# BETA
## SIMULATION SOLUTIONS



### Volvo Car Corporation

# Fastener Library

CAD to CAE Fastener representations recognition and conversion, using a standard-parts model library.

The automotive industry is one of the most competitive industries, mandating the need to streamline and speed up product development processes. In this direction, finding ways to automate tedious tasks and avoid repeated work plays a crucial role in keeping up with market demands.

Standard parts are one of the smallest, yet one of the most important building blocks of any product. To model and simulate accurately each time, Volvo Car Corporation collaborated with BETA CAE Nordic to set up a model library of all standard parts. Using fastener recognition, a CAD representation can easily be replaced with the pertinent CAE representation.

"Replacing and adjusting parts such as bolts and rivet nuts for a new release CAE model can suddenly be done easily, in 5 minutes, and with excellent quality. This in the past would require hours of tedious work!"

Fredrik Fors
Crashworthiness Analysis Engineer
Volvo Cars Safety Center
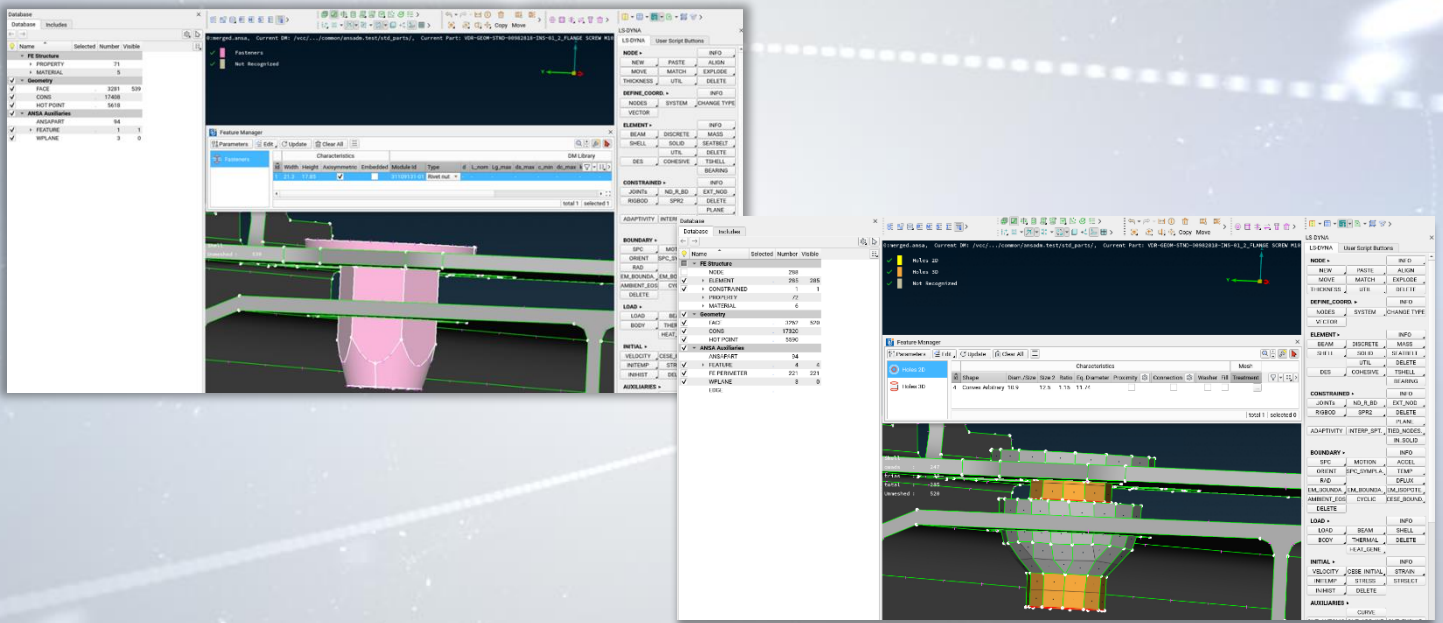
## Challenge

The objective was to reach the maximum possible automation level and to minimize manual work during engineering simulation modelling processes. Such manual work involves multiple tedious tasks including geometry cleanup, shell meshing, extruding layers, pasting nodes, grouping materials, and more.

In this effort, rough patches were:

- The complex geometry.
- Creation of solid mesh consisting of Hexahedral elements.
- The geometric clean up.
- The model size.

## Approach

Volvo Car Corporation decided to employ the ANSA Fastener library to collect all CAD input models of standard parts into one searchable file-based database using DM. The part number serves as a database object and can hold different representations for different analyses and FE solvers. All needed models were added as different representations such as those for LS-Dyna, Abaqus, Nastran, non-FE representation.

## Results

All CAE engineers at Volvo Car Corporation can connect to the fastener library database and with minimal effort replace CAD with the correct FE representation for their analysis.

The engineers know they get the latest and greatest modelling technique, in the correct position in minutes rather than hours or even days.

It is also now easy to update FE models as modelling techniques evolve and add new standard parts to the database when needed. After implementing the ANSA fastener library, CAE engineers can now shift their focus from modelling standard parts in the correct position, to performing the value-added FE analyses confident that the standard parts will represent the true physics of the vehicle.

For more about BETA CAE Systems, visit www.beta-cae.com