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NEW PROPOSALS FOR THE DEVELOPMENT OF MOTORCYCLIST FRIENDLY ROAD RESTRAINT SYSTEMS THROUGH ACCIDENT INVESTIGATION AND REGULATION ANALYSIS

Author: Pere Fonts, Passive Safety, IDIADA

Co-authors: *José-Manuel Barrios, Passive Safety, IDIADA*
Pierre Bordoiz, Passive Safety, IDIADA
Zhengping Zhou, Passive Safety, IDIADA
Laura Moualed, Passive Safety, IDIADA

Affiliation: Applus IDIADA - L'Albornar – P.O. Box 20 - E- 43710 Santa Oliva (Tarragona)
Spain - Tel. +34 977 166 021 - Fax +34 977 166 636 - e-mail: pfonts@idiada.com

Manufacturers and Governmental bodies are facing a considerable dilemma confronting and tackling injuries and fatalities linked with 2 wheeled-road restraint systems. Over previous years European Union statistics have revealed more than 6000 motorcycle related deaths every year, of which nearly a third resulted from collision cases with rigid roadside obstacles. From these rigid obstacle related accidents, the metallic restraint systems are responsible for the largest death toll, 30%, due to the holding posts and the aggressive shape.

As a reaction to this information and a bid to decrease the severity of these collisions, protecting devices have been introduced by various manufacturers. These protective systems are categorised in two ways: punctual protection of the barrier's posts by absorbing impact energy; or redirection of the motorcyclist away from the barrier to the road preventing under running the barrier and contact with posts. Several of these systems are in use at documented potentially dangerous curves, though extension to wide spread use has been limited for economic reasons.

The EN 1317 is presently the official adopted regulation in Europe covering road restraint systems. Its protocols, amongst other things, address issues regarding safety barriers, crash cushions and terminal and transition of barriers. Directly relevant to the safety barrier, the EN 1317 defines criteria and methods for impact testing for vehicle barriers.

Safety of motorcyclists in the event of roadside obstacle collisions is not a priority for all European countries; due to varying weather conditions, number of incidents, motorcycle users, etc. specific regulations are not always considered necessary. However some countries that have deemed this field problematic and in need of extra attention have introduced additional protocols: the UNE-135900 (regulation adopted in Spain as a performance evaluation of protective roadside devices for motorcyclists), and the French test protocol (investigation of head and neck injuries during motorcycle-barrier collisions) are two significant examples.

Developing initiatives taken in the field of motorcyclist protection and assisting manufacturers to optimise the protecting devices for this has been a commitment of IDIADA's for several years. Advanced assessment of existing devices has been conducted, in addition to motorcycle accidentology being carried out in Spain. An in-depth study was initiated and carried out with the aim to improve regulation UNE-135900 and develop the protection during motorcyclist-barrier crashes, exploring the relationship between injury severity and impact configurations. Parameters such as impact velocity, angle and also the influence of barrier shape were considered.

It is possible to provide manufacturers with a new proposal for motorcyclist restraint systems, in accordance with the conclusions of this study, to improve existing protective devices. Meanwhile, a beneficial suggestion for improvement of active regulations shall be delivered to the public administrations.