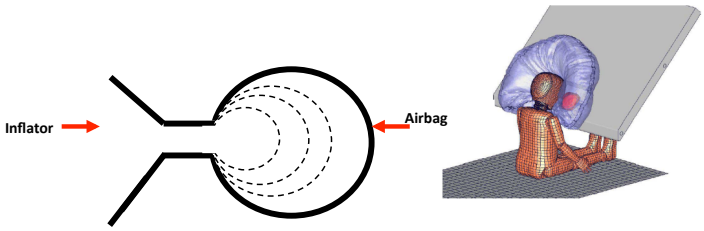
MULTIPHYSICS

Multiphysics Simulation of Out of Position Airbag

Objective

❑ To investigate a numerical modelling technique which can be utilised within the automotive industry in the modelling of transient dynamic fluid-structure interaction of Out of Position (OOP) airbag inflation and occupant interaction .

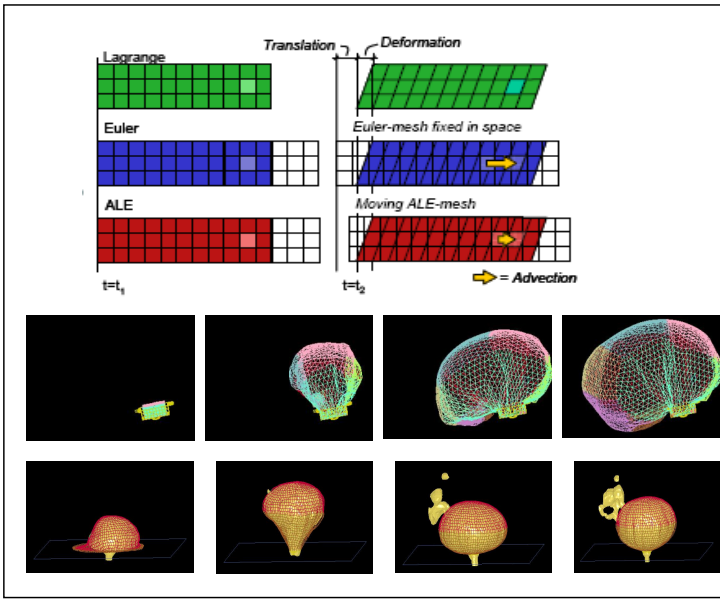


Methodology

❑ The Arbitrary Lagrangian Eulerian (ALE) formulation was used to overcome the disadvantages of the two more commonly utilised finite element procedures, Lagrangian and Eulerian modelling, while at the same time utilising the advantages of both simulation techniques.

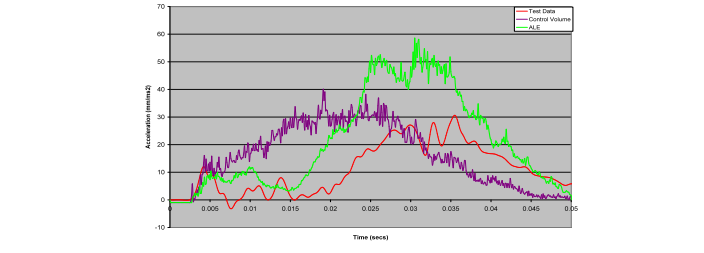
❑ The animation for ALE modelling of an airbag with and without vent are shown opposite.

❑ As can be observed the venting phenomena may also be modelled with the ALE method.



Outcome

❑ The ALE is an appropriate numerical modelling technique to simulate the airbag and occupant interaction in Out of Position scenarios. This method has greater controllability of the gas dynamics, which is particularly important in the early stages of the airbag inflation process. The graph opposite represents the benefit of this approach.



JAGUAR LAND ROVER

Prof. Moji Moatamedi
Multiphysics Centre
Narvik University College
P.O. Box 385
8505 Narvik, Norway
Tel: +47 93 26 65 18
Email: moji@hin.no

Narvik University College