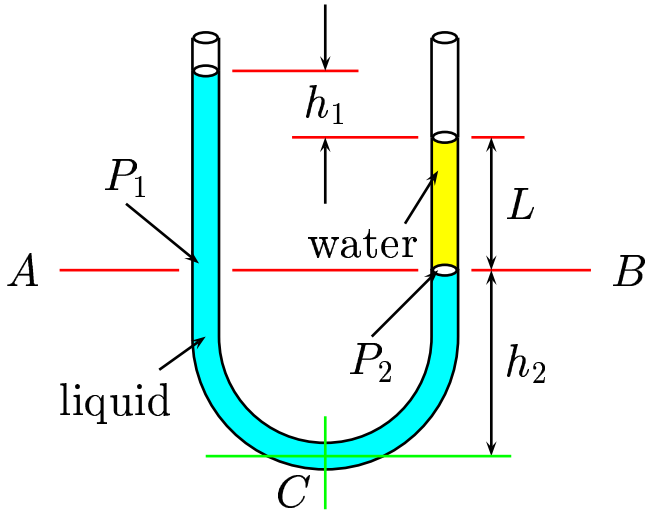


A U tube is filled with a liquid and water. Here the water is denser than the liquid. See the sketch. The horizontal line  $\overline{AB}$  is at the level of the the water-liquid interface.



Compare the pressure  $P_2$ , which the water column exerts on the liquid at the interface, and the pressure  $P_1$ , which the liquid column at the left tube above the line  $\overline{AB}$  exerts on the liquid below it.

- A)  $P_1 < P_2$ .
- B)  $P_1 = P_2$ .
- C)  $P_1 > P_2$ .

Denote  $P_0$  to be the atmospheric pressure.

At point C, which is at the bottom of the U-tube and it is a static point, the pressure from the left must be the same as the pressure from the right.

This implies that

$$P_0 + \rho_{liquid} g (h_1 + L + h_2) = P_0 + \rho_{water} g L + \rho_{liquid} g h_2. \quad (1)$$

Since

$$P_1 = P_0 + \rho_{water} g L$$

and

$$P_2 = P_0 + \rho_{liquid} g (h_1 + L),$$

we see Eq. (1) implies

$$P_1 = P_2.$$

**Answer B**

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