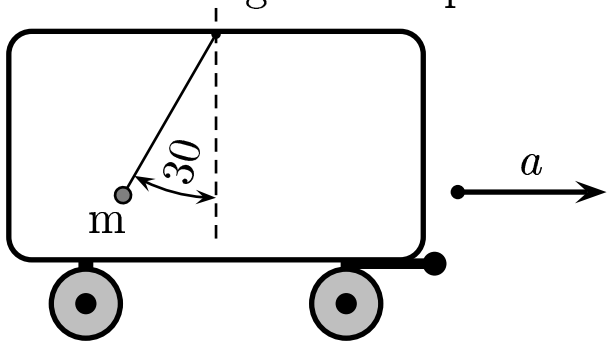
A simple pendulum is suspended at the ceiling of a box car. The car is accelerating with an acceleration $a$. To an observer inside of the box, the mass $m$ is not moving with respect to him.




So in this accelerating frame; *i.e.*, the non-inertial frame, the acceleration $a_{non-inertial} = 0$.

Identify the equation below which states "$F = m\,a$" in this non-inertial frame.

A) $T - m\,a = 0$.
B) $T + m\,a = 0$.
C) $T = m\,a$.

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*Explanation:* To someone on the ground, which is an inertial frame (not the non-inertial frame), "$F = m\,a$" says $T \sin\theta = m\,a$.

However, in the non-inertial frame, where $a_{non-inertial} = 0$, the corresponding net force must be $F_{non-inertial} = T - m\,a = m\,a_{non-inertial} = 0$.

Here "$-\,m\,a$" is the inertial force, which is the "fictitious force".

This fictitious force is present only in an accelerating frame, which the present case this is the box car frame.

Answer **A**.