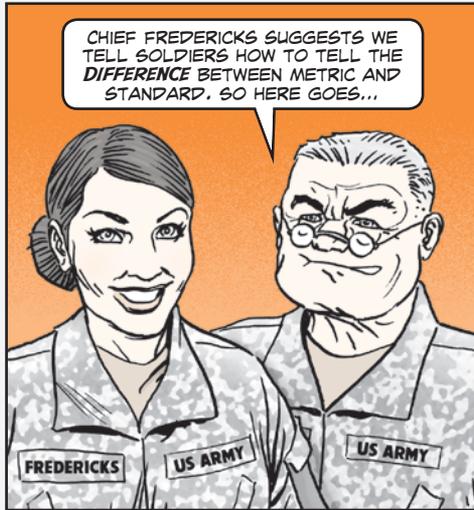
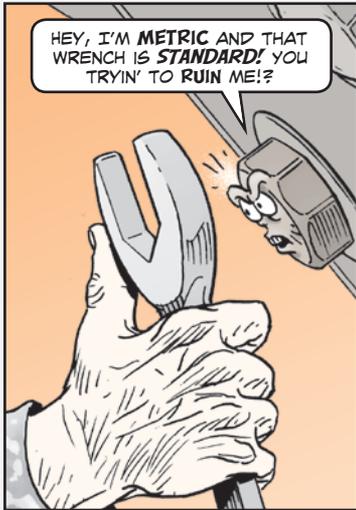


STANDARD VS METRIC: IT MAKES A DIFFERENCE!



Dear Editor,

I often find new mechanics using standard wrenches and sockets on metric bolts and vice versa. They either don't know how to tell the difference or they think it doesn't make any difference.

But it does make a difference. Using the wrong tool rounds off the bolt head and eventually it becomes difficult to remove the bolt. And when the wrench slips off the bolt, you can be injured.

It would be great if PS showed how to tell the difference between standard and metric fasteners and how to ID their grade/class.

CW2 Melissa Fredericks
KYARNG
London, KY

Editor's note: We agree, Chief. Here's the lowdown:

Bolts can be IDed by their head markings. If the bolt head is marked with 8.8, 10.9 or 12.9, it's a metric bolt and diameter, head, length and thread pitch are measured in millimeters.

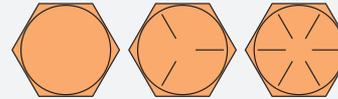
If the bolt has only three or six lines pointing toward the center of the head, the bolt is standard SAE (Society of Automotive Engineers).

Bolts are also classed for strength: grade for SAE and class for metric. Strength is measured by tensile strength, the load that the bolt can withstand before breaking, and yield strength, the maximum load at which the bolt shows .2 percent deformation.

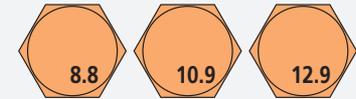
SAE Steel Bolts

Head Marking	Grade and Material	Bolt Diameter (inches)	Minimum yield strength (Ksi)*	Minimum tensile strength (Ksi)
No markings	Grade 2 (low or medium carbon steel)	1/4 - 3/4	57	74
3 radial lines	Grade 5 (medium carbon steel, quenched and tempered)	1/4 - 1	92	120
6 radial lines	Grade 8 (medium carbon alloy steel, quenched and tempered)	1/4 - 1 1/2	130	150
Stainless markings vary. Most stainless is non-magnetic	18.8 stainless steel	1/4 - 5/8	40-90	100-125

STANDARD



METRIC



Metric Steel Bolts

Head Marking	Grade and Material	Bolt Diameter (inches)	Minimum yield strength (Ksi)*	Minimum tensile strength (Ksi)
8.8	Class 8.8 (medium carbon steel, quenched and tempered)	up to 72 mm	93	116
10.9	Class 10.9 (alloy steel, quenched and tempered)	5mm-100mm	136	151
12.9	Grade 12.9 (alloy steel, quenched and tempered)	1.6mm-100mm	160	177
Metric stainless typically marked A-2	A-2 stainless steel	up to 20mm	65	102

This is a good story for repairmen to copy and keep in their tool boxes.

*KSI=1,000 psi