Calculations

Here, the thickness of the plate is 7mm so, d is obtained by equating crushing strength to the shear strength of the joint.

$$\therefore S_c t = \frac{\pi}{4} \cdot d \cdot S_s$$

$$\Rightarrow 120 \times 10^6 \times 0.007 = \frac{\pi}{4} \cdot d \times 60 \times 10^6$$

$$\Rightarrow d = 17.82 \, mm$$

since the next standard size is 19 mm

$$\boxed{\therefore \text{ diameter of the hole} = 19 \, mm}$$

$$\boxed{\text{Corresponding rivet diameter} = 19 \, mm}$$

To Calculate the pitch (p)

$$S_t (p-d)t = S_s \times 2\left(\frac{\pi}{4}\right)d^2$$

$$\Rightarrow (90 \times 10^6 (p - 0.019) \times 0.007) = 60 \times 10^6 \times 2 \times \frac{\pi}{4} \times 0.019^2$$

$$\Rightarrow \boxed{p = 73 \, mm}$$

To Calculate Head diameter (D)

$$D = 1.5d$$

$$\Rightarrow D = 1.5 \times 19 \, mm$$

$$\Rightarrow \boxed{D = 28.5 \, mm}$$

To calculate margin(m)

$$m = 1.5d$$

$$\Rightarrow \boxed{m = 28.5 \, mm}$$

To calculate P_d

$$P_d = \frac{P}{3} + \frac{2d}{3}$$

$$\Rightarrow \boxed{P_d = 37 \, mm}$$

28.5 73 PITCH 73 73

28.5 37 28.5 LAP

28.5

19