

Reducing the vibrations of an unbalanced rotary engine by active force control

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Abstrak

In this article, the Active Force Control (AFC) method is implemented for reducing the vibrations that are caused by an unbalanced rotary engine. By using Matlab Simulink, the dynamic model of an unbalanced rotary engine was simulated. Then a Proportional–Integral–Derivative PID controller with the AFC loop was added. The obtained simulation results proved that when the PID controller was operating without the AFC loop, the vibrations were reduced but with very less efficiency when compared to the case in which the AFC loop was engaged with the PID controller. This means that the amplitude of vibrations was extremely reduced when the PID controller was equipped with the AFC loop, and the same results were observed for the frequency domain case. The robustness of the AFC method was also tested and again the method of AFC was very capable in reducing the vibrations.