

Ganzheitliche Lösungen zur Bekämpfung von Monotonie und Sekundenschlaf als Unfallursache

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Vigilanzminderung, Müdigkeit und erhöhte Tagesschläfrigkeit sind häufig die Ursache von schweren Verkehrsunfällen. Seit 1992 beschäftigt sich die Daimler AG mit dem Phänomen Sekundenschlaf. Daraus resultierend wurden mehrere Assistenzsysteme entwickelt, die die Wirkung des Sekundenschlafs vermeiden oder zumindest Unfallfolgen minimieren können. Die nächsten Entwicklungsschritte zielten auf das Erkennen von bevorstehendem Sekundenschlaf, also das Detektieren der Ursache, welche zur Wirkung des Auffahrens oder Abkommens führen kann. Der aktuelle Ansatz ist nun die Verhinderung der Ursache „Sekundenschlaf“. Dies sind verschiedene Maßnahmen, die entwickelt und ins Fahrzeug integriert worden sind und auf die im Beitrag näher eingegangen wird.

Integrated solutions to combat monotony and microsleep as causes of accidents

Fatigue, daytime drowsiness and a drop in vigilance frequently lead to serious road accidents. The EU Commission intends to halve the number of annual road fatalities and serious injuries in Europe by 2020. Countering the causes of fatigue and microsleep has considerable potential as a means of preventing accidents involving goods vehicles on long monotonous journeys. Official road accident statistics for Germany in 2010 record a total of 243,307 confirmed cases of car drivers making mistakes that led to crashes involving personal injury. Fatigue was cited as a cause of the accident in 1423 cases, 0.6 % of the total. Drivers of heavy goods vehicles caused 26,439 of the accidents, with fatigue attributed as the principal cause in 236 cases, 0.9 % of the total. For the crashes involving fatalities, 2856 were caused by car drivers, with fatigue being held responsible for 44 of them, (1.5 %). The corresponding figure for heavy goods vehicles came to 525, with eight cases being attributed to fatigue - also 1.5 %. The official statistics therefore already indicate a tendency towards the increasing significance of fatigue as a cause of severe crashes and crashes involving heavy goods vehicles. Because it is extremely difficult to prove that an accident was fatigue-induced, experts conjecture that the true figures are in fact much greater. Daimler AG has been looking into the phenomenon of microsleep since 1992. This has led to the development of several assistant systems that prevent microsleep or at least minimize the consequences of an accident. These are proximity-warning radar coupled with an emergency braking system and a lane-keeping assistant system which also helps avoid rear-end collisions. The next stages of development were aimed at detecting the signs of imminent microsleep as a cause of accidents, i.e. when the driver gets too close to a vehicle in front or strays out of lane. Intelligent alarm concepts can warn the driver in time of this situation and thus avoid the accident. Daimler AG has designed assistant systems for this and made them ready for series production in the form of the Attention Assist for cars. The current approach is now to prevent the causes of microsleep. Various features have been developed and integrated into vehicles and will be looked at in more detail in this paper. First of all, a few technical terms such as monotony, vigilance, fatigue versus drowsiness and stress versus strain will be explained. This is necessary for a precise description of various driver states and the features

developed to deal with them. The paper is structured as follows:

- Definition of the various driver states
- Description of the approach taken in the development of recuperation concepts for restful sleep and the associated research findings
- The effects of insufficient or non-recuperative sleep on how economically people drive
- Description of the approach taken in the development of relaxation concepts that lead to a recuperative nap (the power nap) and the associated research findings
- Presentation of the findings of a study that looked at revitalizing features for long-haul drivers
- Which research findings have been taken into account in the New Actros?
- Comparative journeys made to evaluate levels of mental stress in the Actros MP3 and in the New Actros and their findings
- A look ahead at other research work being undertaken in the field of fitness and health and how these can improve the driver's wellbeing.

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Zitat

[Rothe, S.](#); [Schrauf, M.](#); [Jellentrup, N.](#): Ganzheitliche Lösungen zur Bekämpfung von Monotonie und Sekundenschlaf als Unfallursache. Verkehrsunfall und Fahrzeugtechnik 51 (2013), pp. 254 - 261 (#7/8)

Inhaltsangabe

Beiträge zum Thema im VuF

- 2002 #3 [Einschlafen am Steuer - Eine häufig unterschätzte Unfallursache](#)

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