ANYBODY™ TECHNOLOGY

Multi-Contour Seats with Active Motion

The Ford Motor Company recently introduced a new seat design, the Multi-Contour Seat with Active Motion™. The Active Motion™ technology is a subtle massage that not only provides continuous comfort, but also encourages blood flow, which helps prevent driver fatigue. Driver fatigue can occur when muscles become tired from remaining stationary for long periods of time. Computer controls create Active Motion™ by individually inflating and deflating an array of four air bladders within the seat pan. This effect transmits subtle, changing movements in the seat occupant's pelvis that cause continuous changes in muscular activation.

Testimonial

"Biomechanical simulations with the AnyBody Modeling System™ made it possible to quantify and determine key design parameters of the Active Motion™ technology very early in the design phase. The key parameters could only have been found through simulations."

Dr. Karl Siebertz, Technical Specialist, Biomechanics Vehicle Interior Technologies Ford Research & Advanced Engineering Europe

Challenge

Ford Motor Company came up with an idea for a completely new seat design introducing new technologies, ultimately preventing driver fatigue.

Finding the key design parameters and quantifying the benefits of the new design was essential to the success of the project.

How would Ford be able to identify the design parameters without a prototype?

Simulation was the answer.

Solution

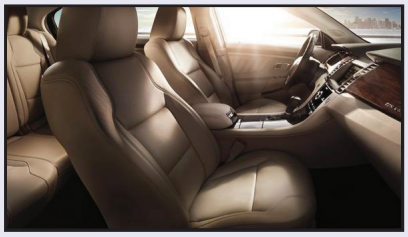
With the AnyBody Modeling System™ it was possible to define and test different ergonomic design parameters simulating the interaction between the car driver and the Active Motion™ Multi-Contour Seat.

A computer model was developed to simulate the cushion inflations, and parameters such as amplitude, frequency, and also phase angles were introduced making it possible to find the optimum ergonomic design.

Benefits

By running simulations in the AnyBody Modeling System™ Ford Motor Company was able to determine the essential design criteria; finding the right match of motion amplitudes and frequencies without adding extra loads to the driver, subsequently obtaining an average relative muscle tension relief up to 60%.

Physical testing on the final seat design confirmed that 4 out of 5 drivers preferred the new seat over the standard seat.



References: *de Zee et al. Computer Simulations of the Active Motion System with Musculoskeletal Models, SAE Technical Paper 2005-01-2705, 2005. http://dx.doi.org/10.4271/2005-01-2705*