**World first from ZF LIFETEC: the Active Heel Airbag can protect against serious foot injuries.**

* **The Active Heel Airbag from ZF LIFETEC is designed to increase protection against injuries in front seats**
* **Sled tests have shown that the legs of occupants can have unfavourable leg kinematics when the seat is pushed back**
* **To reduce the risk of injury, the active heel airbag can support the function of the knee airbag**

**The knee airbag complements the frontal restraint system consisting of the seat belt and front airbag and can further improve occupant protection by transferring some of the restraint energy into the vehicle via the knees and thighs. This requires the feet to be safely positioned in the footwell during a crash. In the future, when seats can be moved further back and into so-called comfort positions, a suitable contact surface for the feet might be to far away. In the event of an accident, the resulting uncontrolled movement of the legs can increase the risk of injuries to the lower extremities. Many of these injuries are not life-threatening, but they can cause long-term damage to the musculoskeletal system of the driver and front passenger. That's why ZF LIFETEC has developed the Active Heel Airbag, which can help to create a stable heel impact point even in a relaxed seating position with the seats pushed back.**

The safety of vehicle occupants depends on a number of factors, including the position of the legs, knees and feet. In conventional seating positions, the vehicle floor provides sufficient support for the feet of front seat occupants to ensure a stable heel strike point that allows for a controlled knee path. This also ensures that the knee joint can enter the knee airbag, if the vehicle is equipped with one, at the most favorable angle, thanks to the secure support of the heel in the footwell. This allows a large portion of the crash energy to be transferred by the femur, the strongest bone in the human body, into the vehicle structure. Crash tests have shown, however, that an additional heel impact point must be created once the occupant pushes his seat back and adopts a more comfortable sitting position, as this increases the distance between the heels and the impact point, meaning that the coupling to the footwell floor is no longer optimal.

**The challenge of the comfort position**   
"If the heel strike point is missing, the knees cannot be effectively deployed into the airbag and the knee airbag is less effective," explains Harald Lutz, head of development at ZF LIFETEC. The knee joints can no longer be supported in the intended position, causing the legs to move uncontrollably. Although the risk of fatal injuries is low in this case, without the Active Heel Airbag, there is a high probability of serious leg and foot injuries. "The Active Heel Airbag helps to ensure an adequate heel impact point even in more comfortable seating positions," adds Lutz.

The Challenge on the driver's side

On the driver's side, the Active Heel Airbag can also be used for comfort positions. This means that in future applications, the Active Heel Airbag can be activated by a comfort position button or by camera-based interior monitoring on the driver's side - for example in assisted driving. By embedding the pedals, the Active Heel Airbag creates a uniform contact surface for the heel in the event of a crash. This further reduces the risk of injury from the foot twisting when it hits an edge, such as the brake pedal.

Space-saving safety technology

The Active Heel Airbag can be integrated directly into the footwell without requiring additional space. In the event of a crash, the airbag inflates under the vehicle's floor carpet, providing the necessary heel stability. The Active Heel Airbag can be adapted to almost any vehicle model worldwide. The Active Heel Airbag will be available in 2028 for automakers who want to offer their passengers seats with additional comfort positions. ZF LIFETEC is a leader in this technology and many other lower extremity protection solutions and will continue to set the standard in passive safety in the future.

**Caption and photo credit**

Caption: ZF LIFETEC’s Active Heel Airbag is a true world first. It helps to protect drivers and passengers in the event of a crash from injuries to the lower legs, which could result in lengthy and costly medical and orthopedic treatment. (Image: ZF LIFETEC)

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**About ZF LIFETEC**

ZF LIFETEC is a leading passive safety technology provider for enhanced protection of vehicle occupants. Employing around 36,000 employees dedicated to the mission of saving lives with a technology driven approach, the company develops, manufactures and distributes a comprehensive product portfolio including airbag, seat belt and steering wheel systems, covering a wide range from small vehicles in the volume segment up to sophisticated luxury vehicles. Featuring a market share exceeding 20 percent in its core product categories, ZF LIFETEC has a worldwide presence at 51 locations across 22 countries. In the fiscal year 2023, the Group generated sales of EUR 4.6 billion. Based on its strong relationships with a diversified customer base of global OEMs, driven by outstanding quality, long-standing R&D collaborations besides a strong global innovation platform, ZF LIFETEC is well positioned for future growth opportunities arising from the automotive megatrends electrification, (semi-) automated driving, smart interior, as well as increasing safety demands and stepped-up safety regulations worldwide.

Learn more at [www.zf-lifetec.com](http://www.zf-lifetec.com)