

[ONLINE] Cutting-edge FMVSS201U targeting and head positioning at General Motors

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ABSTRACT

The interior safety properties of automobiles have been subject to increasingly stricter requirements under occupant protection legislation. The US laboratory test procedure known as FMVSS201U specifically focuses on head protection during impact with the upper interior components, and requires identification of critical targets, upper roof zone, and headform impact angles. To reduce the need for physical tests, manufacturers use CAE software for product performance evaluations as much as possible. However, due to the sheer number of potential load cases, an infinite number of simulations would be necessary to cover all possibilities. As a result flexible tools are needed that not only allow the analysts to automate their processes, but also enable them to intervene at any stage, make modifications, and assess their impact.

General Motors, in collaboration with BETA CAE Systems, has upgraded their target marking process according to FMVSS201U. This has resulted in the achievement of fully automated identification of the desired targets in the upper interiors, as well as the ability to intervene and make modifications to auxiliary data at any step of the process. This is applicable in both FE and CAD data building, bridging the gap between analysts and designers. Additionally, a detailed and robust positioning process has been established to cover all the demanding specifications of the protocol. Finally, ready-to-run load cases for LS-DYNA are created in bulk for all target points.

The presentation provides a comprehensive explanation of the process and showcases how ANSA has met the needs of General Motors in their FMVSS201U process. The presentation also includes metrics that demonstrate the correlation between testing and simulations, offering insight into the added value that BETA and General Motors have gained from their collaboration on the ANSA tool.