

# Lifting a car with two phone books

December 16 2015

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Vehicle lifted using two interleaved phone books. Credit: France 5/2P2L

Astonishingly, it turns out to be practically impossible to separate two interleaved phone books by pulling on their spines, however much force is applied. It is even possible to suspend a car from them.

Using a model that reproduces the [traction](#) and friction forces involved, researchers have shown that when the spines of the interleaved phonebooks are pulled on vertically, part of the vertical force is converted into a horizontal force that presses on the sheets. The pages then remain stuck together due to friction.

The work, which began as a result of a challenge on the program *On n'est pas que des cobayes* on the France 5 TV channel, will be published in January 2016 in the journal *Physical Review Letters*, and is already

available on ArXiv.



Close-up of the interleaved phone books. Credit: France 5/2P2L



Experimental device used in the laboratory to measure the friction force. Credit: Frédéric Restagno et Christophe Poulard

**More information:** Self-amplification of solid friction in interleaved assemblies, [arxiv.org/abs/1508.03290](https://arxiv.org/abs/1508.03290)

Provided by CNRS

Citation: Lifting a car with two phone books (2015, December 16) retrieved 20 April 2024 from <https://phys.org/news/2015-12-car.html>

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