Extending the benefits of ESC

SAE100 *Future look*

In celebration of SAE's Centennial in 2005, industry executives discuss the future of mobility technology.

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In 2005, the automotive industry celebrates 10 years of manufacturing a technology that has proven invaluable for increasing passenger vehicle safety. Electronic stability control (ESC) first came to market on the 1995 **Mercedes-Benz** S-Class. Since being introduced, ESC has received numerous accolades for its ability to reduce vehicle crashes by decreasing skidding and improving vehicle stability. Most recently, the National Highway Traffic Safety Administration (**NHTSA**) confirmed ESC's significant role in passenger safety, indicating that the technology reduced fatal SUV crashes by 67%, and fatal car crashes by 35%.

An important aspect of ESC is its ability to work in conjunction with other safety applications. Rollover mitigation (ROM) is one example of this flexibility at work. Through existing ESC sensors, ROM can help reduce rollover risk by determining when a vehicle is experiencing extreme lateral tire forces, and activate to reduce those forces. Additionally, trailer sway mitigation uses existing ESC system components to prevent unstable oscillations and trailer sway through brake interventions on the tow vehicle.

Looking further into the future, it is evident that ESC will serve as a gateway for other important safety systems. The range of data ESC provides can significantly influence the performance of technologies such as adaptive cruise control (ACC), airbags, collision mitigation, and automatic emergency brake systems. For example, while ACC can theoretically function without ESC, when ESC data is provided, the performance and benefits of ACC are expanded for the driver. Specifically, ESC provides an increased deceleration capability through active braking without sacrificing vehicle stability. Additionally, in the event of an emergency braking situation, ESC allows the vehicle to maximize braking, which in the future will assist collision-mitigation technologies in avoiding an accident or at least minimizing the effects of a collision.

Likewise, as ESC helps to maximize braking scenarios, it can also interact with airbags to result in more effective deployments. ESC has the ability to act as an early indicator, communicating to the airbags that a vehicle is in an unstable condition (such as sliding sideways). By pre-arming the airbags with more comprehensive data, the airbags are then able to deploy more quickly and accurately.

Not only does performance improve when controllers from one system are able to communicate with controllers of another system, but this interaction also provides a way to reduce costs for automakers; further reason for the industry to become involved in initiatives such as Automotive Open System Architecture. Defining a worldwide industry standard for basic functions and interfaces in every automotive electronic control unit will be a necessity to ensure the effective application of these future, system-to-system interfaces. This common standard will also be the only way the industry will truly make the shift from thinking about vehicle safety in terms of crashworthiness to thinking about it from the perspective of crash avoidance, which ultimately will save more lives. And ESC is a key starting point for this growth in system-to-system interface. ***aei***

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