

Monitoring of Belt-Drive Defects Using the Vibration Signals and Simulation Models

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Abstract : The main aim of this paper is to dedicate the belt drive system faults like cogs missing, misalignment and belt worm using vibration analysis technique. Experimentally, the belt drive test-rig is equipped to measure vibrations signals under different operating conditions. Finite element 3D model of belt drive system is created and vibration response analyzed using commercial finite element software ABAQUS/CAE. Root mean square (RMS) and Crest Factor will serve as indicators of average amplitude of envelope analysis signals. The vibration signals pattern obtained from the simulation model and experimental data have the same characteristics. It can be concluded that each case of the RMS is more effective in detecting the defect for acceleration response. While Crest Factor parameter has a response with the displacement and velocity of vibration signals. Also it can be noticed that the model has difficulty in completing the solution when the misalignment angle is higher than 1 degree.

Keywords : simulation model, misalignment, cogs missing, vibration analysis

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