An Experimental Design of Bypass Magneto-Rheological (MR) damper (Confinement Form)

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Abstract

The magneto-rheological (MR) fluid bypass damper fluid flow through a bypass by utilizing an external channel which allows the controllability of MR fluid in the channel. The bypass MR damper (BMRO) contains a rectangular bypass flow channel, current controlled movable piston shaft arrangement and MR fluid. The static piston coil case is winding by a coil which is used inside the piston head arrangement. The current controlled coil case provides a magnetic flux through the MRRO cylinder for controllability. The high strength ofesty oil materials are used for making piston shaft which allows magnetic flux propagation throughout the BMRO cylinder. Using the above design material, a BMRO MR damper is designed and tested. An experiment is applied during the experiment which characterized the BMRO controllability. It is shown that the BMRO with external flow channel allows a high controllable damping force using an excitation current. The experimental result of damping force-displacement characteristic with current excitation and without current excitation are compared in this research. The BMRO model is validated by the experimental result at various frequencies and applied excitation current.

Keywords: Magneto-Rheological damper; Bypass flow; External flow channel.

References (2)

