

Adaptation and optimization of a production chassis for motorsport purposes

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Abstract / Summary

One aim of motorsport is to communicate the fascinations and emotions of the automobile. Furthermore motorsport offers opportunities for the application and further development of new and innovative technologies.

The Institut fuer Kraftfahrzeuge (ika) of the RWTH Aachen University is committed to enthuse young people for automobiles and automotive engineering as well as to do innovative research. For this reasons a team of engineers and students in cooperation with the Tuning Akademie Ingolstadt founded a team and built up an Audi A4 Quattro racing car to compete in the VLN long distance championship at the Nuerburgring.

Besides the engine power and the aerodynamics primarily the chassis is highly important regarding the performance of a racing car. Interacting with the tires the chassis and its components have a wide influence on the driving and the cornering behaviour. Hence a competition chassis thereby features special requirements which partly differ to the requirements on chassis of production cars.

Within the presentation the different requirement on vehicle chassis for production and motorsport purposes are to be identified. Subsequently the necessary modifications on the production chassis to be used for competition racing shall be explained using the example of the built up Audi A4 racing car. The covered modifications include e.g. adjustments on the axle design, the axle kinematics, the axle elastokinematics and the suspension components (body springs, shock absorbers, anti-roll bars). On the basis of the experiences of the first races of the car in the VLN long distance championship 2008 also further optimization potentials, to enhance the current performance of the chassis - and therefore the current performance of the whole car, are to be mentioned.