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Influence of Characteristic Parameters on Contact Bounce in Reed Systems of Relays

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ABSTRACT:

The contact bounce of relays, which is the main cause of electric abrasion and material erosion, is inevitable. This paper presents an investigation of the parameters influencing the dynamics characteristics of contact bounce under different current loading. An experimental model system is designed, which simulates the direct-driven reed systems of relays. The measurements of small bouncing displacement and dynamic contact force have been achieved separately using a high-precision laser displacement sensor and piezoelectric quartz sensor. Several results have been obtained: with driving force augmenting, the range of dynamic contact force variety, the maximum impact speed and overtravel of contacts increased, but the maximum bouncing displacement and time decreased; the first coefficient of restitution had a increasing tendency while the subsequent coefficients had a decreasing tendency of reduction. The overtravel of contacts increased, and the range of dynamic contact force variety and the maximum impact speed decreased, while the maximum bouncing displacement and time have a tendency of first decrease then increase, corresponding to the increase of current. The coefficients of restitution have a decreasing tendency along with the current increasing. The experimental results would be helpful to the further study of the characteristic of contact bounce in DC Electromagnetic Relay.

KEY WORDS: relay; contact bounce; reed systems; current loading

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