ME 360 21.11.29

1) 98% bolts or screws fail in tension

$$\sigma = \frac{F}{A_t}$$

F = tensile load

fail in body of bolt/screw

2) strip threads in bolt/screw (one thread)

$$A_s = \pi d_r W_i p \quad , \quad \text{Eq } 15.8a$$

A_s = strip area

W_i = area factor Table 15-5

$W_i = 0.8$ for bolt

$$\tau = \frac{F}{A_s} \qquad F = \text{axial load}$$

$$\sigma' = \sqrt{3}\,\tau \qquad \text{compare to strength}$$

3) strip thread in nut (one thread)

$$A_s = \pi d W_o p$$

W_o = area factor for d = 0.88

$$\tau = \frac{F}{A_s}$$

$$\sigma' = \sqrt{3}\,\tau$$

usually compare stress for stripping
3 threads to strength

$d < t$

$\frac{1}{4}$-20 into $t = 0.25$ in sheet
5 threads

torque generates axial force

T_i = applied torque
F = axial load

$T_i = 0.21\, F d$

$T_i = K_i F d$ Eq 15.23d
K_i Table 15-11

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strength of bolts
Table 15-6