

A Theoretical Study of Multi-Leaf Spring in Seismic Response Control

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Abstract : Leaf spring dampers are used for commercial vehicles and heavy tracks. The main function of this damper in these vehicles is protection against damage and providing comfort for drivers by creating suspension between road and vehicle. This paper presents a new device, circular leaf spring damper, which is frequently used on vehicles, aiming to gain seismic protection of structures. Finite element analyses were conducted on several one-story structures using finite element software (Abaqus, v6.10-1). The time history analysis was conducted on the records of Kobe (1995) and San Fernando (1971) ground motions to demonstrate the advantages of using leaf spring in structures as compared to simple bracing system. This paper also suggests extending the use of this damper in structures, considering its large control force despite high cycle fatigue properties and low prices.

Keywords : bracing system, finite element analysis, leaf spring, seismic protection, time history analysis

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