APROSYS FINAL EVENT

Integrated Project on Advanced Protection Systems

New Assessment and Test Tools
Advanced side impact test methods
Side Impact Compatibility

TECHNICAL DESCRIPTION

Objective

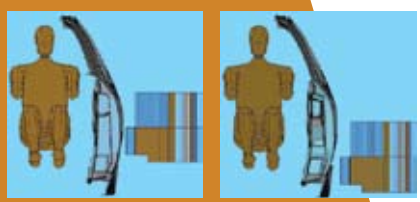
- Investigate the main influencing factors in side impact compatibility.
- Perform a geometrical study.
- Develop concept for future side impact compatibility test.

Approach

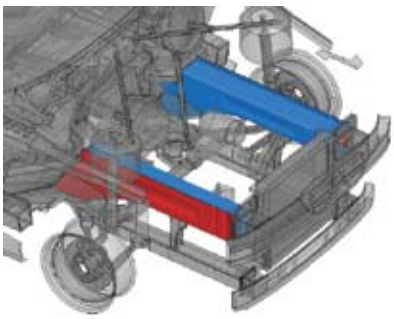
AE-MDB to car simulations were performed to investigate the influencing factors in side impact compatibility. Car to car simulations were performed to investigate the effect of bullet car frontal impact compatibility on side impact performance.

The target car FE model used in this study was the GCM3 v2 (Generic Car Model of a large sized car) developed within APROSYS.

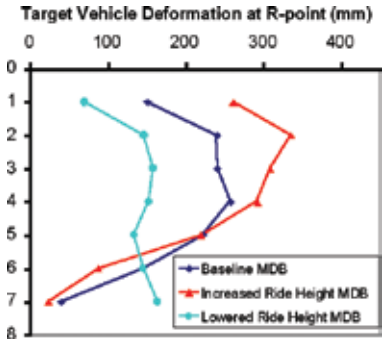
The factors investigated in the AE-MDB simulations included the effect of ride height, impact energy, stiffness, barrier profile, sill interaction and B-pillar loading.



In the car to car simulations, the effect of reduction and increase in strength of components such as the lower rails, bumper crossbeam, subframe and upper rails were investigated.



ES-2 dummy injury parameters and vehicle deformation patterns were analysed for each simulation configuration to determine the effect the factors had on side impact performance.



A protocol was developed for a geometrical survey and 49 cars in different segments were measured. The overlap between bullet cars/MDBs and target vehicles was analysed.

Conclusions

The main conclusion from the AE-MDB simulations was that reduction of loading of the target car in alignment with the dummy had a greater effect in reducing dummy injury risk than increased loading of the target car's sill. This goes against previous thinking relating to side impact compatibility, where sill interaction was thought to be the most significant factor.

The car to car simulations showed that the reduction in lower rail stiffness and the reduction in bumper stiffness reduced the driver dummy injury levels in the target vehicle. Other bullet vehicle modifications, including the addition of a subframe, had little effect. This indicated that increased sill interaction had less effect than reducing load in alignment with the dummy.

A full width frontal test with load cell wall could be used to test side impact compatibility. If the Full Width Deformable Barrier test proposed for frontal impact compatibility was used, this would have the advantage of using one test procedure to assess both front and side impact compatibility.

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SIXTH FRAMEWORK PROGRAMME