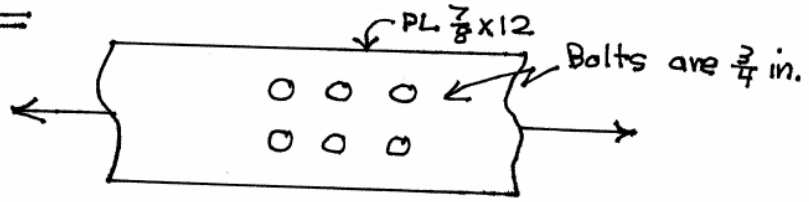
PROB # 3-2

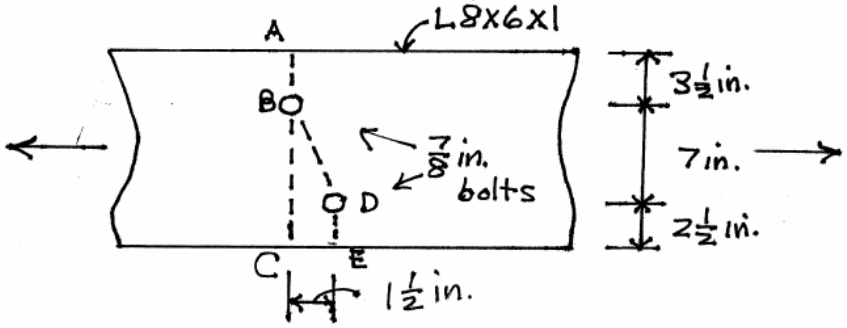


Net $A = (\frac{7}{8})(12) - (2)(\frac{3}{4}+\frac{1}{8})(\frac{7}{8}) = \boxed{8.97 \text{ in.}^2}$

rgcm

PROB # 3-12

Flattening angle



Net widths

$ABC = 13.00 - (1)(\frac{7}{8}+\frac{1}{8}) = 12.00$ in.

$ABDE = 13.00 - (2)(\frac{7}{8}+\frac{1}{8}) + \frac{(1.5)^2}{(4)(7)} = 11.08$ in. ←

Net Area $= (11.08)(1) = \boxed{11.08 \text{ in.}^2}$

rgcm

PROB # 3-30

Using a W14X61 ($A_g = 17.9$ in.^{2}, $d = 13.9$ in., $b_f = 10.0$ in., $t_f = 0.645$ in.)

Nominal or available tensile strength of member

$$P_n = F_y A_g = (50)(17.9) = 895 \text{ k}$$

(a) Gross section yielding

LRFD $\phi_t = 0.90$	ASD $\Omega_t = 1.67$
$\phi_t P_n = (0.90)(895) = 805.5$ k	$\frac{P_n}{\Omega_t} = \frac{895}{1.67} = 535.9$ k

(b) Tensile rupture strength

$A_n = 17.9 - (4)\left(\frac{3}{4} + \frac{1}{8}\right)(0.645) = 15.64$ in.^{2}

$\bar{x} = \bar{y} = 1.25$ in. for half of a W14X61 (WT 7X34.5)

$U = 1 - \frac{1.25}{8} = 0.843$

$b_f = 10.00 > \left(\frac{2}{3}\right)(13.9) = 9.27$ in.

$\therefore U = 0.90$ Case 7 AISC Table D3.1

$A_e = U A_n = (0.90)(15.64) = 14.08$ in.^{2}

$P_n = F_u A_e = (65)(14.08) = 915.2$ k

LRFD $\phi_t = 0.75$	ASD $\Omega_t = 2.00$
$\phi_t P_n = (0.75)(915.2) = 686.4$ k	$\frac{P_n}{\Omega_t} = \frac{915.2}{2.00} = 457.6$ k

Ans. LRFD = **686.4 k** ASD = **457.6 k**

✓ JCMC