





TABLE 10.4 Specifications for Steel Used in Inch Series Screws and Bolts

SAE Grade	Diameter d (in.)	Proof Load (Strength) ^a S_p (ksi)	Yield Strength ^b S_y (ksi)	Tensile Strength S_u (ksi)	Elongation, Minimum (%)	Reduction of Area, Minimum (%)	Core Hardness, Rockwell		Grade Identification Marking on Bolt Head
							Min	Max	
1	$\frac{1}{4}$ thru $1\frac{1}{4}$	33	36	60	18	35	B70	B100	None
2	$\frac{1}{4}$ thru $\frac{3}{4}$	55	57	74	18	35	B80	B100	None
2	Over $\frac{3}{4}$ to $1\frac{1}{4}$	33	36	60	18	35	B70	B100	None
5	$\frac{1}{4}$ thru 1	85	92	120	14	35	C25	C34	
5	Over 1 to $1\frac{1}{4}$	74	81	105	14	35	C19	C30	
5.2	$\frac{1}{4}$ thru 1	85	92	120	14	35	C26	C36	
7	$\frac{1}{4}$ thru $1\frac{1}{4}$	105	115	133	12	35	C28	C34	
8	$\frac{1}{4}$ thru $1\frac{1}{4}$	120	130	150	12	35	C33	C39	

^aProof load (strength) corresponds to the axially applied load that the screw or bolt must withstand without permanent set.

^bYield strength corresponds to 0.2 percent offset measured on machine test specimens.

Source: Society of Automotive Engineers standard 1429K (1979).

TABLE 10.5 Specifications for Steel Used in Millimeter Series Screws and Bolts

SAE Class	Diameter d (mm)	Proof Load (Strength) ^a S_p (MPa)	Yield Strength ^b S_y (MPa)	Tensile Strength S_u (MPa)	Elongation, Minimum (%)	Reduction of Area, Minimum (%)	Core Hardness, Rockwell	
							Min	Max
4.6	5 thru 36	225	240	400	22	35	B67	B87
4.8	1.6 thru 16	310	—	420	—	—	B71	B87
5.8	5 thru 24	380	—	520	—	—	B82	B95
8.8	17 thru 36	600	660	830	12	35	C23	C34
9.8	1.6 thru 16	650	—	900	—	—	C27	C36
10.9	6 thru 36	830	940	1040	9	35	C33	C39
12.9	1.6 thru 36	970	1100	1220	8	35	C38	C44

^aProof load (strength) corresponds to the axially applied load that the screw or bolt must withstand without permanent set.

^bYield strength corresponds to 0.2 percent offset measured on machine test specimens.

Source: Society of Automotive Engineers standard J1199 (1979).