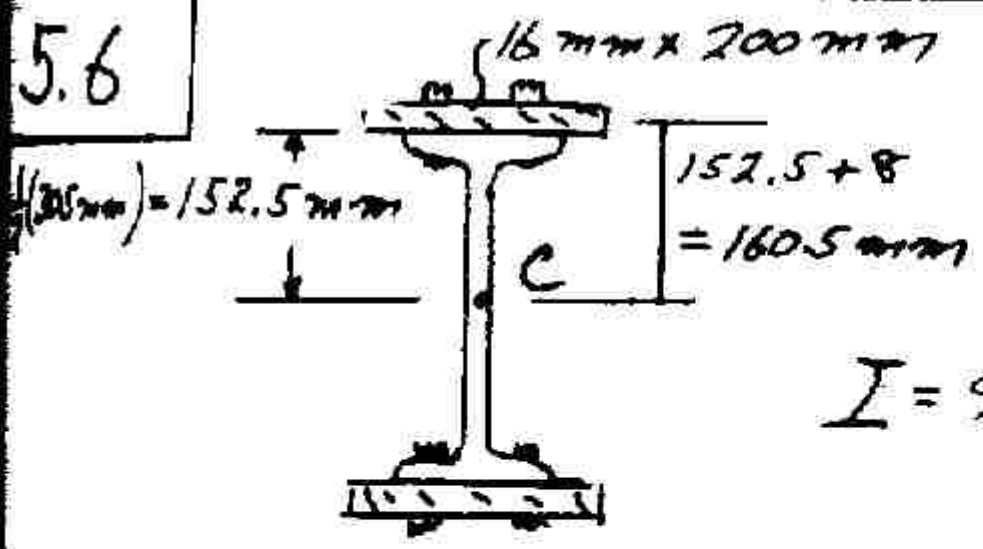
5.6



S310 x 52

$I = 95.3 \times 10^6\ mm^4$

$$I = 95.3 \times 10^6\ mm^4 + 2\left[(16\ mm \times 200\ mm)(160.5\ mm)^2\right]$$

$$I = 260.17 \times 10^6\ mm^4 = 260.17 \times 10^{-6}\ m^4$$

$$Q = (16\ mm \times 200\ mm)(160.5\ mm)$$

$$= 513.6 \times 10^3\ mm^3 = 513.6 \times 10^{-6}\ m^3$$

ALLOWABLE FORCE/BOLT: $d = 18\ mm$ $\tau_{all} = 90\ MPa$

$$F = \tau A = (90\ MPa)\frac{\pi}{4}(0.018\ m)^2 = 22.9\ kN$$

FOR SPACING $S = 120\ mm$, $q = \frac{2F}{S} = \frac{2(22.9\ kN)}{0.120\ m} = 381.67\ kN/m$

$q = \frac{VQ}{I}$; $381.67\ kN/m = \frac{V(513.6 \times 10^{-6}\ m^3)}{260.17 \times 10^{-6}\ m^4}$

$V = 193.3\ kN$ ◀