

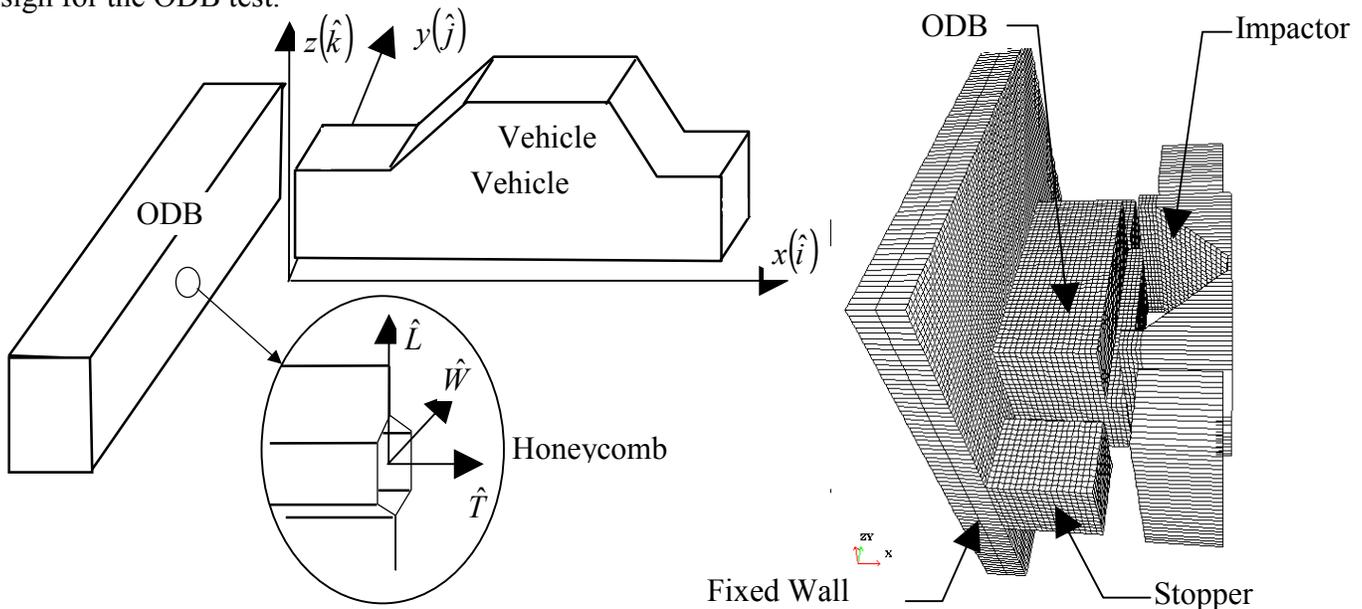
SLED TESTS AND SIMULATIONS OF OFFSET DEFORMABLE BARRIER

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The purpose of this research was the validation of an offset deformable barrier (ODB, below left) model using component and sled testing, and simulations of both (sled test simulation shown below right). We found that the honeycomb material in an ODB is somewhat unstable, because its strength is approximately two orders of magnitude greater in the primary loading direction than in the other two directions [1]. The material parameters developed in punch tests, and their simulations, works well for the ODB model [2]. The finite model developed in this report, results in good correlation between sled tests and simulations. This ODB model can now be used in vehicle models. This will allow the various ODB tests to be better modeled, and may result in better prediction of vehicle response. With better vehicle prediction, crashworthiness engineers may better be able to design for the ODB test.



References

- [1] Zhou, Qing and Mayer, Robert, "Characterization of Aluminum Honeycomb Material Failure in Large Deformation Compression, Shear, and Tearing," *Journal of Engineering Materials and Technology*, October 2002, Volume 124, Issue 4, pp. 412-420.
- [2] Mayer, Robert R. and Zhou, Qing, "Punch Test Simulations of Offset Deformable Barrier Honeycomb Materials," *7th International LS-DYNA Users Conference*, May 19-21, 2002, Dearborn, MI.