

English summaries

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A mathematical model of weightlifting

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Summary. In the weightlifting the competitors are divided into different weight classes. In the competitions there are two ways of lifting: snatch as well as clean and jerk. At the first stage it is typical of both of them that the barbell should be lifted up to the proper height h , so that the lifter is able to go underneath the barbell. The second stage is the rising up with the barbell from the squat. As the first stage is the most important one for the success of a lift, it is studied foremost. The dynamical model is easily derived through the energy principle. When lifting the barbell, the work done is at last turned into potential energy. It is worthwhile to introduce the dimensionless representation referred to the size of the lifter. The quality of a lift is described through the performance index, which makes it possible to compare the results lifted in snatch as well as in clean and jerk at different weight classes.

Key words: lifter similarity, dimensionless representation, characteristic lift parameters, performance index

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An inconsistency in Saint Venant's torsion of a thin-walled beam

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Summary. A contradiction in the Saint-Venant torsion of thin-walled bars is considered. The contradiction is associated with the fact that the twisting moment evaluated by the Saint-Venant's stress function and by the corresponding shearing stresses are not equal: the latter is only half of the former. The contents of the contradiction are discussed first in connection with a thin-walled rectangular cross section. Next a curved thin-walled cross section with a constant thickness and finally a curved thin-walled cross section with a varying wall thickness are considered.

Key words: Saint Venant's torsion, thin-walled cross-section, inconsistency