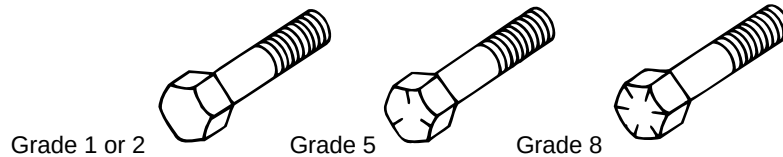


# METRICS

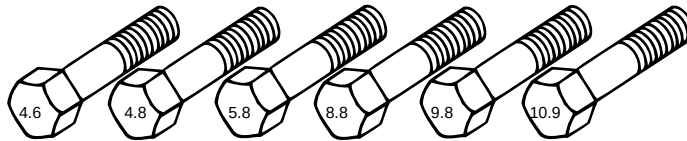
## BOLT STRENGTH IDENTIFICATION

### ENGLISH SYSTEM



**English bolts:** Identification marks on the bolt head represent Rockwell hardness. Generally, the bolt's grade is equal to the number of marks plus two. The higher the grade, the stronger the bolt.

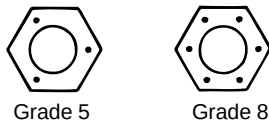
### METRIC SYSTEM



**Metric bolts:** Identification class numbers on bolt heads represent tensile strength. Higher numbers indicate stronger bolts. Common metric fastener bolt strength properties are 9.8 and 10.9.

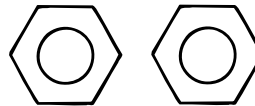
## HEX NUT STRENGTH IDENTIFICATION

### ENGLISH SYSTEM



Identification dots represent Rockwell hardness. The nut's grade is equal to the number of dots plus two. The higher the grade, the stronger the nut.

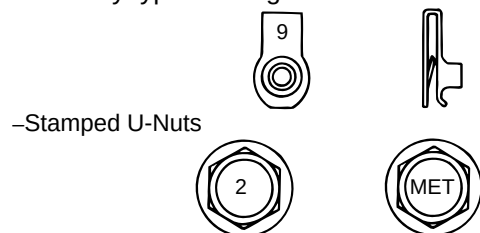
### METRIC SYSTEM



Identification class numbers on nuts represent tensile strength. Higher numbers indicate stronger nuts. Nuts may also have blue finish or paint daub on hex flat.

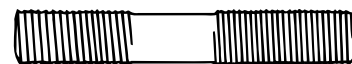
## OTHER TYPES OF PARTS

Metric identification schemes vary by type of part, most often a variation of that used for bolts and nuts. Note that many types of English and Metric fasteners carry no special identification if they are otherwise unique.



–Stamped U-Nuts

–Tapping, thread forming and certain other case hardened screws.



CLASS  
10.9



CLASS  
9.8



CLASS  
8.8

–Studs, Large studs may carry the property class number. Smaller studs use a geometric code on the end.

# METRICS

## ENGLISH/METRIC CONVERSION

| DESCRIPTION        | MULTIPLY                       | BY                                | FOR METRIC EQUIVALENT                    |
|--------------------|--------------------------------|-----------------------------------|------------------------------------------|
| Acceleration       | ft/s <sup>2</sup>              | 0.3048                            | m/s <sup>2</sup>                         |
|                    | in/s <sup>2</sup>              | 0.0254                            | m/s <sup>2</sup>                         |
| Torque             | lb-in                          | 0.11298                           | N·m                                      |
|                    | lb-ft                          | 1.3558                            | N·m                                      |
| Power              | horsepower                     | 0.746                             | kW                                       |
| Pressure or Stress | inches of water                | 0.2491                            | kPa                                      |
|                    | psi                            | 6.895                             | kPa                                      |
|                    | psi                            | 0.069                             | bar                                      |
| Energy or Work     | BTU                            | 1055.0                            | Joules(J)                                |
|                    | lb-ft                          | 1.3558                            | Joules(J)                                |
|                    | kiloWatt-hour                  | 3,600,000<br>or $3.6 \times 10^6$ | Joules(J)                                |
| Light              | foot candle                    | 10.764                            | lumens/square meter (lm/m <sup>2</sup> ) |
| Fuel Performance   | miles/gal                      | 0.4251                            | kilometers/liter (km/L)                  |
|                    | gal/mile                       | 2.3527                            | liters/kilometer (L/km)                  |
| Velocity           | mph                            | 1.6093                            | kilometers/hour (km/h)                   |
| Length             | inch                           | 25.4                              | mm                                       |
|                    | foot                           | 0.3048                            | m                                        |
|                    | yard                           | 0.9144                            | m                                        |
|                    | mile                           | 1.609                             | km                                       |
| Area               | square inch (in <sup>2</sup> ) | 645.2                             | mm <sup>2</sup>                          |
|                    | square ft (ft <sup>2</sup> )   | 6.45                              | cm <sup>2</sup>                          |
|                    |                                | 0.0929                            | m <sup>2</sup>                           |
|                    | square yard                    | 0.8361                            | m <sup>2</sup>                           |
| Volume             | cubic inch (in <sup>3</sup> )  | 16387.0                           | mm <sup>3</sup>                          |
|                    |                                | 16.387                            | cm <sup>3</sup>                          |
|                    |                                | 0.0164                            | liters (L)                               |
|                    | quart                          | 0.9464                            | liters (L)                               |
|                    | gallon                         | 3.7854                            | liters(L)                                |
|                    | cubic yard                     | 0.7646                            | m <sup>3</sup>                           |
| Mass               | pound                          | 0.4536                            | kg                                       |
|                    | ton                            | 907.18                            | kg                                       |
|                    | ton                            | 0.9078                            | tonne (t)                                |
| Force              | kilogram                       | 9.807                             | N                                        |
|                    | ounce                          | 0.2780                            | N                                        |
|                    | pound                          | 4.448                             | N                                        |
| Temperature        | degree Farenheit (°F)          | (°F-32) 0.556                     | degree Celsius (°C)                      |