

عنوان مقاله:

HYDRO-PNEUMATIC SEMI-ACTIVE RESETTABLE DEVICE BY USING MR-FLUID (MR-HSRD) FOR VIBRATION SUPPRESSION

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خلاصه مقاله:

In this article, a novel hydro-pneumatic semi-active resettable device is proposed and studied for vibration suppression applications. The novel device consists of a cylinder-piston system with a control valve as well as a MR-valve mounted on a bypass pipe connecting two sides of the cylinder. The cylinder has two chambers; each chamber contains two parts, pressured gas and MR-fluid. The device behaves effectively as a spring with an adjustable unstressed length. The MR-HSRD is set by changing the stiffness and the damping of the device independently. Moreover, the hysteresis behaviour can be changed by using different control logics for control valve. The stiffness is changed by altering the gas pressure and damping can be adjusted by altering the electrical current. When the device is excited by external load, at the instants when energy in the device is maximized, this energy is dissipated as heat in the MR-fluid by opening a control valve for a short time interval and letting the MR-fluid to flow through the MR-valve. This dissipates the main part of input energy, which is stored in the pressurized gas. In this paper, the experimental results of the MR-HSRD under cyclic loading are presented and the ability of the MR-HSRD for vibration suppression is studied.

کلمات کلیدی:

semi-active control, magneto-rheological fluid, MR-valve, hydro-pneumatic actuator, resettable device, hysteresis behaviour, variable stiffness

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