Question:

Click Here (https://www.chegg.com/homework-help/questions-and-answers/figure-shown-8m-diameter-cylinder-weighs-500n-rests-bottom-tank-3m-long-water-oil-poured-l-q102306996)

Step 1 of 2

As per given data in the question ,

dia of cylinder =8m

weight of cylinder =500 N

tank depth on oil side =4m

tank depth on water side=2m

Calculation ;-

Sum horizontal forces acting on cylinder is equivalent to

$$\left[9{,}810 \times 0.75 \times \tfrac{4}{2} \times (3 \times 4)\right] - \left[9{,}810 \times \tfrac{2}{2} \times (3 \times 2)\right]$$

=117720 N

=117.720 KN

therefore,

the magnitude of the **horizontal components** of the force which will keep the cylinder touching the tank at point B is **117.720 KN towards right.**

Step 2 of 2

Now , Sum of vertical component of force acting on the cylinder from fluids are equivalent to -

$\Rightarrow \mathrm{P_V1} + \mathrm{P_V2}$—weight of cylinder

$$\left[9{,}810 \times 0.75 \times 3\left(\tfrac{90\times\pi}{360} \times 4^2\right)\right] + \left[9{,}810 \times 1 \times 3\left\{\left\{\tfrac{\pi\times 60}{360} \times 4^2\right\} - \left\{\tfrac{1}{2} \times 2 \times \sqrt{4^2 - 2^2}\right\}\right\}\right] - \mathrm{weightofcyl} \in$$

= 92410.2 +144478.68946-500

=**236388.8895 N toward bottom**

= 236.3888895 KN toward bottom

Final Answer

All the answer have been calculated above.