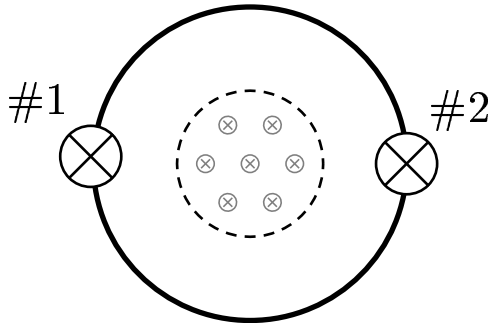


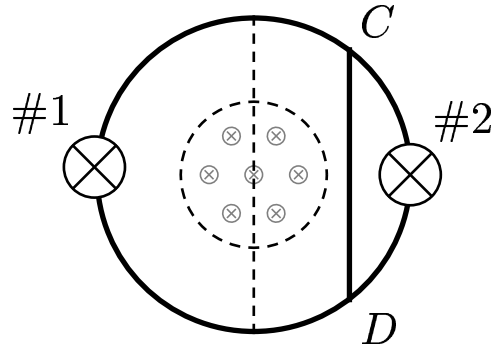
A solenoid is producing the same steadily increasing magnetic flux through two circular circuits shown below.

Case A: Two identical bulbs #1 and #2 are in series. Each has a resistance R . Their brightnesses (or their electric powers) are the same, i.e. $P_1 = P_2$.

Case B: There is a short CD which is to the right of the center line. We label the respective electric powers of the bulbs by P'_1 , and P'_2 .



Case A



Case B

Compare the power of bulb #1 for the two cases.

- A) $P'_1 < P_1$
- B) $P'_1 = P_1$
- C) $P'_1 > P_1$

For case A, denote I to be the loop current, the loop equation is:

$\mathcal{E} - 2IR = 0$, or $I = \frac{\mathcal{E}}{2R}$. For case B, label currents through the bulbs

by I'_1 and I'_2 , and through the short by I' . The loop equations for $C1DC$ and $C2DC$ are : $\mathcal{E}'_1 - I'_1 R = 0$ and $\mathcal{E}'_2 - I'_2 R = 0$ respectively. The emf is proportional to area of the enclosed flux. Thus $I'_1 > I > I'_2$, or $P'_1 > P_1$.

Answer **C**.