

## Press Release

Best protection from airbags and seat belts needs correct seat position

### **Reclining and lounging puts lives at risk**

- Crash consequences for front passengers depend on where they sit
- Submarining: risk of slipping under seat belt in emergency
- Experts warn never to put feet up on dashboard

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**Adjusting the driver's seat is often a routine part of getting behind the wheel of a car. The driver's feet need to be able to reach the pedals, and their hands the steering wheel. As a rule, this will mean that the seat is more or less in the right position for optimum protection from the seat belt and airbag during an accident. However, it is not just the correct positioning of the driver's seat that is crucial when it comes to safety. Recent crash tests underscore that this is also true on the passenger side, explain the DEKRA crash experts.**

"The tests provide striking evidence of the impact individual changes in seat position have on the body as a result of a crash," says DEKRA accident researcher and biomechanical expert Andreas Schäuble. "The protection afforded by seat belts and airbags is largely lost if the seat is in the wrong position."

In three tests, three identical vehicles were crashed, each containing three dummies of different sizes. The three dummies on board were the models known as 50th Male (body height: 175 cm, weight: 78 kg), 5th Female (154 cm, 52 kg), and a prototype elderly dummy (161 cm, 73 kg) by the manufacturer Humanetics which has a different body mass distribution representative of an older woman.

The three dummies were seated alternately in the driver's seat, the front passenger seat, and the back seat in each of the three crash tests. Each time, the driver's seat was adjusted to the individual, so that the pedals and steering wheel were easy to reach. "In all three tests, however, the front passenger seat was left in a central position," explains the DEKRA expert. "We had previously identified this position as the setting that is most common in real life by conducting our own survey of actual cars as well as analyzing accident data."

#### **Front passenger seat: central position is not right for everyone**

The crash tests revealed considerable differences in the outcome of accidents, especially on the passenger side. "The combined seat belt and airbag restraint

Date Stuttgart, June 28, 2022 / No. 069-A  
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system only worked well for 50th Male when the seat was in a central position,” says Schäuble. “For 5th Female, the ideal seat position would have been higher and significantly further forward.” The elderly dummy’s lower center of gravity pushed it further into the surface of the seat, causing it to slip under the lap belt on impact.

“This movement, known as submarining, also happens if seats are reclined too far back,” explains the expert. “It means that neither the shoulder nor lap belts are able to deploy their full restraining effect as required. To be really clear on this point, reclining and lounging are potentially fatal for front passengers in the event of a crash.”

And Andreas Schäuble has another important warning to add: “Passengers that have their feet up on the dashboard can be very seriously injured in an accident,” he explains. “If the airbag goes off while their legs are in this position, the knees will be thrown toward the head and the lap belt will not have any purchase on the pelvic bone, meaning it may be forced deep into the abdominal cavity. It is imperative that feet remain in the footwell.”

### **Correct front passenger seat positioning**

So, what is the correct position for the front passenger seat? “The seat should only be moved far enough back to leave a distance of around three finger widths between the knees and the glove compartment,” says Schäuble. In many modern cars, the seat’s height can also be adjusted – another important factor. “Here, the advice is the same as for drivers, keeping eye level at about halfway up the windshield.” The seat should be as upright as possible so that the shoulders are in contact with the backrest. As for the headrest position, the DEKRA expert advises, “there should be as little space as possible between the headrest and the head. Ideally, the top of the headrest should be about level with the top of the head.”

#### **Caption:**

Reclining and lounging puts lives at risk: Airbags and seat belts can only provide the intended protection if seats are positioned correctly. Photo: DEKRA / Werner Popp

### **About DEKRA**

*DEKRA has been active in the field of safety for almost 100 years. Founded in 1925 in Berlin as Deutscher Kraftfahrzeug-Überwachungs-Verein e.V., it is today one of the world's leading expert organizations. DEKRA SE is a subsidiary of DEKRA e.V. and manages the Group's operating business. In 2021, DEKRA generated sales totaling more than EUR 3.5 billion. The company currently employs almost 48,000 people in approximately 60 countries on all continents. With qualified and independent expert*

*services, they work for safety on the road, at work and at home. These services range from vehicle inspection and expert appraisals to claims services, industrial and building inspections, safety consultancy, testing and certification of products and systems, as well as training courses and temporary work. The vision for the company's 100th birthday in 2025 is that DEKRA will be the global partner for a safe, secure and sustainable world. With a platinum rating from EcoVadis, DEKRA is now in the top one percent of sustainable businesses ranked.*