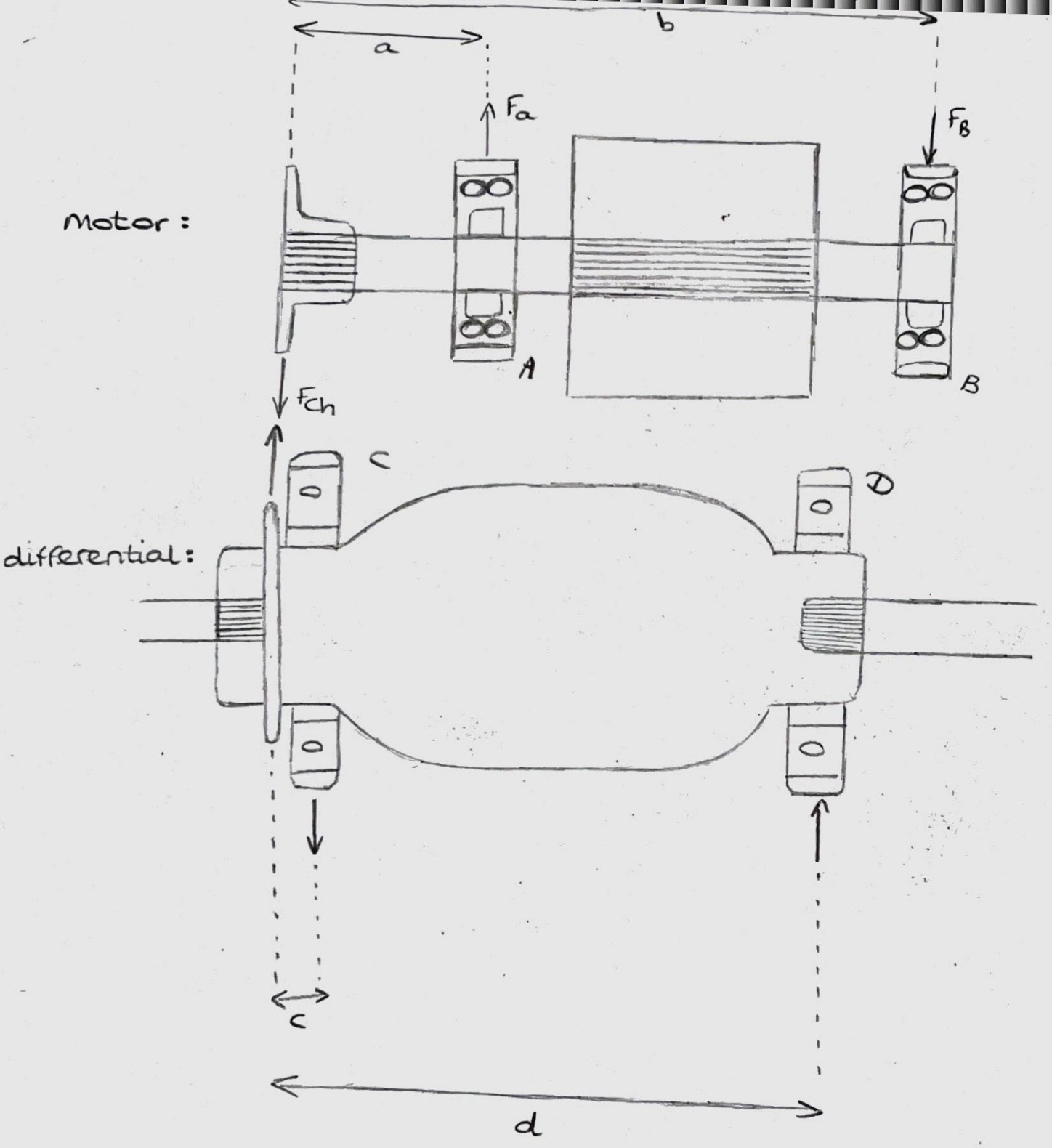


motor: $\downarrow F_{ch} = +F_a - F_b \quad \cdots ①$

$\circlearrowleft_B 0 = (b \times F_{ch}) - [(b-a) \times F_a] \quad \cdots ②$

$(F_{ch} \times b) = (b-a) \times F_a$

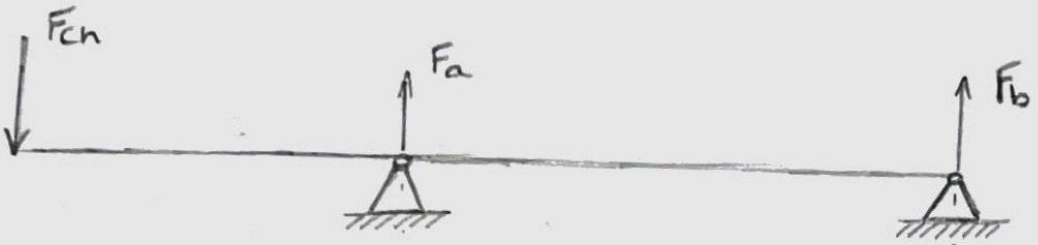
$F_a = \dfrac{F_{ch} \times b}{b-a}$

$F_b = F_a - F_{ch} = F_{ch}\left[\left(\dfrac{b}{b-a}\right) - 1\right]$

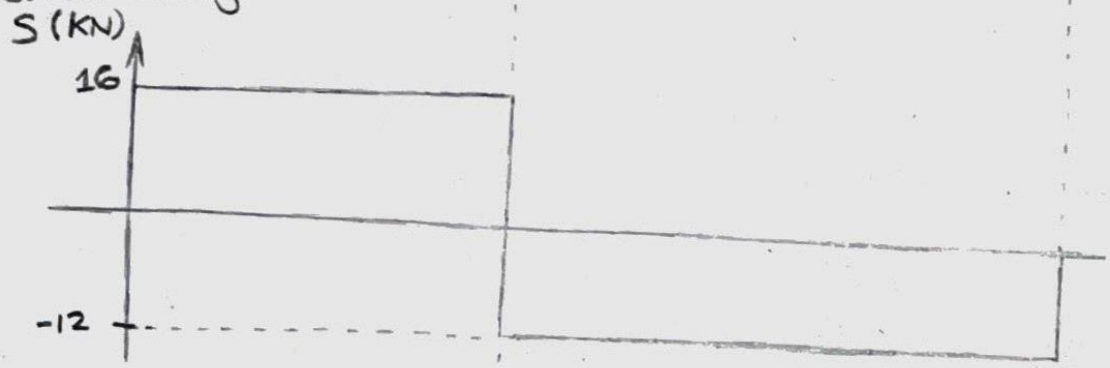
$= \left[\left(\dfrac{b}{b-a}\right) - \left(\dfrac{b-a}{b-a}\right)\right] F_{ch}$

$\therefore F_a = \left(\dfrac{a}{b-a}\right) F_{ch}$

Bending Stress in Shaft:



Shear diagram:



Bending Moment Diagram: