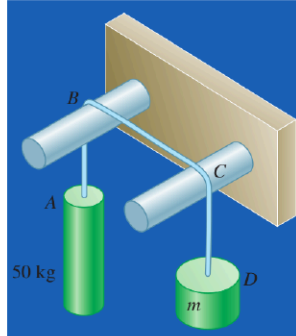


Two cylinders are connected by a rope that passes over two fixed rods as shown. Knowing that the coefficient of static friction between the rope and the rods is 0.40, determine the range of the mass m of cylinder D for which equilibrium is maintained.

$$\beta = 180^\circ$$



$$50 \cdot 9.81 = 490 \text{ N}$$

$$\frac{T_1}{T_2} = e^{\mu_s \beta}$$

$$\beta = 180^\circ \left(\frac{2\pi}{360^\circ} \right) = \pi$$

$$\frac{T_1}{T_2} = e^{0.4\pi} = 3.51$$

$$\frac{490}{w} = 3.51 \Rightarrow \frac{490}{3.51} = w = 139 \text{ N} \Rightarrow 14.2 \text{ kg}$$

$$\frac{w}{490} = 3.51 \Rightarrow 3.51 \cdot 490 = w = 1720 \text{ N} \Rightarrow 176 \text{ kg}$$

Stationary if $14.2 \leq m \leq 176 \text{ kg}$