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On trensverse vibration of belts

The paper examines the transverse vibrations of belts and the impact of the vibration modes on unstable speed ranges. Supposing large deformations, it produces a more general non-linear motion of equation for the vibrations, which may be suitable for the examination of further linear and non-linear vibrations. It is shown that in the course of the belt motion, parametrically excited non-linear vibrations develop. The parametrical excitation is caused by the change in length of the belts resulting from the eccentricity of one of the belt pulleys. Next the paper examines the impact of vibration modes developing during the transverse vibrations of the belts on the main instability range. A first approximation of a closed form is developed for the main instability ranges of transverse vibrations. It is shown that the instability ranges belonging to the higher vibration modes become wider and tend to move towards higher numbers of revolutions.

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