

Ford develops heart rate monitoring seat

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Ford engineers have developed a car seat that can monitor a driver's heartbeat, opening the door to a wealth of health, convenience and even life-saving potential.

A joint project undertaken by experts from Ford's European Research and Innovation Centre in Aachen, Germany and Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen University, the seat uses six special embedded sensors to detect electrical impulses generated by the heart.

“Although currently still a research project, the heart rate monitor technology developed by Ford and RWTH Aachen University could prove to be a hugely important breakthrough for Ford drivers, and not just in terms of the ability to monitor the hearts of those known to be at risk,” said Dr. Achim Lindner, Ford European Research and Innovation Centre medical officer.

“As always in medicine, the earlier a condition is detected the easier it is to treat and this technology even has the potential to be instrumental in diagnosing conditions drivers were previously unaware they had.”

Data collected by the sensors, for example, could be analyzed by medical experts or onboard computer software. Possibilities therefore abound, notes Lindner, from linking to remote medical services and Ford vehicle safety systems to even providing real-time health information and alerts of imminent cardiovascular issues such as a heart attack.

At the heart of the research

The [heart rate](#) monitor seat is the latest addition in the Ford research portfolio of possible in-car health and wellness solutions aimed at helping people with chronic illnesses or medical disorders manage their condition while on the go.

This month, Ford also announced research into how it is leveraging Ford SYNC and its ability to connect devices via Bluetooth, access cloud-based Internet services and control smartphone apps to develop industry-first voice-controlled in-car connections to an array of health aids from glucose monitoring devices, diabetes management services, asthma management tools and Web-based allergen alert solutions.

The seat sensor technology under development could initially be of most benefit to drivers known to have heart conditions – primarily those in more mature age groups, a globally growing population.

According to the U.S. Census Bureau, the number of Americans 65 and older is projected to more than double by 2050, reaching some 88.5 million. Predictions in Europe suggest a growing trend as well, with the over-65 population reaching nearly 23 percent by 2025 and 30 percent by 2050.

“With increasing life expectancy meaning higher numbers of people and therefore drivers at risk of heart diseases, the ability to monitor hearts at the wheel could offer massive benefits in terms of health and road safety, both for the user and the wider public,” said RWTH Aachen University Professor Steffen Leonhardt, who originally proposed taking the university’s work with contactless infant heart monitoring to Ford. “The car is an obvious choice; it’s a place where occupants spend long periods sitting in a rather calm position and a place that’s increasingly less physically demanding, making it the ideal environment to measure

heart activity.”

Initial testing

Working with RWTH Aachen University, Ford developed the six-sensor system positioned on the surface of the seat backrest. The unobtrusive electrodes have been specially designed to be able to detect the electronic signature of the heart through clothing.

“The sensors use a very specially designed system and carefully researched materials to be able to give a good signal without contact on the skin,” Lindner said.

“We are still fine-tuning their operation to work with some materials; certain types of synthetic fabric and lamb’s wool can cause electrical interference that upsets the signal, but we can achieve a strong signal through 10 layers of cotton.”

In stationary testing, 90 to 95 percent of subjects proved to be compatible and on-road testing of the [Ford heart](https://phys.org/news/2011-05-ford-heart-seat.html) rate monitoring seat proved it was possible to achieve highly accurate readings for up to 98 percent of the time spent behind the wheel, even at this early stage of development.

Provided by Ford Motor Company

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