is measured from the underhead bearing surface to the extreme end of the screw.

FRAME BOLTS / FLANGE BOLTS													ASME B18.2.1 (2010) & SAE J429	
Nominal Size	E		F			G		B	U	D	H	L _T	Gr-8 Alloy Bolts Only	
	Body Diameter		Width Across Flats			Width Across Corners		Flange Diam.	Flange Thickness	Head Height	Hex Height	Thread Length	Tensile Strength, Lbs.	Proof Load, Lbs.
	Max	Min	Basic	Max	Min	Max	Min	Max	Min	Max	Min	Basic		
1/4	0.2500	0.2450	3/8	0.3750	0.367	0.433	0.409	0.56	0.04	0.28	0.17	0.750	4,750	3,800
5/16	0.3125	0.3065	1/2	0.5000	0.489	0.577	0.548	0.68	0.05	0.32	0.21	0.875	7,850	6,300
3/8	0.3750	0.3690	9/16	0.5625	0.551	0.650	0.618	0.81	0.06	0.39	0.25	1.000	11,600	9,300
7/16	0.4375	0.4305	5/8	0.6250	0.612	0.722	0.685	0.93	0.07	0.46	0.30	1.125	15,900	12,800
1/2	0.5000	0.4930	3/4	0.7500	0.736	0.866	0.825	1.07	0.08	0.51	0.34	1.250	21,300	17,000
5/8	0.6250	0.6170	15/16	0.9375	0.922	1.083	1.034	1.33	0.10	0.62	0.42	1.500	33,900	27,100
3/4	0.7500	0.7410	1-1/8	1.1250	1.100	1.299	1.234	1.59	0.11	0.73	0.51	1.750	50,100	40,100

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.
	1/4 to 3/8	-0.03	-0.04	-0.06
	7/16 and 1/2	-0.03	-0.06	-0.08
	5/8 and 3/4	-0.03	-0.08	-0.10

Description	A one-piece hex-washer head bolt with a flat bearing surface, made of high-alloy steel. Indented top of the head is optional	A one-piece hex-washer head bolt with a flat bearing surface, made of stainless steel. Indented top of the head is optional.
Applications/ Advantages	For use on truck frames. The flange eliminates washers and helps compensate for a misaligned hole. Used with a Grade-GT lock nut, the bolt system resists bolt slippage by distributing the clamp load over a wide area.	Used in applications where greater resistance to corrosion is required and increased bearing area is desired.
Material	AISI 4037 - 5135 or equivalent alloy steel	18-8 Stainless Steel
Heat Treatment	Grade-8 frame bolts shall be heat-treated, oil-quenched and tempered at a minimum temperature of 800°F.	-
Core Hardness	Rockwell C33 - C39	Overall Hardness:
Surface Hardness	Rockwell 30N58.6 maximum	1/4 thru 5/8" diameters: Rockwell B95 - C32 3/4 thru 1 1/2" diameters: Rockwell B80 - C32
Proof Load	120,000 psi.	-
Yield Strength	130,000 psi. minimum	1/4 thru 5/8" diameters: 65,000 psi. 3/4 thru 1 1/2" diameters: 45,000 psi.
Tensile Strength	150,000 psi. minimum	1/4 thru 5/8" diameters: 100,000 - 150,000 psi. 3/4 thru 1 1/2" diameters: 85,000 - 140,000 psi.
Coating	See Appendix-A for information on the plating of frame bolts.	Stainless flange bolts are usually supplied with no additional finish.

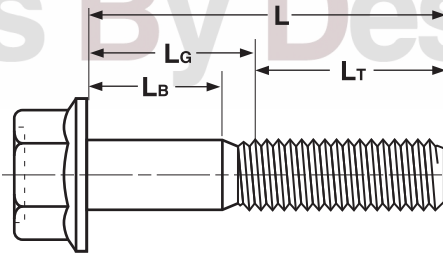
**Product standards require the manufacturer's head marking to appear on the top of all bolts 1/4" diameter and larger.

"X" represents one location such a marking may appear.

Thread Length Specifications

FRAME BOLTS, HEX WASHER

Fasteners By Design Inc.



HEX WASHER FRAME BOLTS													ASME B18.2.1-2010	
Maximum Grip Gaging Lengths, L_G , and Minimum Body Lengths, L_B														
Nominal Diameter	1/4		5/16		3/8		7/16		1/2		5/8		3/4	
Nominal Lengths	LB Min	LG Max	LB Min	LG Max	LB Min	LG Max	LB Min	LG Max	LB Min	LG Max	LB Min	LG Max	LB Min	LG Max
1-1/4														
1-3/8	0.225	0.625												
1-1/2	0.350	0.750	0.208	0.625										
1-5/8	0.475	0.875	0.333	0.750	0.187	0.625								
1-3/4	0.600	1.000	0.458	0.875	0.312	0.750								
1-7/8	0.725	1.125	0.583	1.000	0.437	0.875	0.286	0.750						
2	0.850	1.250	0.708	1.125	0.562	1.000	0.411	0.875	0.269	0.750				
2-1/8	0.975	1.375	0.833	1.250	0.687	1.125	0.536	1.000	0.394	0.875				
2-1/4	1.100	1.500	0.958	1.375	0.812	1.250	0.661	1.125	0.519	1.000				
2-3/8	1.225	1.625	1.083	1.500	0.937	1.375	0.786	1.250	0.644	1.125				
2-1/2	1.350	1.750	1.208	1.625	1.062	1.500	0.911	1.375	0.769	1.250				
2-5/8	1.475	1.875	1.333	1.750	1.187	1.625	1.036	1.500	0.894	1.375	0.352	1.125		
2-3/4	1.600	2.000	1.458	1.875	1.312	1.750	1.161	1.625	1.019	1.500	0.477	1.250		
2-7/8	1.725	2.125	1.583	2.000	1.437	1.875	1.286	1.750	1.144	1.625	0.602	1.375	0.325	1.125
3	1.850	2.250	1.708	2.125	1.562	2.000	1.411	1.875	1.269	1.750	0.727	1.500	0.450	1.250
3-1/4	2.100	2.500	1.958	2.375	1.812	2.250	1.661	2.125	1.519	2.000	0.977	1.750	0.700	1.500
3-1/2	2.350	2.750	2.208	2.625	2.062	2.500	1.911	2.375	1.769	2.250	1.227	2.000	0.950	1.750
3-3/4	2.600	3.000	2.458	2.875	2.312	2.750	2.161	2.625	2.019	2.500	1.477	2.250	1.200	2.000
4	2.850	3.250	2.708	3.125	2.562	3.000	2.411	2.875	2.269	2.750	1.727	2.500	1.450	2.250
4-1/4	3.100	3.500	2.958	3.375	2.812	3.250	2.661	3.125	2.519	3.000	1.977	2.750	1.700	2.500
4-1/2	3.350	3.750	3.208	3.625	3.062	3.500	2.911	3.375	2.769	3.250	2.227	3.000	1.950	2.750
4-3/4	3.60	4.000	3.458	3.875	3.312	3.750	3.161	3.625	3.019	3.500	2.477	3.250	2.200	3.000
5	3.850	4.250	3.708	4.125	3.562	4.000	3.411	3.875	3.269	3.750	2.727	3.500	2.450	3.250

Frame Bolt lengths above heavy black line are fully threaded (for parts made after 2002)

Fasteners By Design Inc.