$I$ 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: \( \mathcal{E} = \int \vec{E} \cdot d\vec{s} = -\frac{d\phi}{dt} \); \( \mathcal{E} = EL \) 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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