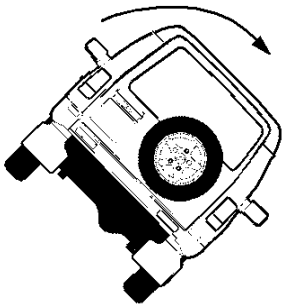
Safety Devices International Ltd
1 Enterprise Court, Studlands Park Avenue, Newmarket, Suffolk, CB8 7EP, England
Tel: +44 (0) 1638 560524 ▪ Fax: +44 (0) 1638 561743
▪ Email: pat.fall@safetydevices.com ▪ Website: www.safetydevices.com

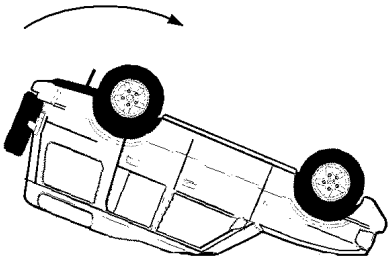
Roll Cages for Vehicles in Extreme Environmental Conditions

A vehicle can roll in various ways

Sideways



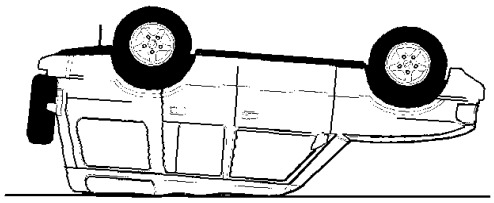
End over end

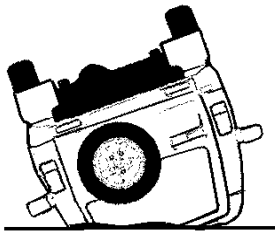


- And most commonly a combination of both

When a roll occurs the energy/inertia of the vehicle must be dissipated. In an unprotected vehicle this is accomplished through friction of the bodywork on the ground and resulting collapse of the vehicle.

Friction →





The subsequent loads on the external body panels are a combination of 3 moments

Vertical ↓

Longitudinal ← Lateral →

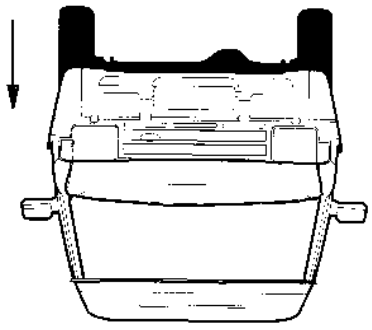
reads

Downward ↓

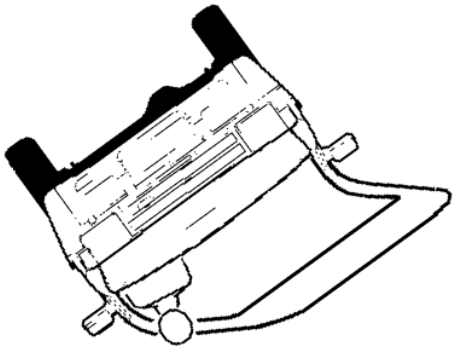
Long ways ← Sideways →

The roll cage/bar must be designed in such a way as to resist the vertical load as a priority followed by the longitudinal and lateral loads.

A vertical load rarely happens on it's own

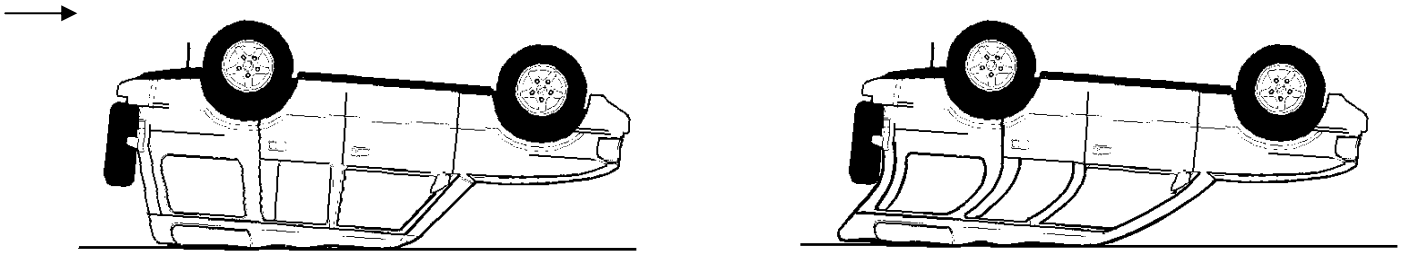


The lateral loads if not correctly accounted for will create lozenging of the vehicle body allowing the head to touch the road and roof area



Safety Devices International Ltd
1 Enterprise Court, Studlands Park Avenue, Newmarket, Suffolk, CB8 7EP, England
Tel: +44 (0) 1638 560524 ▪ Fax: +44 (0) 1638 561743
▪ Email: pat.fall@safetydevices.com ▪ Website: www.safetydevices.com

At some stage during a roll, longitudinal loads are sure to be applied resulting in lozenging in a longitudinal direction.



This is the most dangerous form of load, especially in a single cab pick-up which has relatively small roof pillars and no rearward bracing. As a result, there is very minimal integrated strength. Unless reinforced by a roll cage, it has been proven that total collapse of the roof will occur, often resulting in fatalities. A similar incident with roll over protection installed will normally result in minimal or no injures.