$I$ is flowing along the positive $y$-axis in $yz$-plane at $x = 0$. The current direction is shown by arrows in the current sheet. At some instant after turning on $I$, the front of the $\vec{B}$ field passes window $ABCD$ with speed $v$ as shown in the figure.

Determine the direction of $\vec{E}$ at $A'$.

A) The direction of $\vec{E}$ is $\uparrow$.
B) The direction of $\vec{E}$ is $\rightarrow$.
C) The direction of $\vec{E}$ is $\downarrow$.
D) The direction of $\vec{E}$ is $\leftarrow$. 
Faraday’s law: $\mathcal{E} = \oint \vec{E} \cdot \vec{d}s = -\frac{d\phi}{dt}$; $\mathcal{E} = EL$ and $\phi = BLx$. Faraday’s law implies that the induced emf is out of the window, or the induced field $\vec{E}$ is along $AD$, i.e. it is down.

Answer C.

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