

# Increasing efficiency in CAE cockpit development by using LS-DYNA for explicit as well as implicit calculation with only one model

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**Abstract**

Using a cockpit system as an example of automotive components, this paper presents how efficiency in product development can be increased by using LS-DYNA explicit / implicit. Concerning the development of these complex and highly integrated subsystems, a great variety of static, dynamic and crash load cases has to be considered. In case of a cockpit, this comprises for example stiffness and bending modes of the structure as well as knee and head impact and dummy impact. Today, it is common to examine all these load cases by means of CAE simulation. For these calculations mostly two FEM models are built up: one model for static and dynamic problems and another model for crash load cases. Using one FEM model for all load cases leads to high increase in efficiency. Expenses for model assembling are reduced as double meshing of CAD Data is no longer necessary. During the project, alterations need to be applied to the model only once, without the need of reworking the other model too. Further benefit is achieved by calculating the variety of load cases with the same FEM code. Besides the acknowledged explicit code for impact simulation, in version 970 LS-DYNA provides a highly improved implicit code. Thus, in the familiar environment of LS-DYNA, static and dynamic analysis can be accomplished with the same model used for crash simulation.

