

## Vibration Control of a Tracked Vehicle Driver Seat via Magnetorheological Damper

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**Abstract :** Tracked vehicles are exposed to severe operating conditions during their battlefield. The suspension system of such vehicles plays a crucial role in the mitigation of vibration transmitted from unevenness to vehicle hull and consequently to the crew. When the vehicles are crossing the road with high speeds, the driver is subjected to a high magnitude of vibration dose. This is because of the passive suspension system of the tracked vehicle lack the effectiveness to withstand induced vibration from irregular terrains. This paper presents vibration control of a semi-active seat suspension incorporating Magnetorheological (MR) damper fitted to a driver seat of an amphibious tracked vehicle (BMP-1). A half vehicle model featuring the proposed semi-active seat suspension is developed and its governing equations are derived. Two controllers namely; skyhook and fuzzy logic skyhook based to suppress the vibration dose at driver's seat are formulated. The results show that the controlled MR suspension seat along with the vehicle model has substantially suppressed vibration levels at the driver's seat under bump and sinusoidal excitations

**Keywords :** Tracked Vehicles, MR dampers, Skyhook controller, fuzzy logic controller

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