

D3PLOT 22.1

D3PLOT 22.1 – Contents

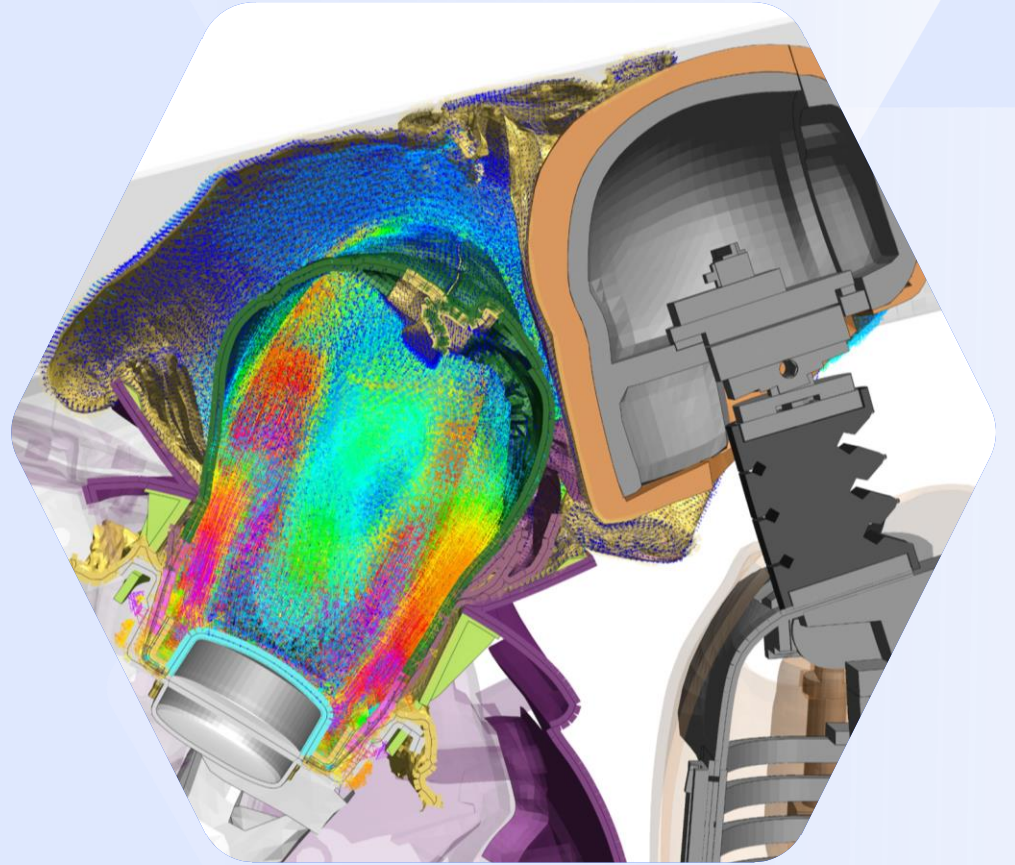
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Complete Ansys LS-DYNA Support

Airbags

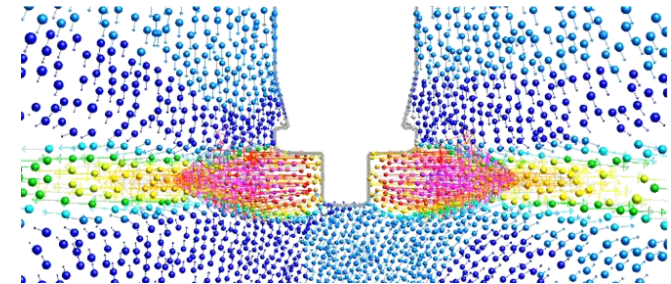
Support for *AIRBAG_CPG

A New Airbag Gas Solver



Support for Continuum-based Particle Gas (CPG)

- CPG is a new continuum-based particle approach for airbag simulations, available from Ansys LS-DYNA 2025R1 (R16).
- As a fully functional fluid solver, CPG is more effective at simulating gas flow than the corpuscular particle method (CPM), and more capable at internal fluid-structure interaction than ALE.
- Key features:
 - Compressible Navier-Stokes solver coupled with an ideal gas equation of state.
 - Meshless by design, based on a generalized finite-difference scheme.
 - Particle cloud fills airbag volume, gas passes from particle to particle (Eulerian approach).
 - Particles added or removed only when necessary.
 - Excellent accuracy, robustness & scalability to hundreds of cores.
- Designed for airbag simulation, validated by airbag CAE engineers:
 - Simple *AIRBAG_CPG keyword format that copies other *AIRBAG_ types. Same input data for inflators, fabric, etc.
 - First release supports internal structures, simple venting, fabric porosity, multiple gases/orifices/inflators, moving environment, local particle refinement, and more.
 - Inviscid with free-slip boundary by default, although viscosity and wall friction available.
- CPG is destined to take airbag simulation to the next level required for virtual testing, however accurate input data and well folded models are also vital to achieve useful results.



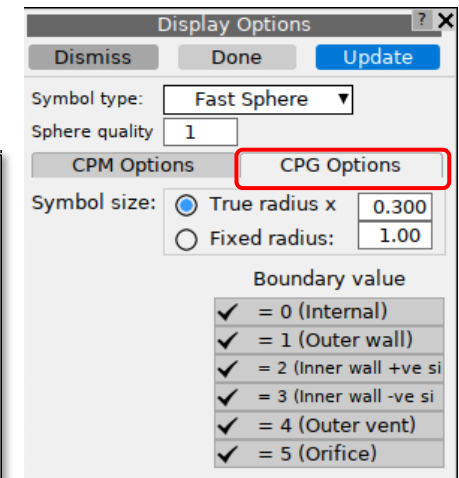
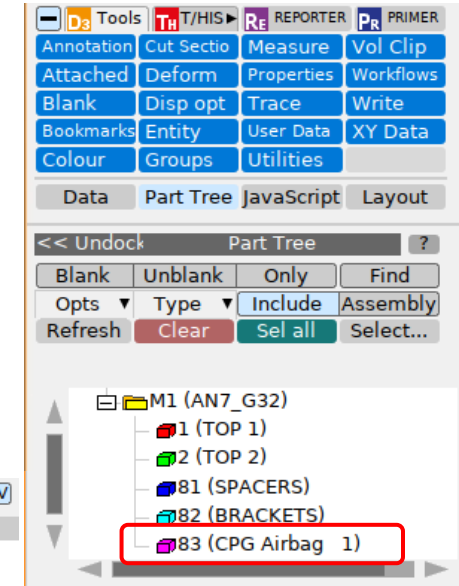
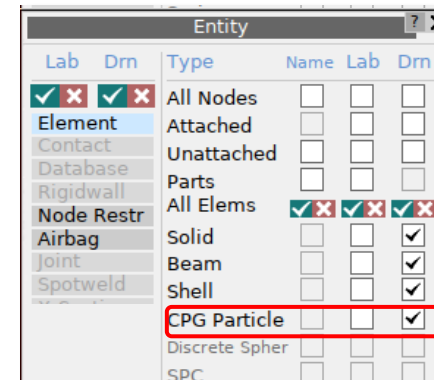
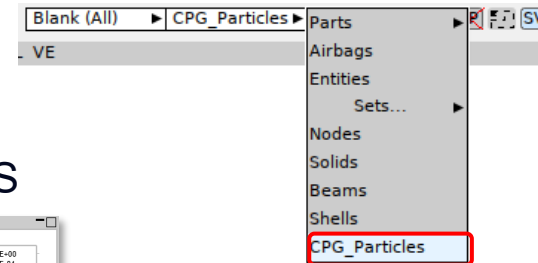
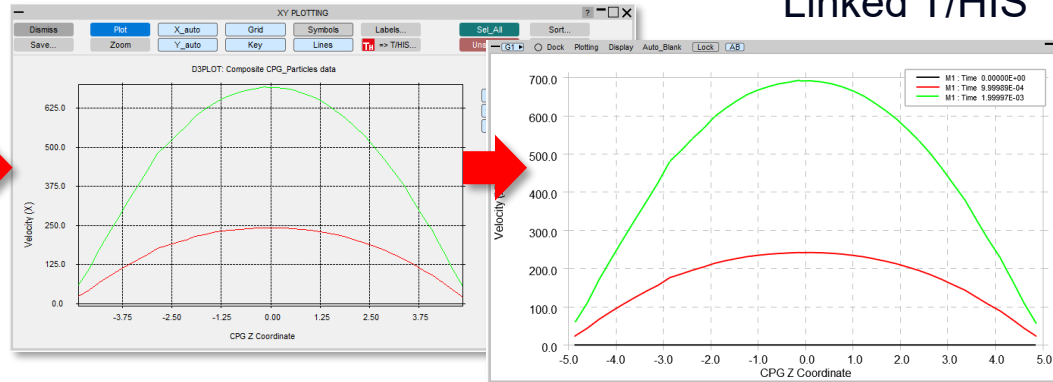
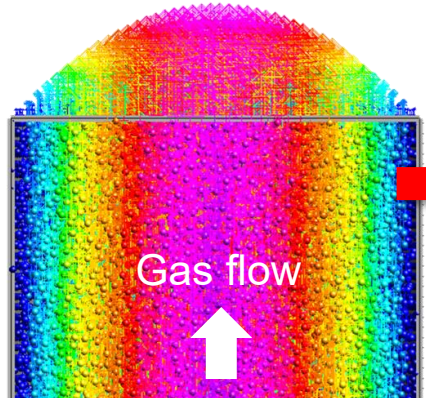
Support for CPG Results in D3PLOT

We work closely with Ansys to ensure that the Oasys LS-DYNA Environment is the leading choice for CPG workflows

D3PLOT 22.0 supports all CPG data in the new d3dat output file:

- Particle visibility control: Part Tree, Quick Pick, and Entity panels
- Particle symbol size control and visibility per boundary type
- Trace lines, target markers, cut-sections
- Data output (Write to Excel) and composite graphs (XY Data)

Velocity profile plots can be made using Composite XY Data – helps understand flow characteristics through part of the airbag.

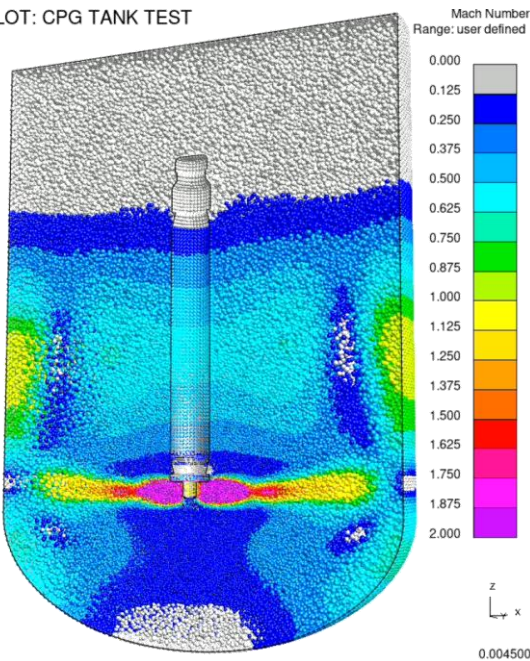


Support for CPG Results in D3PLOT

We work closely with Ansys to ensure that the Oasys LS-DYNA Environment is the leading choice for CPG workflows

All CPG data components can be plotted on particles:

D3PLOT: CPG TANK TEST



Scalar 1 | Scalar 2 | Vector | "Vel" | ?

☒ Scalar 1 Active | Scalar 1 Options...

Category : CPG Particles

Component : CPG_STATIC_PRESSURE

Contours : CPG Scalar Data

Max & Min : CPG_X_COORD

Envelope : CPG_Y_COORD

Ref frame : CPG_Z_COORD

Opacity : CPG_MACH_NUMBER

Data Plot Ref

CPG_VELOCITY

Explain this

X Vector X term

Y Vector Y term

Z Vector Z term

MAG Vector magnitude

CPG Vector Data

CPG_MESH_VELOCITY

CPG_VELOCITY

CPG Mapped Data (Averaged)

CPG_MACH_NUMBER

CPG_DENSITY

CPG_STATIC_PRESSURE

CPG_TOTAL_PRESSURE

CPG_STATIC_TEMPERATURE

CPG_TOTAL_TEMPERATURE

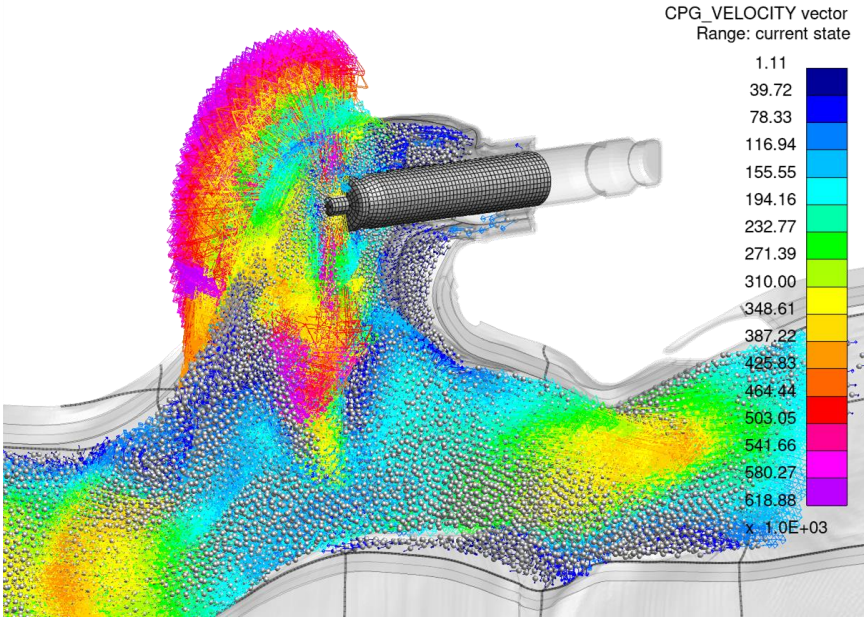
CPG_SPECIFIC_ENERGY

CPG_GAS_MASS_FRACTION_00

CPG_RADIUS_OF_INFLUENCE

CPG_PROC_ID

Flow velocity can be visualised using **Vector** arrows:



Tools | T/HIS | Re | REPORTER | PR | PRIMER

Annotation | Cut Sectio | Measure | Vol Clip

Attached | Deform | Properties | Workflows

Blank | Disp opt | Trace | Write

Bookmarks | Entity | User Data | XY Data

Colour | Groups | Utilities

Data | Part Tree | JavaScript | Layout

Scalar 1 | Scalar 2 | Vector | "Vel" | ?

☒ Vector Active

Category : CPG Particles

Component : CPG_VELOCITY

Contours : CPG Scalar Data

Max & Min : CPG Vector Data

Envelope : CPG_MESH_VELOCITY

Ref frame : CPG_VELOCITY

Opacity : Opacity ON

Data Plot Refre

Contour Options

Cloud Plots | Iso Plots | Princ Plots | Mapping

Levels | Limiting val | Resolution | Vec Plots

Arrow Properties

4.0 Arrow Lent | 1 Arrow Width (pixe

☐ Fixed length for all arrows

☐ Fixed Colour | Colour

CT | LC | SI | CL | Iso | Draw | Li | Hi | Sh | Save | Lock

PR | DP | Vel | Vec | RE | AC | Zoom | CN | All

Manu | Tidy | +XY | +YZ | +XZ | +ISO | Views | Rev

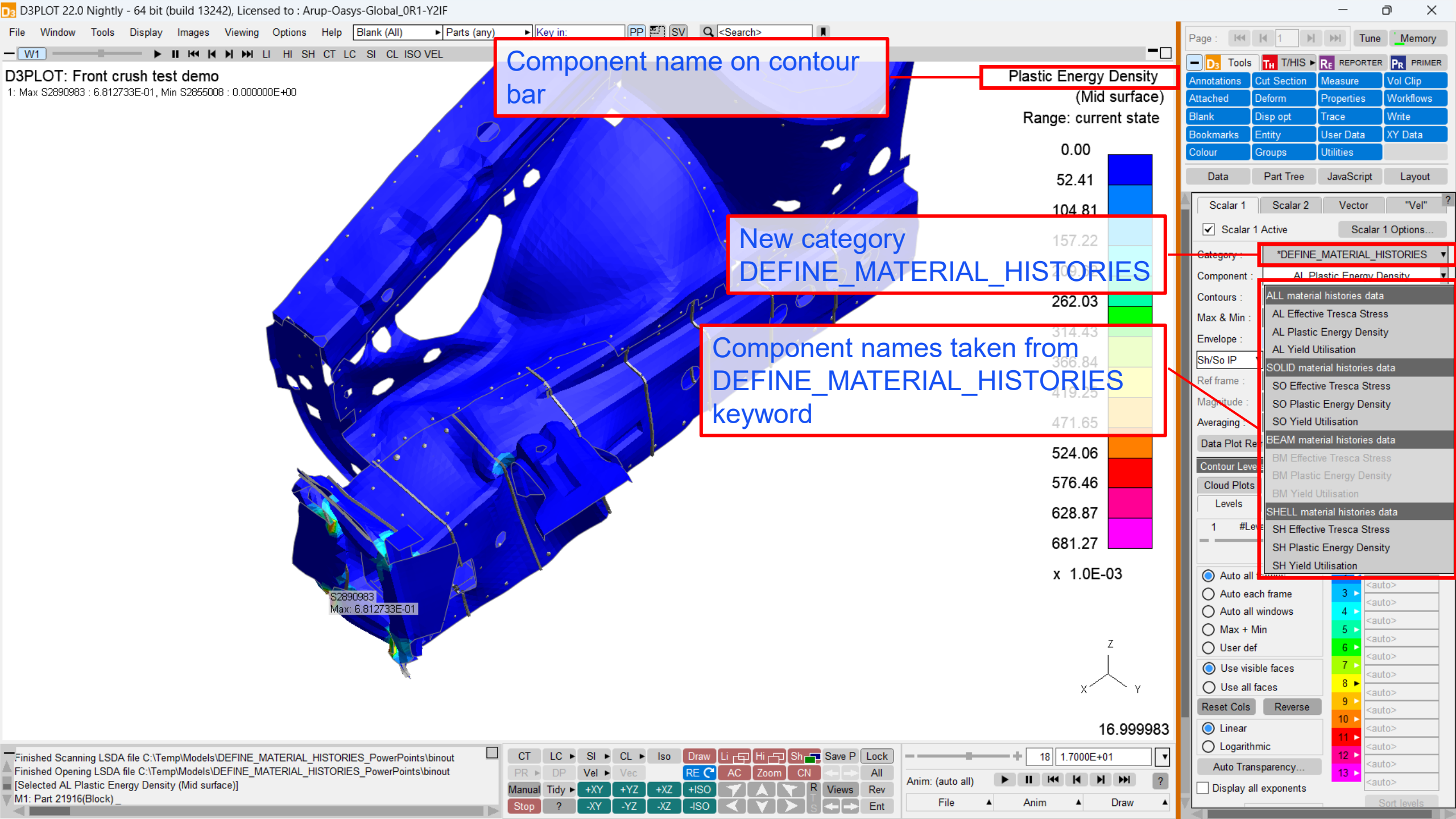
Stop | ? | -XY | -YZ | -XZ | -ISO | Ent

Images courtesy of JSOL Corporation

Define Material Histories

D3PLOT Supports *DEFINE_MATERIAL_HISTORIES Results

- D3PLOT has a new component category called “*DEFINE_MATERIAL_HISTORIES”.
- Components in this category use the user-defined names from the keyword, so you can more easily select the component you want.
- Components can be plotted on individual element types or across all element types at once.
- The contour bar is labelled with the component name, resulting in clearer results for reporting.
- The “Extra” component category remains available, so you can still plot extra history variables by number, if you prefer.
- This functionality relies on information in the ZTF file, so it must be available. You can generate a ZTF file for each model using PRIMER 22.0.

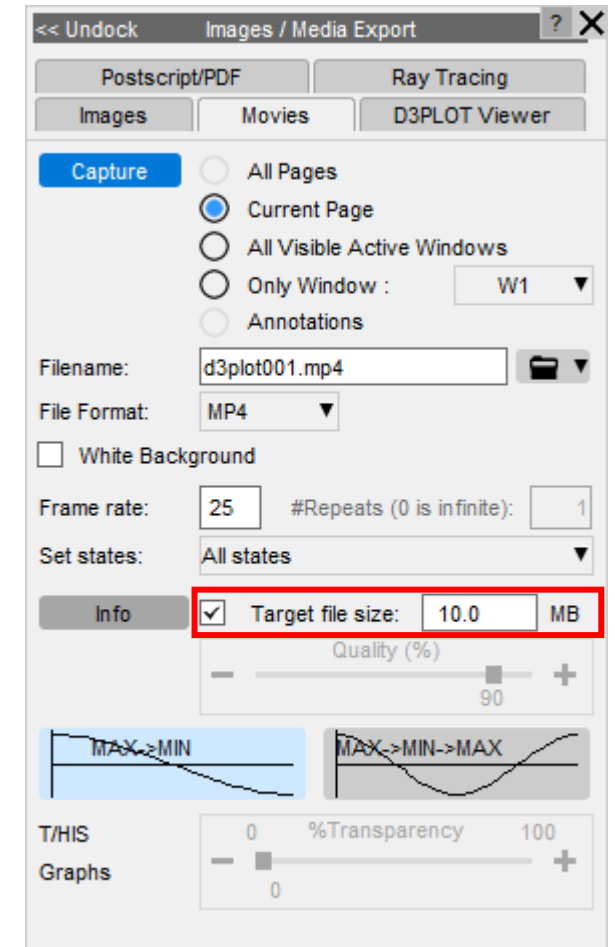


Efficient End-to-End Workflows

Movie File Size

Movie target file size

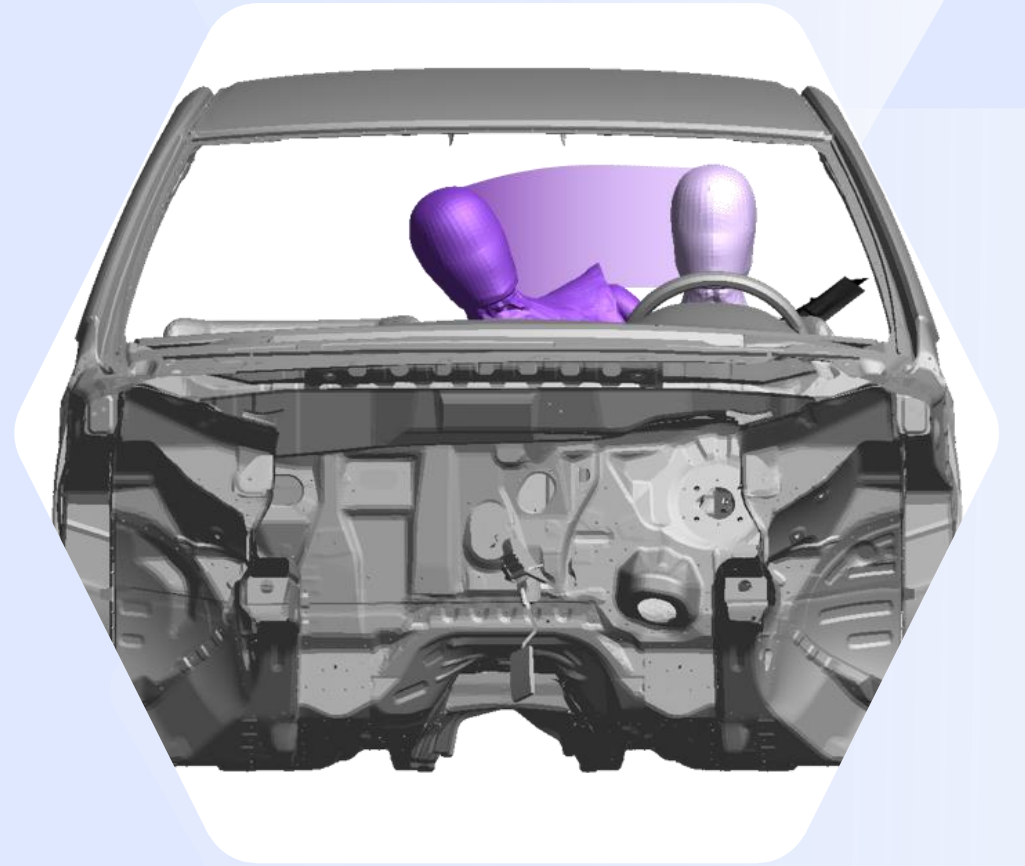
- By default, D3PLOT exports high quality videos at the screen resolution of the graphics window(s). For MP4 files, this can result in large file sizes. Sometimes, smaller file sizes are desired.
- For MP4 files, a target file size (in megabytes) can now be specified.
- When this option is selected, the required bitrate for the movie is determined by that size instead of the Quality (%) slider.
- The file size is a target and is not guaranteed. The actual size of the movie file can vary and can typically be smaller than requested by a few percent.



Virtual Testing

- [C-NCAP Management Regulation](#)
- [Euro NCAP 2026 Protocols](#)
- [Working with Test Data](#)
- [LS-DYNA to ISO-MME Improvements](#)
- [Automotive Assessments Improvements](#)
- [SimVT](#)
- [VTC Quality Criteria Workflows](#)
- [VTC Videos Workflows](#)

C-NCAP Management Regulation

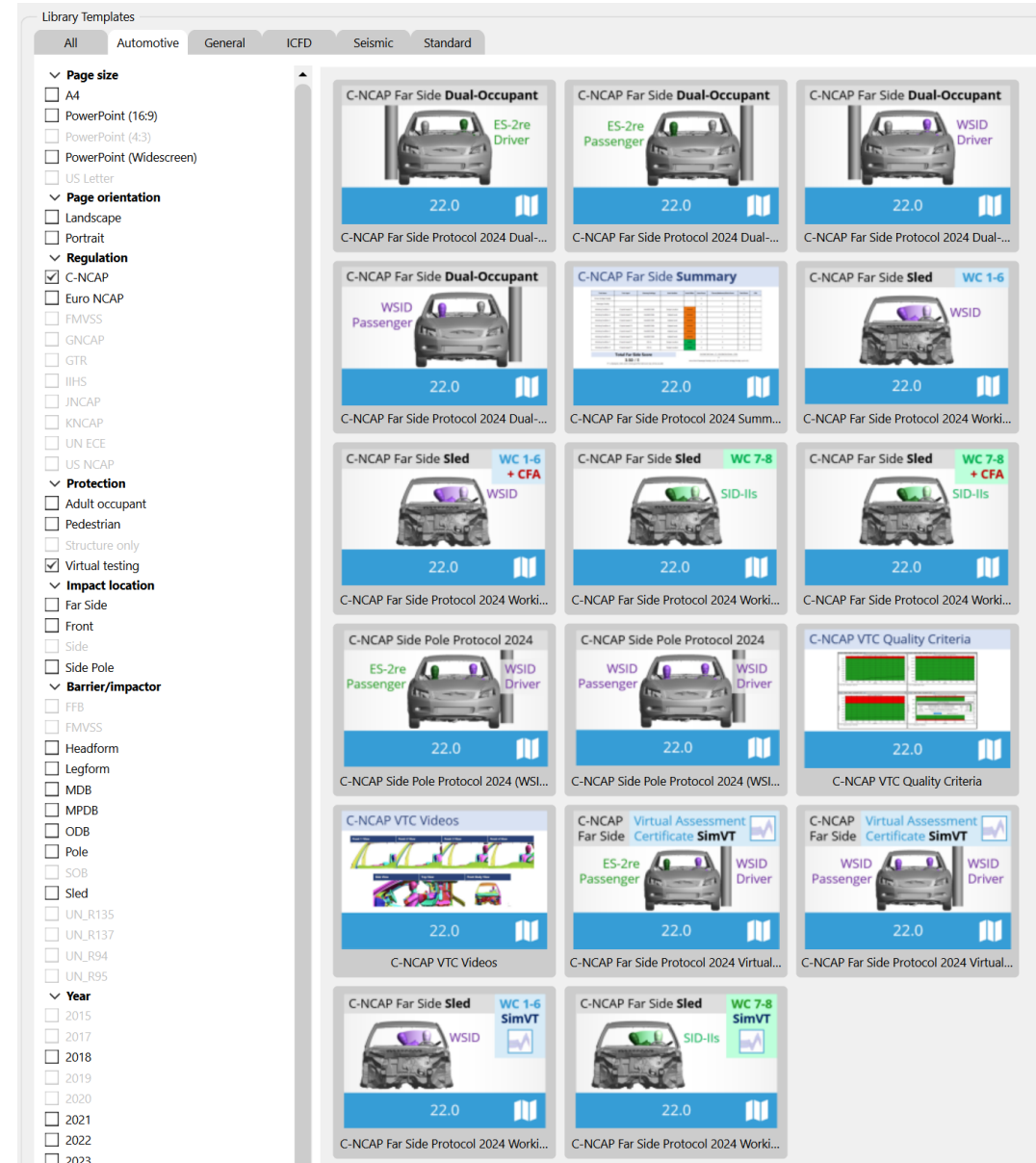


C-NCAP Management Regulation (2024 Edition)

Since Oasys 21.1, there has been support for the various requirements of the C-NCAP Far Side Occupant Protection Protocol, including:

- For each of the eight Working Conditions:
 - Occupant injury assessment
 - ISO Correlation Fitting indices
 - Correction Factor A
- Dual-Occupant Penalty calculation
- ISO correlation fitting indices for the Virtual Assessment Certificate (prerequisite for the symmetry of far side occupant protection airbags)
- Overall score calculation

[Read the documentation to learn more](#)

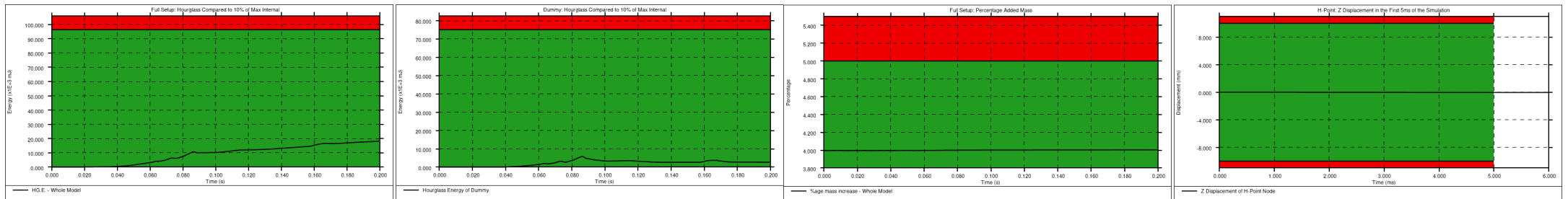


C-NCAP VTC Quality Criteria

- The C-NCAP VTC Quality Criteria Workflow tool follows the same principals as the Euro NCAP version but assesses the quality criteria specified in section H.1.1(f) of the C-NCAP Far Side Simulation & Assessment Protocol.
- The tool can be automated using the REPORTER template provided.

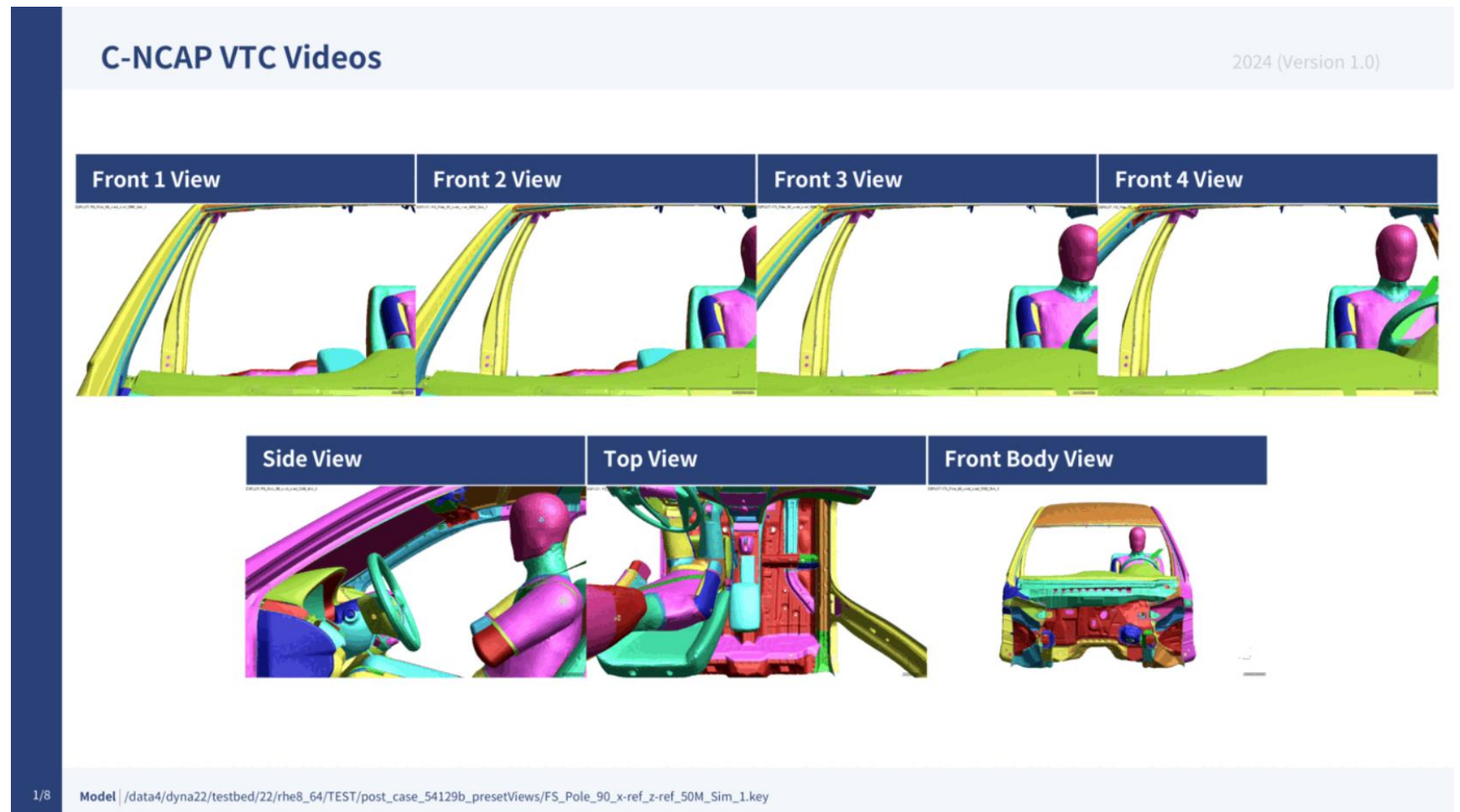
C-NCAP VTC Quality Criteria				
Component	Test Description	Limit	Result	
Full Setup	Maximum Hourglass Energy < 10% of Maximum Internal Energy	96312	18243	✓
Dummy	Maximum Hourglass Energy < 10% of Maximum Internal Energy	75128	5834.5	✓
Full Setup	Maximum Added Mass (%) < Total Model Mass at the Beginning of the Simulation	5	4.0043	✓
H-Point Node	Z Displacement (mm) in the First 5ms of the Simulation	10	0.00085449	✓

Write Results Model Units: U2 (mm, t, s)



C-NCAP VTC Videos

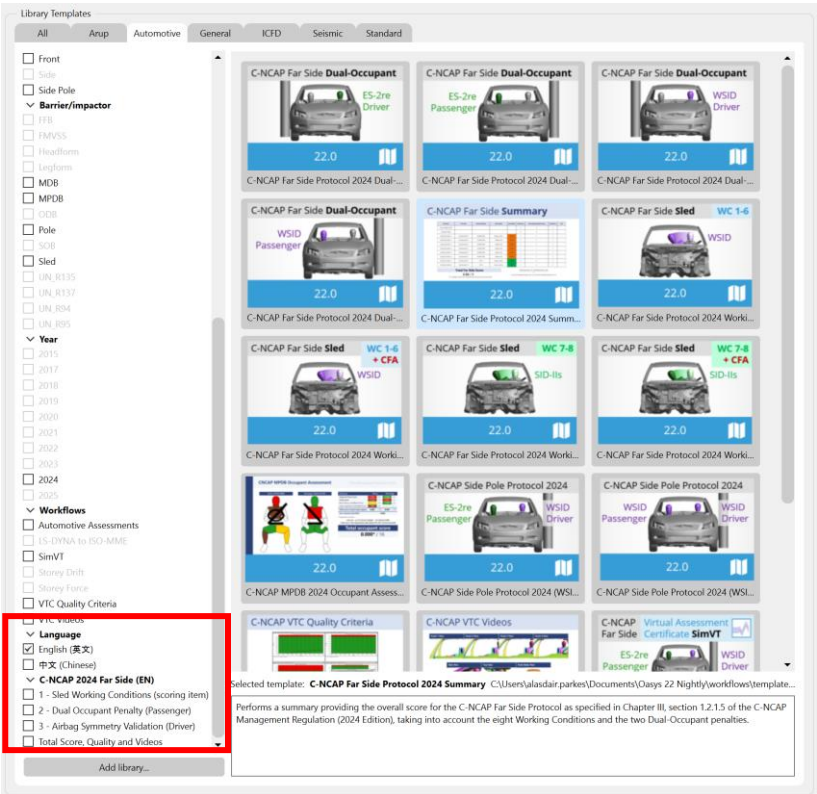
- The **C-NCAP VTC Videos** Workflow tool follows the same principles as the Euro NCAP version but helps you calculate the views and export the videos specified in section H.2.8 of the C-NCAP Far Side Occupant Protection Protocol (2024 Edition).
- Use the standard Workflow method in **PRIMER** and **D3PLOT** or the whole process can be automated using the **REPORTER** template provided.



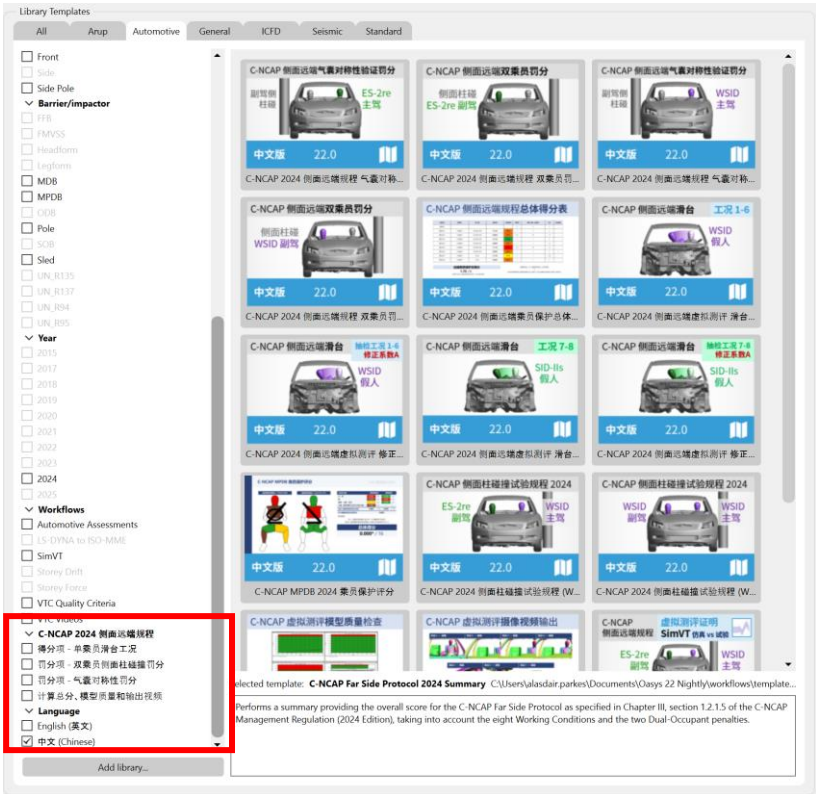
Chinese Language Reports

中文版报告模板

- You now have access to all the C-NCAP REPORTER templates in both English and Chinese, for ease of communication with your teams, partners, suppliers, and C-NCAP.
- 所有 C-NCAP REPORTER 模板都同时提供英文和中文版供您使用，方便您与团队、合作伙伴、供应商，和 C-NCAP 沟通。



- ✓ C-NCAP 2024 侧面远端规程
 - ☐ 得分项 - 单乘员滑台工况
 - ☐ 罚分项 - 双乘员侧面柱碰撞扣分
 - ☐ 罚分项 - 气囊对称性扣分
 - ☐ 计算总分、模型质量和输出视频
- ✓ Language
 - ☐ English (英文)
 - ☒ 中文 (Chinese)
- ✓ C-NCAP 2024 Far Side (EN)
 - ☐ 1 - Sled Working Conditions (scoring item)
 - ☐ 2 - Dual Occupant Penalty (Passenger)
 - ☐ 3 - Airbag Symmetry Validation (Driver)
 - ☐ Total Score, Quality and Videos



Chinese Language Reports

中文版报告模板

- Example reports generated by C-NCAP REPORTER templates, in English (left) and Chinese (right):
- 下方展示了由 C-NCAP REPORTER 模板自动生成的英文版（左侧）和中文版（右侧）报告示例。



C-NCAP 2024 侧面远端虚拟测评 滑台工况 7 - 8 相关性对标证据 (SID-H)

Item	Test	Condition	Category	Value	Weight	Unit	Result	Pass	Score
H1	11440000000000000000	TS	1	1	1	1	1	1	1
H2	11440000000000000000	TS	1	1	1	1	1	1	1
H3	11440000000000000000	TS	1	1	1	1	1	1	1

传感器得分 > 0.7 (通过)

C-NCAP 2024 侧面远端虚拟测评 修正系数 A (抽检滑台工况 1, WSID)

远端虚拟测评滑台工况 1 得分

CF	Sim	Test
1	2/8	2/8

C-NCAP 2024 侧面远端虚拟测评 双乘员得分 (侧面碰撞, WSID 副驾)

Item	Test	Condition	Category	Value	Weight	Unit	Result	Pass	Score
H1	11440000000000000000	TS	1	1	1	1	1	1	1
H2	11440000000000000000	TS	1	1	1	1	1	1	1
H3	11440000000000000000	TS	1	1	1	1	1	1	1

C-NCAP 2024 侧面远端虚拟测评 气囊对称性虚拟测评 (侧面碰撞, WSID 主驾, WSID 副驾)

Item	Test	Condition	Category	Value	Weight	Unit	Result	Pass	Score
H1	11440000000000000000	TS	1	1	1	1	1	1	1
H2	11440000000000000000	TS	1	1	1	1	1	1	1
H3	11440000000000000000	TS	1	1	1	1	1	1	1

C-NCAP 2024 侧面远端虚拟测评 气囊对称性验证评分 (副驾驶侧碰撞, ES-2re 主驾)

Item	Test	Condition	Category	Value	Weight	Unit	Result	Pass	Score
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H3	11440000000000000000	TS	1	1	1	1	1	1	1

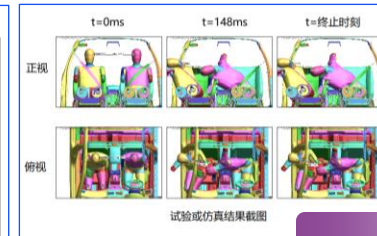
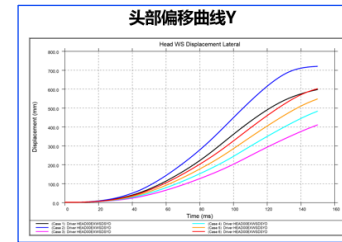
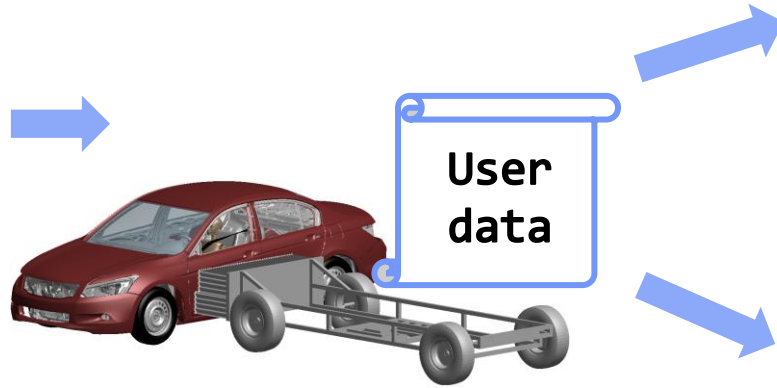
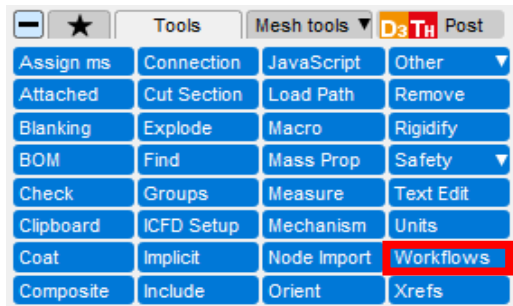
C-NCAP 2024 侧面远端乘员保护总体得分表

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H3	11440000000000000000	TS	1	1	1	1	1	1	1

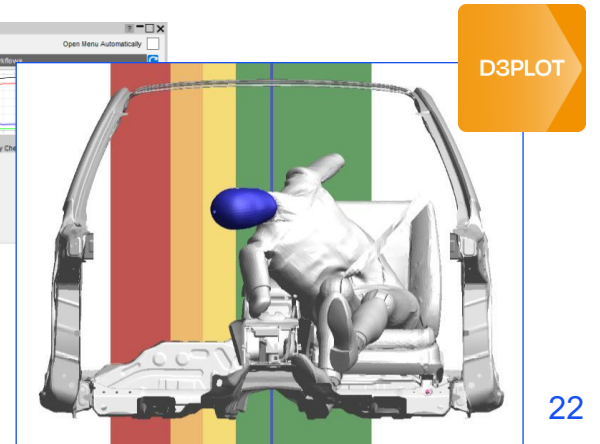
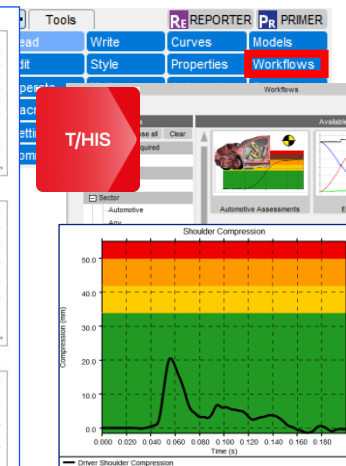
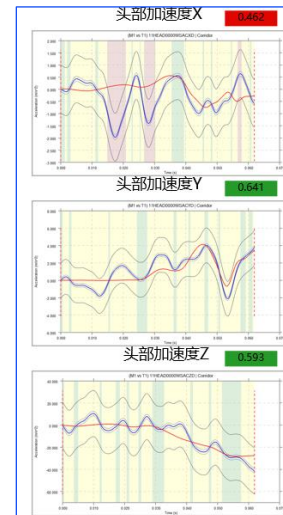
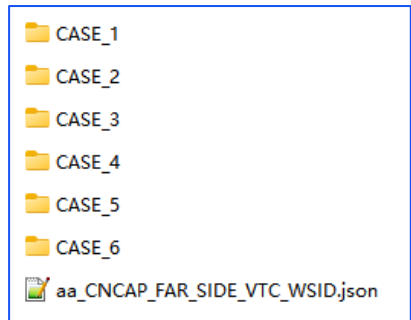
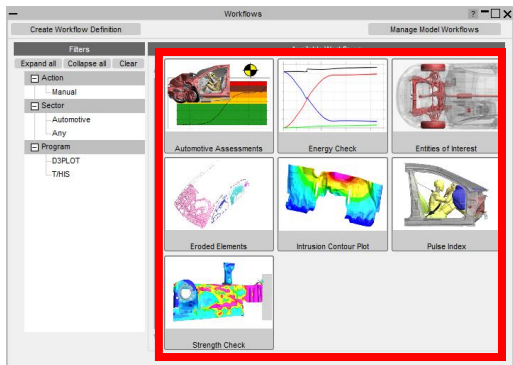
C-NCAP Far Side 2024 Official Format Template (inc. O2O)

- The C-NCAP Far Side 2024 protocol (including Occupant to Occupant Assessment) can now be produced in the official format template as requested by C-NCAP. Set up your models in PRIMER, tag with user data using Workflows, and run the REPORTER Templates. Alternatively, outputs can be viewed interactively in D3PLOT and T/HIS. Full instructions in Chinese can be found in our documentation under Workflows.

序号	工况	假人	座椅位置	头部偏移量	头部得分	胸部得分	合计
工况1*	32柱碰*75°	WS50	设计位置	黄色区	4	4	8
工况2	32柱碰*75°	WS50	座椅位置: 最高	橙色区	3	3	6
工况3	32柱碰*90°	WS50	设计位置	绿色区	4	4	8
工况4*	32柱碰*90°	WS50	座椅位置: 最高	绿色区	4	4	8
工况5	32柱碰*60°	WS50	设计位置	黄色区	4	4	8
工况6*	32柱碰*60°	WS50	座椅位置: 最高	黄色区	4	4	8
工况7	32柱碰*75°	sid2s	设计位置	橙色区	3	3	6
工况8*	32柱碰*75°	sid2s	最高	橙色区	3	3	6
合计总分							58,000
换算分(占乘员保护)							7,250



REPORTER

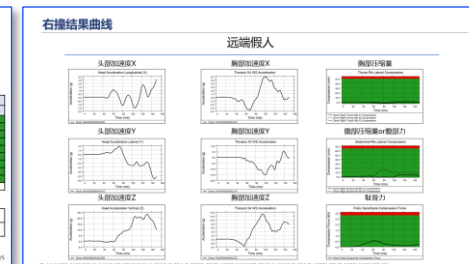
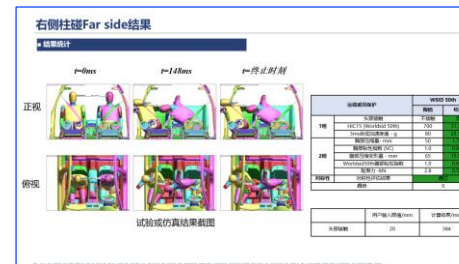
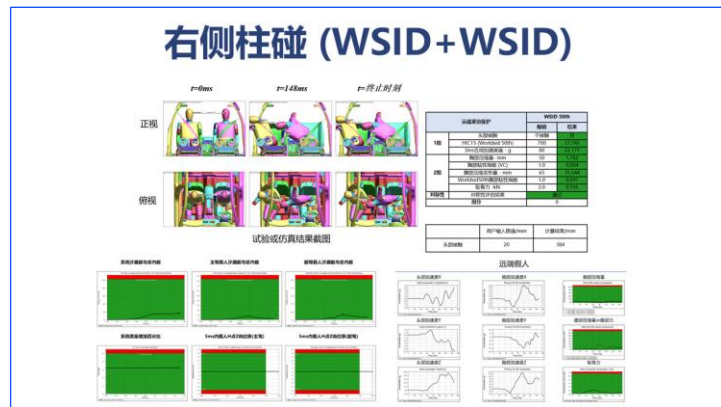


D3PLOT

- Below shows a preview of the automatically generated contents for C-NCAP 2024 Far Side VTC report.



- Below shows a preview of the automatically generated contents for C-NCAP 2024 O2O report.



C-NCAP Front AEB OOP 2024 Official Format Template

- The C-NCAP Front AEB OOP 2024 protocol can now be produced in the official format template as requested by C-NCAP. Set up your models in PRIMER, tag with user data using Workflows, and run the REPORTER Templates. Alternatively, outputs can be viewed interactively in D3PLOT and T/HIS. Full instructions in Chinese can be found in our documentation under Workflows.

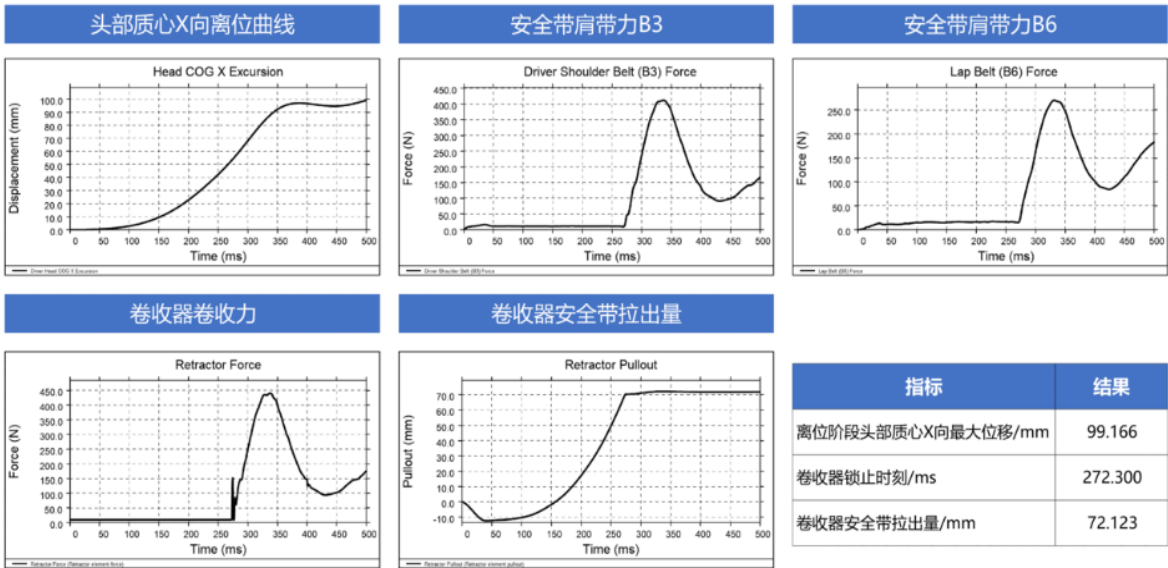
工况OOP+MPDB预测伤害明细

■ 工况OOP+MPDB预测结果统计

	测量部位	测量参数	滤波频率等级CFC	伤害指标计算	OOP+MPDB
驾驶员 THOR 50th 男性假人	头部	加速度Ax、Ay、Az	1000	HIC15合成加速度	27.410
				3ms 合成加速度值(g)	20.801
				脑损伤DAMAGE	0.169
	颈部	力Fx	1000	剪切力 Fx (kN)	1.696
		力Fz		张力 Fz (kN)	0.810
		力矩My	600	伸张弯矩 My (Nm)	-6.259
	胸部	胸部压缩量	180	左上肋骨位移量(mm)	23.387
				左下肋骨位移量(mm)	10.346
				右上肋骨位移量(mm)	33.836
				右下肋骨位移量(mm)	20.621
	腹部	腹部压缩量	180	左侧腹部压缩量(mm)	28.829
				右侧腹部压缩量(mm)	31.657

工况OOP+MPDB乘员伤害结果预测曲线

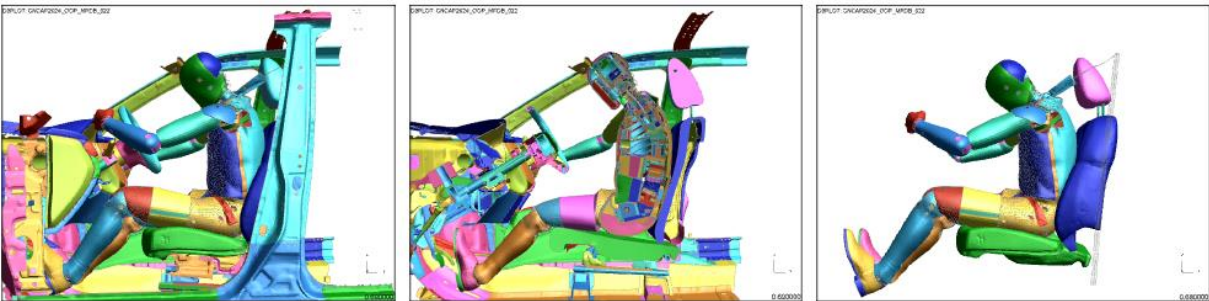
■ 制动阶段离位预测结果 (0~500ms)



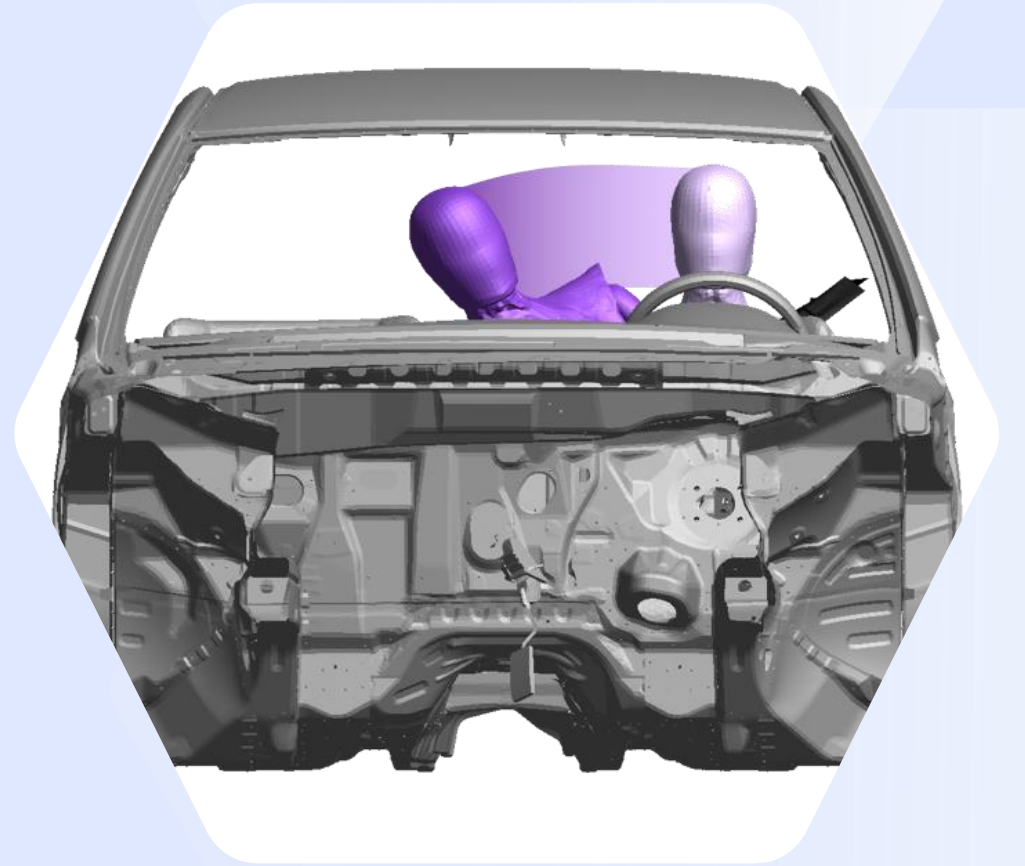
全局

过H点XZ剖视

只有假人、座椅、
安全带、气囊的动画



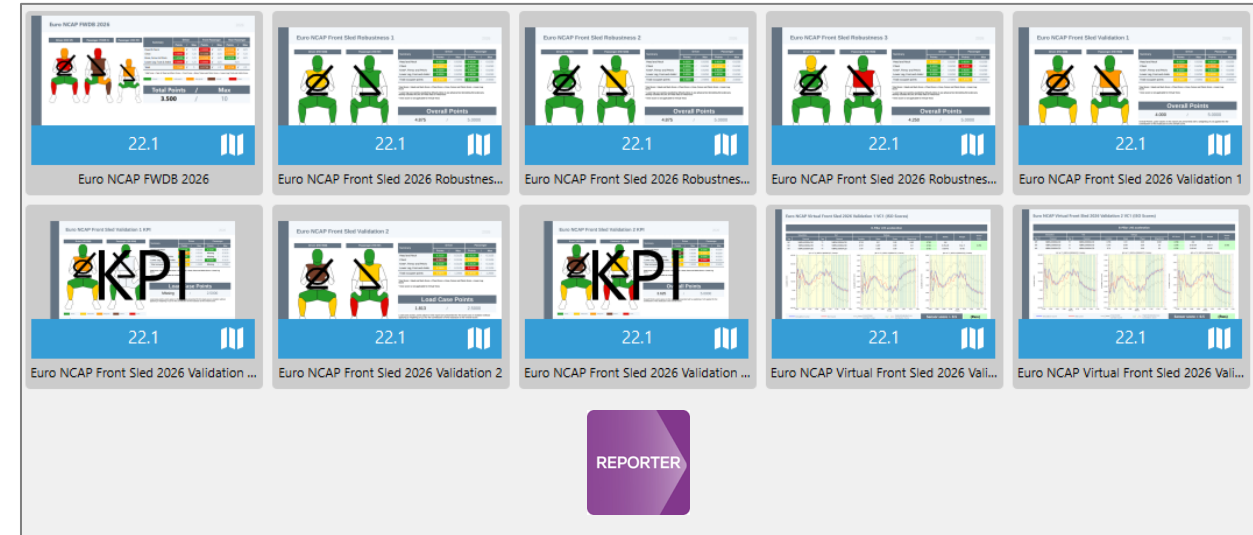
Euro NCAP 2026 Protocols



Euro NCAP Virtual Frontal Impact – Overview

In Oasys 22.1, support has been added for the 2026 Virtual Frontal Impact Protocol. This new protocol supports the following Crash Tests:

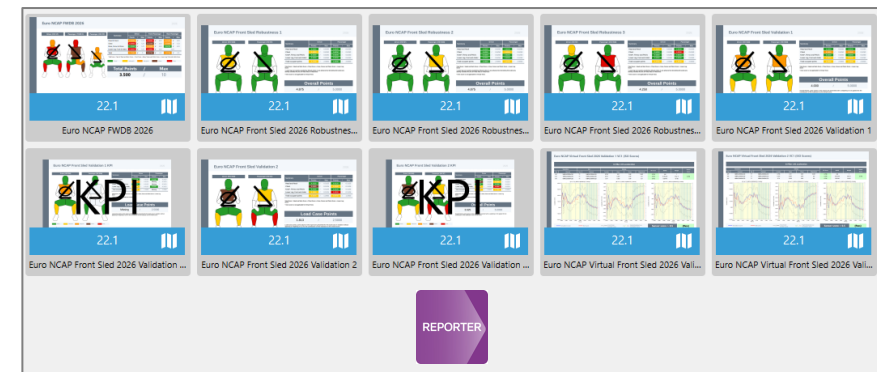
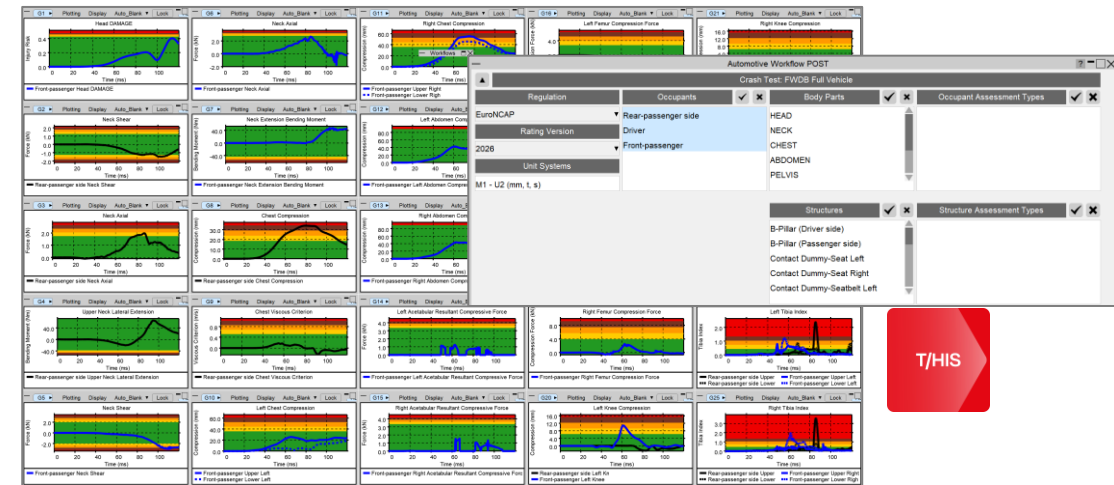
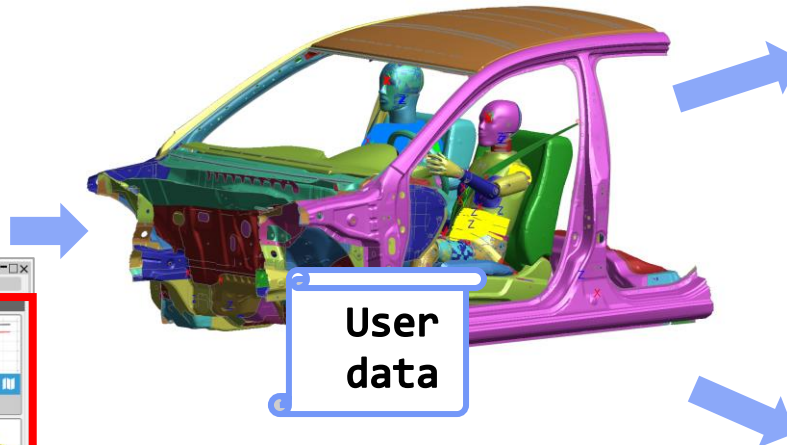
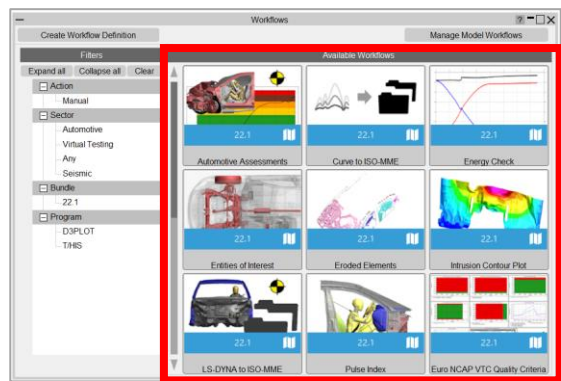
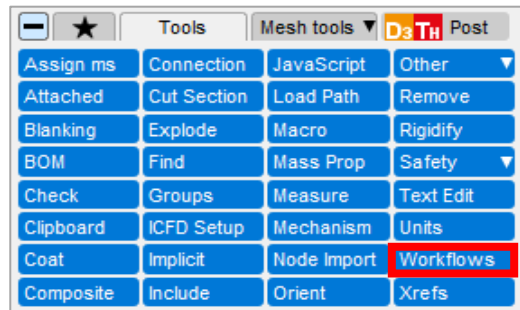
- Front Sled
 - Robustness 1
 - Robustness 2
 - Robustness 3
 - Validation 1
 - Validation 1 KPI
 - Validation 2
 - Validation 2 KPI
- Full Width Deformable Barrier (FWDB)
- All templates provide summary tables, graphs of injury criteria and calculate scores in compliance with Euro NCAP.



- Please see related documentation:
 - [Euro NCAP FWDB](#)
 - [Euro NCAP Validation](#)
 - [Euro NCAP Validation KPI](#)
 - [Euro NCAP Robustness](#)
 - [Euro NCAP Scoring & Colour Bands](#)
 - [Euro NCAP Points](#)

Euro NCAP Virtual Frontal Impact – Workflow

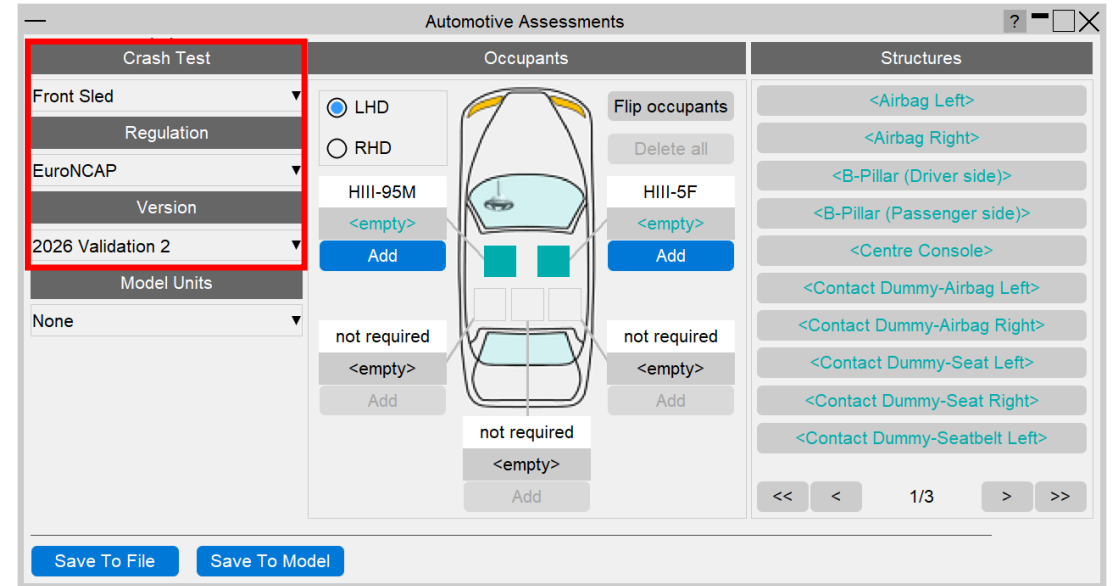
- The Euro NCAP Full Frontal protocol (including Occupant to Occupant Assessment) can now be produced in the official format template as requested by Euro NCAP. Set up your models in PRIMER, tag with user data using Workflows, and run the REPORTER Templates. Alternatively, outputs can be viewed interactively in T/HIS.



Automotive Assessments in PRIMER

- In Automotive Assessments in PRIMER, select **Regulation** → **Euro NCAP**
- Then, to configure the various new Euro NCAP Virtual Front Protocol load cases, select:

- **Crash Test** → **FWDB Full Vehicle**
 - **Version** → **2026**
- **Crash Test** → **Front Sled**
 - **Version** → **2026 Robustness 1**
 - **Version** → **2026 Robustness 2**
 - **Version** → **2026 Robustness 3**
 - **Version** → **2026 Validation 1**
 - **Version** → **2026 Validation 2**



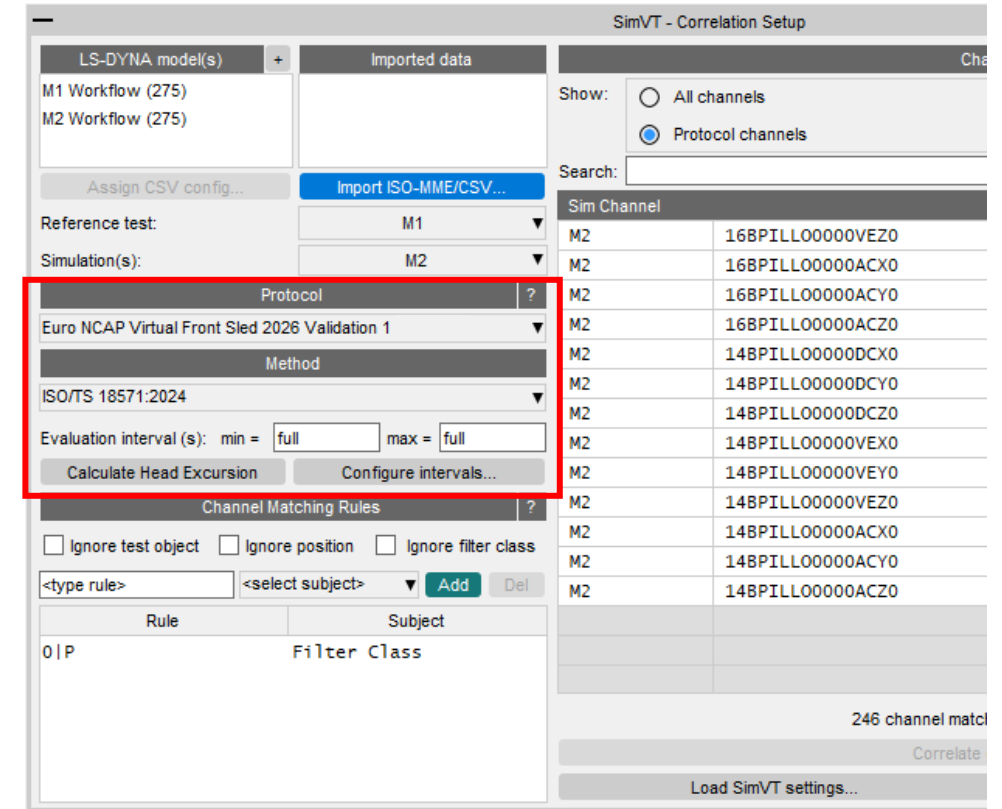
- Thereafter, proceed with setup as you would normally for Automotive Assessments ([see Automotive Assessments PRIMER documentation for details](#))

Automotive Assessments in PRIMER

The easiest way to use SimVT is to [save Automotive Assessments user data for your LS-DYNA models first](#).

Then:

1. In T/HIS, read the model results
2. Select **Tools** → **Workflows** → **SimVT**
3. Import ISO-MME/CSV data for your test/reference
4. Select one of the Euro NCAP Virtual Front protocols:
 - Euro NCAP Virtual Front Sled 2026 Validation 1
 - Euro NCAP Virtual Front Sled 2026 Validation 2
5. Proceed as normal for SimVT ([see SimVT documentation for details](#))



Euro NCAP Virtual Frontal Impact

Preview of Validation 1 KPI Template

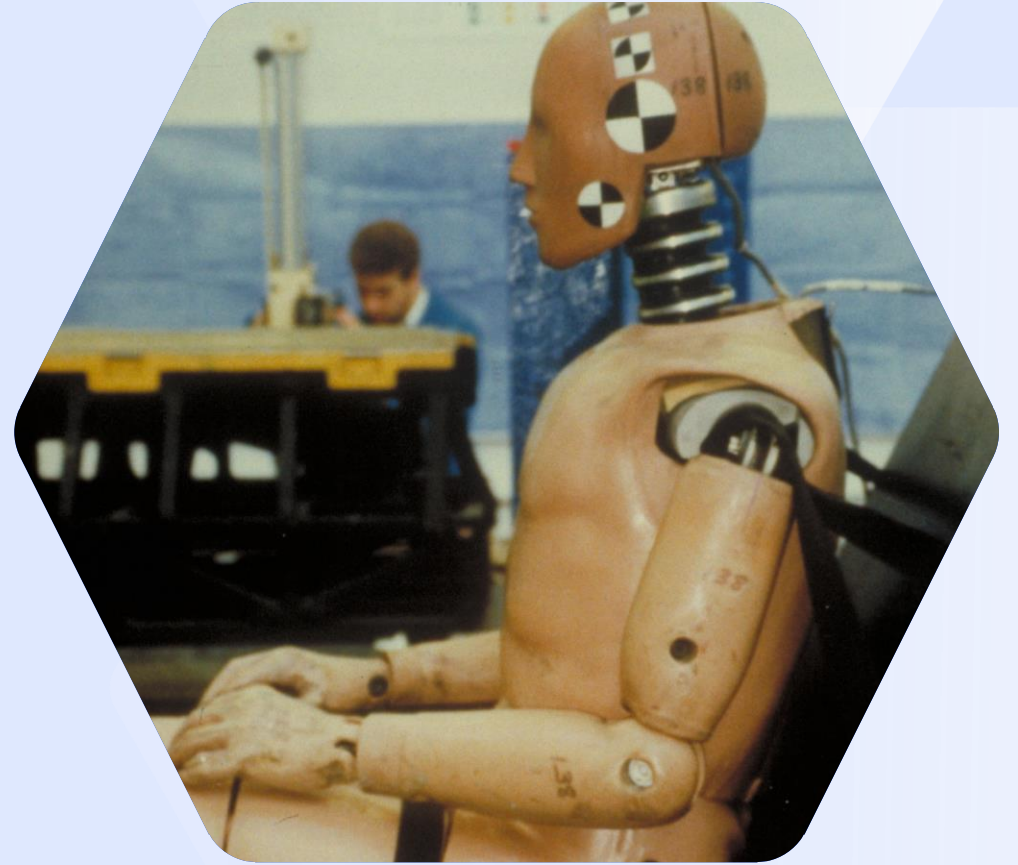


Euro NCAP Virtual Frontal Impact

Preview of FWDB Template



Working with Test Data



Improved unit handling and configuration for imported data

- Previously, imported ISO-MME data was assumed to be in SI units. This assumption was not always valid and data with non-standard units (e.g. accelerations in 'g' or rotations in 'degrees') needed to be manually scaled.
- Additionally, the vehicle drive side was inferred from the position code of the first occupant channel, which was assumed to be the driver.
- Now, when importing ISO-MME channel data, T/HIS attempts to automatically determine the units from the unit header in each channel file and the drive side from the "Driver position object 1" header in the MME file. However, it is not always possible to correctly infer this information.
- The new Import Configuration window (and Import Config. file) gives you the option to correct any issues with the channel units, polarity, scale and naming before importing ISO-MME or CSV data.

A	B	C	D
1 #DATA_SOURCE	/path/to/iso.mme		
2			
3 #DRIVE_SIDE	LHD		
4			
5 #PROTOCOL	None		
6			
7 #UNITS			
8 TIME	ms		
9 ACCELERATION	g		
10 FORCE	kN		
11 LENGTH	mm		
12 MOMENT	kN*m		
13 ROTATIONAL_VELOCITY	deg/s		
14 VELOCITY	ft/s		
15			
16 #CHANNEL_DATA			
17 Channel	New Name	Y Scale	Unit Type
18 11HEAD0000WSDCX0	<optional>	1	LENGTH
19 11HEAD0000WSDCY0	<optional>	1	LENGTH
20 11HEAD0000WSDCZ0	<optional>	1	LENGTH
21 11HEAD0000WSAVX0	<optional>	1	ROTATIONAL_VELOCITY
22 11HEAD0000WSAVY0	<optional>	1	ROTATIONAL_VELOCITY
23 11HEAD0000WSAVZ0	<optional>	1	ROTATIONAL_VELOCITY
24 11HEAD0000WSACX0	<optional>	1	ACCELERATION

Import
Config.
File

Import ISO-MME/CSV ...

Import ISO-MME or CSV data in
Automotive Assessments
and SimVT

Configure import

Import Configuration

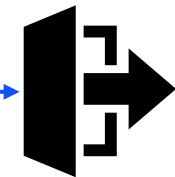
Apply Configuration file: Load Save Import additional channels from CSV...

Protocol: CNCAP Far Side Sled 2024 (WSID)

Drive side: LHD

Units: TIME s, ACCELERATION m/(s*s), DISPLACEMENT m, ENERGY J, FORCE N, MASS kg, MOMENT Nm, ROTATION rad, ROTATIONAL_VELOCITY rad/s

Channel	New Name	Y Scale	Unit Type
HEAD_EXCURSION_X	<optional>	1	DISPLACEMENT
HEAD_EXCURSION_Y	<optional>	1	DISPLACEMENT
HEAD_EXCURSION_Z	<optional>	1	DISPLACEMENT
11HEAD0000WSACX0	<optional>	1	ACCELERATION
11HEAD0000WSACY0	<optional>	1	ACCELERATION
11HEAD0000WSACZ0	<optional>	1	ACCELERATION
11HEAD0000WSAVX0	<optional>	1	ROTATIONAL_VELOCITY
11HEAD0000WSAVY0	<optional>	1	ROTATIONAL_VELOCITY
11HEAD0000WSAVZ0	<optional>	1	ROTATIONAL_VELOCITY
11NECKL000WSFOY0	<optional>	1	FORCE
11NECKL000WSFOZ0	<optional>	1	FORCE
11NECKL000WSMOX0	<optional>	1	MOMENT
11SHLDRI00WSFOX0	<optional>	1	FORCE
11SHLDRI00WSFOY0	<optional>	1	FORCE
11SHLDRI00WSFOZ0	<optional>	1	FORCE
11THSP0400WSACX0	<optional>	1	ACCELERATION
11THSP0400WSACY0	<optional>	1	ACCELERATION
11THSP0400WSACZ0	<optional>	1	ACCELERATION
11PELV0000WSACX0	<optional>	1	ACCELERATION
11PELV0000WSACY0	<optional>	1	ACCELERATION



Data Imported

Import C-NCAP head excursion channel data from CSV file

- When importing ISO-MME or CSV test data, you can now import additional channels from a CSV file to associate them with the test data.
- The most common use case for this is to import a CSV with head excursion channel data that has been extracted from the physical test video footage using tracking software (e.g. as part of the C-NCAP Far Side 2024 protocols).

Import Configuration

Configuration file: Load Save **Import additional channels from CSV...**

Protocol: CNCAP Far Side Sled 2024 (WSID)
Drive side: LHD
Units: TIME

Channel	New Name
HEAD_EXCURSION_X	<optional>
HEAD_EXCURSION_Y	<optional>
HEAD_EXCURSION_Z	<optional>
11HEAD0000WSACX0	<optional>
11HEAD0000WSACY0	<optional>
11HEAD0000WSACZ0	<optional>
11HEAD0000WSAVX0	<optional>
11HEAD0000WSAVY0	<optional>
11HEAD0000WSAVZ0	<optional>
11NECKL000WSFOY0	<optional>
11NECKL000WSFOZ0	<optional>
11NECKL000WSMOX0	<optional>
11SHLDRI00WSFOX0	<optional>
11SHLDRI00WSFOY0	<optional>
11SHLDRI00WSFOZ0	<optional>
11THSP0400WSACX0	<optional>
11THSP0400WSACY0	<optional>
11THSP0400WSACZ0	<optional>
11PELV0000WSACX0	<optional>
11PELV0000WSACY0	<optional>

Import Data from Additional Channels

Import

Source: [Text Box]

Channel name row number: 1 ☒ Is imported data head excursion?
Units row number: 2 ☒ Show all rows
Start reading data from row number: 3

Name: Import? HEAD_EXCURSION_X HEAD_EXCURSION_Y HEAD_EXCURSION_Z
New name: Time HEAD_EXCURSION_X HEAD_EXCURSION_Y HEAD_EXCURSION_Z
Units: TIME mm mm mm
Zero data? ☒ ☒ ☒ ☒

Row #	A	B	C	D
1	CHANNELS	HEAD_EXCURSION_X	HEAD_EXCURSION_Y	HEAD_EXCURSION_Z
2	TIME	mm	mm	mm
3	0.00000	0.00000	0.00000	0.00000
4	9.99810e-4	2.44141e-4	-1.83105e-4	7.07775e-17
5	1.99962e-3	9.76563e-4	-1.22070e-3	1.22070e-4
6	2.99943e-3	1.46484e-3	-2.19727e-3	7.32422e-4
7	3.99987e-3	-4.88281e-4	-5.49316e-4	2.28882e-3
8	4.99968e-3	-8.30078e-3	9.03320e-3	4.85229e-3
9	5.99949e-3	-2.70996e-2	3.38135e-2	8.85010e-3
10	6.99993e-3	-6.07910e-2	8.02002e-2	1.39771e-2
11	7.99974e-3	-1.13770e-1	0.153809	1.99280e-2
12	8.99955e-3	-1.91895e-1	0.264893	2.67029e-2
13	9.99999e-3	-3.06641e-1	0.429504	3.39355e-2
14	1.09998e-2	-4.69482e-1	0.665710	4.17175e-2
15	1.19996e-2	-6.88477e-1	0.985352	5.01099e-2
16	1.29994e-2	-9.62646e-1	1.38715	5.93872e-2
17	1.39999e-2	-1.28223	1.85797	6.93054e-2
18	1.49997e-2	-1.63599	2.38013	7.95288e-2
19	1.59995e-2	-2.01611	2.94177	8.96606e-2
20	1.69999e-2	-2.42090	3.54181	9.96704e-2

1 ACCELERATION
1 ACCELERATION
1 ACCELERATION
1 ACCELERATION

Time of first sample

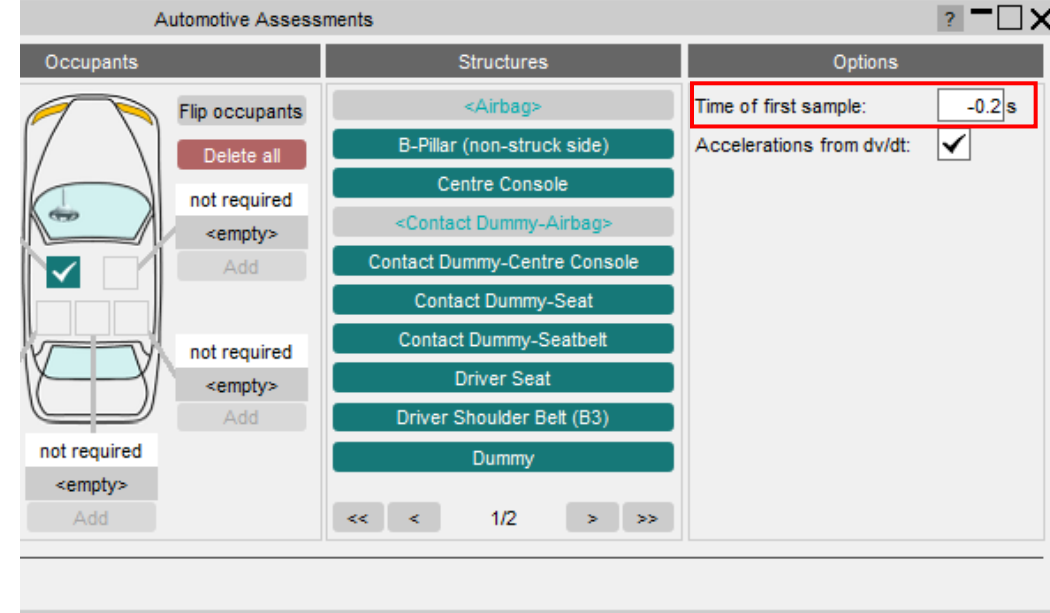
To accommodate the pre-crash (settling) phase in a simulation, a new “Time of first sample” input has been added to the Automotive Assessments workflow set-up in PRIMER.

Automotive Assessments and SimVT

- In accordance with ISO-MME convention a **negative** time value is used to shift the start time of the output curves when post-processing using the Automotive Assessments or SimVT workflows in T/HIS.
- For example, if your analysis begins with 200 milliseconds of set-up (e.g. seat squash etc.) before the crash test load case commences then you would enter -0.2 in the “Time of first sample” input to shift the curves so that the crash test will effectively start at $t=0$.
- Any data before $t=0$ is automatically discarded.

LSDYNA to ISO-MME

- The “Time of first sample” value is also used by the LS-DYNA to ISO-MME workflow.
- If it is defined, then the “Time of first sample” header value will automatically be set in the channel files.
- Note that in this instance the samples which are shifted to time < 0 will not be discarded as this only happens when the ISO-MME data is processed.



```
Test object number      :1
Name of the channel     :Accel x - Node 10001 : ( HEAD0000WSAC) (Reg 0.100E-03)
Laboratory channel code :NOVALUE
Customer channel code   :NOVALUE
Channel code            :11HEAD0000WSACX0
Unit                    :m/(s*s)
Reference system        :NOVALUE
Pre-filter type         :NOVALUE
Cut off frequency       :NOVALUE
Channel amplitude class :NOVALUE
Sampling interval       :0.0001
Bit resolution          :NOVALUE
Time of first sample    :-0.02
Number of samples       :2000
0
-2.86178e-08
-5.19904e-09
```

LS-DYNA to ISO-MME Improvements

LS-DYNA to ISO-MME

Assessments User Data		Solver Information	
Front Sled		Solver Name:	LS-DYNA
EuroNCAP		Solver Version:	SP
2026 Robustness 1		Solver Precision:	RHE8
Platform Name:			
Simulation Information			
Number of CPUs:	32	Time step setting:	7.2e-7
Contact type between dummy and seat:	SURFACE SOF	Contact type between dummy and seatbelt:	SURFACE SOFT=
Contact type between dummy and airbag:	SURFACE SOFT=1	Number of contacts used in the overall simulation setup:	54
Number of elements:	2202649	Mass of total setup in kg:	410.73
Mass of driver dummy in kg:	79.09	Mass of passenger dummy in kg:	49.53
Mass of seat in kg:	28.32	Mass of sled in kg:	N/A
Mass of centre console in kg:	N/A		
<button>Calculate</button>			
Vehicle data			
Name:	TUG		
Reference number:	1234		
Longitudinal velocity:	N/A		
Lateral velocity:	N/A		
Velocity:	35		
Mass:	1000		
Impactor data			
Name:			
Velocity:			

Textbox fields with this colour are required for success
Note that all fields are required to conform to the

Support for Euro NCAP 2026

- Added new inputs according to Euro NCAP 2026 protocol
- We have also disabled the inputs which are not applicable according to version (e.g. 2024 or 2026)
- Added support for frontal VTC protocol channels export

LS-DYNA to ISO-MME

Automotive Assessments User Data	
Automotive Assessments Crash Test:	Front Sled
Automotive Assessments Regulation:	EuroNCAP
Automotive Assessments Version:	2026 Robustness 1

User Data	
Test name:	Front Sled 2026 Robustness 1
Laboratory name:	Oasys Ltd
Customer name:	Euro NCAP
Customer test ref number:	001
Customer project ref number:	1234
Virtual testing ref ID:	Other - fill in textbox below dropdown
Subtype of test:	Virtual-Mid
Test date:	<input checked="" type="radio"/> Today <input type="radio"/>
ISO-MME format:	1.6
Title:	Euro NCAP 2026
Regulation:	N/A
Type of data source:	Simulation
Dummy Simulation Model Driver:	Hill v1.7 (Humanetics)
Dummy Qualification Ref Driver:	NA_TECHNICAL_REPORT_USER_MANUAL.pdf
Dummy Simulation Model Passenger:	Hill v2.0 (Humanetics)
Dummy Qualification Ref Passenger:	NA_TECHNICAL_REPORT_USER_MANUAL.pdf
Distance between head CoG and green line (in metres):	N/A
Distance between head CoG and yellow line (in metres):	N/A
Distance between head CoG and orange line (in metres):	N/A
Distance between head CoG and red line (in metres):	N/A
Required output channels CSV:	Is/EuroNCAP_FRONT_SLED_R1_LHD.csv
Output directory:	NCAP_Front_Sled_R1\lsdyna_to_isomme

Export

Solver Information	
Solver Name:	LS-Dyna
Solver Version:	ls-dyna_mpp_s_R11_2_2
Solver Precision:	SP
Platform Name:	RHE8

Simulation Information	
Number of CPUs:	32
Time step setting:	7.2e-7
Contact type between dummy and seat:	SURFACE SOFT=1 FS=0.2
Contact type between dummy and seatbelt:	SURFACE SOFT=1 FS=0.2
Contact type between dummy and airbag:	SURFACE SOFT=1 FS=0.2
Number of contacts used in the overall simulation setup:	54
Number of elements:	2202649
Mass of total setup in kg:	410.73
Mass of driver dummy in kg:	79.09
Mass of passenger dummy in kg:	49.53
Mass of seat in kg:	28.32
Mass of sled in kg:	N/A
Mass of centre console in kg:	N/A

Calculate

Vehicle data	
Name:	TUG
Reference number:	1234
Longitudinal velocity:	N/A
Lateral velocity:	N/A
Velocity:	35
Mass:	1000

Impactor data	
Name:	-
Velocity:	-

Textbox fields with this colour are required for successful LS-DYNA to ISO-MME conversion.
Note that all fields are required to conform to the Euro NCAP VTC protocol.

Mass calculation and Platform name update

- PRIMER workflow:
 - Replaced “Calculate Mass” with **“Check mass”** (the previous calculation could omit mass that was part of an encrypted keyword file).
 - Removed functionality which obtained the platform name from d3hsp/otf as it was reporting platform on which LS-DYNA was built on rather than where analysis was run. **Platform name** is now a manual input in the PRIMER workflow.
- T/HIS workflow:
 - Mass calculation for mass of different parts now works using the d3hsp/otf file rather than relying on the d3thdt/thf file.

The screenshot displays the LS-DYNA to ISO-MME interface, which is divided into several sections for configuring simulation parameters. The 'Automotive Assessments User data' section includes fields for 'Crash Test' (Front Sled), 'Regulation' (EuroNCAP), and 'Version' (2026 Robustness 1). The 'User data' section contains fields for 'Test name', 'Laboratory name', 'Customer name', 'Customer test ref number', 'Customer project ref number', 'Virtual testing ref ID', 'Subtype of test', 'Test date', 'ISO-MME format', 'Title', 'Regulation', 'Type of data source', 'Dummy Simulation Model Driver', 'Dummy Qualification Ref Driver', 'Dummy Simulation Model Passenger', 'Dummy Qualification Ref Passenger', and 'Required output channels CSV'. The 'Contact data' section includes 'Contact Type between dummy and seat', 'Contact Type between dummy and seatbelt', and 'Contact Type between dummy and airbag'. The 'Vehicle data' section includes 'Name', 'Reference number', 'Longitudinal velocity', 'Lateral velocity', 'Velocity', and 'Mass'. The 'Impactor data' section includes 'Name' and 'Velocity'. The 'Distance between head CoG and excursion lines' section includes four distance fields. The 'Mass of parts' section includes a 'Check mass' button. The 'Simulation Information' section includes a 'Platform Name' field, which is highlighted with a red box and contains the value 'RHE8'. A red box also highlights the 'Check mass' button. A note at the bottom states: 'Textbox fields with this colour are required for successful LS-DYNA to ISO-MME conversion. Note that all fields are required to conform to the Euro NCAP VTC protocol.'

Automotive Assessments User data	
Automotive Assessments Crash Test:	Front Sled
Automotive Assessments Regulation:	EuroNCAP
Automotive Assessments Version:	2026 Robustness 1

User data	
Test name:	Front Sled 2026 Robustness 1
Laboratory name:	Oasys Ltd
Customer name:	Euro NCAP
Customer test ref number:	001
Customer project ref number:	1234
Virtual testing ref ID:	Other - fill in textbox below dropdown
Subtype of test:	Virtual-Mid
Test date:	<input checked="" type="radio"/> Today <input type="radio"/> <input type="text"/>
ISO-MME format:	1.6
Title:	Euro NCAP 2026
Regulation:	N/A
Type of data source:	Simulation
Dummy Simulation Model Driver:	Hill v1.7 (Humanetics)
Dummy Qualification Ref Driver:	NA_TECHNICAL_REPORT_USER_MANUAL.pdf
Dummy Simulation Model Passenger:	Hill v2.0 (Humanetics)
Dummy Qualification Ref Passenger:	NA_TECHNICAL_REPORT_USER_MANUAL.pdf
Required output channels CSV:	hannels/EuroNCAP_FRONT_SLED_R1_LHD.csv

Contact data	
Contact Type between dummy and seat:	FACE_TO_SURFACE SOFT=1 FS=0.2
Contact Type between dummy and seatbelt:	FACE_TO_SURFACE SOFT=1 FS=0.2
Contact Type between dummy and airbag:	FACE_TO_SURFACE SOFT=1 FS=0.2

Vehicle data	
Name:	TUG
Reference number:	1234
Longitudinal velocity:	N/A
Lateral velocity:	N/A
Velocity:	35
Mass:	1000

Impactor data	
Name:	-
Velocity:	-

Distance between head CoG and excursion lines	
Distance between head CoG and green line (in metres):	N/A
Distance between head CoG and yellow line (in metres):	N/A
Distance between head CoG and orange line (in metres):	N/A
Distance between head CoG and red line (in metres):	N/A

Mass of parts	
Check mass	

Simulation Information	
Platform Name:	RHE8

Textbox fields with this colour are required for successful LS-DYNA to ISO-MME conversion.
Note that all fields are required to conform to the Euro NCAP VTC protocol.

REPORTER Template update

- The MME header table in the report is now updated dynamically depending on the header contents.

LS-DYNA to ISO-MME

EuroNCAP Front Sled 2026 Robustness 1

MME Headers

Description	Value
Data format edition number	1.6
Laboratory name	Oasys Ltd
Customer name	Euro NCAP
Customer test ref. number	001
Customer project ref. number	1234
Title	Euro NCAP 2026
Timestamp	3/11/2025, 3:39:42 pm
Type of the test	Frontal Impact
Subtype of the test	Virtual-Mid
Date of the test	3/11/2025
Name of test object 1	TUG
Ref. number of test object 1	1234
Velocity test object 1	35
Mass test object 1	1000
Driver position object 1	1
Impact side test object 1	FR
Name of test object 2	-
Velocity test object 2	-
Type of data source	Simulation

Model

C:\Cases\Case_52799\post\1-his\EuroNCAP_FRONT\FRONT_SLED_R1\post_light_52799_EuroNCAP_Front_Sled_R1\05_Virtual-Sled-Robustness1-35kmph_002.key

Required output channel CSV

C:\SOURCE22\workflow_wizard_trunk_for_checking_post534\workflow_definitions\scripts\ldyna_to_issomme\EuroNCAP_VTC_Channels\EuroNCAP_FRONT_SLED_R1_LHD.csv

Output directory

C:\Cases\Case_52799\post\1-his\EuroNCAP_FRONT\FRONT_SLED_R1\post_light_52799_EuroNCAP_Front_Sled_R1\ldyna_to_issomme

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LS-DYNA to ISO-MME

EuroNCAP Front Sled 2026 Robustness 1

MME Headers	
Description	Value
.Dummy Simulation Model Driver	HIII v1.7 (Humanetics)
.Dummy Qualification Ref Driver	HUMANETICS_HIII_50M_V1.7_HARMONIZED_LS_DYNA_TECHNICAL_REPORT_USER_MANUAL.pdf
.Dummy Simulation Model Passenger	HIII v2.0 (Humanetics)
.Dummy Qualification Ref Passenger	HUMANETICS_HIII_SF_V2.0_HARMONIZED_LS_DYNA_TECHNICAL_REPORT_USER_MANUAL.pdf
.Solver Name	LS-Dyna
.Solver Version	ls-dyna_mpp_s_R11_2_2
.Solver Precision	SP
.Platform Name	RHEB
.Number of CPUs	32
.Time step setting	NOVALUE
.Contact Type dummy -seat	AUTOMATIC_SURFACE_TO_SURFACE SOFT=1 FS=0.2
.Contact Type dummy -belt	AUTOMATIC_SURFACE_TO_SURFACE SOFT=1 FS=0.2
.Contact Type dummy -airbag	AUTOMATIC_SURFACE_TO_SURFACE SOFT=1 FS=0.2
.Number of contacts	54
.Number of elements	2202649
.Mass of total setup in kg	410.73
.Mass of dummy 1 in kg	79.09
.Mass of dummy 2 in kg	49.53
.Mass of seat in kg	28.32

Model

C:\Cases\Case_52799\post\1-his\EuroNCAP_FRONT\FRONT_SLED_R1\post_light_52799_EuroNCAP_Front_Sled_R1\05_Virtual-Sled-Robustness1-35kmph_002.key

Required output channel CSV

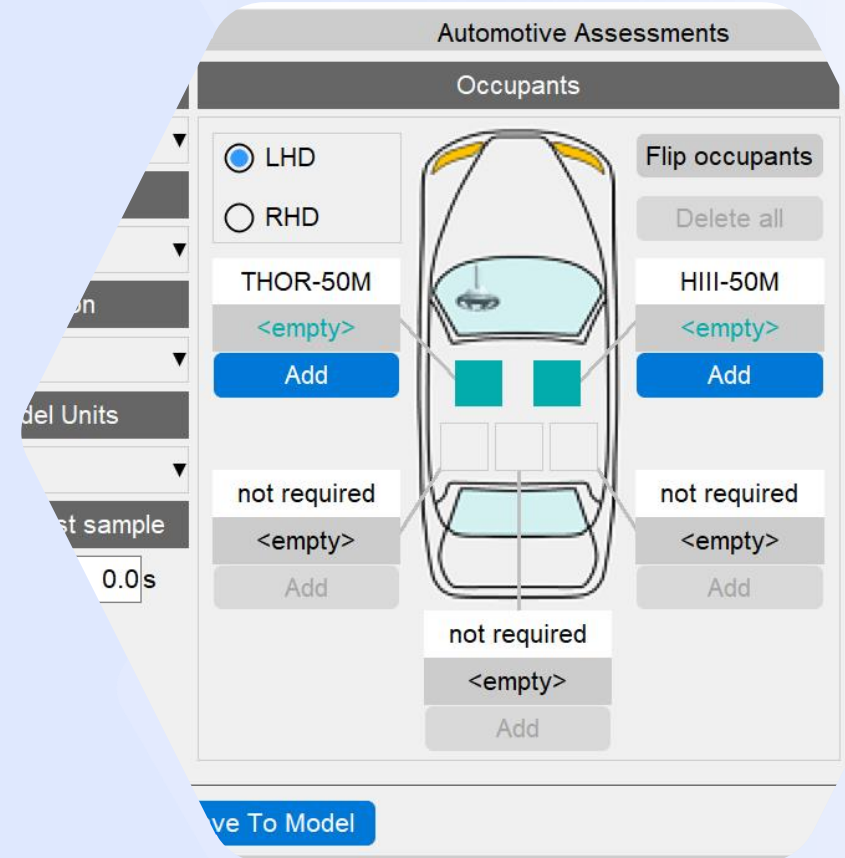
C:\SOURCE22\workflow_wizard_trunk_for_checking_post534\workflow_definitions\scripts\ldyna_to_issomme\EuroNCAP_VTC_Channels\EuroNCAP_FRONT_SLED_R1_LHD.csv

Output directory

C:\Cases\Case_52799\post\1-his\EuroNCAP_FRONT\FRONT_SLED_R1\post_light_52799_EuroNCAP_Front_Sled_R1\ldyna_to_issomme

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Automotive Assessments Improvements



Automotive Assessments Improvements

- Entity IDs that are defined but don't have corresponding *DATABASE_HISTORY_XXXX keyword defined are now shown with a latent cyan-coloured textbox background:

HEAD		
Head: Global Coordinates (X,Y,Z)	node	10123
Head: Acceleration, Velocity (X,Y,Z)	node	10001
Head: Angular Accel. Angular Velocity. Angle (X,Y,Z)	node	10006
Head Offset (for C-NCAP calculation)	node	32198

- A window is now mapped when such entity IDs are selected or typed into the text box, giving you the option to create the corresponding *DATABASE_HISTORY_XXXX keyword for them. It also provides an option to select the include file to which the keyword will be added. **Note:** you have to save the include and re(run) the analysis to obtain results for the corresponding entity.

Create *DATABASE_HISTORY_NODE?

*DATABASE_HISTORY_NODE not present for 32198. Do you wish to create it?

Create in Include: 08_FS_AEMDB_75_x-ref_z-ref_50M_Sim_1.key

☒ Update Current Layer Include

☐ Title:

Create Cancel

Dropdown to select the include file

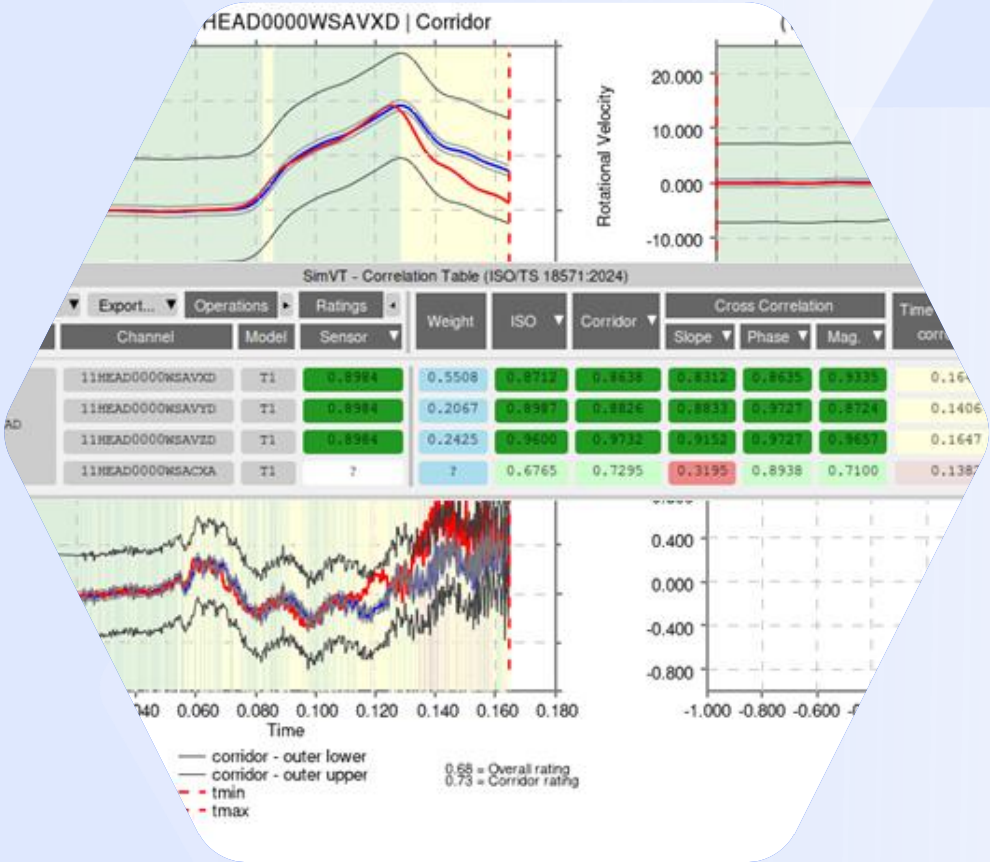
If ticked, then the current layer include will be updated to the one selected in the dropdown above

Option to provide optional Title

Automotive Assessments Improvements

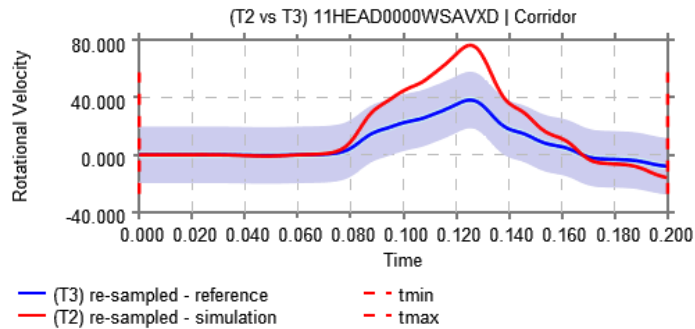
- The ISO channel codes have been updated for several channels in the Far Side VTC v1.1 draft protocol. The necessary changes have been incorporated in Automotive Assessments workflows tool, and backward compatibility support has been added for the older ISO codes. The channels whose ISO codes have changed are:
 - LAP Belt (SEBE000**3**B6FO00 to SEBE000**0**B6FO00)
 - Shoulder Belt (SEBE000**3**B3FO00 to SEBE000**0**B3FO00)
 - Contact Dummy-Airbag (**ARB**G0000WSFOX/Y/Z to **AIRB**0000WSFOX/Y/Z)
 - Thoracic Spine 04 and 12 Displacements (THSP04/1200**00**DCX/Y/Z0 to THSP04/1200**WS**DCX/Y/Z0).
- The 'Far Side + VTC' and 'Far Side' crash tests have been renamed to 'Far Side Sled' for consistency across the tools. The version for the former 'Far Side + VTC' is now 2024, while the version for the former 'Far Side' crash test is 2022. Support for backward compatibility has also been added.
- The term 'Physiology' has been renamed to 'Anthropometry' and support for backward compatibility has also been added.
- Users can now select multiple contacts for contact structures (Contact Dummy – Airbag, Contact Dummy – Centre Console, Contact Dummy –Seat and Contact Dummy - Seatbelt) via SELECT option.
- The WSID 50M dummy supplier has been renamed from “PDB” to "DYNAmore-PDB" to make it clearer that the dummy is from DYNAmore and co-developed with the PDB consortium.
- Acceleration curves from LS-DYNA results can now be derived by differentiating velocity curves (instead of raw acceleration output) by ticking the “Use dv/dt” option in PRIMER Automotive Assessments before saving user data. This option is honoured by SimVT and LS-DYNA to ISO-MME workflows which utilise Automotive Assessments user data.
- Added support to locate and load FEMZIP files in REPORTER templates when original d3plot results files have been deleted.

SimVT

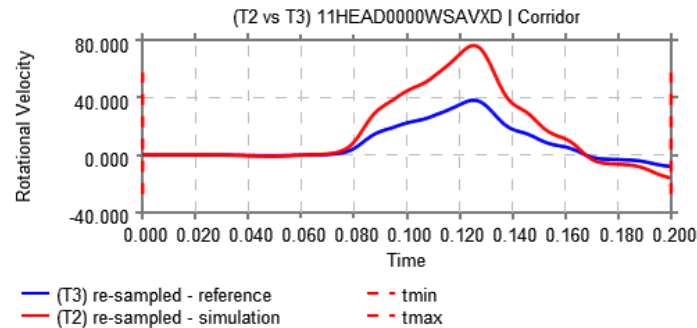


SimVT: Graph Options – Show Corridors

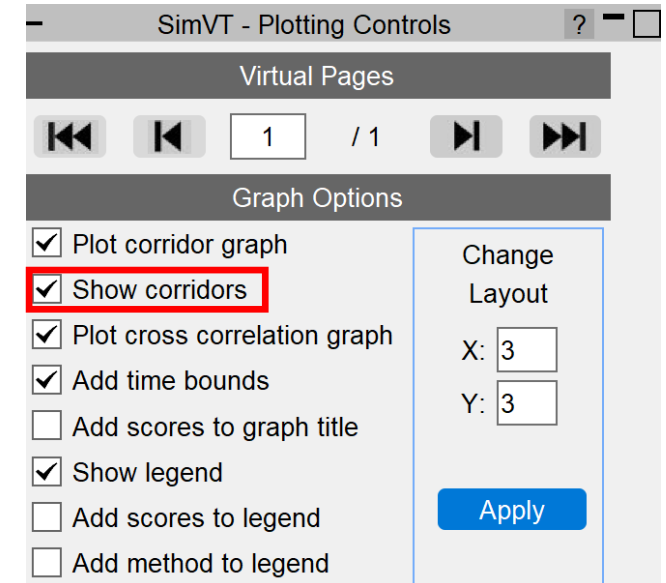
- A new graph option “Show corridors” has been added to SimVT plotting controls. This determines whether the inner and outer corridors are plotted along with the reference and simulation curves.
- Deselecting show corridors can help reduce clutter on the graphs.



Corridors turned on

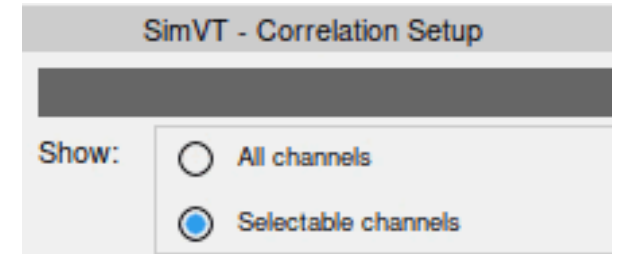


Corridors turned off



SimVT: Improvements

- The performance of SimVT has improved when loading a large number of channels and when switching the channel table to show “All Channels”.

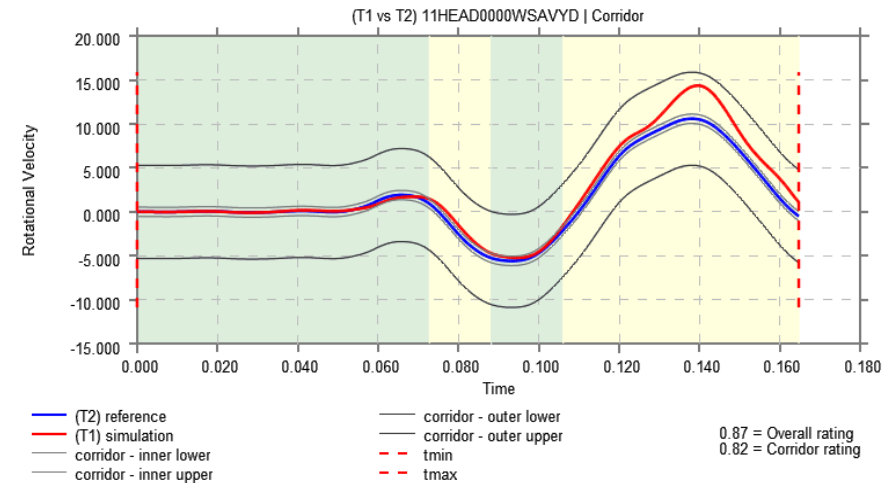
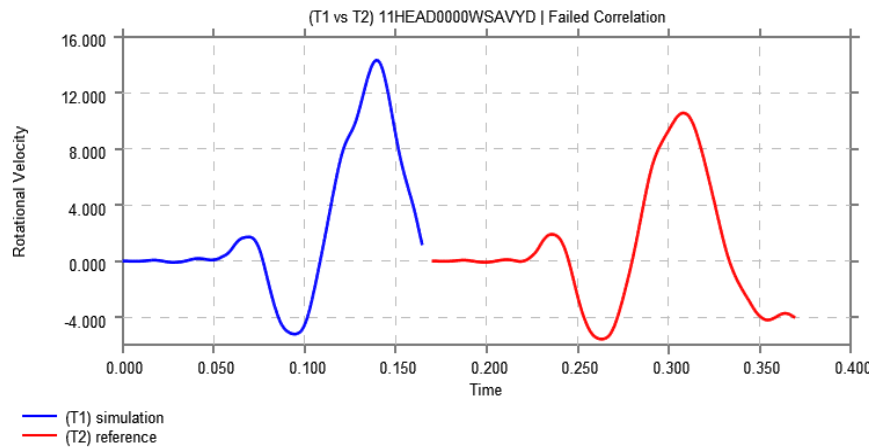


SimVT: Diagnostic Tools

- In Virtual Testing, once the problem of data submission is overcome, the real challenge begins: **how to achieve an excellent safety rating?**
- **Achieving good correlation between simulation and test is crucial** – without good correlation in the validation loadcases, the virtual loadcases count for nothing and the overall score is low.
- SimVT now contains a set of **diagnostic tools** to help you **rapidly pinpoint problem areas** in your simulations and identify the **sources of poor correlation** – enabling you to **correct models, improve the robustness of designs, and maximise your safety rating.**

SimVT: Error Graphs when results cannot be correlated

- If a correlation fails, error graphs will be shown. A common example of when a correlation might fail is when the simulation and reference curves are not aligned in time. This helps you identify any issues with the input data, and with this insight, you can correct any issues.
- An example is shown below with simulation and reference curves before correction (left), and after correction with correlation applied (right).



- The curves can be made to overlap using the operations panel available in the Correlation Table (e.g. by using ADDX, etc to meaningfully shift the simulation curve in time to overlap).

SimVT: Correlation Table Filtering

- To help you navigate and analyse results more efficiently, SimVT now includes filtering controls in column headers.
- When filters are applied, rows that do not meet the selected criteria are hidden from view.
- These controls allow you to filter by various rating thresholds (e.g., pass/fail, with min/max values, etc).
- This feature improves usability, especially when working with large datasets, and ensures that you can quickly identify areas of interest or concern.

Drop down boxes for the score filters

Back

Auto plot

Re-plot

Export...

Operations

Ratings

Object

Location

Channel

Model

Sensor

Weight

ISO

Corridor

Cross Correlation

Slope

Phase

Mag.

Time of poorest correlation

Start of divergence

11	HEAD	11HEAD0000WSAVXD	T1	0.8914	0.6083	0.8745	0.8634	0.8511	0.8635	0.9313	0.1647	0.1265
		11HEAD0000WSAVYD	T1	0.8914	0.1687	0.8708	0.8246	0.8669	0.9727	0.8654	0.1406	0.0692
		11HEAD0000WSAVZD	T1	0.8914	0.2229	0.9530	0.9608	0.9056	0.9727	0.9652	0.1647	0.1474
		11HEAD0000WSACXA	T1	?	?	0.6973	0.7874	0.3028	0.8938	0.7152	0.1382	0.1318

SimVT: Correlation Table Filtering

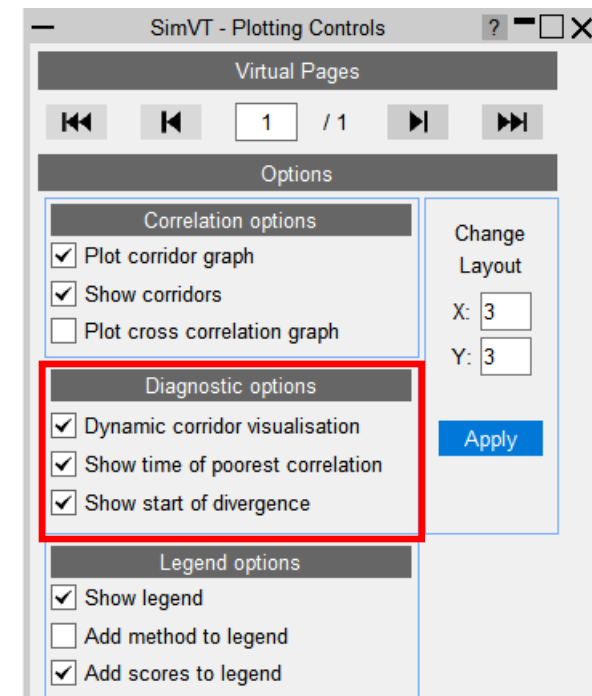
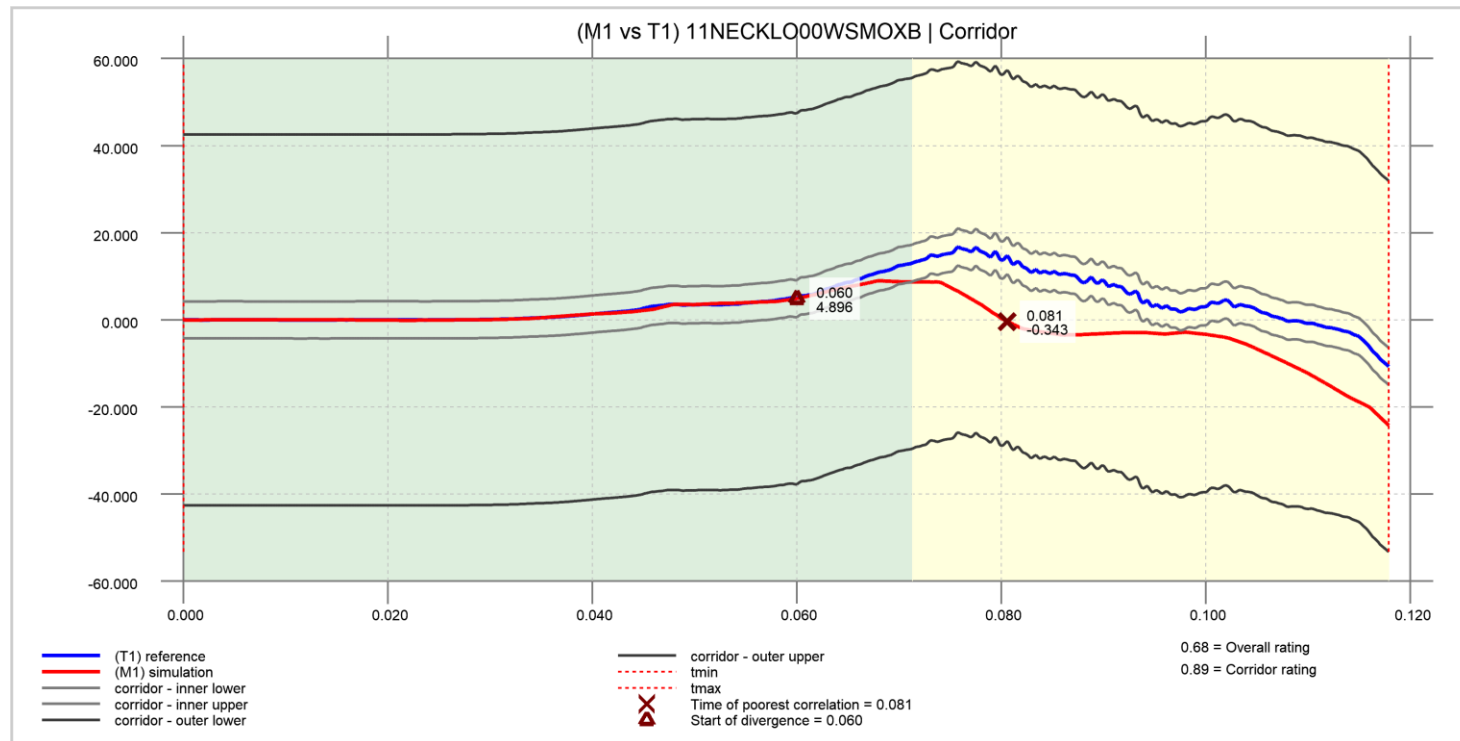
- The rating categories available include Excellent, Good, Fair, and Poor, and Pass and Fail (available when the protocol is set).
- The optional Pass and optional Fail filter checkboxes are displayed with brackets around them.
- There is also an Invalid checkbox which can be used to filter out any rows with any scores that had issues in obtaining the result.
- For ease of use, only the relevant checkboxes are active (ungreyed) when the popup appears.
- Additionally, you can set the Min and Max values to limit values between a certain threshold.
- You can use the Clear Filters button to remove all applied filters and restore the full dataset. Directly beneath this, a Close button allows users to exit the filter popup.

The screenshot shows the SimVT - Correlation Table (ISO/TS 18571:2024) interface. The main table displays data for Object 11, Location HEAD, with four channels (11HEAD0000WSAVXD, 11HEAD0000WSAVYD, 11HEAD0000WSAVZD, 11HEAD0000WSACXA) and their corresponding Model (T1), Sensor, Weight, and ISO ratings. The ISO ratings are Excellent, Good, Fair, and Poor. A red arrow points to the ISO column header, which has a dropdown menu open. The dropdown menu lists the rating categories: Excellent, Good, Fair, Poor, Pass, Fail, (Pass), (Fail), Invalid, Min (0.0000), Max (1.0000), Clear Filters, and Close. The Pass and Fail categories are highlighted with brackets.

To access them, right click on the header above a rating column (e.g. ISO).

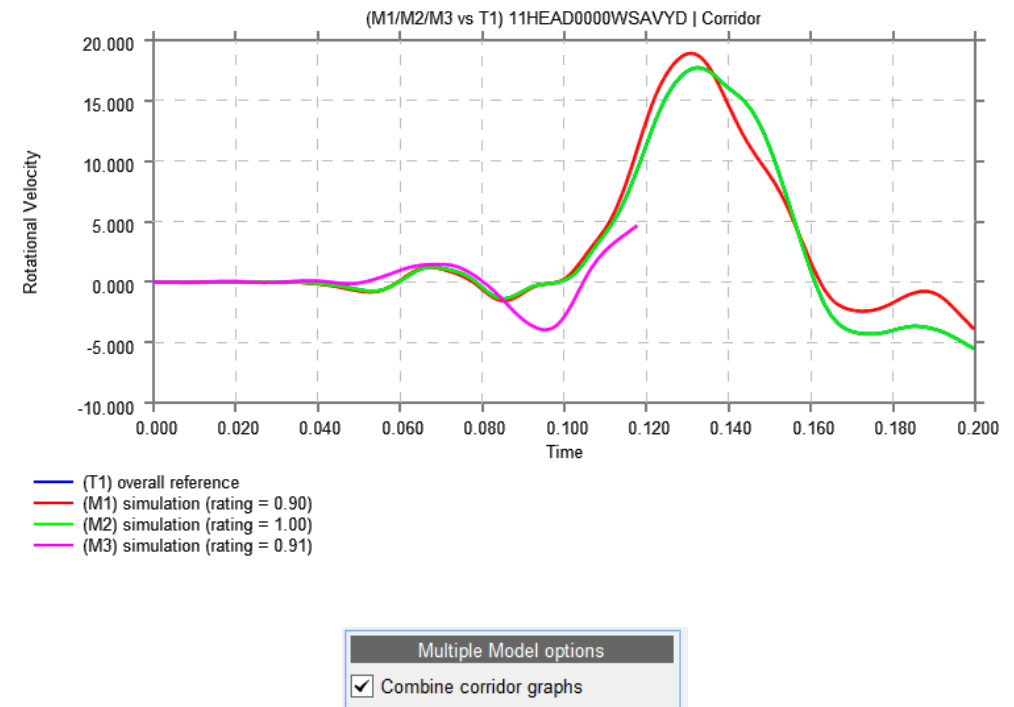
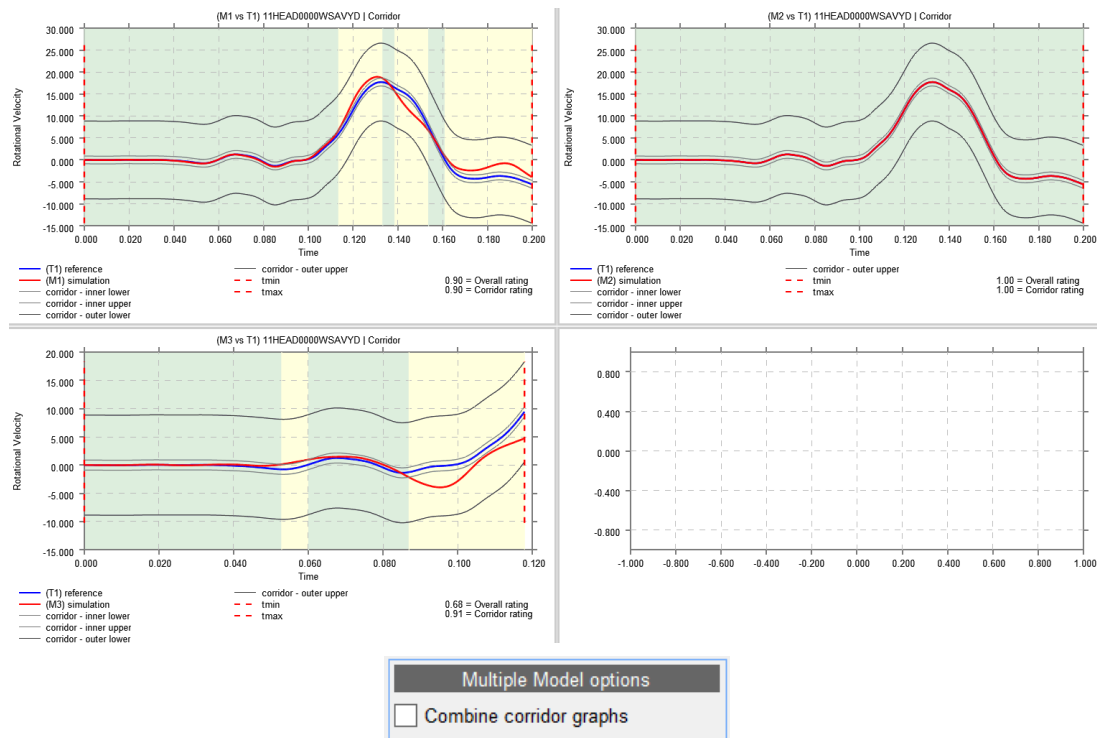
SimVT: Dynamic Corridor Visualisation and Event Identification

- A new option “**Dynamic corridor visualisation**” has been added to help you visualise corridor performance over time and pinpoint problem areas quickly. When activated, it highlights **High correlation zone**, **Moderate correlation zone** and **Low correlation zone** over time.
- New options “**Show time of poorest correlation**” and “**Show start of divergence**” help you rapidly identify key time events in your analysis that could be causing poor correlation.

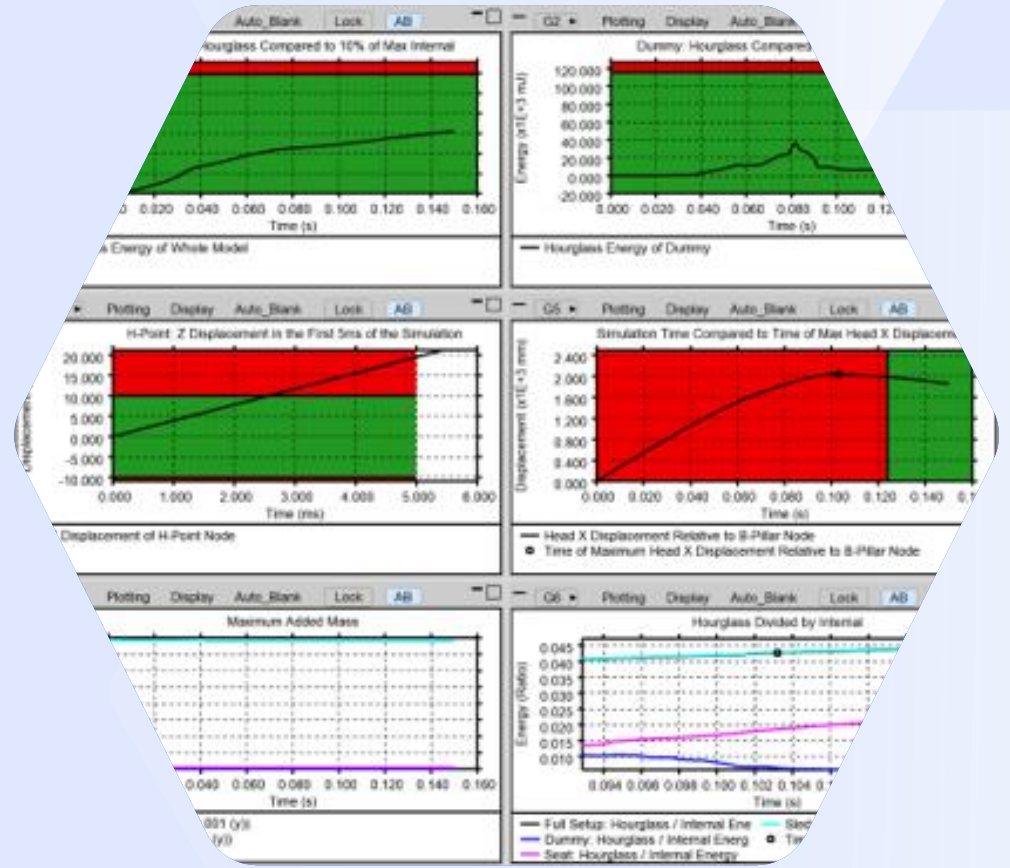


SimVT: Overlaying multiple model results

- A new option **Combine corridor graphs** has been added, which controls if corridor graphs that share the same channel are combined in a single graph.
- Below is an example of a combination of plots with **Combine corridor graphs** unticked (left) and ticked (right).

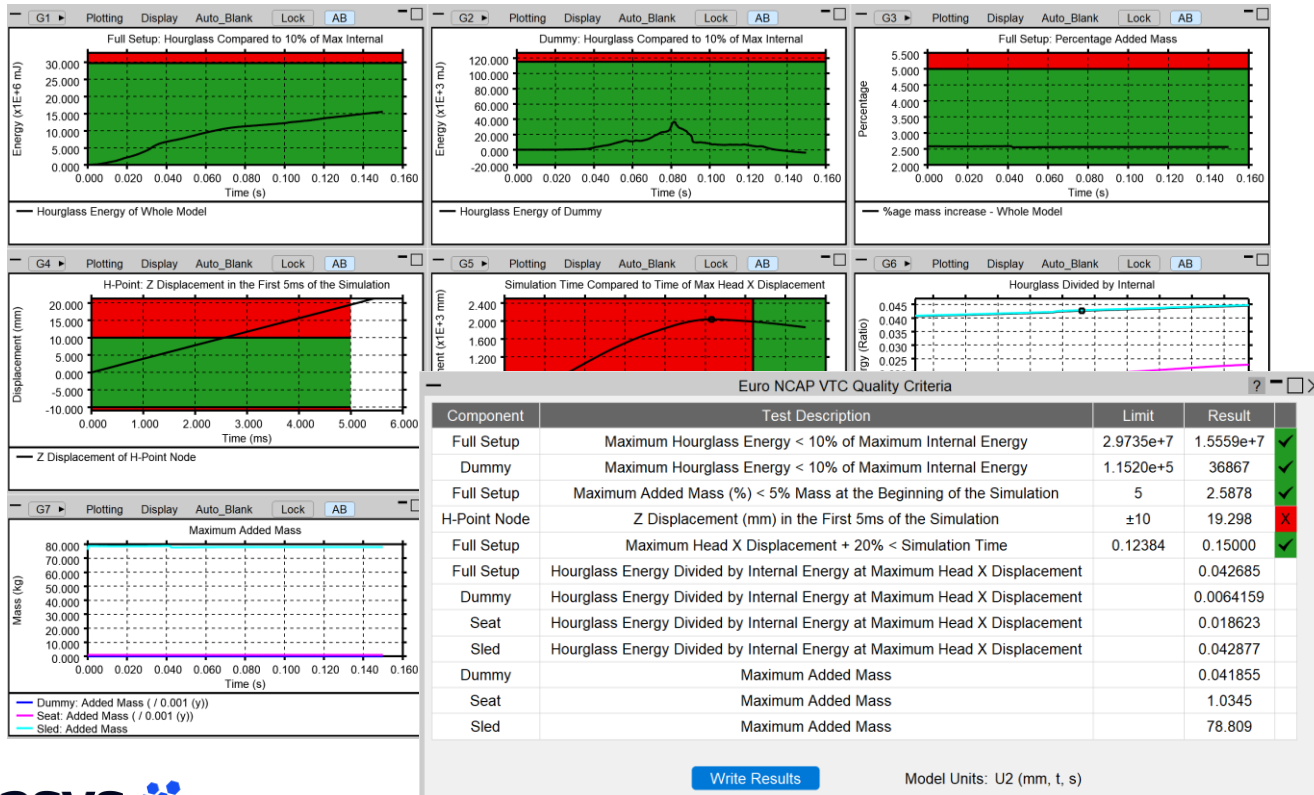


VTC Quality Criteria Workflows



Quality Criteria – Euro NCAP Frontal

- The Euro NCAP VTC Quality Criteria Workflows tool and associated REPORTER Template are now capable of assessing the Euro NCAP Virtual Frontal Simulation & Assessment Protocol (draft) as well as the existing Far Side protocol.



Euro NCAP VTC Quality Criteria

Test Type: Frontal (Draft)

Model Unit System: U2 (mm, t, s)

Display Time Unit: Seconds [s]

Display Energy Unit: Millijoules [mJ]

Display Displacement Unit: Millimetres [mm]

Display Mass Unit: Kilograms [kg]

Dummy Parts: 1030 PARTs selected

Head History Node (Global): 01HEAD0000T3ACX

H-point History Node: 01PELV0000T3ACZ

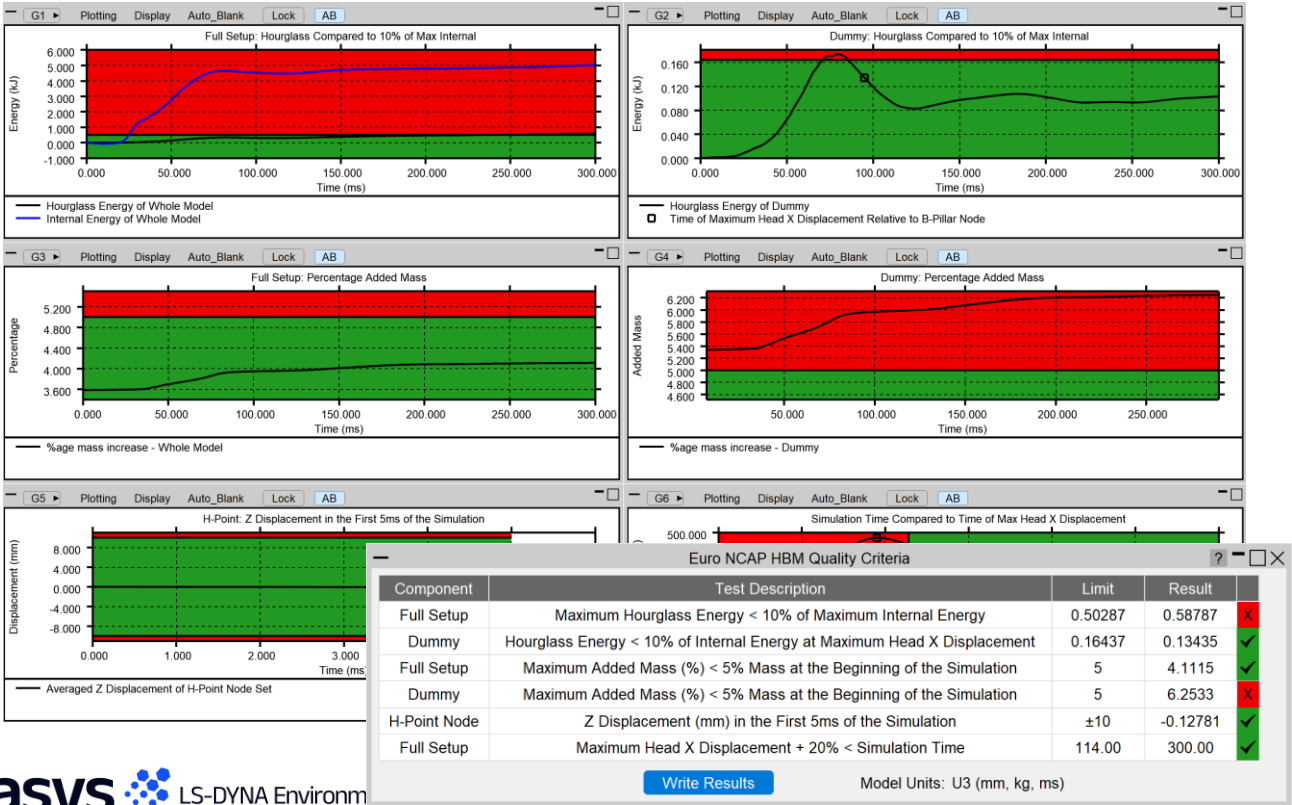
B-pillar History Node: 45011535

Seat Parts: 109 PARTs selected

Save To File Save To Model

Quality Criteria – Euro NCAP HBM

- The Euro NCAP HBM Quality Criteria Workflows tool and associated REPORTER Template allow you to perform the quality checks outlined in Section 7.1 of the Euro NCAP VTC HBM Frontal Protocol (draft) relating to energy, added mass and displacements.



Euro NCAP HBM Quality Criteria

Model Unit System

U3 (mm, kg, ms)

Display Time Unit

Milliseconds [ms]

Display Energy Unit

Kilojoules [kJ]

Display Displacement Unit

Millimetres [mm]

Dummy Parts

1423 PARTs selected

Head History Node (Global)

ted-Kinematics_Node_Global

H-point History Node

e-History-Node_Node_Global

B-pillar History Node

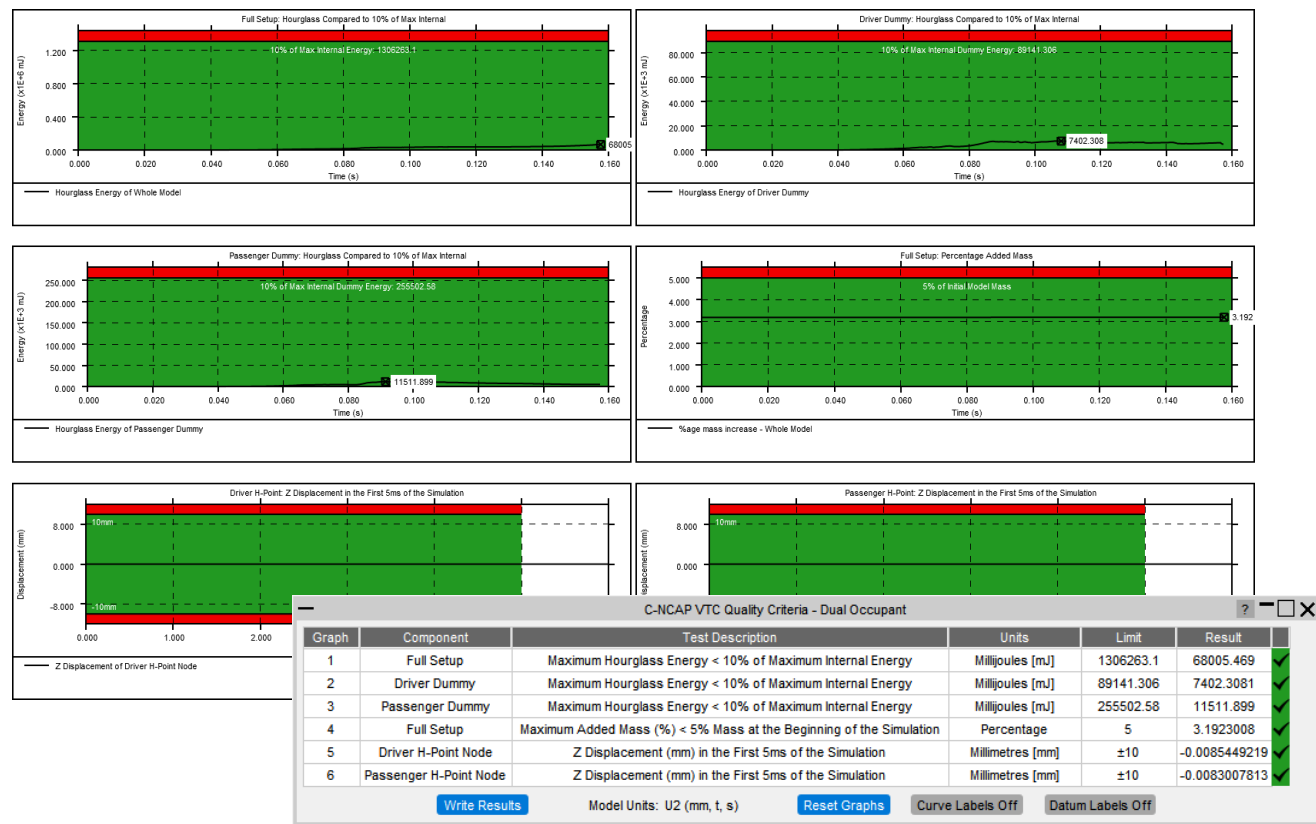
B-Pillar-accelerometer: 1

Save To File

Save To Model

Quality Criteria: C-NCAP Occupant to Occupant (Dual Occupant)

- The C-NCAP Occupant to Occupant tool and associated REPORTER Template allow you to perform the quality checks required by the C-NCAP Far Side Occupant to Occupant Official Template, outlined in appendix H1.1.(f) of the C-NCAP 2024 Management Regulation relating to energy, added mass and displacements.



C-NCAP VTC Quality Criteria

Load Case

O2O (dual occupant)

Model Unit System

U2 (mm, t, s)

Display Time Unit

Seconds [s]

Display Energy Unit

Millijoules [mJ]

Driver Dummy Parts

918 PARTs selected

Driver H-pt History Node

10056

Passenger Dummy Parts

918 PARTs selected

Passenger H-pt History Node

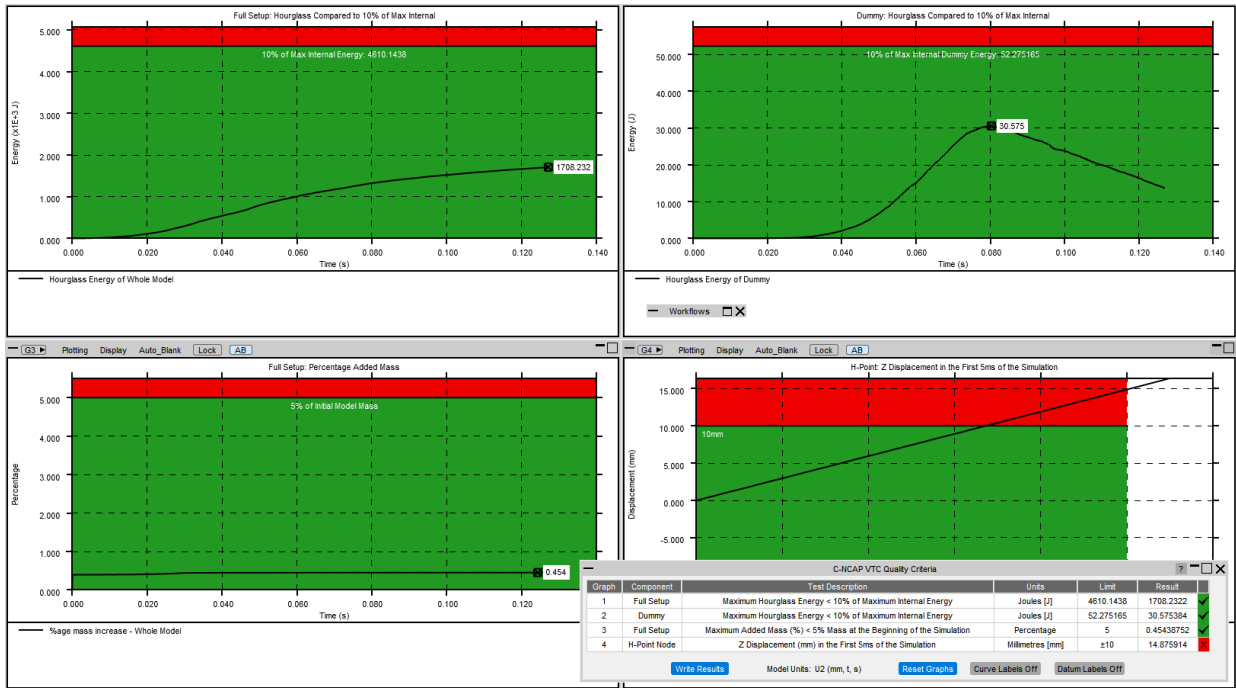
92010056

Save To File

Save To Model

Quality Criteria: C-NCAP Front AEB OOP 2024

- A new load case “Front AEB OOP” is added to the C-NCAP VTC Quality Criteria tool. Fill in and save user data, then output the report in REPORTER, or view results interactively in T/HIS.



C-NCAP VTC Quality Criteria

Load Case

Front AEB OOP

Model Unit System

U2 (mm, t, s)

Display Time Unit

Seconds [s]

Display Energy Unit

Millijoules [mJ]

Dummy Parts

687 PARTs selected

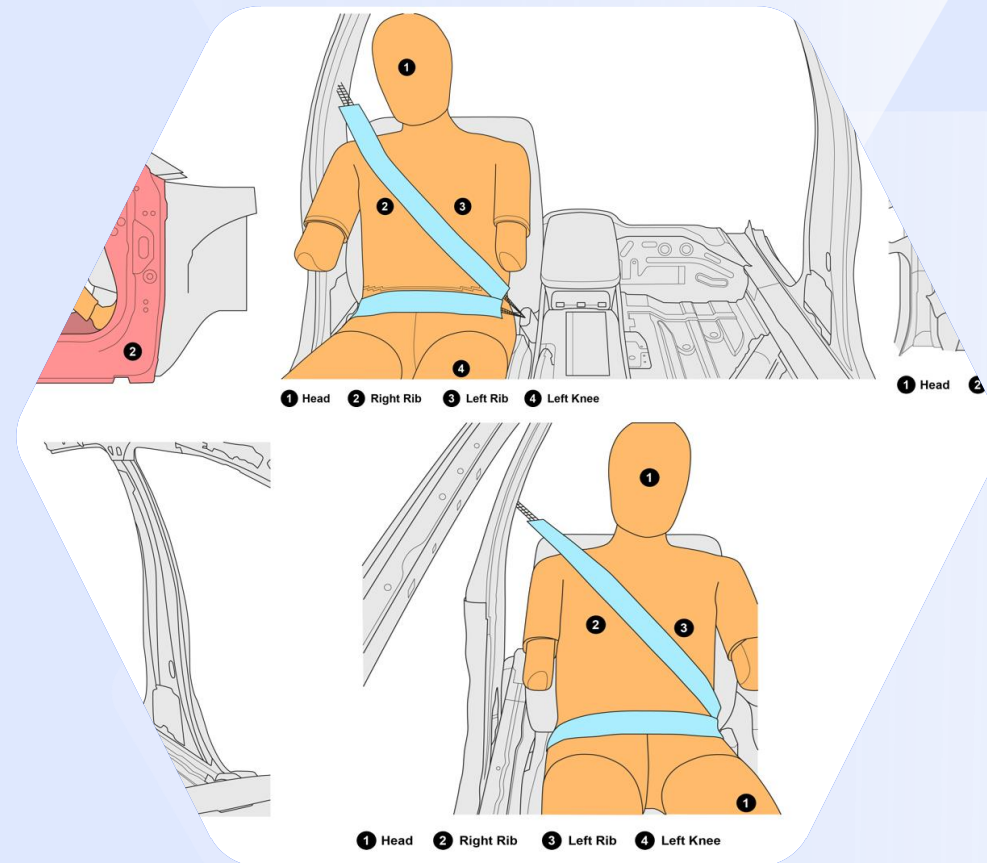
H-point History Node

01PELV0000H3AC0

Save To File

Save To Model

VTC Videos Workflows



VTC Videos Updates in PRIMER

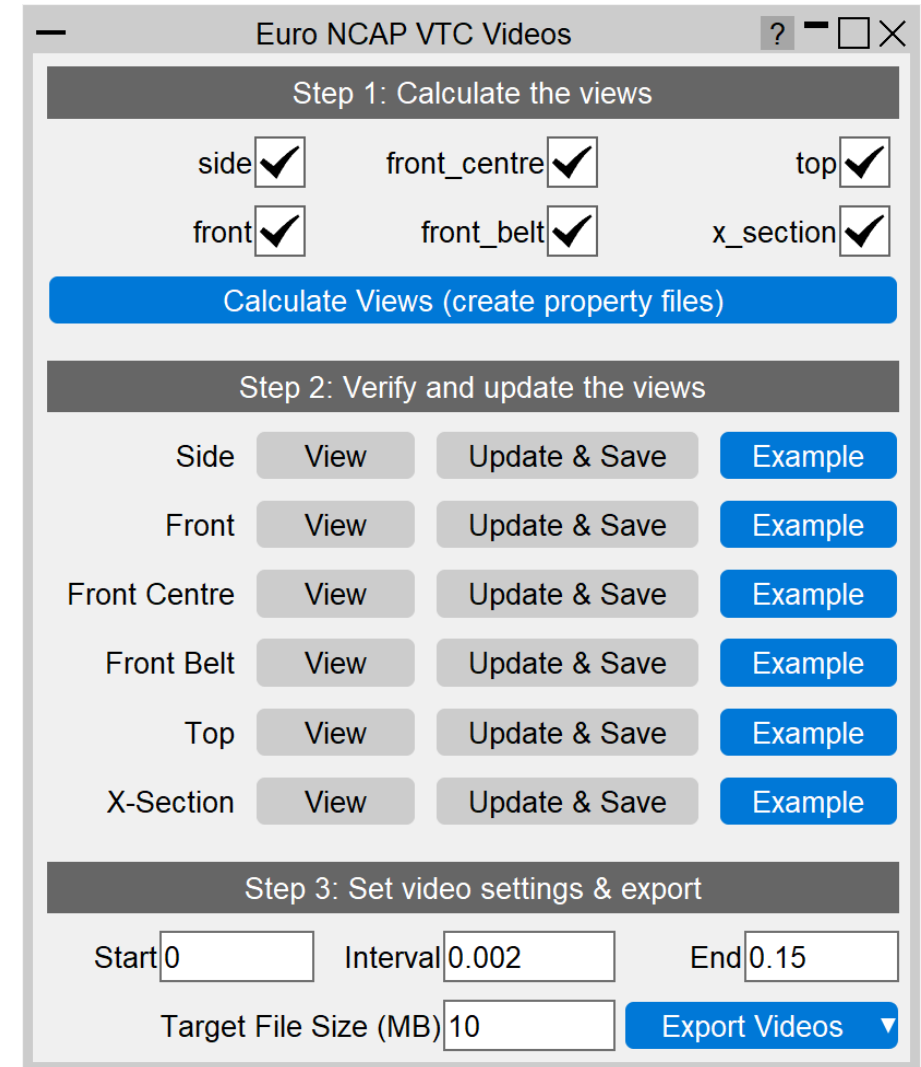
- VTC Videos are now combined into one Workflow, rather than having separate Workflows for each protocol.
- Inputs required for Euro NCAP Far Side have been significantly reduced
- Three shift deform nodes have been re-introduced as an option alongside using 1 shift deform node

The screenshot shows the 'Euro NCAP Far Side' configuration window. It contains the following fields and controls:

- Protocol:** A dropdown menu set to 'Euro NCAP Far Side'.
- Reference ID:** A dropdown menu set to 'FS_Pole_75_x-ref_z-ref_50M_Sim_1' and an empty text input field below it.
- Unit System:** A dropdown menu set to 'None'.
- *DATABASE_BINARY_D3PLOT DT:** A text input field followed by a blue 'Save DT' button.
- Head Node:** A text input field with a right-pointing arrow.
- Dummy Parts:** A text input field with a right-pointing arrow.
- Fixed Reference Node 1 (required):** A text input field followed by a 'Select...' button.
- Fixed Reference Node 2 (optional):** A text input field followed by a 'Select...' button.
- Fixed Reference Node 3 (optional):** A text input field followed by a 'Select...' button.
- Parts to Blank:** A text input field with a right-pointing arrow.
- Property Files Directory:** A text input field followed by a folder icon button.
- Side Selection:** Two radio buttons labeled 'LHD' and 'RHD'.
- Buttons:** A grey button with a question mark '?' and two buttons at the bottom: 'Save To File' and 'Save To Model'.

VTC Videos Updates in POST

- The 'Step 2' section of the GUI has been redesigned for simplification adding an example button for each view.
- In 'Step 3', the displayed End time is now determined by model simulation end time rounded down to three decimal places rather than model simulation end time minus 1 interval step (which had caused issues with video capture previously).
- In 'Step 3', For the Euro NCAP versions, the Video Quality slider has been replaced with a target file size option to allow users to satisfy the 1-10 MB video requirement.
- REPORTER will now use the specified property files save directory from the Workflow data, rather than the REPORTER Template output directory.



The screenshot displays the 'Euro NCAP VTC Videos' application window, which is organized into three sequential steps:

- Step 1: Calculate the views**
 - Views to calculate are selected via checkboxes: side, front, front_centre, front_belt, top, and x_section. All are currently checked.
 - A blue button labeled 'Calculate Views (create property files)' is located below the checkboxes.
- Step 2: Verify and update the views**
 - This section contains a table of view controls:

View	View	Update & Save	Example
Side	View	Update & Save	Example
Front	View	Update & Save	Example
Front Centre	View	Update & Save	Example
Front Belt	View	Update & Save	Example
Top	View	Update & Save	Example
X-Section	View	Update & Save	Example
- Step 3: Set video settings & export**
 - Input fields for 'Start' (0), 'Interval' (0.002), and 'End' (0.15) are provided.
 - A 'Target File Size (MB)' field is set to 10.
 - A blue button labeled 'Export Videos' with a dropdown arrow is at the bottom right.

VTC Videos new protocol: C-NCAP Occupant to Occupant

- The C-NCAP Occupant to Occupant tool and associated REPORTER Template allow you to create the images required by the C-NCAP Far Side Occupant to Occupant Official Template to show the minimum distance between the far side head and the near side head.

Step 1: Calculate the views

Front ☒ Top ☒

Calculate Views (create property files)

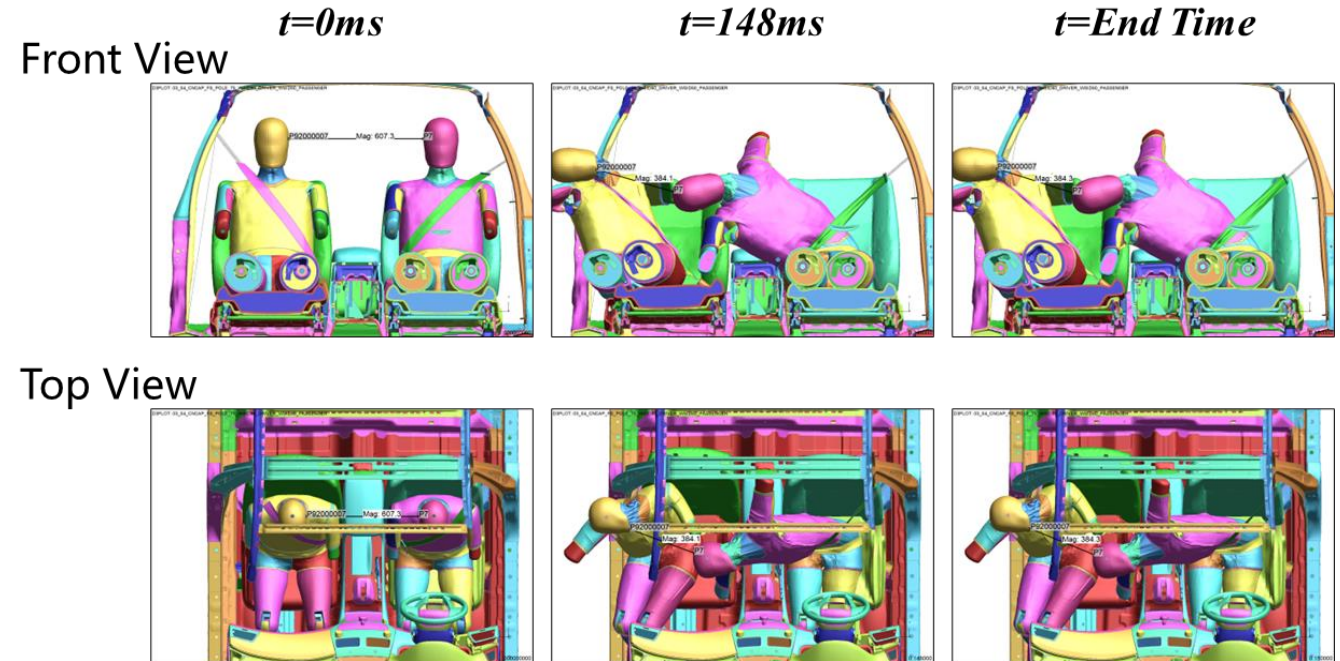
Step 2: View, Verify and update the views (Hover for help)

View Front Update & Save front view and Cut section

View Top Only update & save top view property

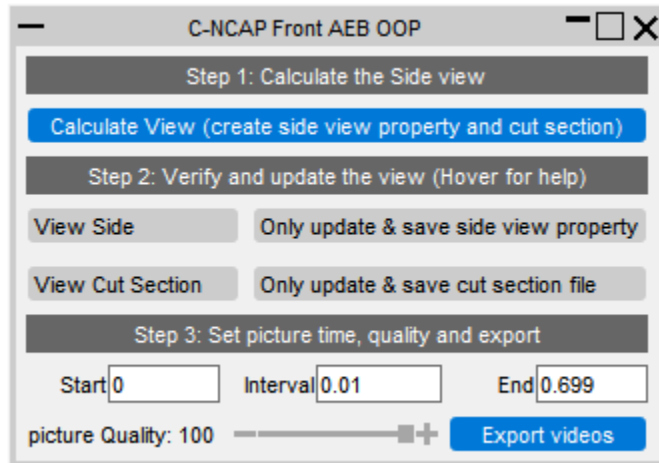
Step 3: Export the Picture

Export pictures



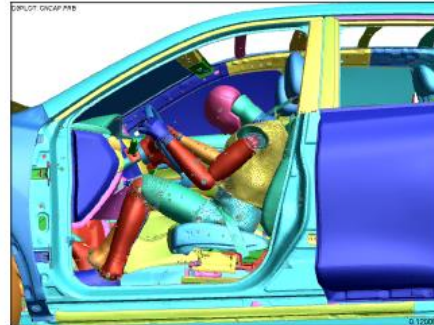
VTC Videos new protocol: C-NCAP Front AEB OOP

- The C-NCAP Front AEB OOP tool and associated REPORTER Template allow you to create the images required by the C-NCAP 2024 Frontal VTC Official Template to show the required 3 views for all models used for this protocol.

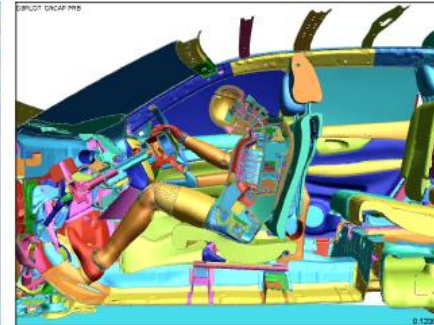


Videos for
FRB / MPDB

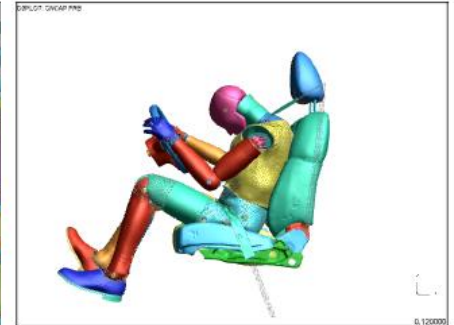
Side View



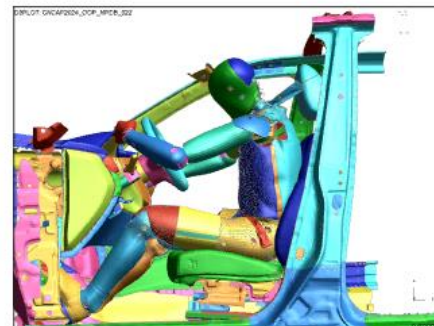
H-point Cut Section View



Dummy, Seatbelt and
Seat only



Side View



H-point Cut Section View



Dummy, Seatbelt and
Seat only



Videos for
OOP + FRB /
OOP + MPDB

Human-Safe Design

Automotive Protocols

New Protocols and Regulations V22.0

- Automotive Assessments and REPORTER now support the following new protocols and regulations:

Regulation	Loadcase
Global NCAP	MDB, ODB, Side Pole
JNCAP	FFB, MDB, ODB
KNCAP	FFB, MDB, Side Pole
UN ECE	R94, R95, R135, R137



New Protocols and Regulations V22.1

- Automotive Assessments and REPORTER now support the following new protocols and regulations:

Regulation	Loadcase
C-NCAP	Far Side (inc O2O & Official Format Versions), Front AEB OOP (Official Format), Side MDB, FRB
FMVSS	208 Front FFB
Euro NCAP	FWDB 2026, Front Sled 2026 (Validation 1 + (KPI), Validation 2 + (KPI), Robustness 1, Robustness 2, Robustness 3)

Euro NCAP Front Sled Validation 2 KPI

2026

Value		IAC		GAC
Sim	Test	Sim	Test	
327.899	51.719	0.326	0.074	
48.745	26.248	0.609	0.359	
1.842	0.891	0.460	0.223	
30.254	10.363	0.398	0.136	
1.539	1.116	0.405	0.294	
30.330	23.542	0.915	0.419	
0.175	0.081	0.175	0.081	
0.488	0.811	0.042	0.071	
1.232	1.929	0.107	0.168	

Euro NCAP Front Sled Validation 1

2026

Driver (HIII 50M)

Passenger (HIII 95M)

Summary	Driver		Passenger	
	Points	Max	Points	Max
Head and Neck	0.3125	0.3125	0.3125	0.3125
Chest	0.1250	0.3125	0.1250	0.3125
Knee ¹ , Femur and Pelvis	0.3125	0.3125	0.3125	0.3125
Lower Leg, Foot and Ankle	0.2500	0.3125	0.2500	0.3125
Total occupant points	1.0000	1.2500	1.0000	1.2500

Total Score = Head and Neck Score + Chest Score + Knee, Femur and Pelvis Score + Lower Leg Score
¹ Knee score is not applicable for Virtual Tests

Overall Points

2.000 / 2.5000

Overall Points: point values in this report are presented with a weighting of 1/2 applied for the contribution of this loadcase to the overall score.

1/43

Model | Testbedrml_64TESTType524Validation1-50kmph

FMVSS 208 Front FFB (HIII 50M)

2025 Title 49 Subtitle B Chapter V Part 571.208

	Driver (HIII 50M)	Passenger (HIII 50M)
Rating	Fail	Pass
	Pass	Pass
	Pass	Pass
	Fail	Pass

Total Score

Fail

REPORTER

Far side气囊保护效果一致性证明报告
【左侧柱碰，WSID + ES2RE】

提交日期 X年X月X日

提交单位 XXX

提交人 XXX

提交人联系方式 XXXXXXXXXXXX

左侧柱碰试验结果图

左侧柱碰试验结果图

左侧柱碰试验结果图

左侧柱碰试验结果图

左侧柱碰试验结果图

左侧柱碰试验结果图

左侧柱碰试验结果图

左侧柱碰试验结果图

Upgraded Protocols

- The following protocols have been updated:

Regulation	Loadcase	Update
C-NCAP	MPDB Occupant Assessment	<ul style="list-style-type: none">• Rear Occupants Added
Euro NCAP	MPDB Occupant Assessment	<ul style="list-style-type: none">• 2024 (Follows Adult Occupant Protocol v9.3)• Includes DAMAGE assessment
IIHS	Front SOB	<ul style="list-style-type: none">• 2024 (Version VII)• New fuel modifier
IIHS	Side MDB	<ul style="list-style-type: none">• 2024 (Version IV)• New fuel modifier and updated head protection rating system

Latest Protocol Support

- Available for some time
- New in version 22.1
- New in version 22.0

Automotive Assessments Workflow

Regulation	Year	Loadcase/Workflow	PRIMER	T/HIS	D3PLOT	REPORTER (migrated to workflows)	REPORTER (standard template)
C-NCAP	2018	ODB	●	●			●
	2021	Head Impact					●
		Leg Impact					●
	2023	MPDB Compatibility					●
	2024	MPDB Occupant	●	●		●	
		Side Pole	●	●		●	
		Far Side Pole	●	●		●	
		Far Side Sled	●	●		●	
		VTC Quality Criteria	●	●		●	
		VTC Videos	●		●	●	
		LS-DYNA to ISO-MME	●	●		●	
		SimVT		●		●	
		FRB	●	●		●	
		Side MDB	●	●		●	
		Far Side CNCAP Official Format	●	●	●	●	
		O2O CNCAP Official Format	●	●	●	●	
		O2O VTC Quality Criteria	●		●	●	
		O2O VTC Videos	●	●		●	
		Front AEB OOP Official Format	●	●	●	●	
		Front AEB OOP Quality Criteria	●	●		Part of Official Format	
		Front AEB OOP VTC Videos	●		●	Part of Official Format	

Latest Protocol Support

Automotive Assessments Workflow

- Available for some time
- New in version 22.1
- New in version 22.0

Regulation	Year	Loadcase/Workflow	PRIMER	T/HIS	D3PLOT	REPORTER (migrated to workflows)	REPORTER (standard template)
Euro NCAP	2017	FFB	●	●		●	
		ODB	●	●		●	
	2020	MPDB Occupant	●	●		●	
		Side Pole	●	●			
		MDB	●	●	●		
	2022	Far Side	●	●	●		
		MDB	●	●	●	●	
		Side Pole	●	●		●	
	2023	MPDB Compatibility					●
		Head Impact					●
		Leg Impact					●
	Continued...						

Latest Protocol Support

Automotive Assessments Workflow

- Available for some time
- New in version 22.1
- New in version 22.0

Regulation	Year	Loadcase/Workflow	PRIMER	T/HIS	D3PLOT	REPORTER (migrated to workflows)	REPORTER (standard template)
Euro NCAP	2024	Far Side Sled	●	●		●	
		MPDB Occupant	●	●		●	
		VTC Quality Criteria	●	●		●	
		VTC Videos	●		●	●	
		LS-DYNA to ISO-MME	●	●		●	
		SimVT		●		●	
	2026	Front Sled	●	●		●	
		FWDB Full Vehicle	●	●		●	
		VTC Quality Criteria	●	●		●	
		VTC HBM Quality Criteria	●	●		●	
		SimVT		●		●	

Latest Protocol Support

Automotive Assessments Workflow

- Available for some time
- New in version 22.1
- New in version 22.0

Regulation	Year	Loadcase/Workflow	PRIMER	T/HIS	D3PLOT	REPORTER (migrated to workflows)	REPORTER (standard template)
FMVSS	2024	208 Front FFB	●	●		●	
Global NCAP	2022	MDB	●	●		●	
	2023	ODB	●	●		●	
	2024	Side Pole	●	●		●	
GTR	2019	Leg Impact					●
	2020	Head Impact					●
IIHS	2017	MDB	●	●	●		
		ODB	●	●			
		SOB	●	●			
	Continued...						

Latest Protocol Support

Automotive Assessments Workflow

- Available for some time
- New in version 21.1
- New in version 22.0

Regulation	Year	Loadcase/Workflow	PRIMER	T/HIS	D3PLOT	REPORTER (migrated to workflows)	REPORTER (standard template)
IIHS	2021	MDB	●	●	●	●	
		MDB Structure Only				●	
		ODB	●	●		●	
		ODB Structure Only				●	
		SOB	●	●		●	
		SOB Structure Only				●	
	2024	MDB	●	●		●	
		MDB Structure Only				●	
		SOB	●	●		●	
		SOB Structure Only				●	

Latest Protocol Support

Automotive Assessments Workflow

- Available for some time
- New in version 22.1
- New in version 22.0

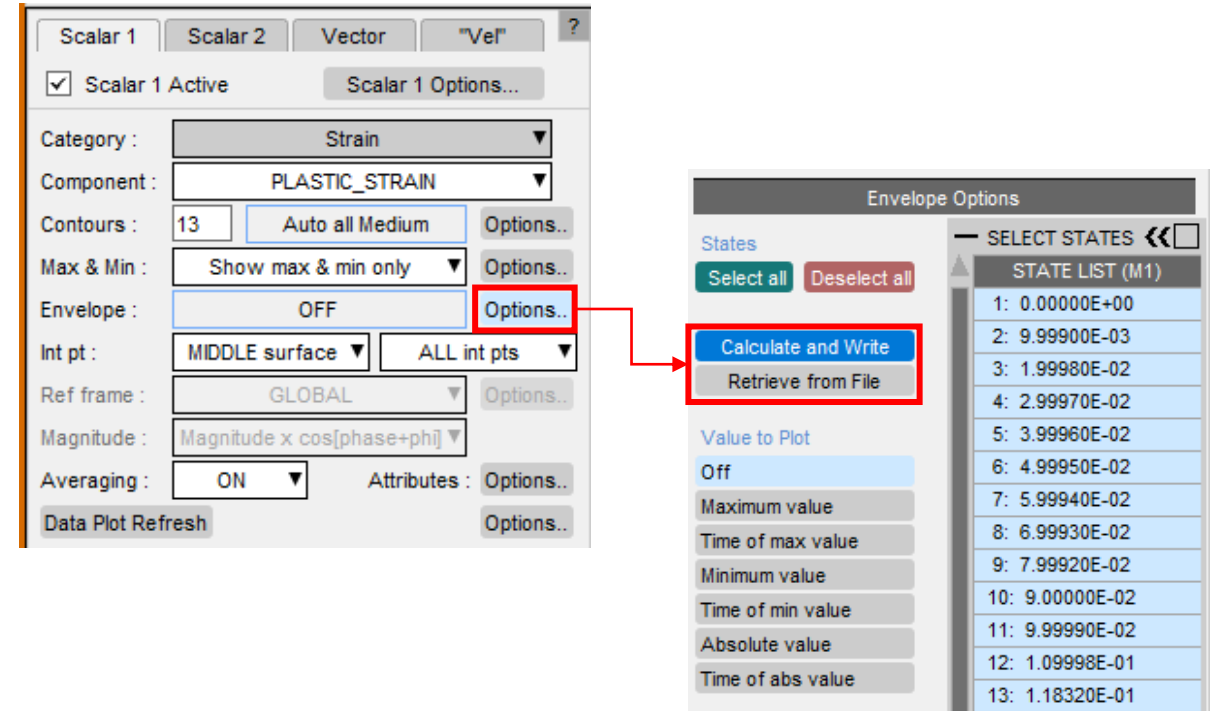
Regulation	Year	Loadcase/Workflow	PRIMER	T/HIS	D3PLOT	REPORTER (migrated to workflows)	REPORTER (standard template)
JNCAP	2018	Leg Impact					●
	2023	FFB	●	●		●	
		MDB	●	●		●	
		ODB	●	●		●	
KNCAP	2019	Leg Impact					●
	2024	FFB	●	●		●	
		MDB	●	●		●	
		Side Pole	●	●		●	
UN ECE	2015	R135 (Side Pole)	●	●		●	
	2022	R94 (ODB)	●	●		●	
	2023	R95 (Side MDB)	●	●		●	
		R137 (FFB)	●	●		●	

Speed and Performance

Envelope Data

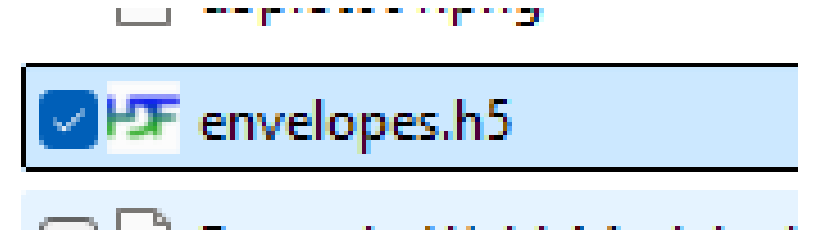
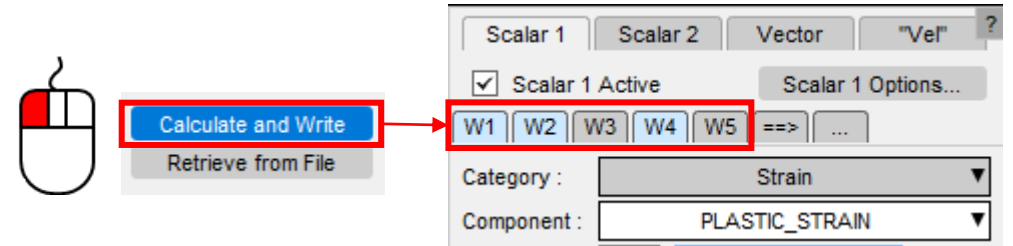
Saving and Retrieving Envelope Data

- An envelope plot is a contour plot of data across all (or several selected) states in a model – typically used to check the maximum values that have occurred across the duration of a simulation.
- We've recognised that sometimes envelope plots can take a while to calculate because of the size of a model.
- D3PLOT now has the capability to save and retrieve enveloped data. This means that once you have computed the envelope plot, you can save and retrieve it for rapid reuse later in the session or in future sessions.
- Retrieving a saved envelope plot is many, many times faster than computing it from scratch.



Saving an Envelope – Interactive

- Upon clicking the “Calculate and Write” button, D3PLOT will loop through all currently active windows as designated by the data panel window selection.
- Any windows that are active and have models which have components that are valid for enveloping will automatically be calculated and the envelope data will be placed within an *envelopes.h5* file within the respective model results directory.

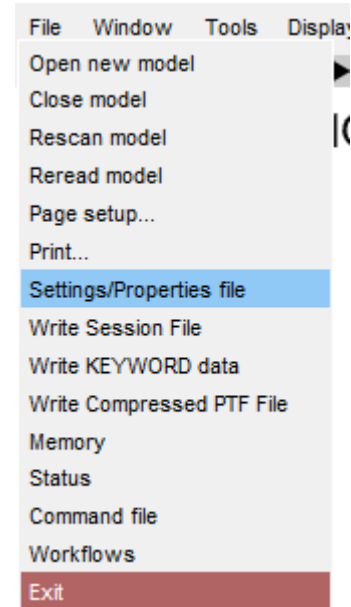


Saving an Envelope – Batch

- To save time, you can write the envelope data as a batch process – for example, as a step to complete automatically at the end of your LS-DYNA run.
- You will first require a Settings file:
 - For each envelope plot, create a unique Window in your D3PLOT session, add the same model to each, and configure the envelope plot.
 - Write a Settings file from the File menu.
- Then for a given run you can issue the following command:

```
<install-dir>/d3plot22_x64.exe -d=batch -env_out  
-set="<settings file path>/d3plot001.set"  
"model_path/model_filename.d3plot"
```

- When the **-env_out** command is issued, it will flag all the components you had setup in the settings file to automatically calculate the envelope data and then write to the corresponding model's path with the "envelopes.h5" file.



Saving an Envelope – Limitations

- The batch mode currently has the limitation that each settings file should contain a single model. For multiple LS-DYNA runs you will have to loop each *.d3plot/*.ptf output with the same settings file.
- Currently, the batch mode can only output envelopes across all states rather than over a selected subset of states.
- Currently, envelope data is always written to an *envelopes.h5* file in the results directory. In future versions, we will aim to make output directory and filename more flexible.

Retrieving an Envelope

- Upon clicking Retrieve from File and selecting your file you will be greeted with a list of the envelopes saved within it.
- Hovering a Data Component will give you more context about the envelope data:

Calculate and Write

Retrieve from File

Retrieve Envelopes

Cancel Empty List Apply Map or choose models

Browse for a HDF5 (*.h5) file

	Envelope Name	Data Component (Hover for more details)	Model pathname of original model	Map envelope to model
<input checked="" type="checkbox"/>	envelope_1	VON_MISES_STRESS	C:\Users\Jonathan.Moxey\Desktop\models\post172\crush4.ptf	M1 : DEMO ▼
<input type="checkbox"/>	envelope_2	YZ_SHEAR_STRESS	C:\Users\Jonathan.Moxey\Desktop\models\post172\crush4.ptf	M1 : DEMO ▼
<input type="checkbox"/>	envelope_3	QXZ_SHEAR_FORCE	C:\Users\Jonathan.Moxey\Desktop\models\post172\crush4.ptf	M1 : DEMO ▼
<input type="checkbox"/>	envelope_4	INTERNAL_ENERGY_DENS	C:\Users\Jonathan.Moxey\Desktop\models\post172\crush4.ptf	M1 : DEMO ▼
<input type="checkbox"/>	envelope_5	MASS	C:\Users\Jonathan.Moxey\Desktop\models\post172\crush4.ptf	M1 : DEMO ▼

Integration Point: MIDDLE surface

On plan/ solid integration point: ALL int pts

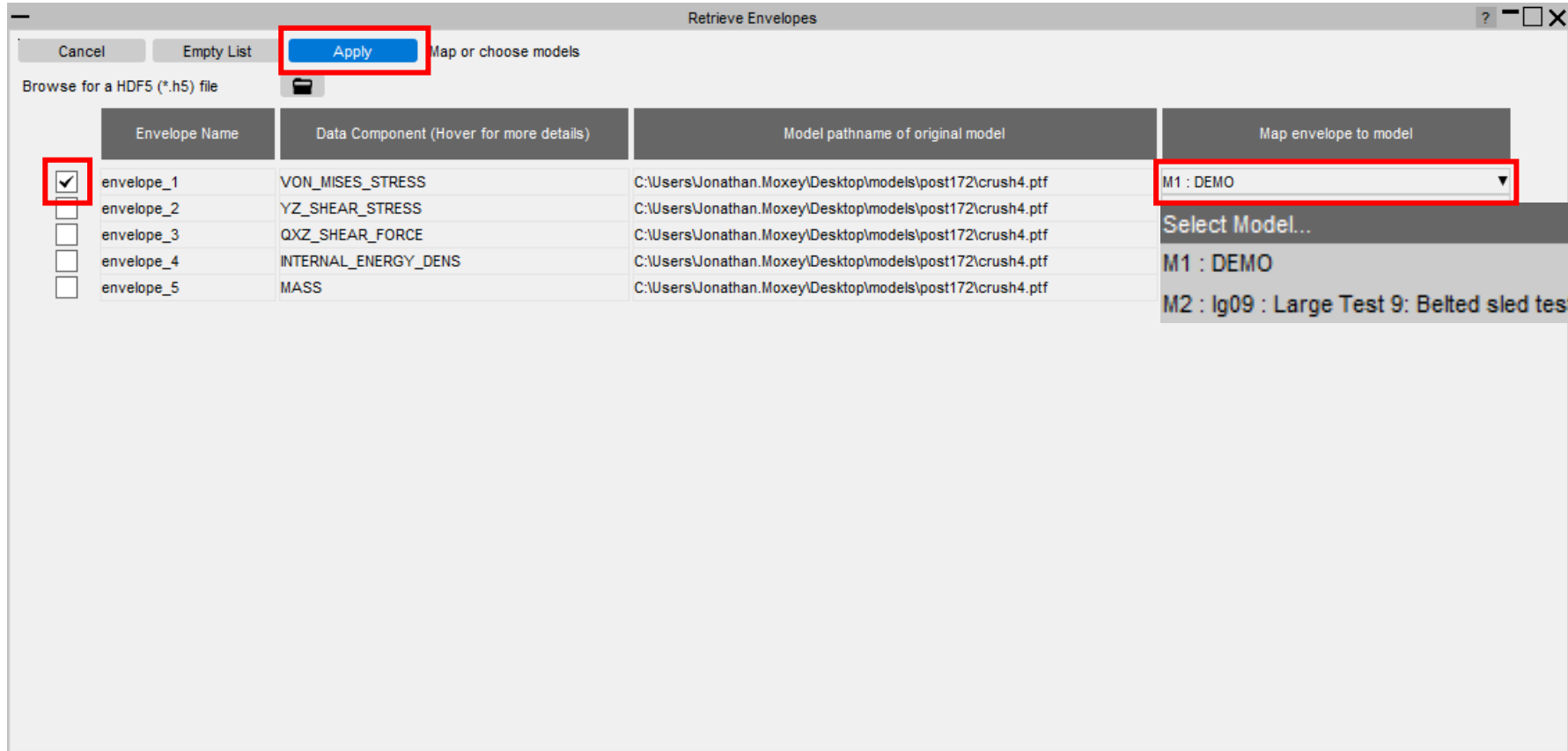
Reference Frame: Global

States: 7 selected

States: 1-7

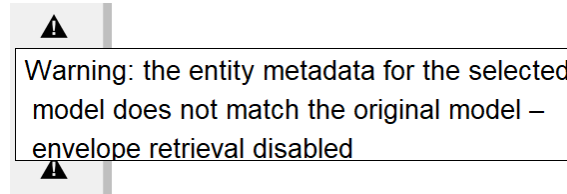
Retrieving an Envelope (continued)

- You can then map this data onto another model present in your session that corresponds to the model it was saved from:

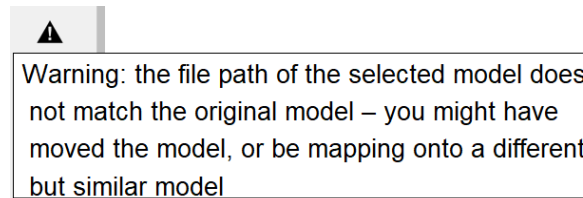


Retrieving an Envelope (continued)

- If the model you're trying to map onto does not match the model data from the envelope that you have saved, you will not be able to retrieve the envelope onto it
- This could either be missing entity metadata (e.g. a different number of elements) where you are **not** permitted to read.



- Or it could be that you have moved the envelope file or model to a different directory, but you **will** be permitted to read.



Data Plots

Data Plot Refresh Options

- Large models can take a long time to update, so by default, D3PLOT doesn't automatically refresh data plots when you make changes in the Data menu.
- A new panel has been added that allows you to control when data plots are refreshed automatically:
 - For models smaller than a certain size (number of nodes)
 - When you change specific settings
 - When envelope plots are active
- If the automatic refresh options are deactivated and a manual refresh is required, click the "Data Plot Refresh" button.

The screenshot shows the 'Scalar 1 Options...' panel in D3PLOT. The 'Data Plot Refresh' section is highlighted with a red box. Below it, the 'Data Plot Refresh Options' panel is visible, showing settings for automatic refreshing based on model size and specific data changes.

Scalar 1 Options...

☒ Scalar 1 Active

Category : Strain

Component : PLASTIC_STRAIN

Contours : 13 Auto all Medium Options..

Max & Min : Show max & min only Options..

Envelope : OFF Options..

Int pt : MIDDLE surface ALL int pts

Ref frame : GLOBAL Options..

Magnitude : Magnitude x cos[phase+phi]

Averaging : ON Attributes : Options..

Data Plot Refresh Options..

Data Plot Refresh Options

Max Model Size (#nodes) 1000000 Help

Refresh on Change ☐ Update on Envelope

All Settings ☒ ☒

Component ☐

Contours ☐

Max/Min ☐

Envelope ☐

Int Pt ☐

Ref Frame ☐

Magnitude ☐

Averaging ☐

Opacity ☐

Scalar/Vector Active ☐

100M+ Element Models

Improvements for very large models

We have had the opportunity to work on a gigacasting project featuring a model with 330 million elements and 70 million nodes.

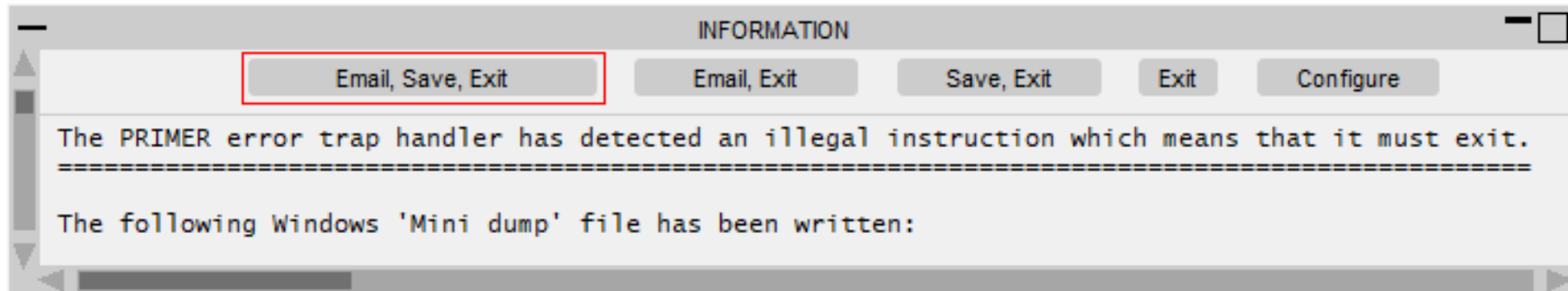
This presented problems because the lengths of some data vectors exceeded the $\sim 2.147e9$ limit ($2^{31}-1$) imposed by 32-bit signed integer arithmetic, with the result that some internal calculations overflowed.

In D3PLOT 22, those limits have been removed by substituting 64-bit arithmetic and models of this size are now processed successfully.

Email Minidump Files

Windows Minidump files can now be emailed

- Following a crash on Windows a “minidump” file is created which, if sent, can sometimes enable us to diagnose the cause of the crash, suggest workarounds and fix the bug. Historically this file has been written to an obscure temporary directory making it laborious to extract and send it.
- D3PLOT can now:
 - Compose an email automatically, attaching the minidump file.
 - Include further information about the crash (stack trace) in that email.
 - Launch the default email handler on the system so that you can add further information if you wish.
- This email is **not** sent automatically, you can choose to send it or not.
- Composition of these emails is optional; they can be turned off.

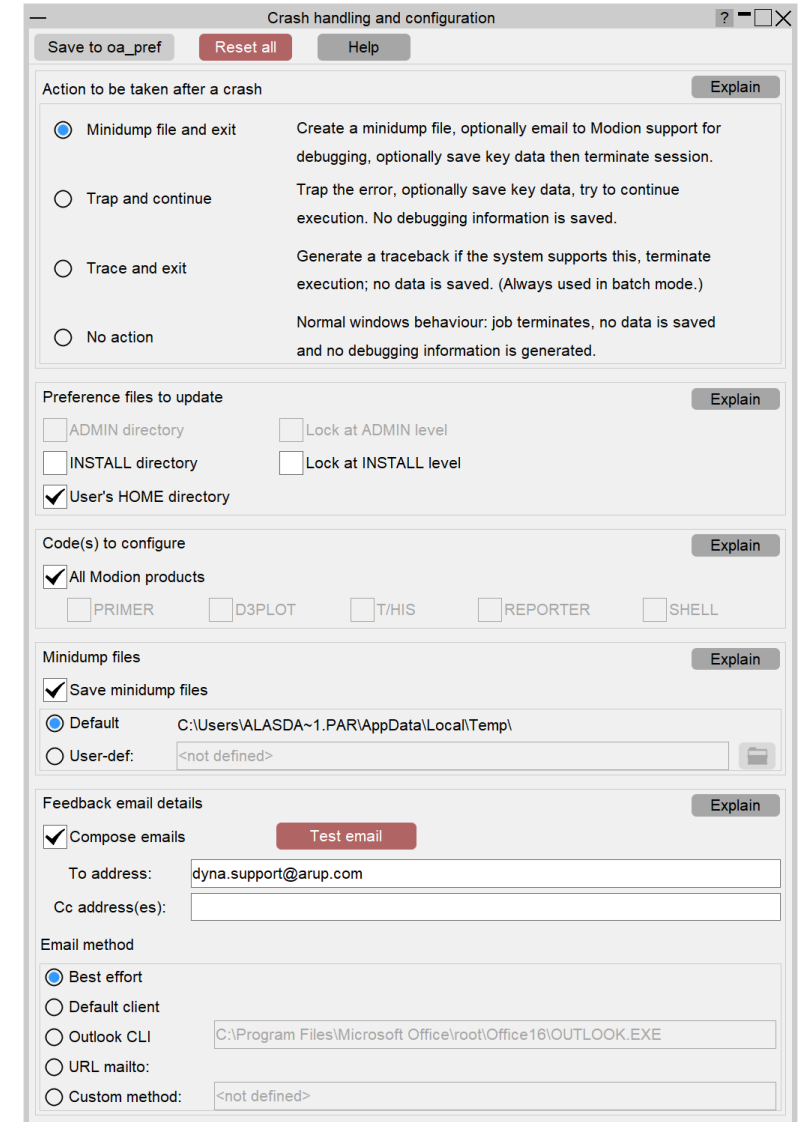


Email Minidump Files (continued)

- Minidump files and crash handling generally can be configured by preferences, but to make this easier there is now an interactive GUI which can be used to control this behaviour:



- Crash dump behaviour can also be configured at the “admin” or “installation” levels during software installation, configuring it for all users.

A screenshot of a 'Crash handling and configuration' dialog box. The dialog has a title bar with a question mark icon and standard window controls. Below the title bar are three buttons: 'Save to oa_pref', 'Reset all', and 'Help'. The main content area is divided into several sections, each with an 'Explain' button on the right. The first section, 'Action to be taken after a crash', contains four radio button options: 'Minidump file and exit' (selected), 'Trap and continue', 'Trace and exit', and 'No action'. The second section, 'Preference files to update', contains four checkboxes: 'ADMIN directory', 'INSTALL directory', 'User's HOME directory' (checked), and 'Lock at ADMIN level'. The third section, 'Code(s) to configure', contains a checked checkbox for 'All Modion products' and several unchecked checkboxes for 'PRIMER', 'D3PLOT', 'T/HIS', 'REPORTER', and 'SHELL'. The fourth section, 'Minidump files', contains a checked checkbox for 'Save minidump files' and two radio button options: 'Default' (selected) and 'User-def:'. The fifth section, 'Feedback email details', contains a checked checkbox for 'Compose emails' and a 'Test email' button. Below this are text fields for 'To address:' (filled with 'dyna.support@arup.com') and 'Cc address(es):'. The final section, 'Email method', contains four radio button options: 'Best effort' (selected), 'Default client', 'Outlook CLI', and 'URL mailto:'. There are also text fields for 'Outlook CLI' (filled with 'C:\Program Files\Microsoft Office\root\Office16\OUTLOOK.EXE') and 'Custom method:' (filled with '<not defined>').

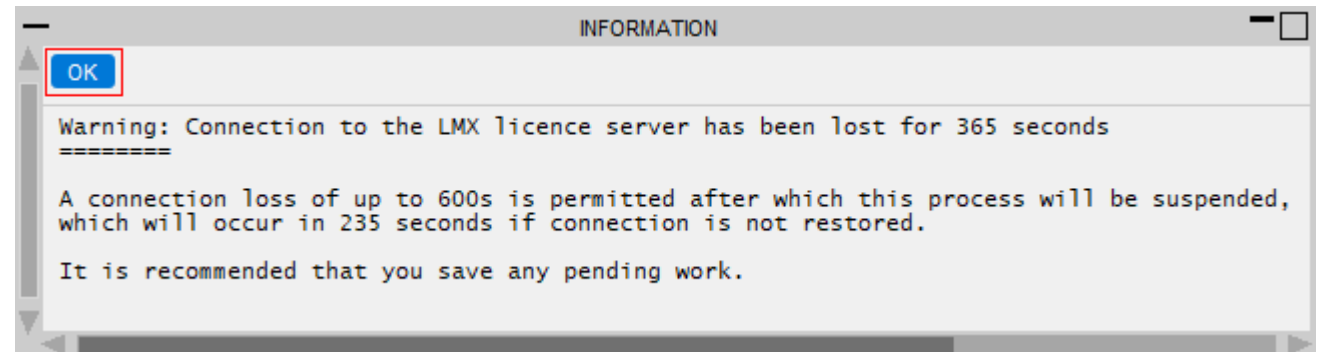
Improved LMX server connection
loss behaviour (V22.1 onwards)

Improved LMX server connection loss behaviour (V22.1)

Oasys Ltd software uses the LMX licensing system which requires connection to a licence server when the software first starts. It also maintains regular contact with that server during the session to enable the server to keep track of usage. If contact with the server is lost for more than approximately 10 minutes the behaviour in versions before V22.1 was to terminate the session.

This has been changed from V22.1 onwards so that the session is suspended rather than terminated. When connection with the licence server is regained it will continue as before, or alternatively the user can choose to terminate it. The process now works as follows:

After approximately 6 minutes of server connection loss a warning message will appear:



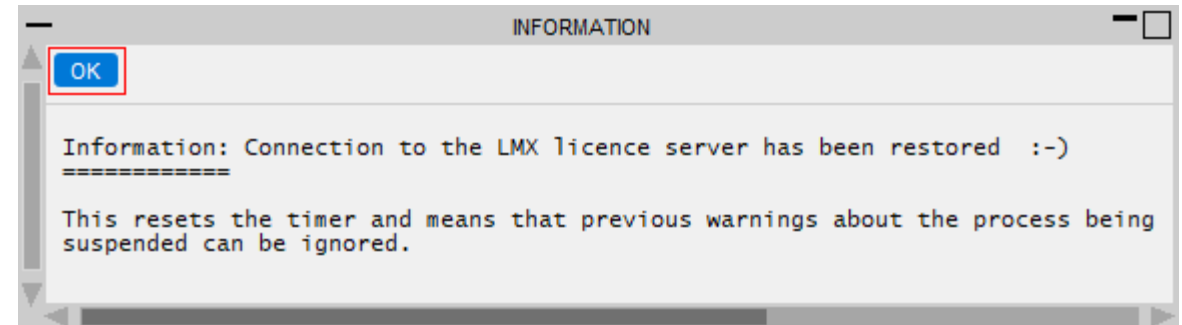
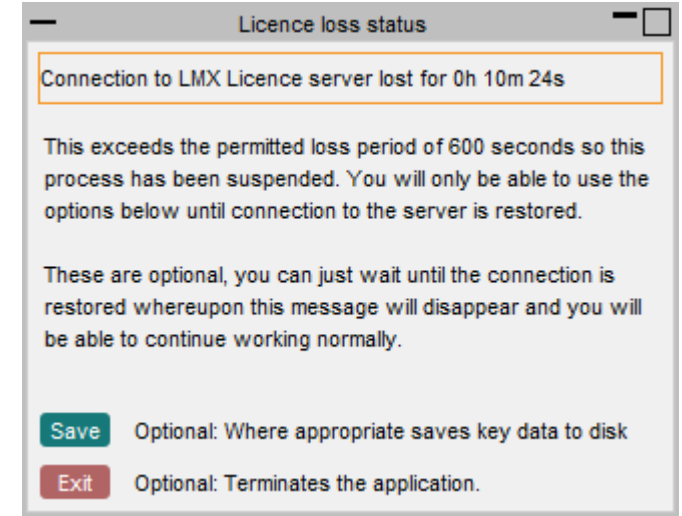
Improved LMX server connection loss behaviour (V22.1)

This message will be updated at approximately one minute intervals, giving the time remaining, until the limit of ten minutes is reached. During this period D3PLOT will operate normally.

When ten minutes of licence loss have elapsed it will be replaced with this dialogue. The D3PLOT session will remain live but “frozen” so that no further work can be done. No data will be lost.

The user can just wait and do nothing, or **Save** key data to disk and continue to wait for the licence connection to be restored, or **Exit** normally.

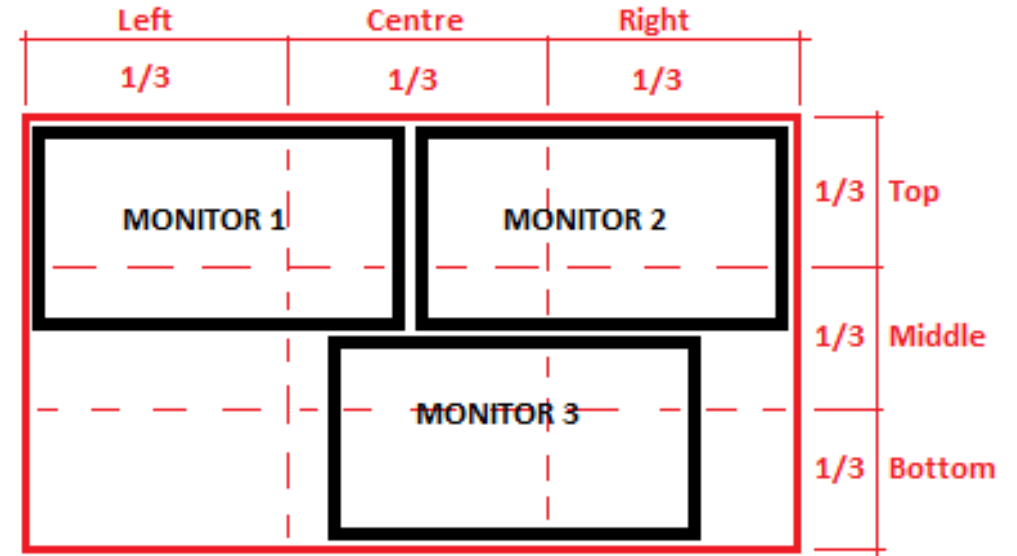
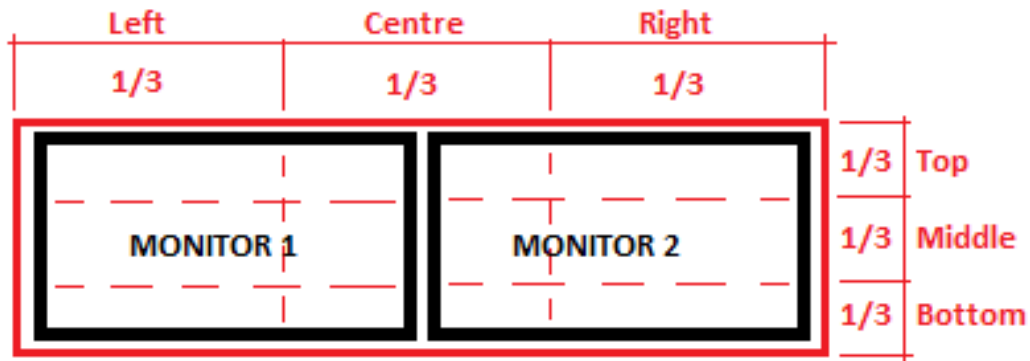
If the licence server connection is restored this panel will disappear, this confirmation message will be shown and D3PLOT will resume working normally.



Initial Window Placement

Initial Window Placement

- On a multi-monitor desktop, the “placement” preference can be used to select which of multiple monitors on a desktop the master D3PLOT window starts in. Previously this was always the main display window. The bounding box (red) around the monitors (black) that make up the desktop in pixel space which is divided into 1/3rds. For example:



The preference value may be a combination of
LEFT | CENTRE | RIGHT
and / or

TOP | MIDDLE | BOTTOM

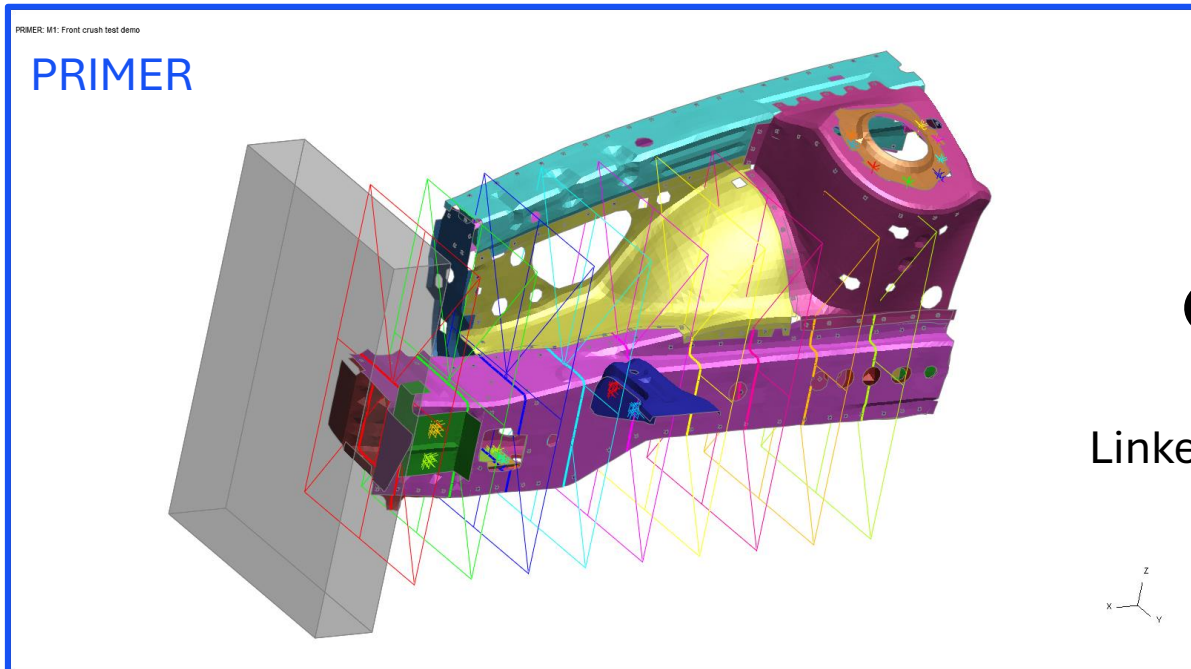
The monitor nearest to the centre of that 1/3rd sub-area is used.

Flexible Automation and Integration

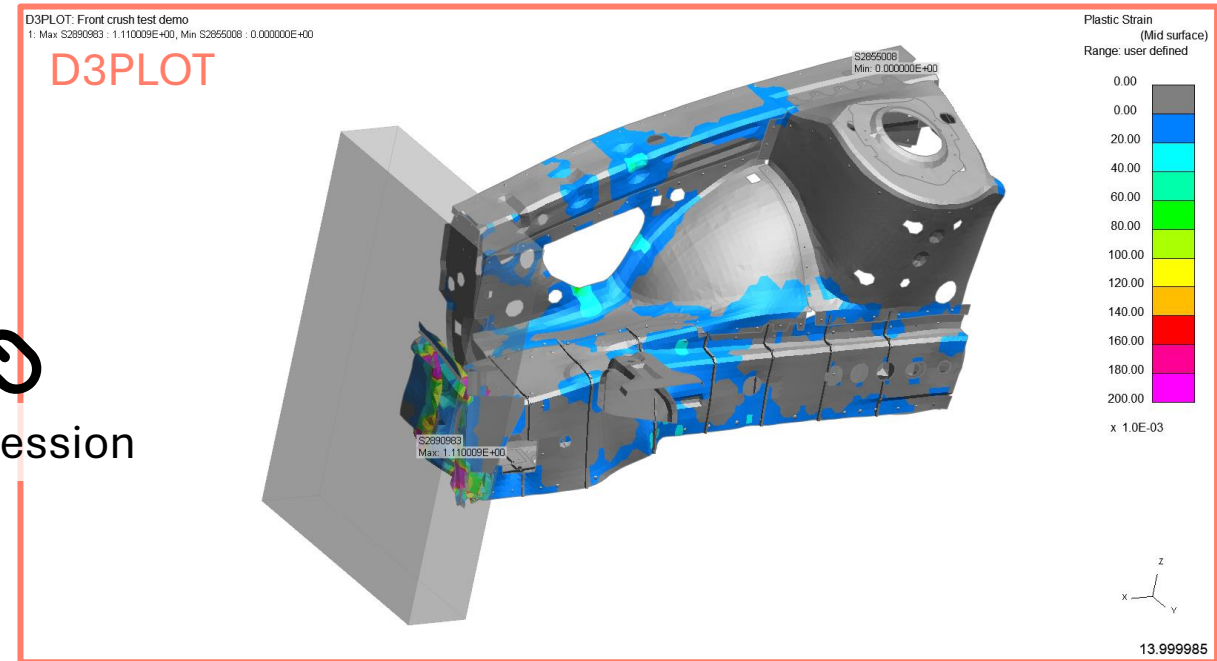
D3PLOT-PRIMER Integration

Linked PRIMER Session Blanking Lock Behaviour

- D3PLOT now preserves the blanking **Lock** status when an Unblank action is carried out in linked PRIMER sessions (and vice versa).



Linked session



JavaScript API

JavaScript API

- It is no longer necessary to specify the memory required when running a script. The memory is now automatically increased as required.
- The **GetAll** and **GetFlagged** methods available for several classes can now take an optional argument, which is a property from the object to return in the array, instead of the object itself.
- The following has been added to the Part class:
 - A **composite** property which returns true if the Part is a *PART_COMPOSITE
 - A **nip** property to get the number of integration points in a *PART_COMPOSITE
 - A **GetCompositeData()** method to get the Material ID and Thickness at a specified integration point in a *PART_COMPOSITE

JavaScript API

- The function assigned to the Window **onClose** event can now return false to prevent the window closing if required.
- **GetTargetEye** and **SetTargetEye** instance methods have been added to the **GraphicsWindow** class to enable getting/setting the target and eye position.

Python API

Python API

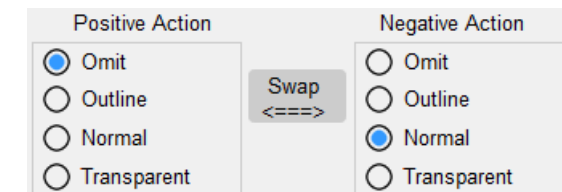
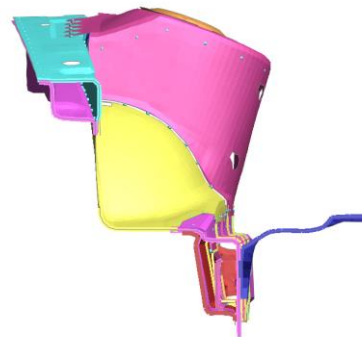
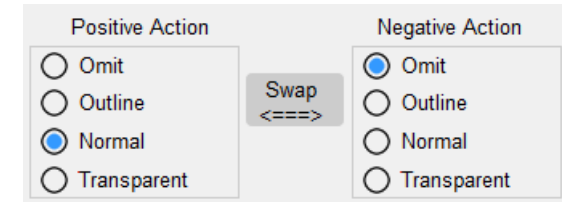
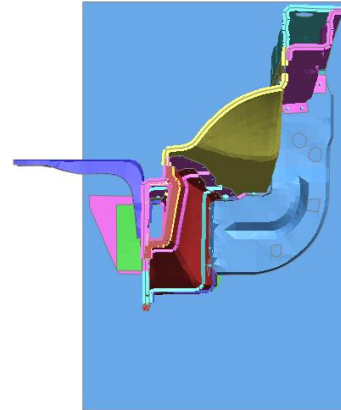
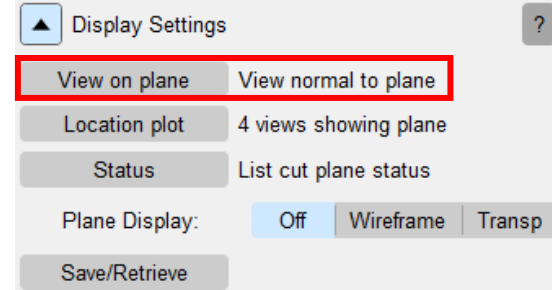
- The **GetAll** and **GetFlagged** methods available for several classes now work for very large lists. In version 21 there was a limit of ~300,000 items.
- Similarly, the **GetMultipleData** method for several classes also had a limit which has now been removed.

Other Developments and Preferences

Cut Sections

View on Plane Behaviour

- For Cut Sections, the "View on Plane" button under the Display Settings section now orients to face the most transparent side.
- Priority of transparency: Omit, Outline, Transparent, then Normal.
- For ease of use, the "V" shortcut key (uppercase "V" – lowercase "v" shortcut is for the View menu) now sets the currently active window to "View on Plane".



Cut Forces Table

- The cut forces table can now be sorted by clicking on column headers similarly to the Write table.

WRITE Table

Dismiss

Save as : C:\models\ACCORD_56KPH_FFB_DEMO\ld3plot001.txt

Save

Select All

Select None

Write : All

Format : Text

Model	Window	Direction	Offset	Part	Time	X Cut Force	Y Cut Force	Z Cut Force	Mag Cut Force	XX Moment	YY Moment	ZZ Moment
1	1	1	0.0	100213	1.20001E-01	-5.423575E+03	3.342152E+03	8.399012E+03	N/A	-2.741988E+06	-5.828919E+06	5.143698E+05
1	1	1	0.0	100067	1.20001E-01	-8.749117E+02	-3.173624E+00	7.376201E+02	N/A	-1.565791E+05	-6.741361E+05	-3.863178E+05
1	1	1	0.0	100009	1.20001E-01	-6.046431E+02	-3.281265E+02	3.575662E+02	N/A	-1.279910E+05	8.170148E+04	1.095315E+05
1	1	1	0.0	100320	1.20001E-01	-5.971558E+02	3.774984E+00	7.382128E+02	N/A	5.587798E+05	-5.779490E+05	4.352366E+05
1	1	1	0.0	100239	1.20001E-01	-5.192515E+02	-3.467118E+03	-2.104020E+03	N/A	9.871526E+05	-1.595096E+06	2.424992E+06
1	1	1	0.0	400003	1.20001E-01	-5.138940E+02	-1.327578E+02	-3.505966E+01	N/A	1.364306E+04	-2.726323E+04	-1.537546E+05
1	1	1	0.0	100109	1.20001E-01	-4.333562E+02	7.692681E+02	8.913616E+02	N/A	1.817913E+05	-6.939262E+05	4.923005E+05
1	1	1	0.0	400010	1.20001E-01	-3.839746E+02	-3.753535E+01	-1.172090E+03	N/A	6.468858E+05	1.534707E+05	-2.314133E+05
1	1	1	0.0	400000	1.20001E-01	-2.793947E+02	8.543321E+00	7.796779E+02	N/A	-6.584674E+03	-1.434585E+05	8.723012E+04
1	1	1	0.0	600056	1.20001E-01	-2.329324E+02	1.748479E+02	1.651135E+03	N/A	-8.576731E+05	-1.624380E+05	-2.192976E+05
1	1	1	0.0	550020	1.20001E-01	-1.376559E+02	-5.249579E+02	-1.603969E+03	N/A	-8.668425E+04	-2.035400E+04	1.341989E+05
1	1	1	0.0	550023	1.20001E-01	-1.255875E+02	-1.175276E+02	-2.304759E+02	N/A	-1.770217E+05	-2.489932E+04	2.766222E+04
1	1	1	0.0	100077	1.20001E-01	-1.194911E+02	1.518446E+02	-9.122614E+01	N/A	-2.090689E+04	6.275254E+04	1.725499E+05
1	1	1	0.0	100050	1.20001E-01	-1.065623E+02	6.501924E+02	1.215948E+03	N/A	-4.208049E+05	9.401897E+05	-5.383864E+05
1	1	1	0.0	100332	1.20001E-01	-8.498953E+01	-4.950859E+02	1.633163E+03	N/A	1.066205E+06	9.818324E+05	3.554444E+05
1	1	1	0.0	550022	1.20001E-01	-5.818669E+01	2.501112E+02	6.567514E+02	N/A	1.996697E+05	-4.432918E+05	7.645319E+04

Cut Sections

Cutting switch: ON

Deformed space

Direction: ☒ ☐ ☐

Drag (D)

<= ?

D1

D2

D3

Constant X

X coordinate: -683.15

Pick Node (N)

Cancel Pick

Section follows origin node

Positive Action

Negative Action

Thick cut

Thickness: 55.9

Multiple cuts

Custom spacing

Spacing: 111.7

planes +/-: 999 999

Transparency Settings

Element Capping and Outline

Entities to exclude

Output Forces

Forces...

System: Local (def)

Write to File

tCrushDemo\sectforce001.csv

Display section force summary

(Summary forces turned off)

Exclude Solid SPG Parts From Forces

Display Settings

Options & Tuning

New preferences

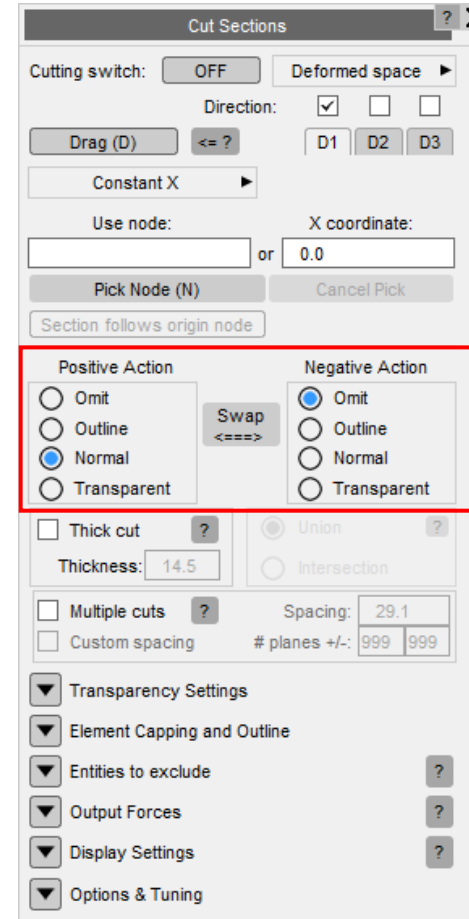
- There are now preferences

`d3plot*cut_section_pos_action`

and

`d3plot*cut_section_neg_action`

for positive and negative actions of cut sections.



Eigenmode Magnification

Eigenmode Magnification Controls

- New controls to modify eigenmode model (d3eigv, Nastran, and OptiStruct) magnification factors after they have been read in have been added to the Deform → Magnify panel.
- Both absolute and percentage factors can be set, just like in the OPEN PLOT FILE menu.
- Note that the magnification value specified in this panel overrides the value set in the OPEN PLOT FILE panel. The two values are not applied to the model in a compound way.

Displacement Magnifications

Fx: 1.00 Fy: 1.00 Fz: 1.00

x 0 x .001 x .01 x .1

Cancel (x1) x 5 x 50 x 500

x 10 x 100 x 1000

Auto 15.0 % ?

Factor on Curr

Magnification Text Display Options:

Magnification Switch

Format Automatic

Exponent 3

Dec. Plac 3

Eigenmode Magnification Factor:

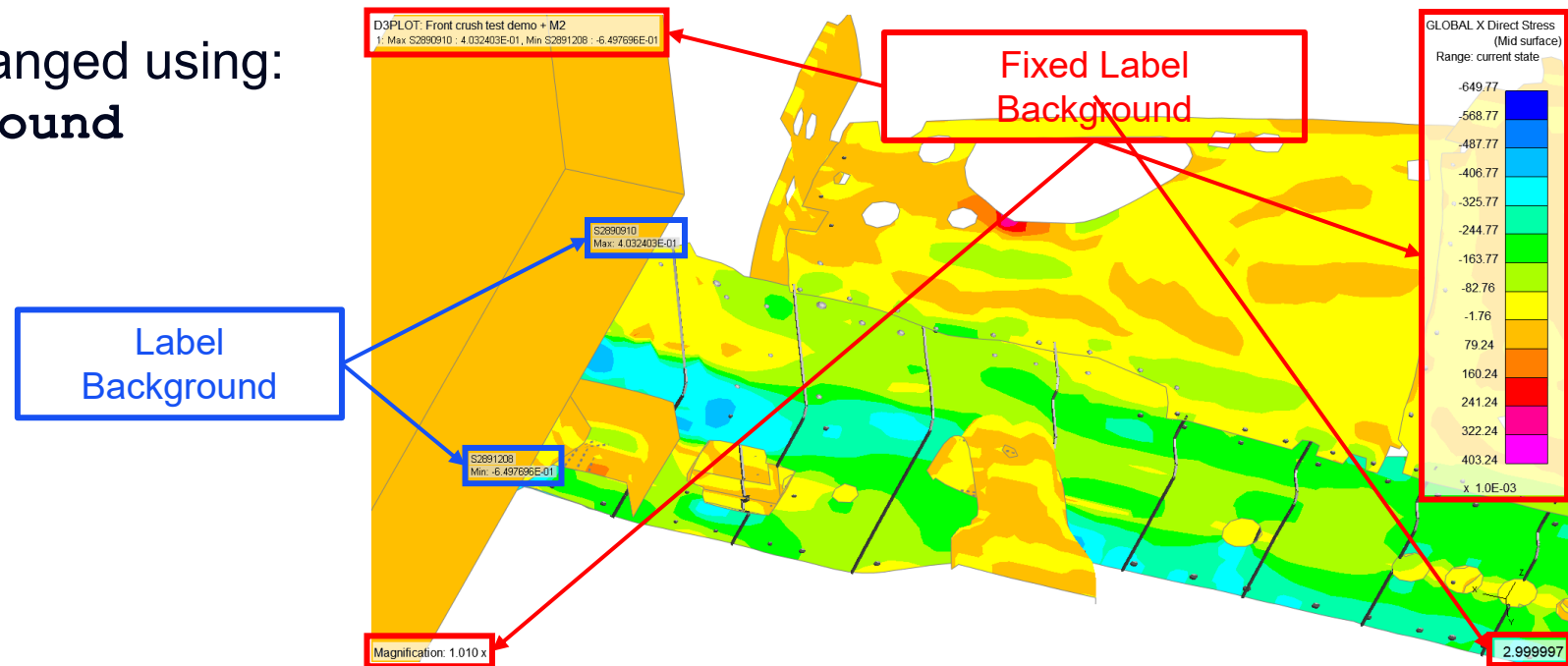
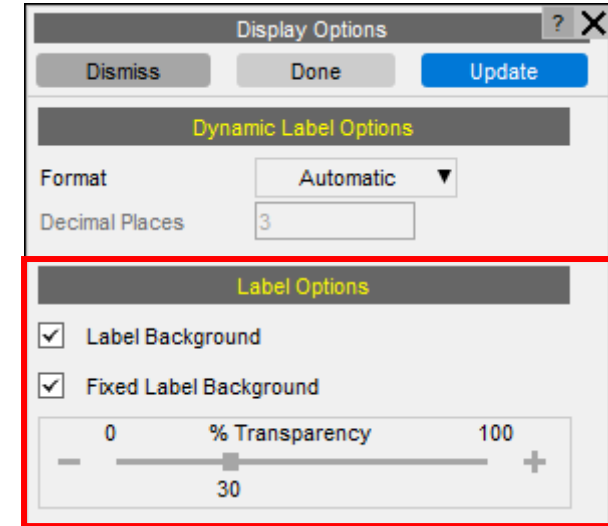
☐ Absolute 1.00 Explain

☒ Percent 15.0

Label Background

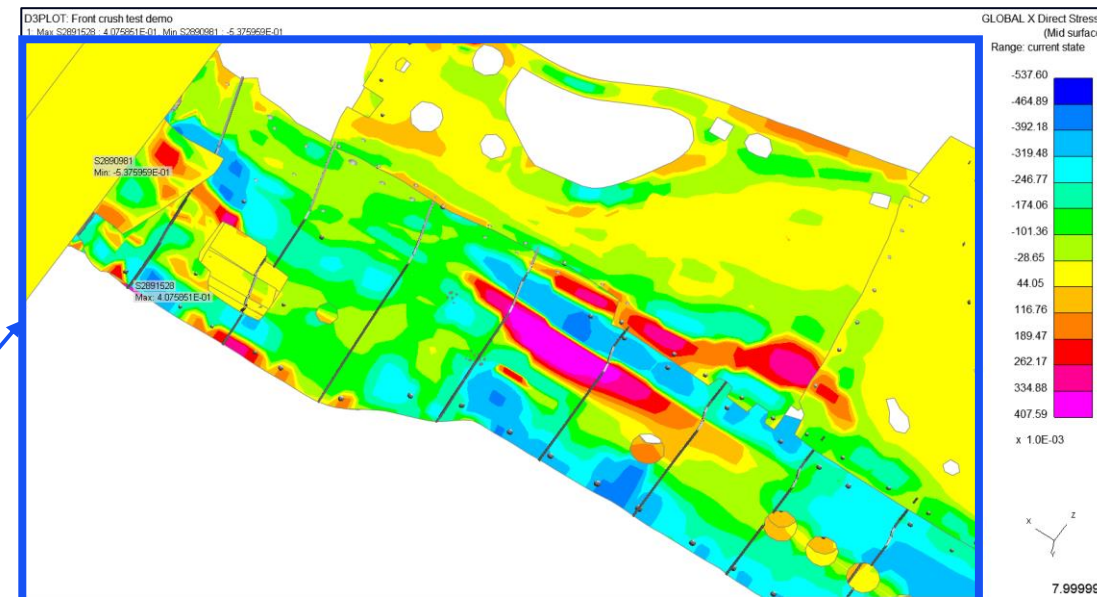
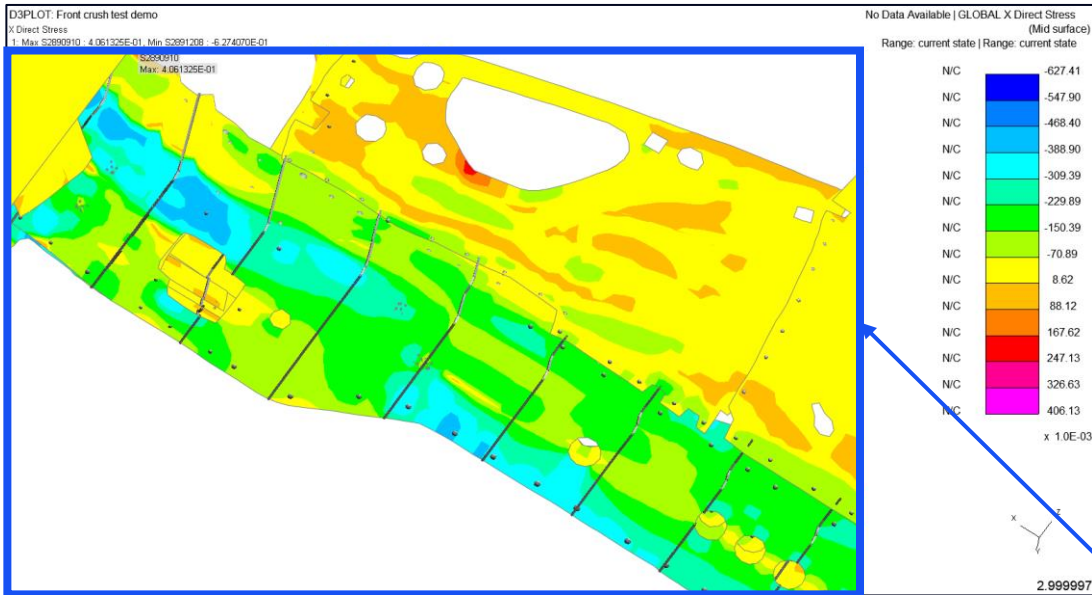
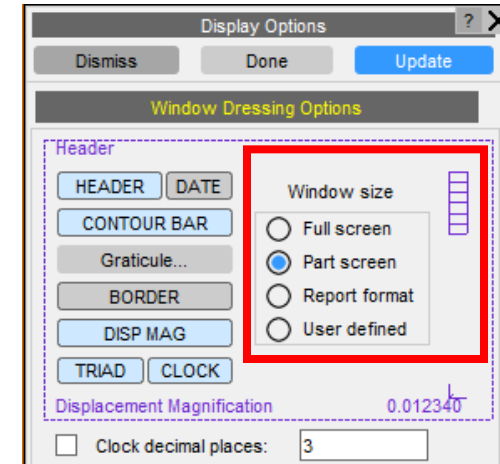
Label Background

- New “Fixed Label Background” option in **Display Options** → **Label Options** maps a background to increase legibility of fixed labels that do not move with the model.
- This includes header, clock, contour bars, deform factor and any other ‘fixed’ label written in the graphics area.
- Additionally, an option is given to adjust the transparency of these backgrounds.
- Inactive by default, this can be changed using: `d3plot*fixed_label_background`



Window Dressing – Part Screen

- Changes have been made to the way **Display Options** → **Window Dressing** → **Window size** → **Part Screen** works.
- The graphics window area in Part Screen mode will now dynamically adjust to the maximum possible available area that can be used without overlapping with the header or the contour bar.
- Full screen by default, this can be changed using: `d3plot*window_mode`



Part Screen
Graphics Area

New Preferences

New preferences

Preference	Description
<code>oasys*javascript_maximum_memory_size</code>	Maximum memory allocated for garbage collection (MB)
<code>oasys*cd_compose_email</code> <code>d3plot*cd_compose_email</code>	Whether or not to offer to compose an email for sending minidump files.
<code>oasys*cd_email_address</code> <code>d3plot*cd_email_address</code>	Email address in To: field of crash dump emails.
<code>oasys*cd_cc_addresses</code> <code>d3plot*cd_cc_addresses</code>	Email address(es) in Cc: field of crash dump emails.
<code>oasys*cd_custom_email</code> <code>d3plot*cd_custom_email</code>	Custom method of sending emails.
<code>oasys*cd_dump_directory</code> <code>d3plot*cd_dump_directory</code>	Directory in which to save crash dump files
<code>oasys*cd_email_method</code> <code>d3plot*cd_email_method</code>	Method used to create crash dump emails.
<code>oasys*cd_minidump_file</code> <code>d3plot*cd_minidump_file</code>	Whether or not to create minidump files, and what to do with them.

New preferences

Preference	Description
<code>d3plot*cut_section_cap2d_fac2</code>	True-thickness-constant factor for shell element cut section capping
<code>d3plot*cut_section_neg_action</code>	Negative action for cut sections
<code>d3plot*cut_section_pos_action</code>	Positive action for cut sections
<code>d3plot*cache_data_mode</code>	How data storage is managed
<code>d3plot*cache_data_limit</code>	Percentage of memory used at which automatic storage switches to scalar
<code>d3plot*recycle_tensors</code>	Percentage of memory used at which unused tensor data is evicted from memory
<code>d3plot*data_refresh_max_model_size</code>	Maximum number of nodes allowable for any model in any window for an immediate refresh
<code>d3plot*data_refresh_max_model_size_on</code>	When TRUE, enable the max model size (#nodes) option for immediate refreshes
<code>d3plot*data_update_on_envelope_on</code>	When TRUE, the plot is updated regardless of the envelope status if needed

New preferences

Preference	Description
<code>d3plot*data_force_refresh_opts</code>	When set to ALL, all data plot refresh on change settings tick boxes are ticked
<code>d3plot*fixed_label_background</code>	Fixed label background display
<code>d3plot>window_mode</code>	Controls how the graphics window occupies the screen
<code>d3plot*cpg_visibility</code>	CPG (Airbag Continuum-base Particle Gas) visibility
<code>d3plot*des_visibility</code>	DES (Discrete Element Sphere) visibility
<code>d3plot*sph_visibility</code>	SPH (Smooth Particle Hydrodynamics) visibility

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