

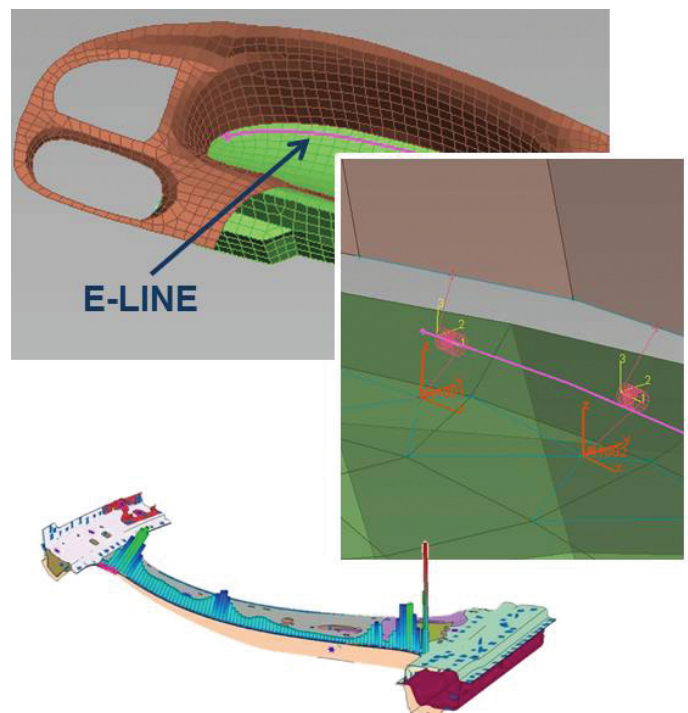
## Volvo Car Corporation: Squeak and Rattle analysis

### Challenge

- The investigation of squeak and rattle issues by simulating the relative displacement between two parts of the model due to a random signal.

### Approach

- Based on pure geometric data, an advanced ANSA script has been developed to produce RBE3-CBUSH-RBE3 elements between a master and a slave part. A coordinate system, used to orient the CBUSH element, is created on each "master" node. The respective coordinate system is oriented according to four different configurations, each corresponding to the phenomenon that the user needs to examine (squeak or rattle). In META, a toolbar has been utilized to visualize the results on the CBUSH elements through circular annotations and through colored cylinders aligned to the local direction.



### Results

- E-LINE analysis has led to quick and accurate results in squeak and rattle investigation. The evaluation of results is done through innovative functionality that leads to safe conclusions.

*"The E-LINE creation script in ANSA is a key enabler for efficient use of the E-LINE approach and greatly facilitates the connection of simulation results to both tolerance data and physical stick-slip tests, needed for squeak and rattle assessment"*

*Jens Weber,  
CAE Development Engineer, AF*