عنوان مقاله:

Electromagnetic Valve Control in Internal Combustion Engines by PID

محل انتشار:

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خلاصه مقاله:

Engines with variable poppet valve timing systems are among numerous efforts that aim to reduce engine emissions and/or increase efficiency. In the present paper we have investigated the stability of a magnetic valve system in MATLAB. First we designed the magnet and interactive forces inside the electromagnetic valve system, then we produced a mechanical model for the system by using a two degree of freedom mass and spring system and finally designed a PID controller to maintain system stability. The results of the present study indicate that the controller had decreased the maximum valve displacement domain and duration from ۲ mm to ۰.۰۰۱ mm and ۰.۱ seconds to ۰.۰۲۲ seconds, respectively. Poppet valve settling speed was ۰.۰۱۲۶ and had a standard deviation of ۰.۱۳۰۴ while the armature settling speed was ۰.۰۱۸۴, with a standard deviation of ۰.۱۳۶۳. Passes for the phases were -۳۷.۵ and -۱۶۹, with gains of ۱۰.۳ and -۹.۳۵.

کلمات کلیدی:

Electromagnetic poppet valve actuator, Hossein Sharifi, en, Variable poppet valve timing system, Islamic Azad University, Magnetic capacity, Majlesi Branch, PID Controller, Department of Electrical Engineering