

# Review of Suspension Chassis Interaction Effects on Heavy Vehicle Structural Integrity

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**Abstract:** Heavy on-road vehicles operate under complex loading conditions arising from variable payloads, uneven road profiles, braking, cornering, and long-duration service cycles. The suspension system plays a critical role in transmitting and moderating these loads before they reach the chassis frame. The interaction between suspension components and the chassis significantly influences structural integrity, durability, fatigue life, and overall vehicle safety. This review paper examines the suspension–chassis interaction mechanisms in heavy vehicles, focusing on load transfer characteristics, stress distribution, vibration response, and fatigue behavior of the chassis structure. Analytical, numerical, and experimental approaches used in evaluating these interactions are discussed, along with material considerations and emerging design trends aimed at enhancing chassis reliability.

**Keywords:** Heavy vehicle dynamics, Chassis durability, Modal analysis