

ATV INJURIES AND FATALITIES

Crush Protection Device as a Solution

All-terrain vehicle (ATV) rollovers cause a staggering number of preventable injuries and fatalities with increasing numbers of incidents each year. This growing trend is costly, claiming lives of children and adults around the world. A properly designed and installed Crush Protection Device (CPD) may be the best intervention available. A CPD provides space under an overturned vehicle to prevent crush-related injuries to the rider and does not require a restraint system (like a seat belt) to be effective.

Data: In 1987, the United States Consumer Product Safety Commission (CPSC) concluded that all-terrain vehicles (ATVs) were an “imminently hazardous consumer product.” Rollovers are the most frequent cause of death and injury associated with these vehicles.

In the United States, the estimated numbers of ATV-related fatalities were 657 for 2013 and 674 for 2014. In 2015, there were an estimated 97,200 ATV-related, emergency department-treated injuries. An estimated 28 percent of these involved children younger than 16 years of age. (1)

In Canada between 2007 and 2011, 912 riders lost their lives due to mishaps involving ATVs and other off-road vehicles. In 2009-2010, there were nearly 3,400 hospitalizations for ATV injuries across Canada. Over half of ATV-related fatalities were due to rollovers. (2)

Population at Risk: All age groups (especially children), recreational riders and all workers utilizing ATVs are at risk. Occupational sectors and activities that have higher use of ATVs include agriculture, the government, oil and gas industry, forestry, railways, pipeline installation and maintenance, and search and rescue operations.

Economic Data: Based on Australian ATV bike fatality information, the estimated total economic cost of ATV-related deaths from 2001-2010 was \$288 million, with an average cost of \$2.3 million Australian dollars or \$1.75 million United States dollars for each fatality. (3)

United States researchers have reported that the estimated hospitalizations for ATV-related injuries increased 90%, from 8,232 in 2000 to 15,630 in 2004. Total hospital charges for these injuries increased 243%, from \$109 million in 2000 to \$374 million in 2004. (4)



Crush Protection Devices (CPD) as a Solution:

A CPD is a structure designed to form a protective space between the ATV and the ground surface in the event of a rollover. Such devices prevent or reduce injuries incurred due to the ATV striking or crushing the rider, and from the vehicle asphyxiating the rider due to compression on the chest or neck.

While education and behavior-related methods have failed to abate the ATV-related injury epidemic, CPDs have shown great promise in reducing overturn-related injuries and their severity. (5) Research has shown life-changing injuries and death can be mitigated by up to 70% if a CPD is used with a helmet and extra riders are kept off the vehicle. (6)

CPDs are designed to be used without occupant restraints like a seat belt. This allows the rider to use active riding techniques and to separate themselves from the vehicle during loss of control events. Some ATV manufactures provide CPDs as an aftermarket accessory.

One popular CPDs is the Quadbar. It provides crush protection clearance for the rider in ATV rollovers, especially those that occur at low energy. In addition, the Quadbar often acts as an anti-roll bar stopping a continuous roll in a side overturn, and usually diverts the machine to the side, away from the rider in a rear rollover.



Rollover Tests: (1) crush protection provided when the Quadbar serves as an anti-roll bar in a side overturn, (2) the clearance provided by a Quadbar for the dummy in a forward overturn, and (3) a dummy crushed in a forward overturn without a CPD. Source: Grzebieta et al. 2015. (7)

Conclusions: ATV overturns cause hundreds of deaths and tens of thousands of injuries year, a tragic and unintended consequence of these machines entering the market. A significant reason for these deaths and injuries are ATV overturns that crush or asphyxiate the rider. Installing a CPD like the Quadbar, has the potential to significantly reduce serious and fatal injuries in ATV rollovers. The performance of the Quadbar in terms of rollover crash harm minimisation appeared superior. (8)

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