

Design of Riveted Joint

Step ① Dia of rivet \Rightarrow

By Unwin's formulae

$$\text{Nominal Dia of rivet} = 6\sqrt{t} \text{ (mm)}$$

$$\text{① Gross Dia} = \text{Nominal Dia} + 1.5$$

If (Nominal Dia \leq 25 mm)

$$\text{② Gross Dia} = \text{Nominal Dia} + 2 \text{ mm}$$

(Nominal Dia $>$ 25 mm)

Step ② Pitch of rivet

② (a) If the efficiency is known to us

$$\eta = \frac{p-d}{p} \times 100$$

(known)

$d =$ Gross dia (from Step 1)

we can calculate 'p'

(b) If efficiency is not known to us
~~For~~ consider per pitch length

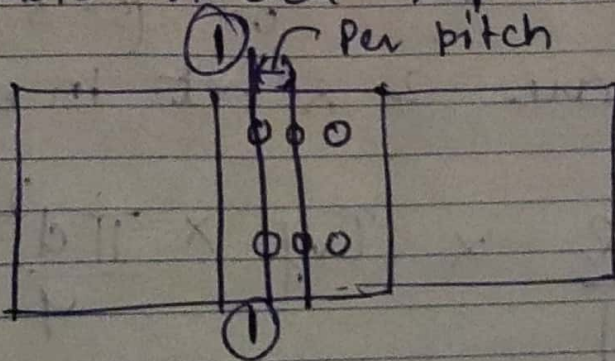
$$\sigma_{at} (p - nd) \times t = \text{Min. of } P_s \text{ \& } P_o$$

Term L
For Joint

$$\sigma_{at} = 150 \text{ (for plate)}$$

Term m

for double riveted Lap Joint



for per pitch

$$\text{Term L} = \sigma_{at} (p - nd) \times t$$

$$\sigma_{at} = 150 \text{ N}$$

$$n = 2$$

t = thickness of least of

(a) plate

(b) Total cover plate thickness

Term m

For one rivet

$$P_s = \tau_{vf} \times \frac{\pi d^2}{4} \rightarrow \text{single shear}$$

for double cover butt joint $\Rightarrow P_s = 2 \times \tau_{vf} \times \frac{\pi d^2}{4}$

$$P_b = \sigma_{pf} \times d \times t$$

has

But in a case of ~~1-1~~ (1-1) or (2-2) or (3-3)

There are 2 rivets in all the section

$$\text{So } P_s = \underbrace{2}_{\substack{\text{no of} \\ \text{rivets} = 2}} \times \tau_{vf} \times \frac{\pi d^2}{4}$$

$$P_b = 2 \times \sigma_{pf} \times d \times t$$

Equating both term we can
find out p

Minimum pitch $\geq 2.5 \times$ Nominal dia of rivet

Step-3

$$\text{No. of rivet} \Rightarrow \frac{\text{Load}}{\text{Rivet value}}$$

Rivet value is always calculated for one rivet which is minimum of P_s & P_b

$$\text{Load} = \text{given}$$

Step-4

Arrangement of rivet \rightarrow It can be arranged as chain or zig zag.

Note If there is any question where you have to find out only number of rivet of joint there you can take the value of

(1) pitch = $3 \times$ Nominal dia

(2) edge distance = $2 \times$ Nominal dia