BETA
SIMULATION SOLUTIONS

Ground breaking
Simulation Solutions

physics on screen

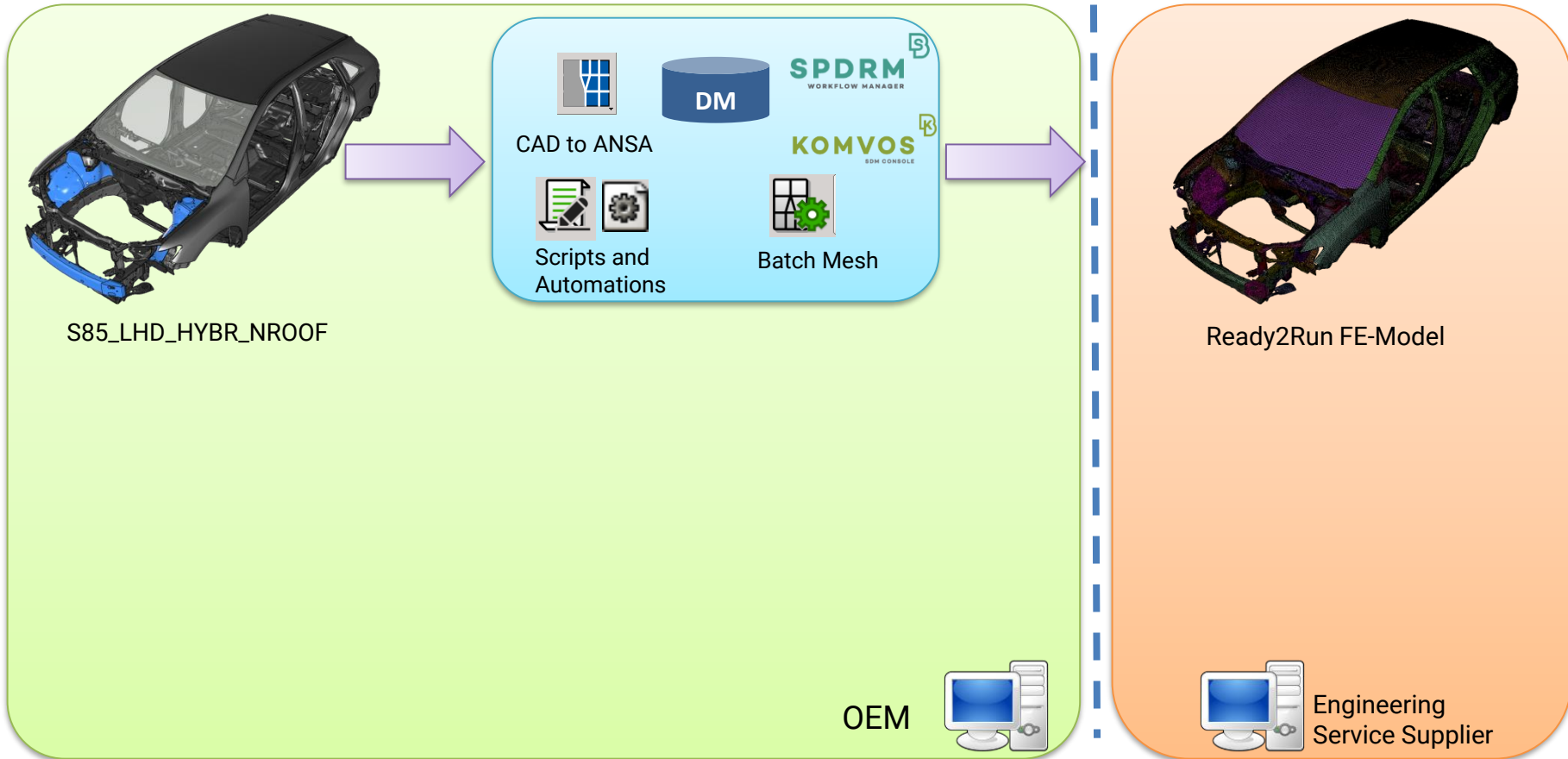# How Compare-function can become the secret ingredient for reducing model build-up effort
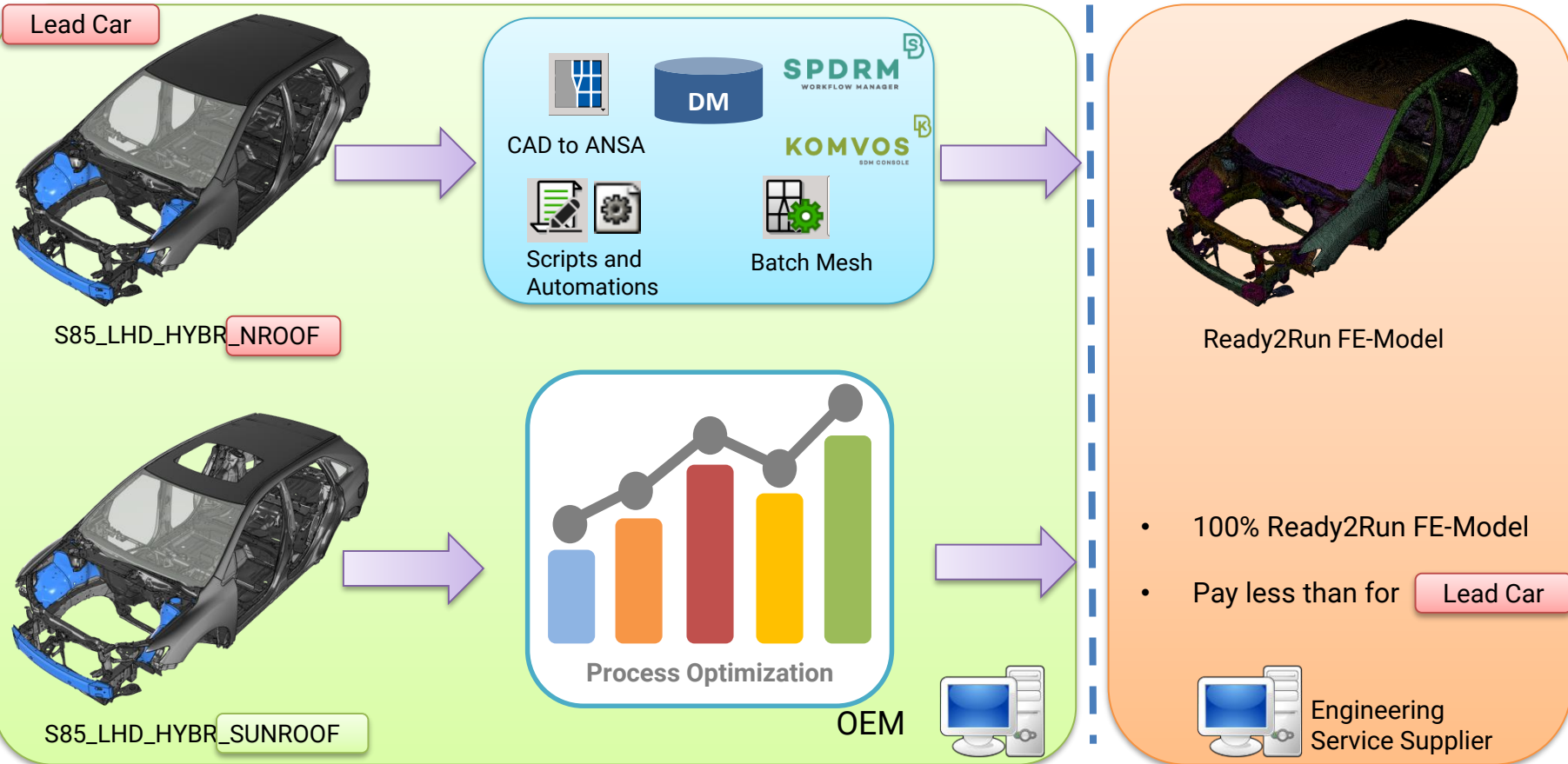
Michael Tryfonidis

BETA
SIMULATION SOLUTIONS

Contents

- Motivation
- Requirements
- Commonalities
- Compare aids decision making
- Outcome
- Further uses

Motivation: Model Preparation process
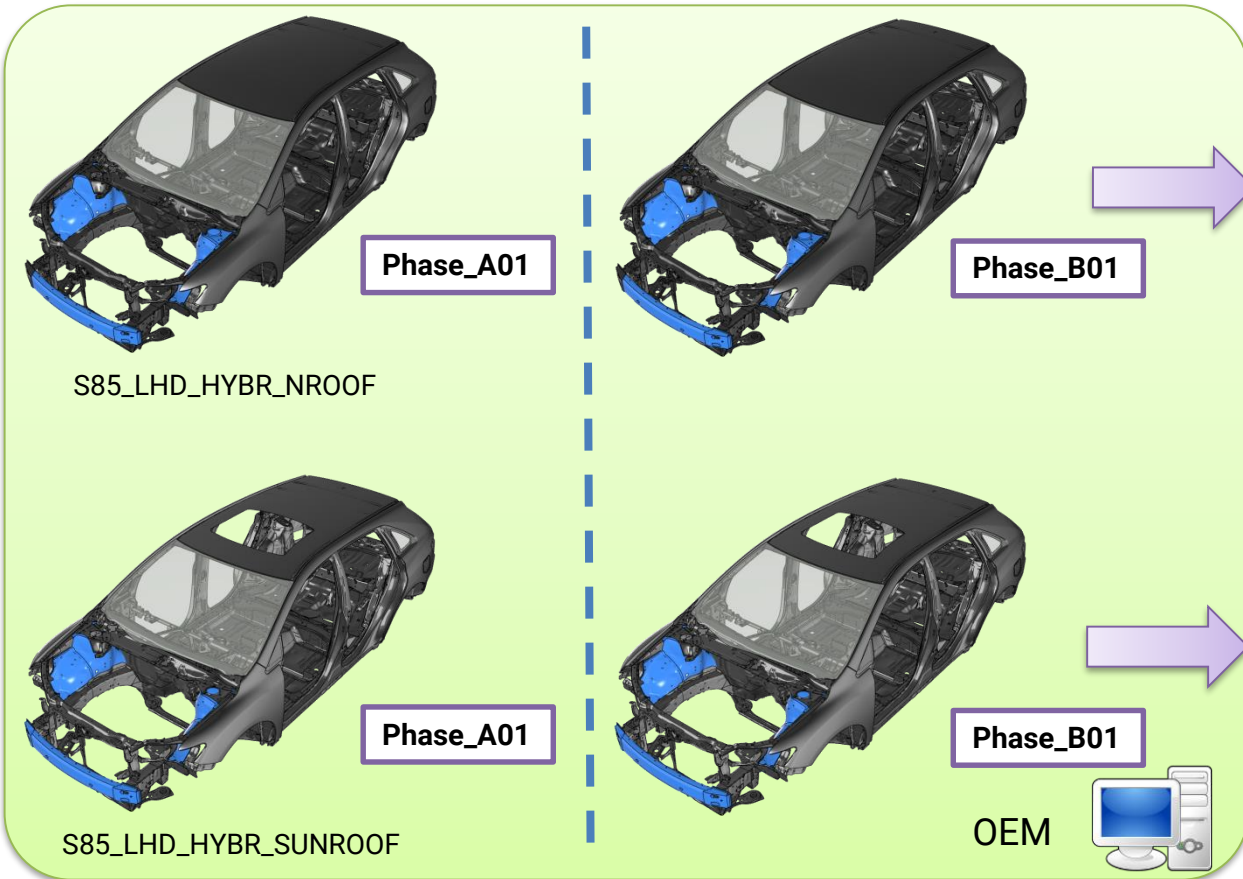

S85_LHD_HYBR_NROOF

CAD to ANSA

DM

SPDRM
WORKFLOW MANAGER

KOMVOS
SDM CONSOLE

Scripts and
Automations

Batch Mesh

OEM

Ready2Run FE-Model

Engineering
Service Supplier

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Motivation: Model Preparation process

Lead Car

S85_LHD_HYBR_NROOF

CAD to ANSA

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Ready2Run FE-Model

S85_LHD_HYBR_SUNROOF

Process Optimization

OEM

- 100% Ready2Run FE-Model

- Pay less than for   Lead Car

Engineering Service Supplier

Motivation: Model Preparation process

Phase_A01

S85_LHD_HYBR_NROOF

Phase_B01

- 100% Ready2Run FE-Model

- Pay less than for Phase_A

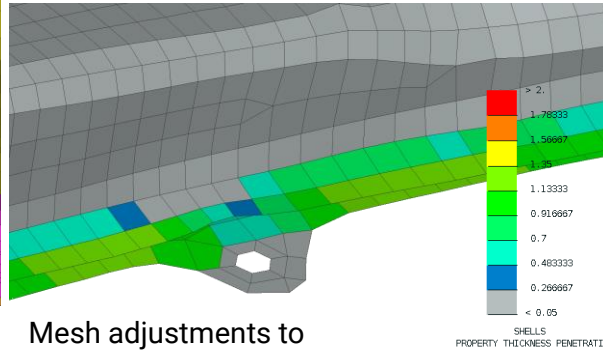**Phase_A01**

S85_LHD_HYBR_SUNROOF

Phase_B01

OEM

- 100% Ready2Run FE-Model

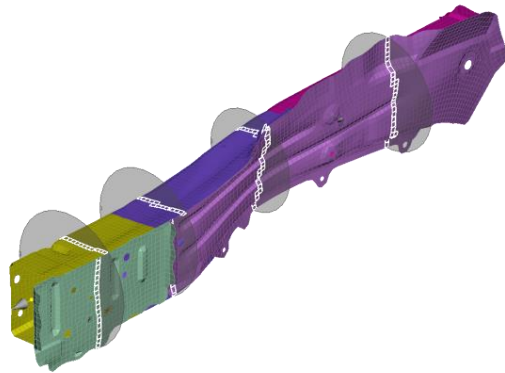- Pay less than for Phase_A

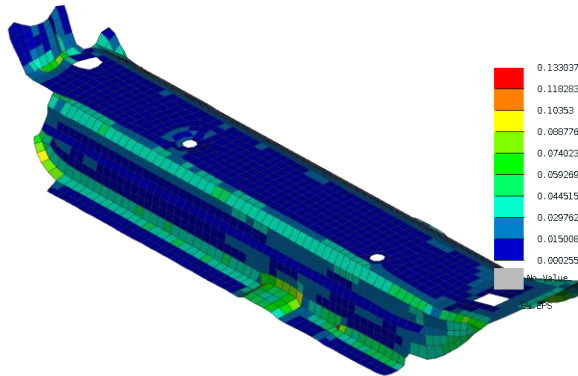Engineering
Service Supplier
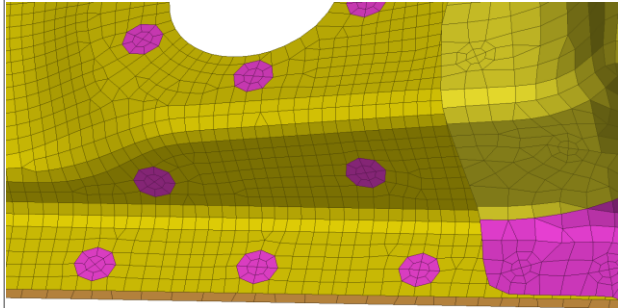
Special meshing for welding

Mesh adjustments to solve penetration cases

Boundary Conditions and Output Requests

Several additions such as forming simulation data, composite data etc.

Model Preparation Process

Requirement is to inherit the most from the reference ready-2-run FE-include files

- Special meshing for welds
- Contacts, sets
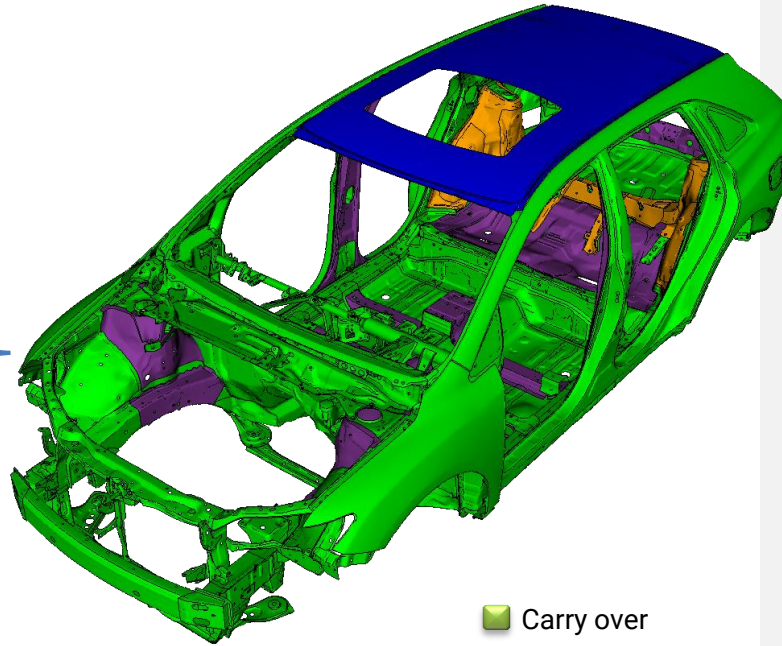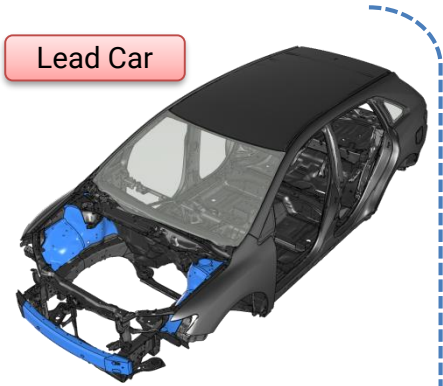- Output requests
- Any other special adjustment

Compare Commonalities

Calculate the commonality factor of a model by comparing it's structure to a reference model.

Requires CAD-Attribute:
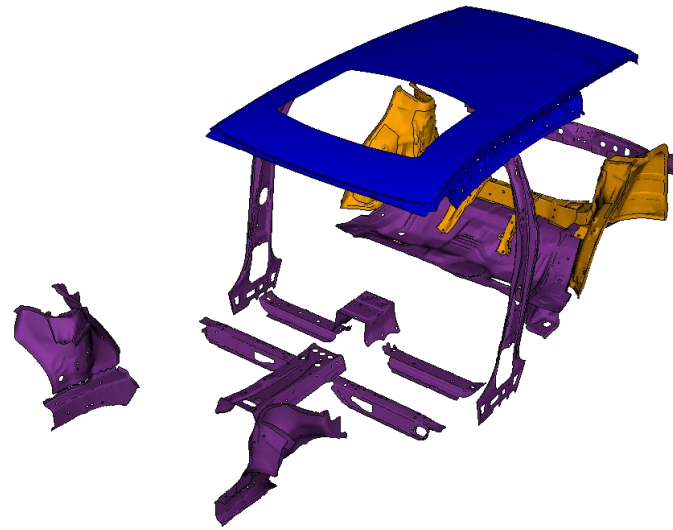- Part/Module Id's
- Version
- Transformation Matrix

Lead Car

S85_LHD_HYBR_NROOF

S85_LHD_HYBR_SUNROOF

S85_LHD_HYBR_SUNROOF vs. **Lead Car**
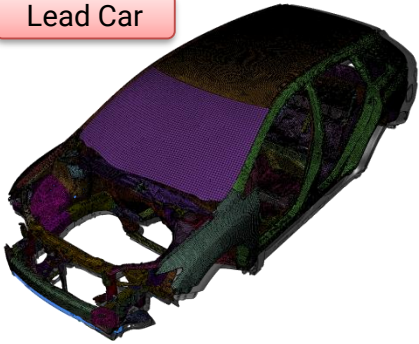
- Carry over
- New Parts
- New Version
- Moved

Compare Commonalities

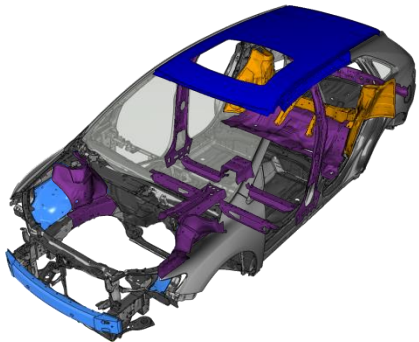Calculate the commonality factor of a model by comparing it's structure to a reference model.

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Lead Car

S85_LHD_HYBR_NROOF

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S85_LHD_HYBR_SUNROOF vs. Lead Car

- Carry over
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Lead Car

S85_LHD_HYBR_NROOF
Ready2Run FE-Model
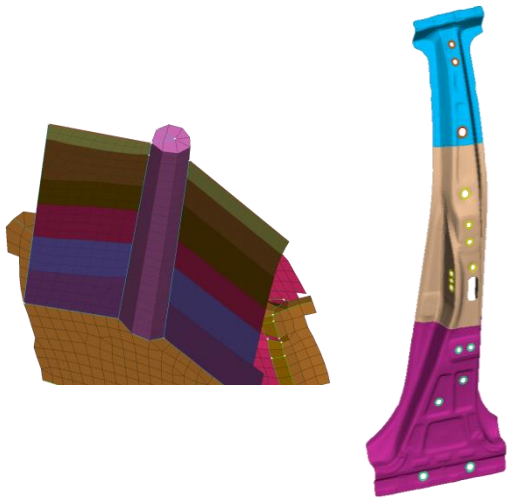
S85_LHD_HYBR_SUNROOF

Ready2Run FE-Model means
- Might require the input of multiple files
- Cannot rely on the existence of hierarchic info
- No ANSA-comments
- Cannot rely on nomenclatures

Compare Tool
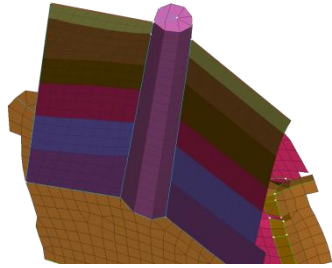
Compare in Detail Requirements

Dealing with FE-Includes

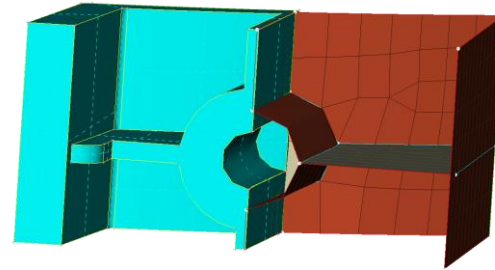Parts may consist of multiple
pids or FE-element types chosen

Compare in Detail Requirements

Dealing with FE-Includes

- Group FE-entities into parts to enable comparison

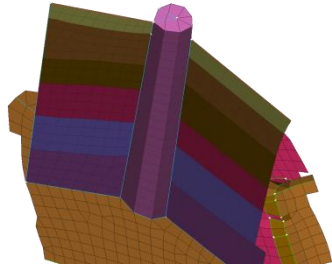Parts may consist of multiple pids or FE-element types chosen

Recognize solid vs. mid-surface comparison cases
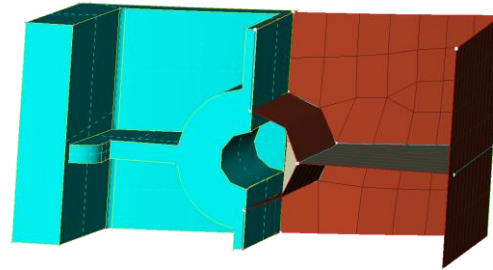
Compare in Detail Requirements

Dealing with FE-Includes
- Group FE-entities into parts to enable comparison
- Solid vs mid-surface description

Parts may consist of multiple pids or FE-element types chosen
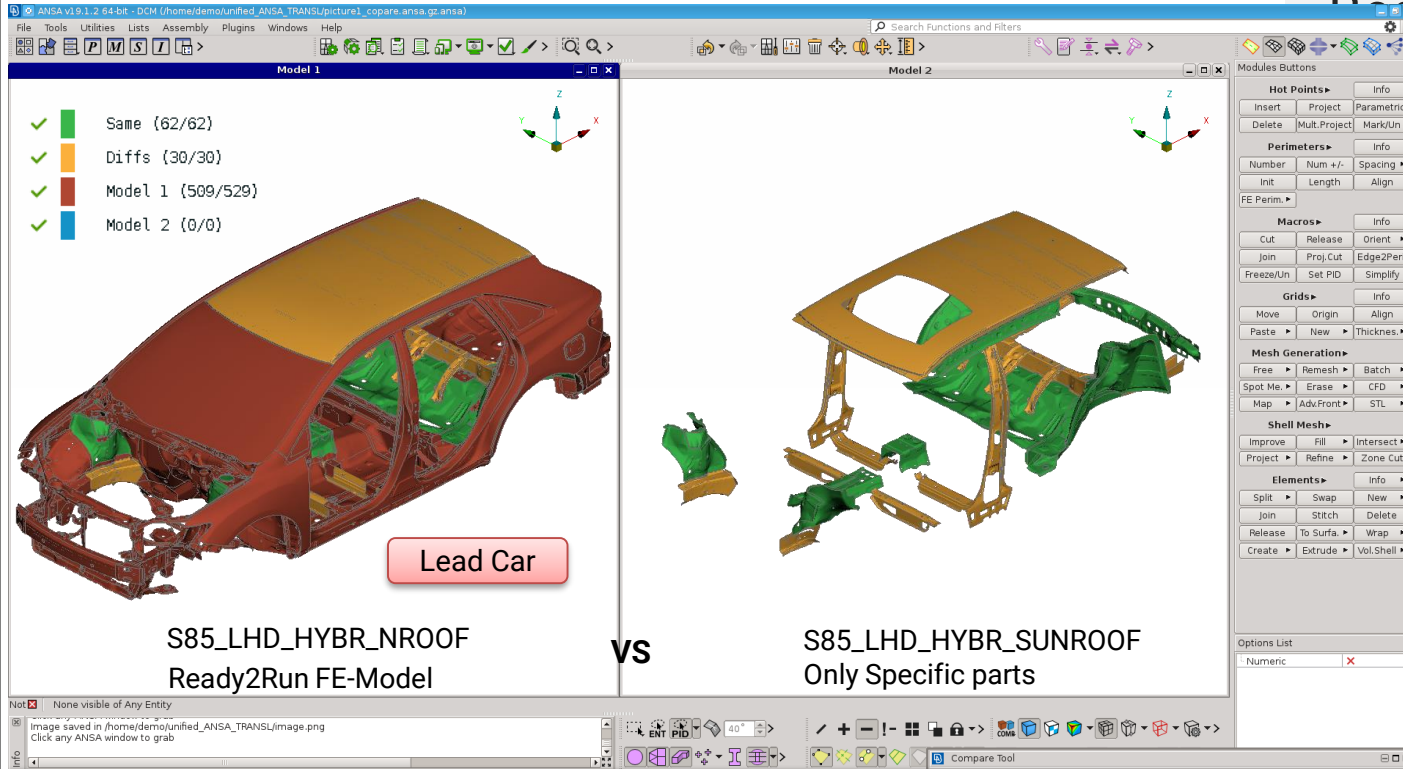
Recognize solid vs. mid-surface comparison cases

Compare criteria to decide when a difference should actually be considered as such

Compare in Detail Requirements

Dealing with FE-Includes
- Group FE-entities into parts to enable comparison
- Solid vs mid-surface description
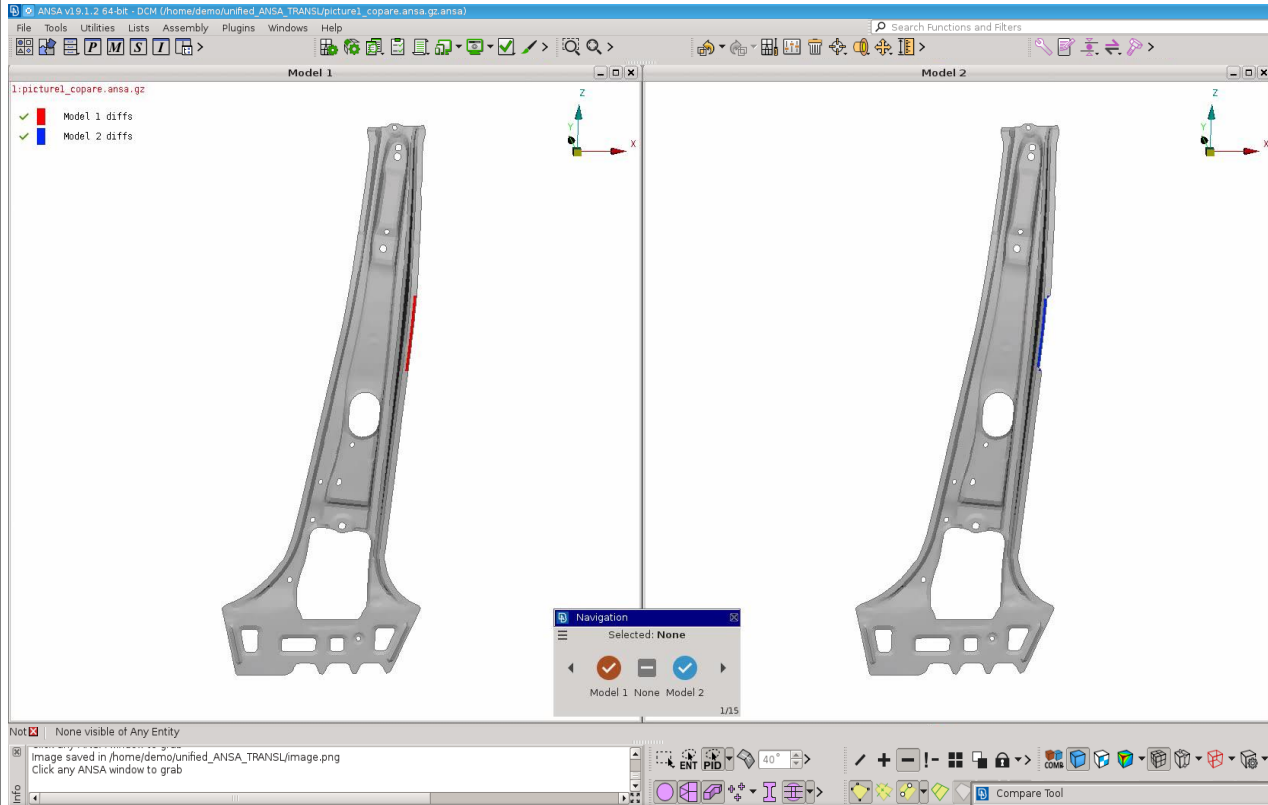- Define the decisive criteria for difference computation
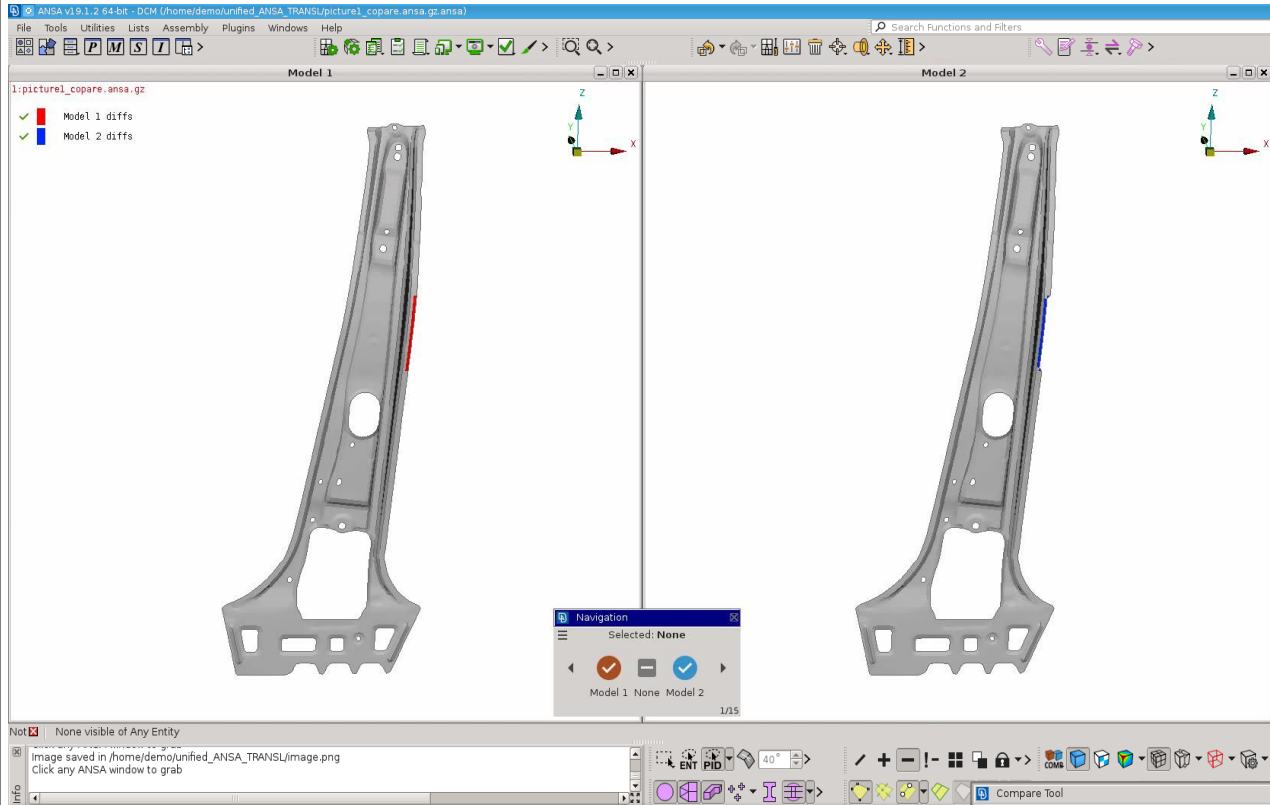
Compare in Detail Requirements

- ...ing with FE-Includes
- ...roup FE-entities into ...arts to enable ...omparison
- ...olid vs mid-surface ...escription
- ...efine the decisive ...riteria for difference ...omputation
- ...verview of pairs ...ith differences ...ccording to the ...ompare Criteria

Compare in Detail
Decision making

- Examine each pair to explore differences

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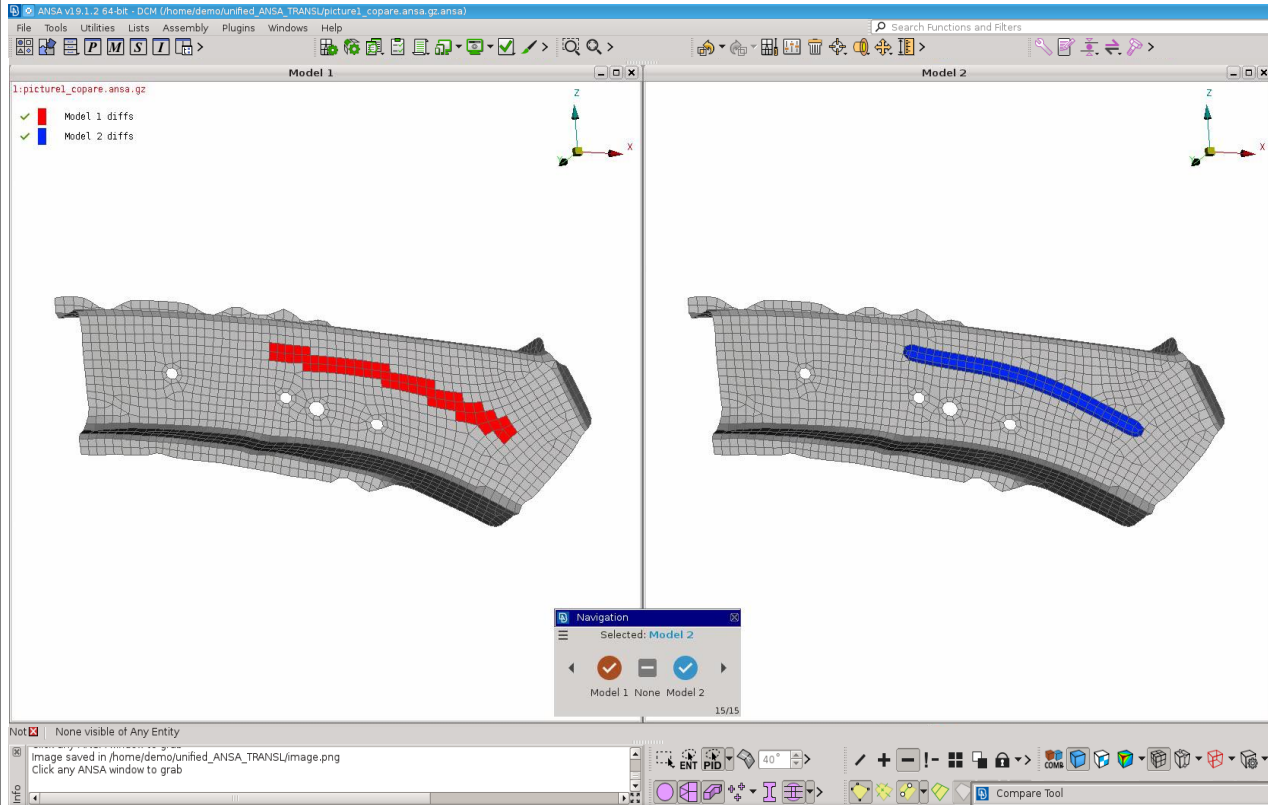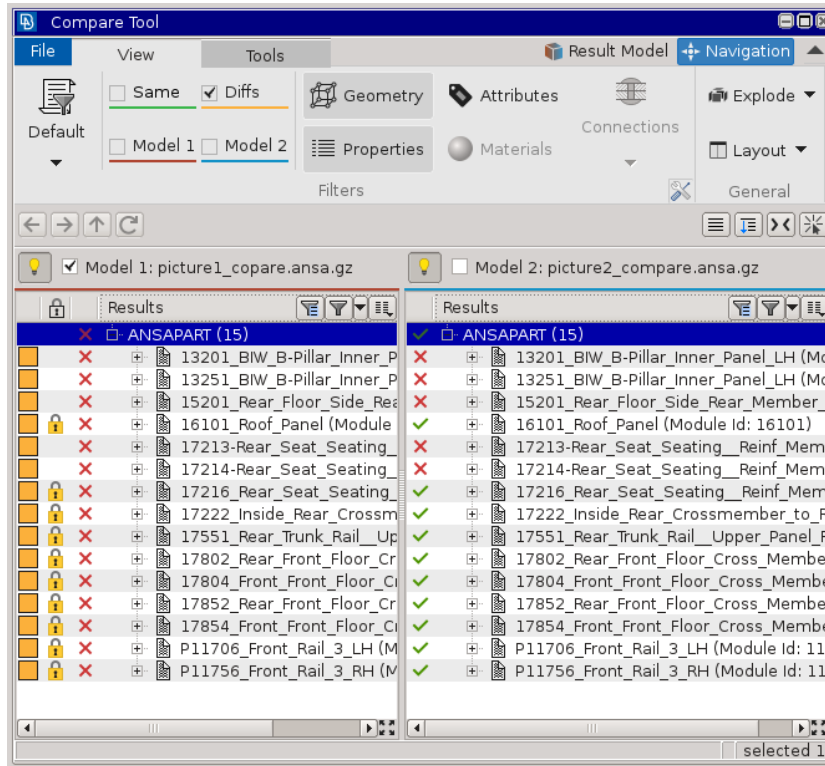- For decisive differences, parts are marked to be kept

Compare in Detail Decision making

- Examine each pair to explore differences
- For non decisive parts differences, parts can be marked as excluded
- For decisive differences, parts are marked to be kept
- Produce Result Model

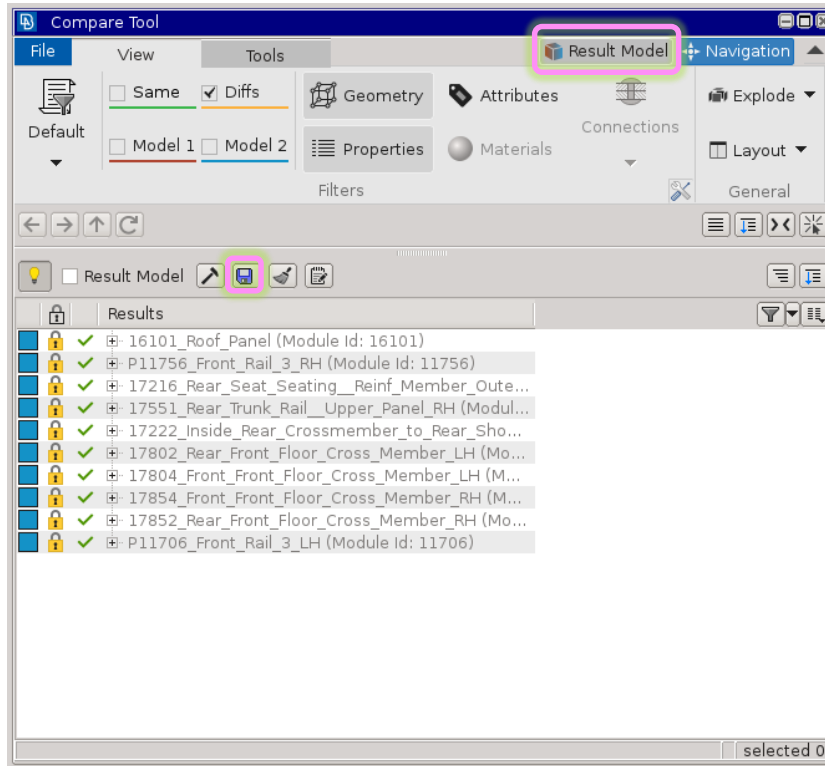# Compare in Detail Decision making

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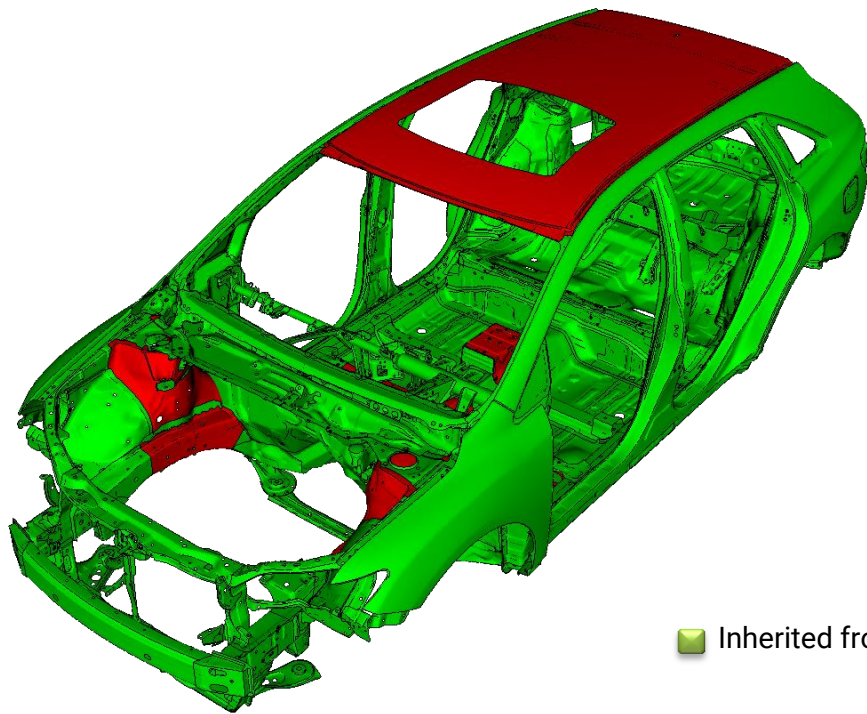## Compare in Detail Decision making

- Examine each pair to explore differences
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Inherited from [Lead Car]

New parts

Compare in Detail
Decision making

- Examine each pair to explore differences
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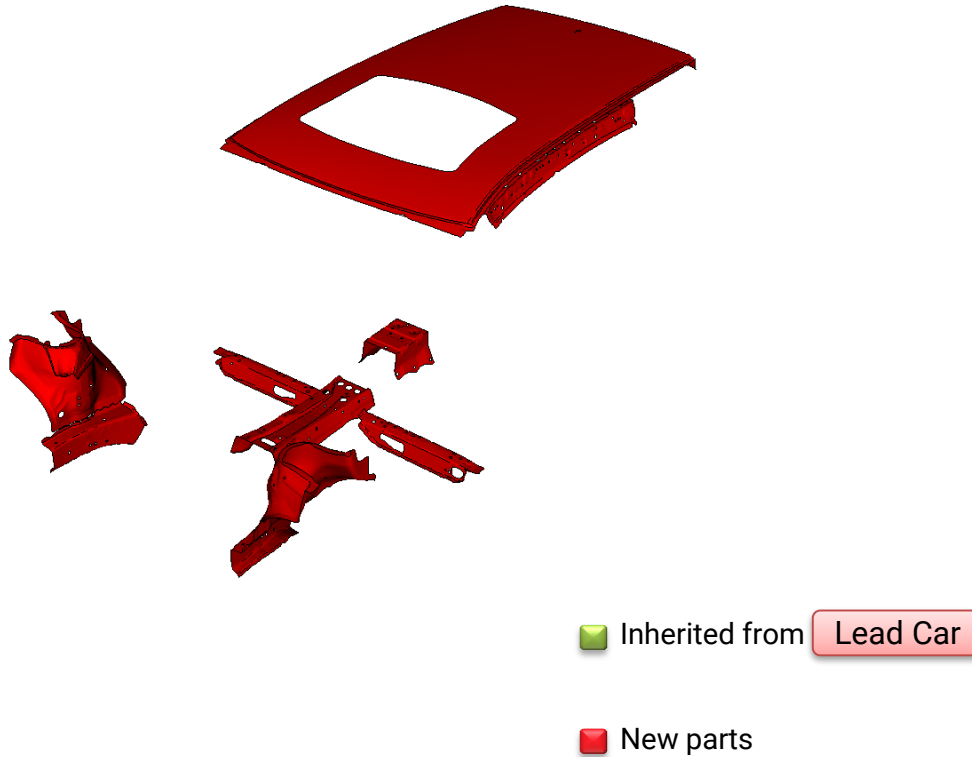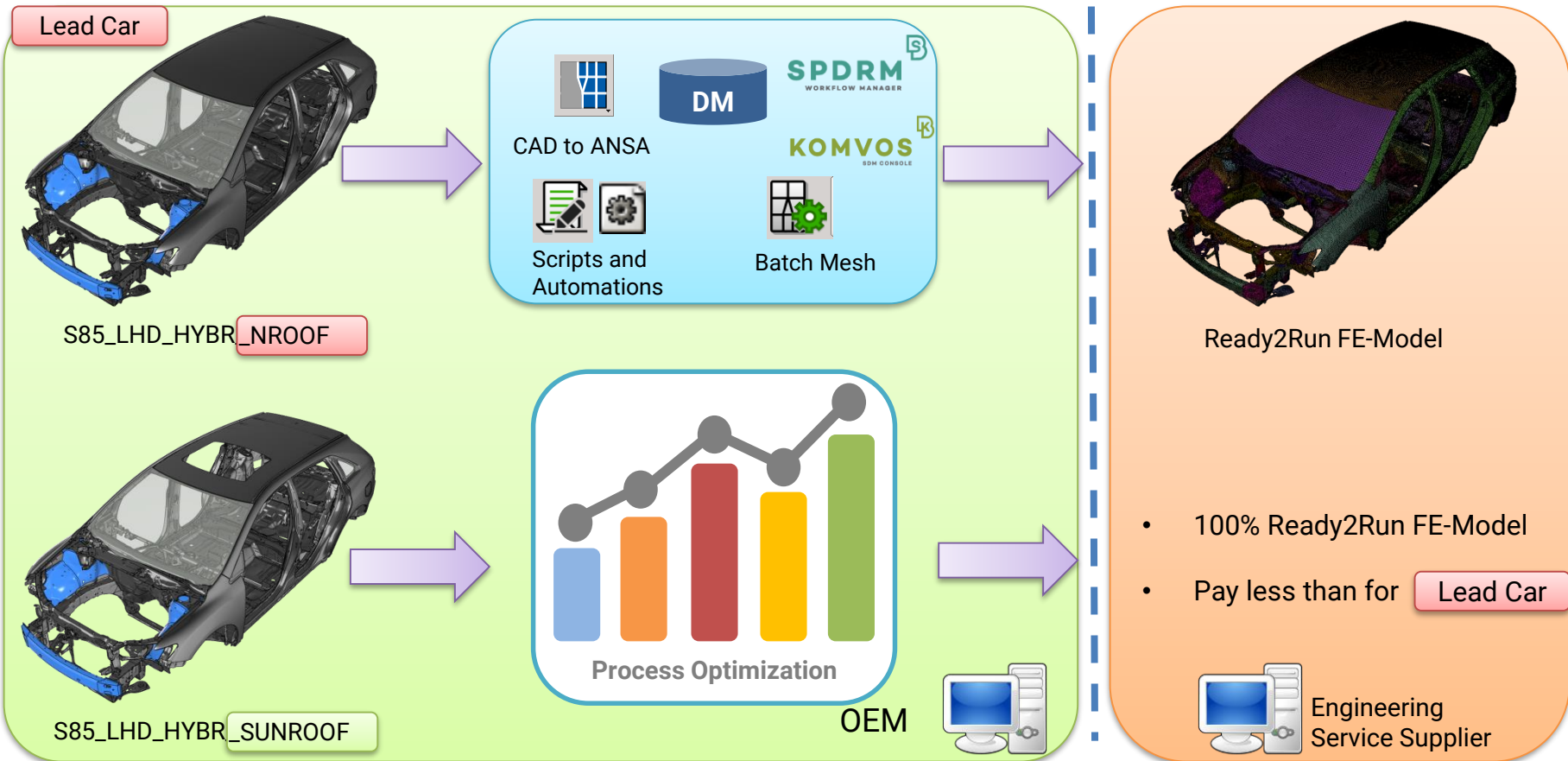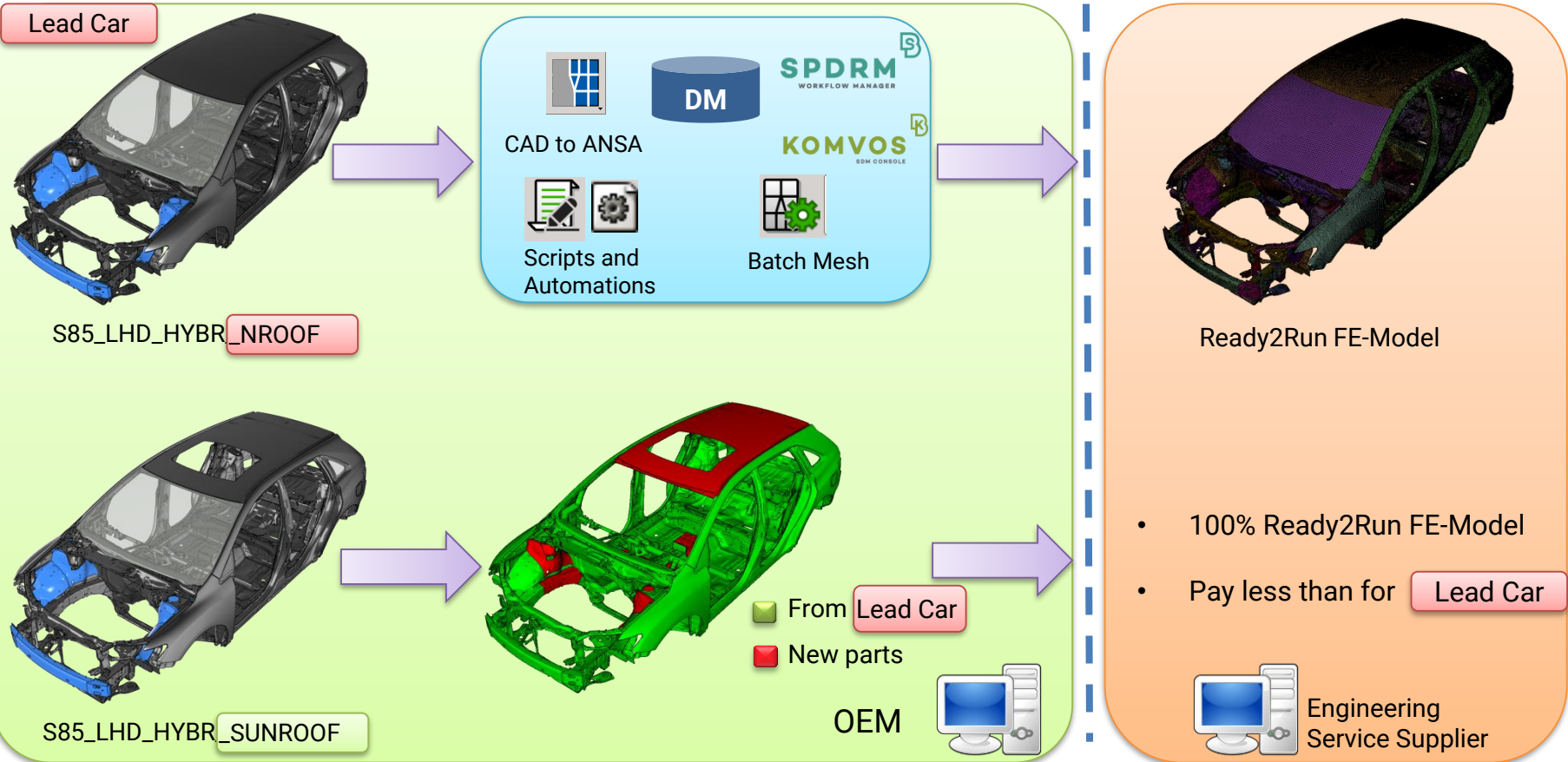- Produce Result Model

Inherited from **Lead Car**

New parts

Outcome

Lead Car

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Engineering Service Supplier

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From Lead Car

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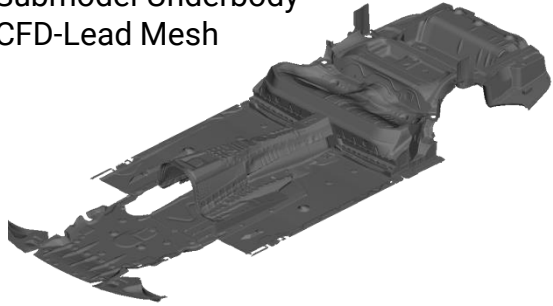
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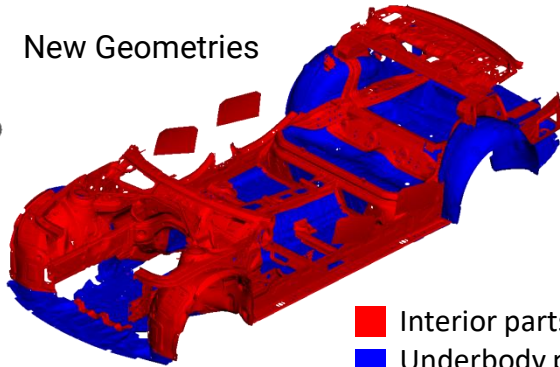
Engineering Service Supplier

- Transfer individual properties/faces between models
- Mapping purposes: PID, Material names, Stamp mapping process
- Quality check and reporting
- Feedback Mesh representation in ANSA-DM
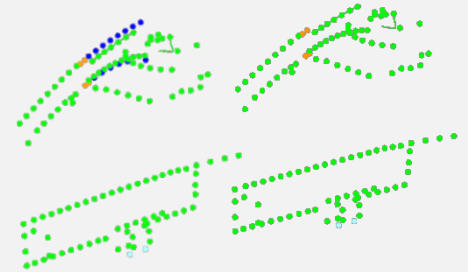- Special compare for Composites, Stamp Data
- Compare CFD

Compare Tool Other uses

Submodel Underbody
CFD-Lead Mesh

New Geometries

Interior parts
Underbody parts

Compare CFD-Scenario

Welds Compare

Comparison Report

Model 1   Model 2
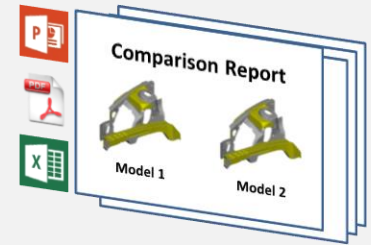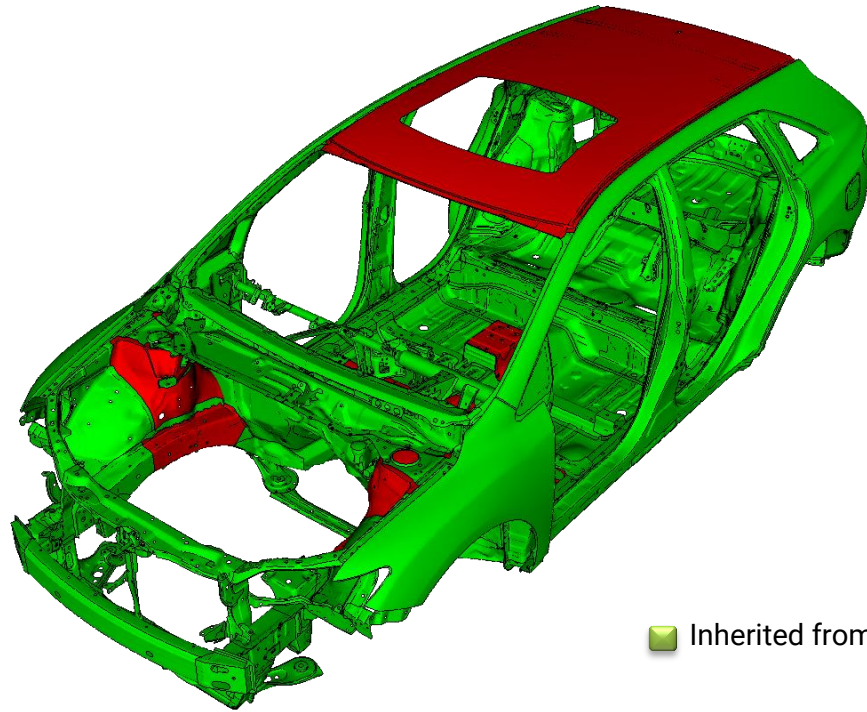
Compare Report

Stay connected

Inherited from **Lead Car**

New parts

Stay connected

Text size no smaller than 16

Text Box

Title

Description