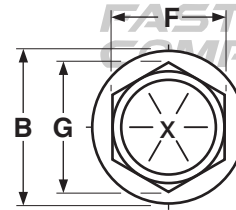
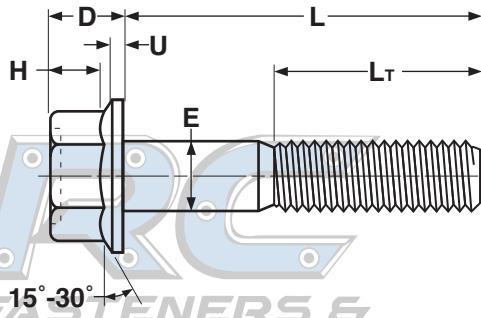


# FRAME BOLTS, HEX WASHER

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 <sub>T</sub> | 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                          |
|                     | 7/16 and 1/2      | -0.03               | -0.06                          | -0.08                          |
|                     | 5/8 and 3/4       | -0.03               | -0.08                          | -0.10                          |

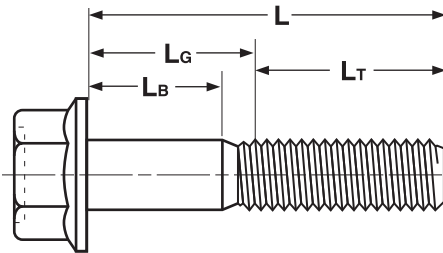
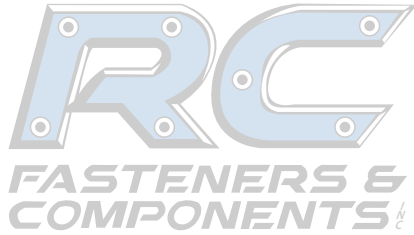
| Description              | A one-piece hex-washer head bolt with a flat bearing surface, made of high-alloy steel. Indented top of the head is optional   | A one-piece hex-washer head bolt with a flat bearing surface, made of stainless steel. Indented top of the head is optional. |
|--------------------------|--|--|
| 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:<br>1/4 thru 5/8" diameters: Rockwell B95 - C32<br>3/4 thru 1 1/2" diameters: Rockwell B80 - C32            |
| Surface Hardness         | Rockwell 30N58.6 maximum   |  |
| Proof Load               | 120,000 psi.   | -  |
| Yield Strength           | 130,000 psi. minimum   | 1/4 thru 5/8" diameters: 65,000 psi.<br>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.<br>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 & COMPONENTS



| 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)

