Adaptive Seat To Reduce Neck Injuries in Male and Female Occupants

ADAPTIVE SEAT TO REDUCE NECK INJURIES IN MALE AND FEMALE OCCUPANTS

THE ADSEAT CONSORTIUM

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ADSEAT

www.adseat.eu
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ADSEAT WORK PACKAGES

WP1: REAL WORLD DATA
An extensive literature review and analysis of databases was carried out. Real-world data analysis shows that existing whiplash protection concepts are more effective for males than females, with a 45% risk reduction in permanent medical impairment for females and 60% for males.

WP2: BIOLOGICAL TESTS
Test data from volunteer tests using males and female volunteers in identical conditions were collected and analysed. Two test rigs for whiplash exposure have been manufactured and tested. A new acceleration sled test set-up with a high-speed X-ray movie recording unit has been installed for testing.

WP3: COMPUTATIONAL MODELLING
A first model of a finite element dummy model of an average female, called EvaRID, has been developed. A detailed evaluation against biomechanical requirements was made. The first evaluation showed that the model response correlates reasonably well with the test data, but further model refinement is needed.

WP4: INJURY CRITERIA/THRESHOLDS
Analysing injury risk, assessing the usefulness of currently used neck injury criteria and comparing injury predictors for males and females based on computer simulations and sled tests. Theoretical suggestions were developed and will be complemented by sled testing and computer simulations to investigate their practical applicability.

WP5: SEAT EVALUATION GUIDELINES
Developing an illustrator describing how the level of protection can be increased. Providing guidance on how to evaluate the protective performance of vehicle seat designs with female as well as male motor vehicle occupants in mind. The findings in WP5 will constitute a component of the final outcome of the ADSEAT project.

BACKGROUND
Whiplash injury puts a significant social and financial burden on the European society and females have a higher risk of sustaining whiplash injuries in vehicle crashes than males. Despite many endeavors to reduce whiplash injuries, they still account for approximately 70% of the cost for the insurance companies of all injuries leading to permanent medical impairment following a collision.

APPROACH
The project will provide different measures, considering the female injury risk in future (seat) development and thus extend current optimization processes which focus on male occupants.