Post Processing Update

April 2018

D3PLOT 15.0

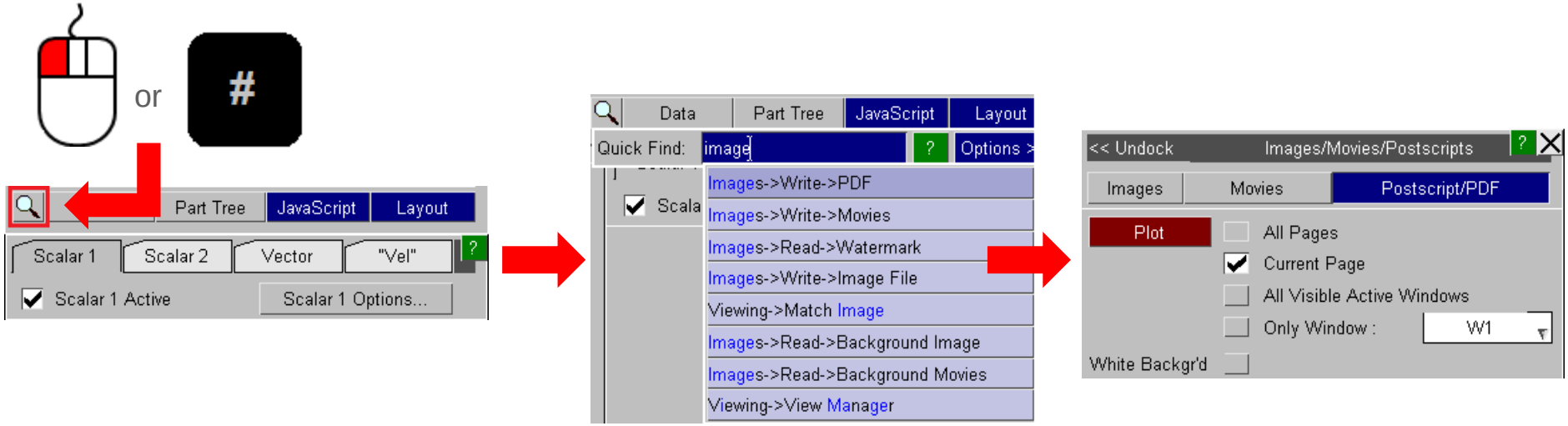
Quick Find

Quick Find

A ‘Quick Find’ feature has been added to allow users to search for and then quickly go to menus / functionality in D3PLOT.

It can be accessed by clicking on the magnifying glass next to the Data button or by pressing the ‘#’ key.

Typing in the textbox brings up a list of found items that match the entered text. Items in the list can be selected by clicking on them or by using the up and down arrow keys and pressing enter. The selected item will then perform the task, e.g. open a menu.



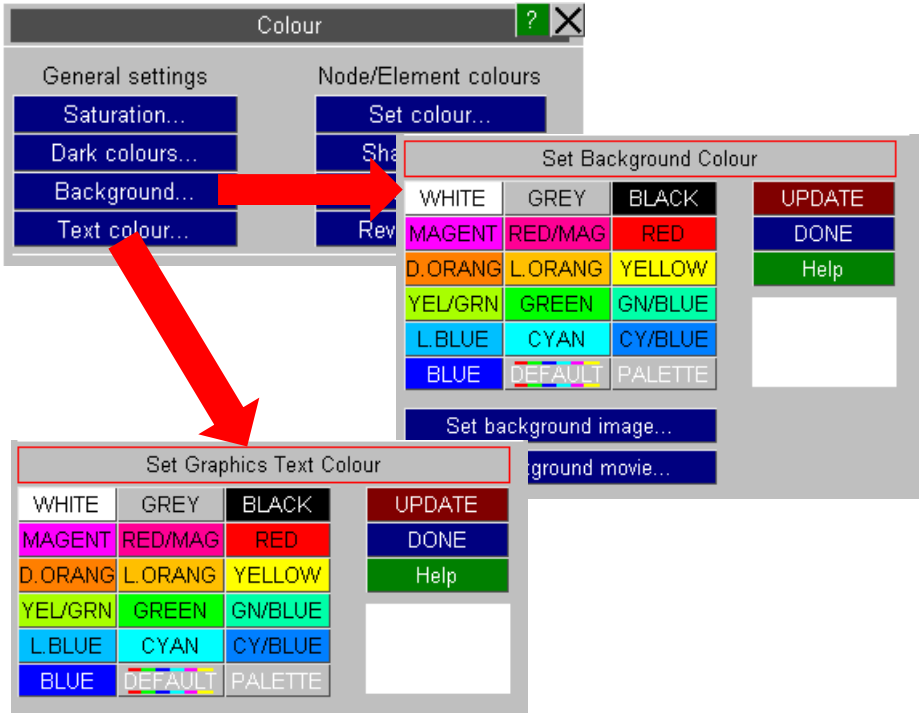
DEMO

Display Enhancements in D3PLOT

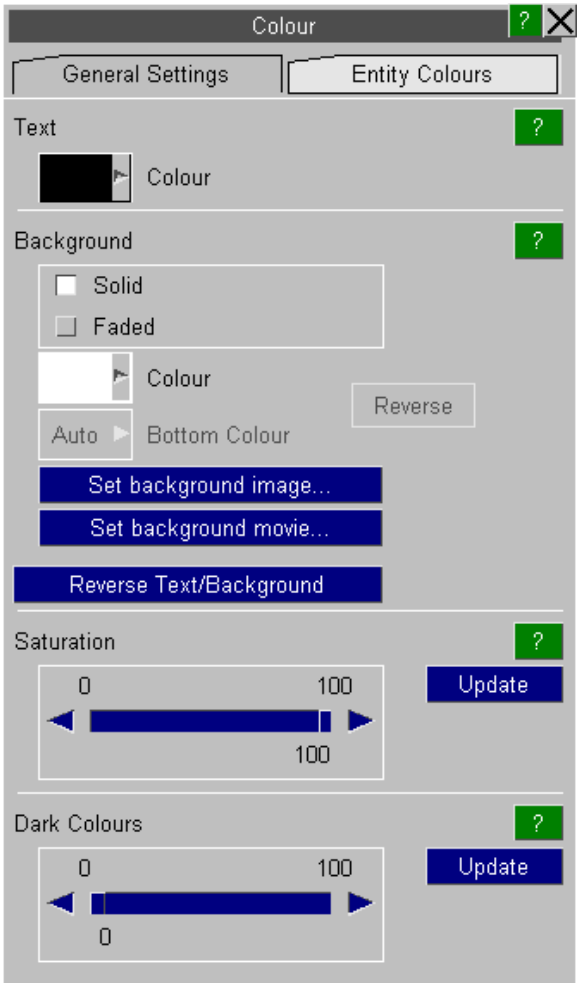
Colour Settings

Colour Settings

In Version 15 the “Colour” menu has been modified to bring most of the commonly used options into 1 menu.



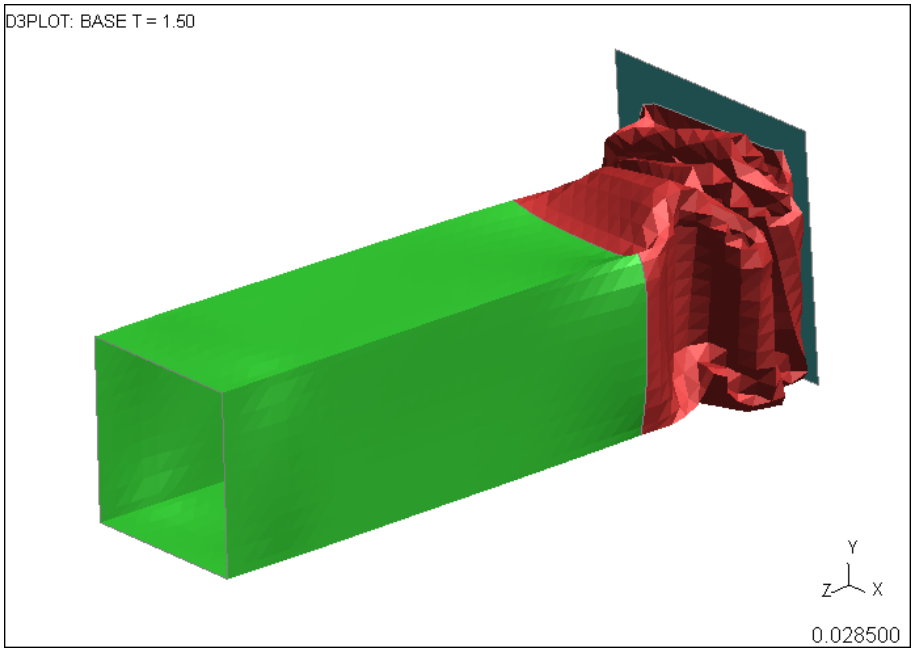
Version 14

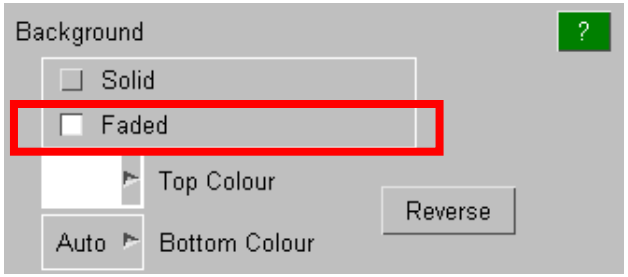


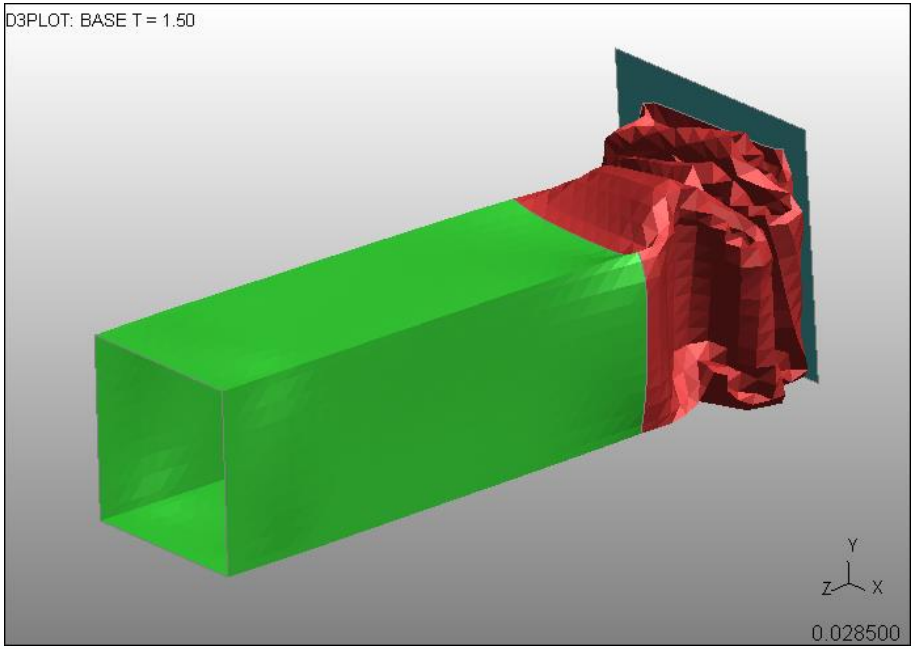
Version 15

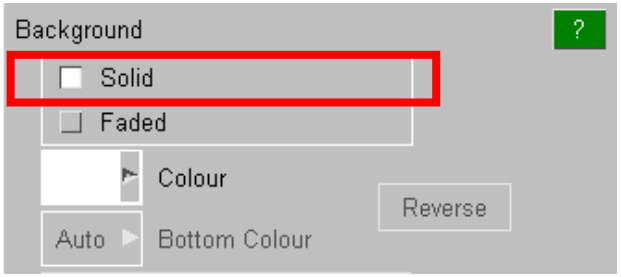
Colour Settings - Background

In Version 15 the background can now be set to either a Solid colour (default) or a Faded colour



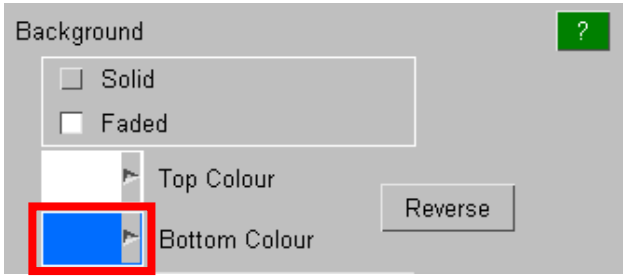


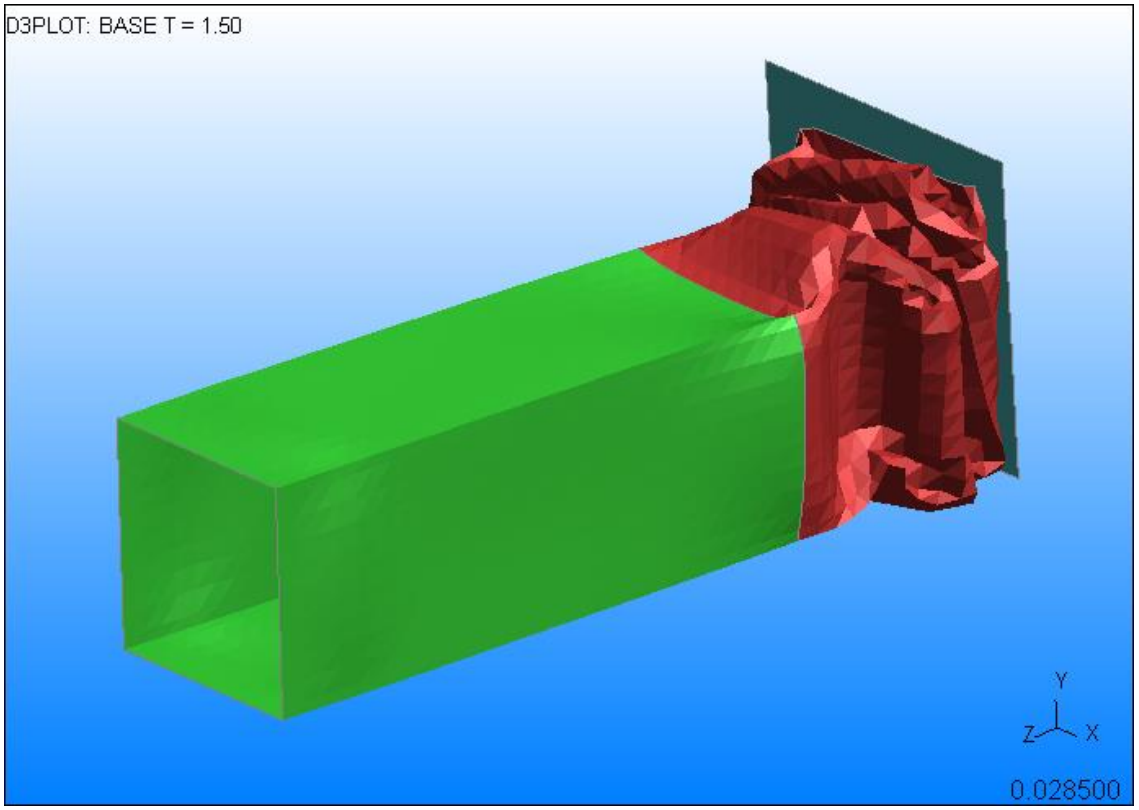




Colour Settings - Background

Alternatively a separate colour can be specified for the bottom of the screen





Two new preferences have also been added to control the new background options.

d3plot*background_mode

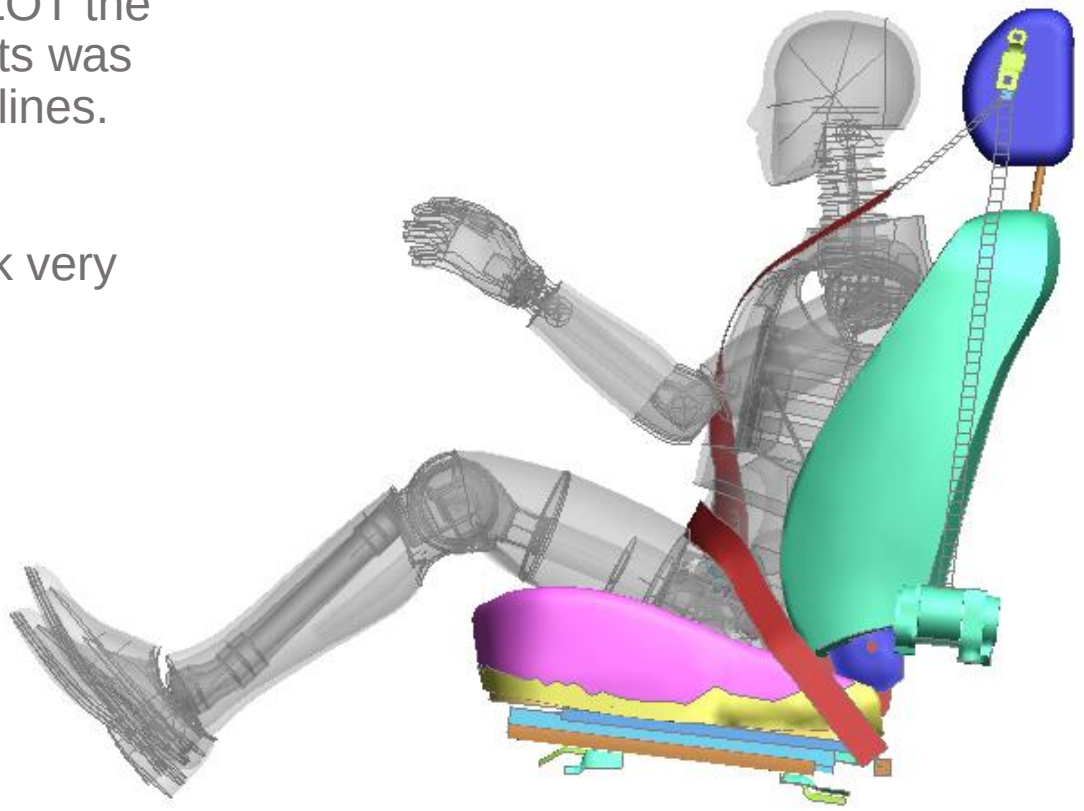
d3plot*background_bottom_colour

Transparency

Overlay Transparency

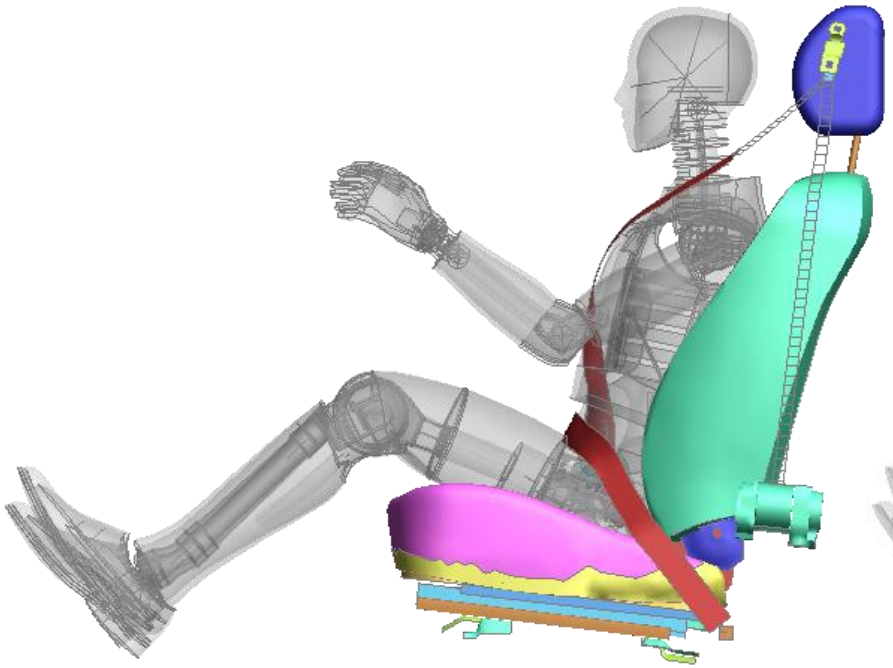
In previous versions of D3PLOT the overlay on transparent objects was always drawn using opaque lines.

This could make the plot look very cluttered and confusing.

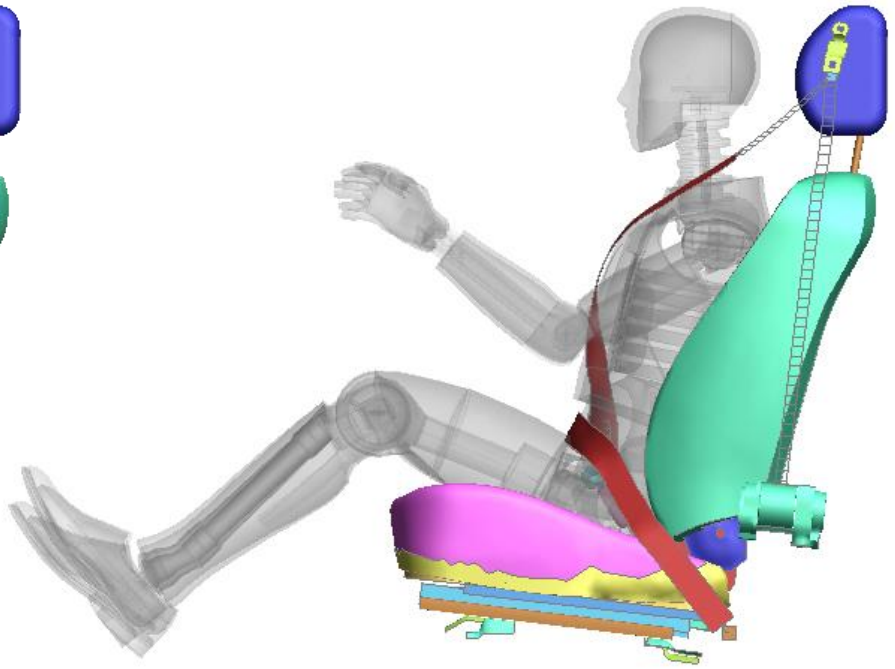


Overlay Transparency

By default in version 15 the overlay on transparent parts is also drawn with transparency.



Version 14

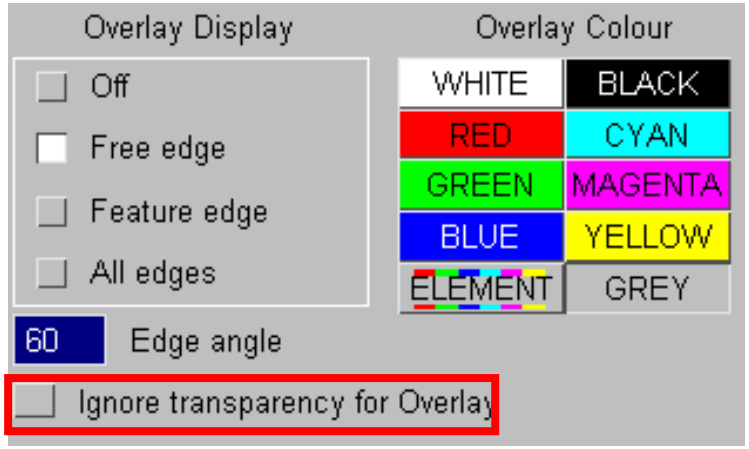


Version 15

Overlay Transparency

By default in version 15 the overlay on transparent parts is also drawn with transparency.

The previous behaviour can be selected via a new option in the Display Options menu.



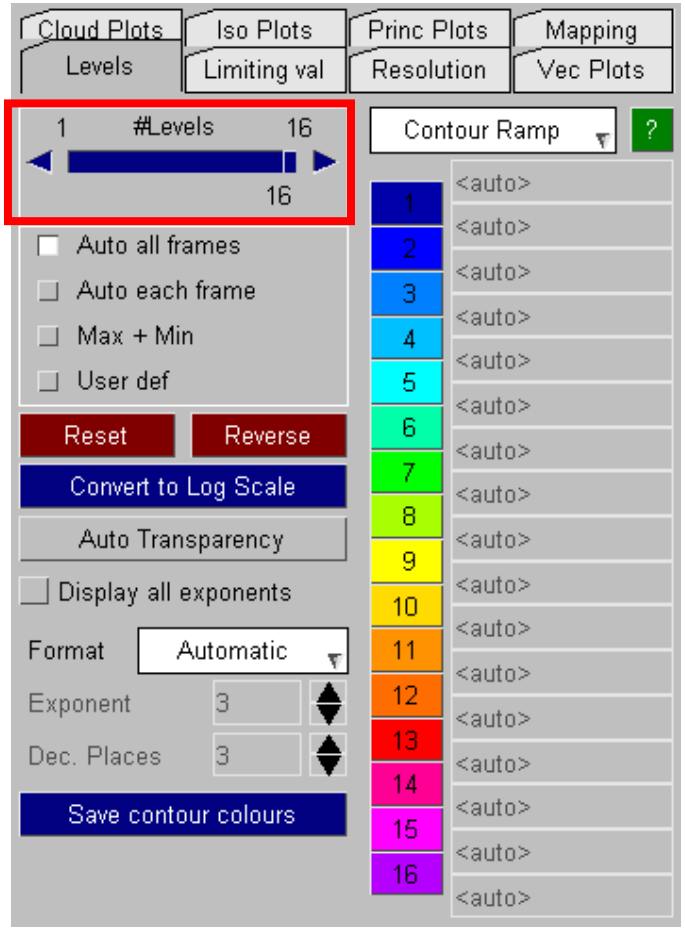
The default behaviour can also be set using a new preference option.

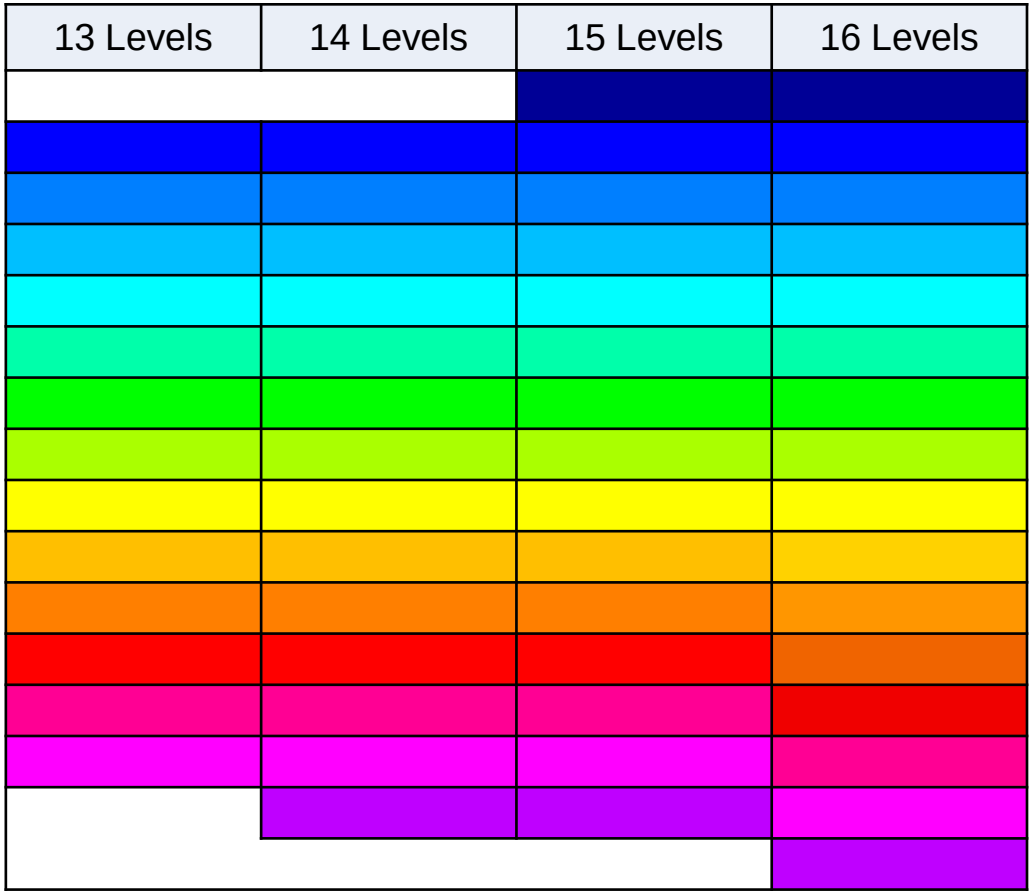
d3plot*overlay_transparency

Contouring

Contouring – Contour Levels

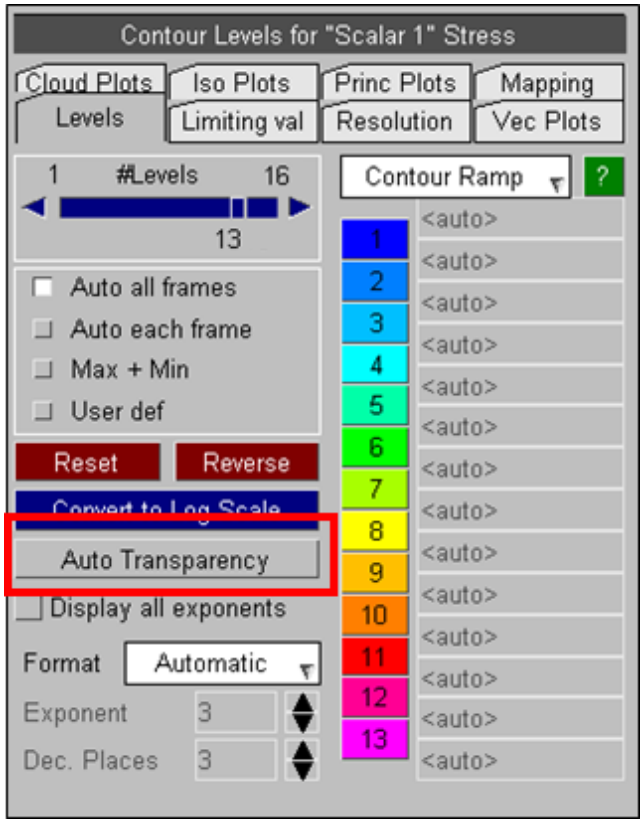
In Version 15 the maximum number of contour levels has been increased from 13 to 16.

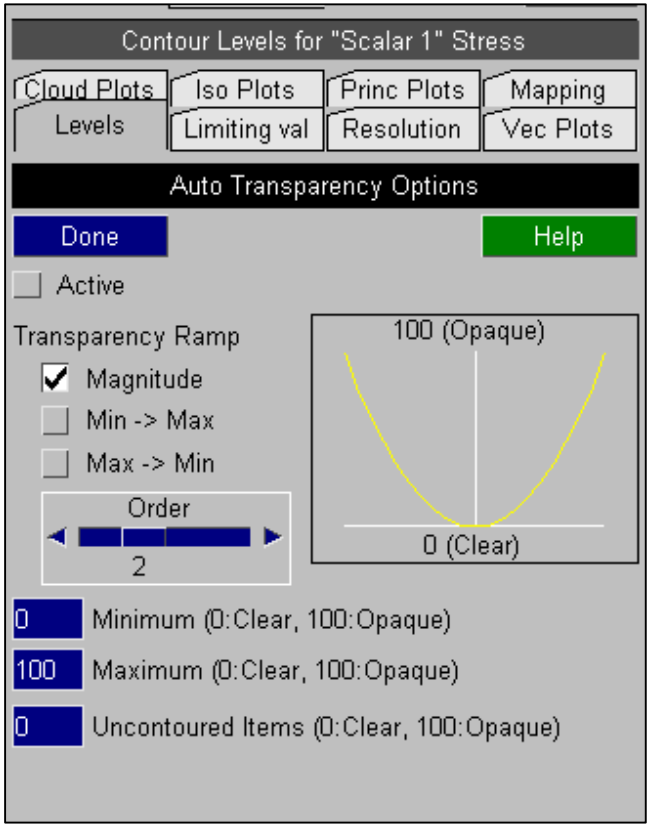




Contouring – Automatic Transparency

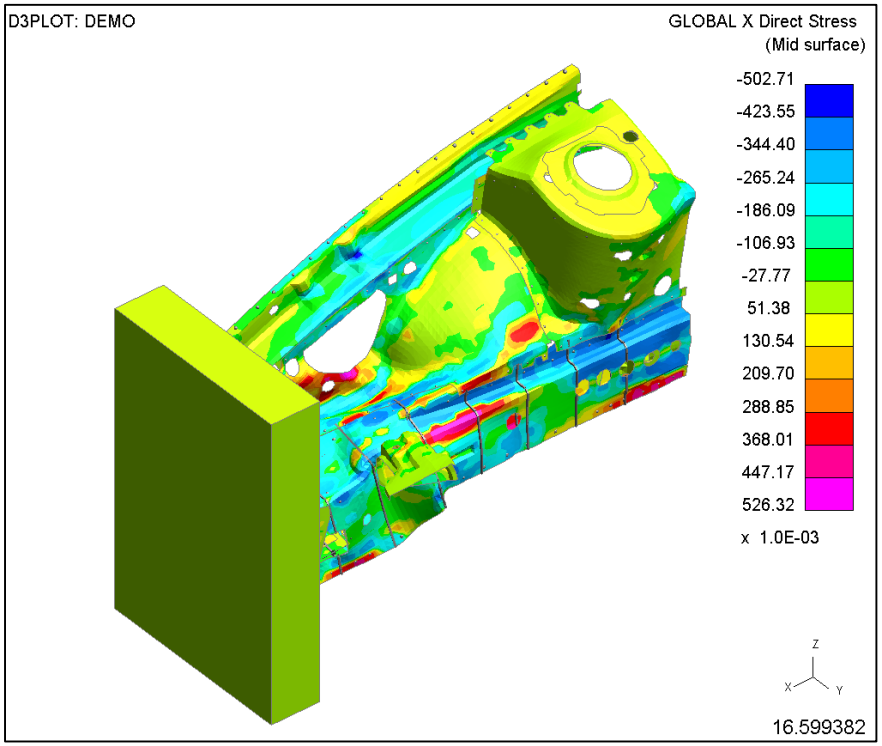
The “Levels” sub-menu within the Data Component menu contains a new “Automatic transparency” option.



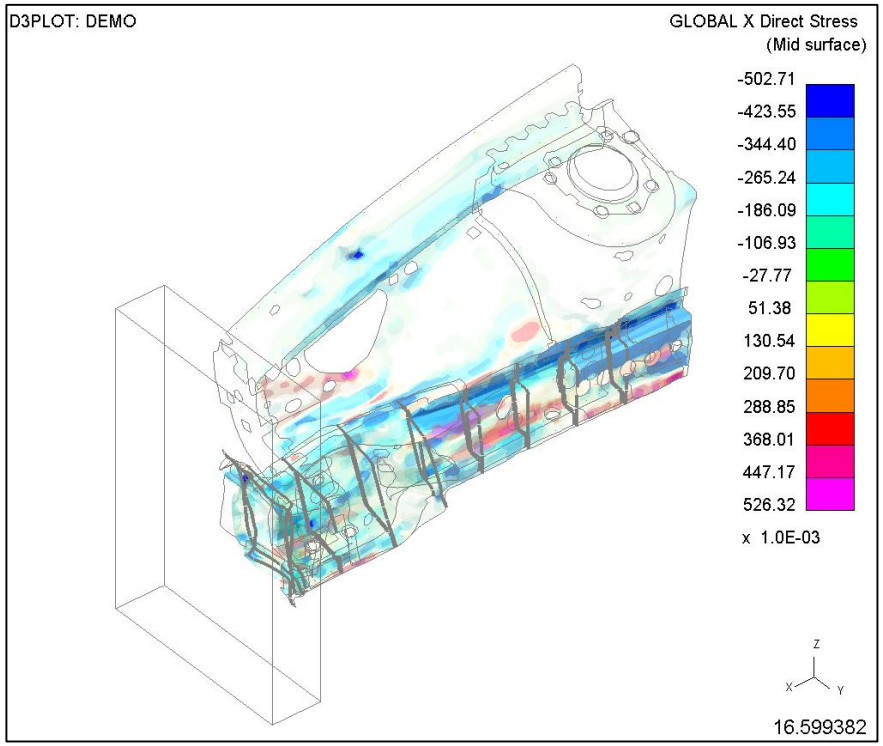


Contouring – Automatic Transparency

This option can be used to automatically adjust the transparency of entities in CT, SI and CL plots based on their data values.



SI plot



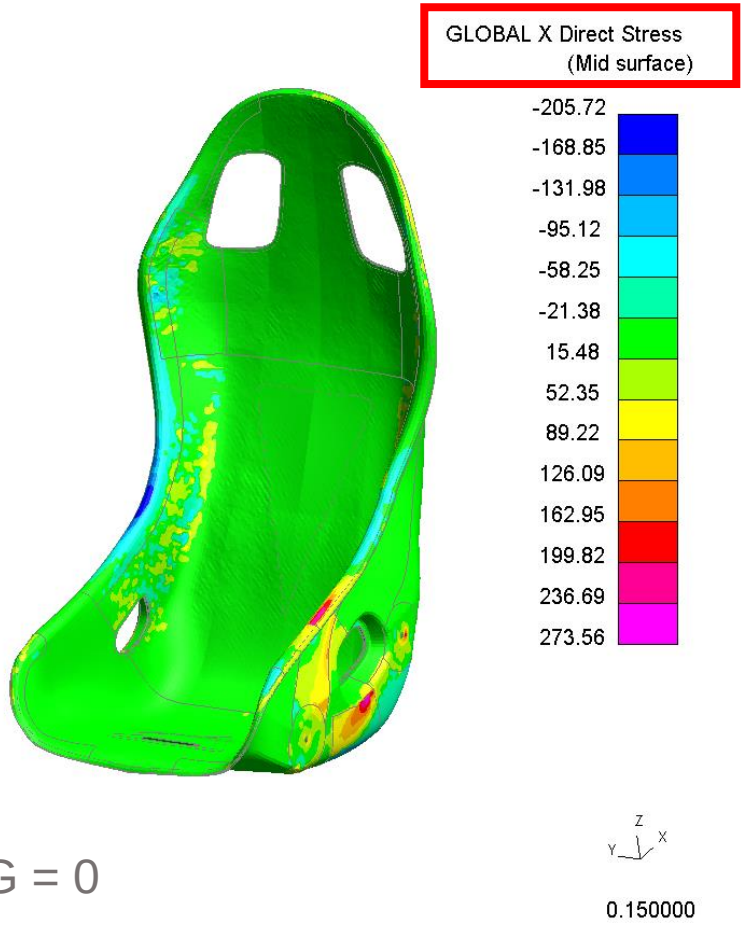
SI plot + default Automatic transparency

DEMO

Support for Plotting Results In Material Axes Coordinate Systems

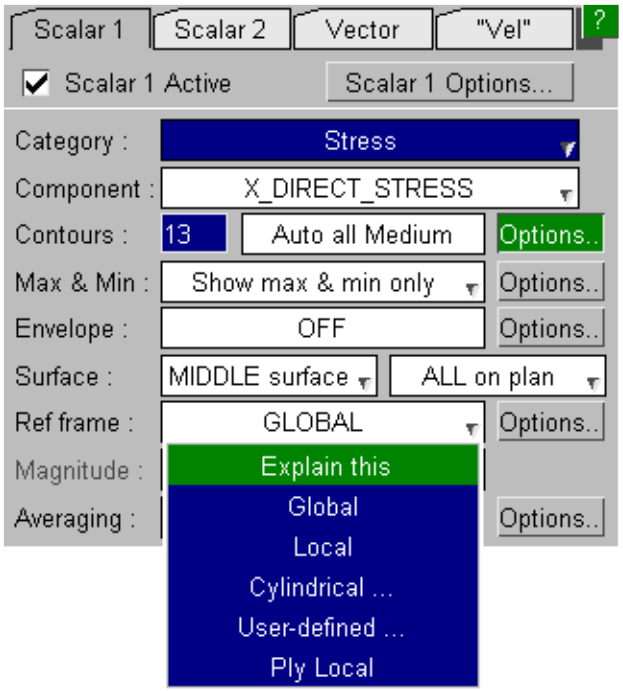
Material Axes

In LS-DYNA the default output option writes stresses and strains into the PTF (d3plot) binary files using the global coordinate system.



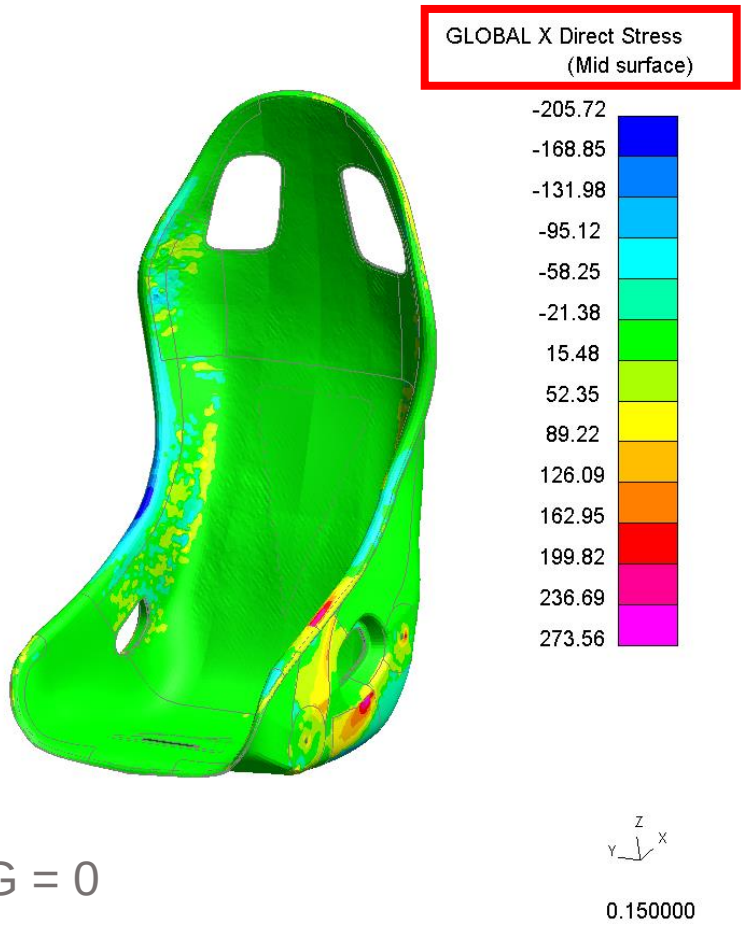
CMPFLG = 0

D3PLOT can then transform these results from the global coordinate system into one of the other systems that it supports.

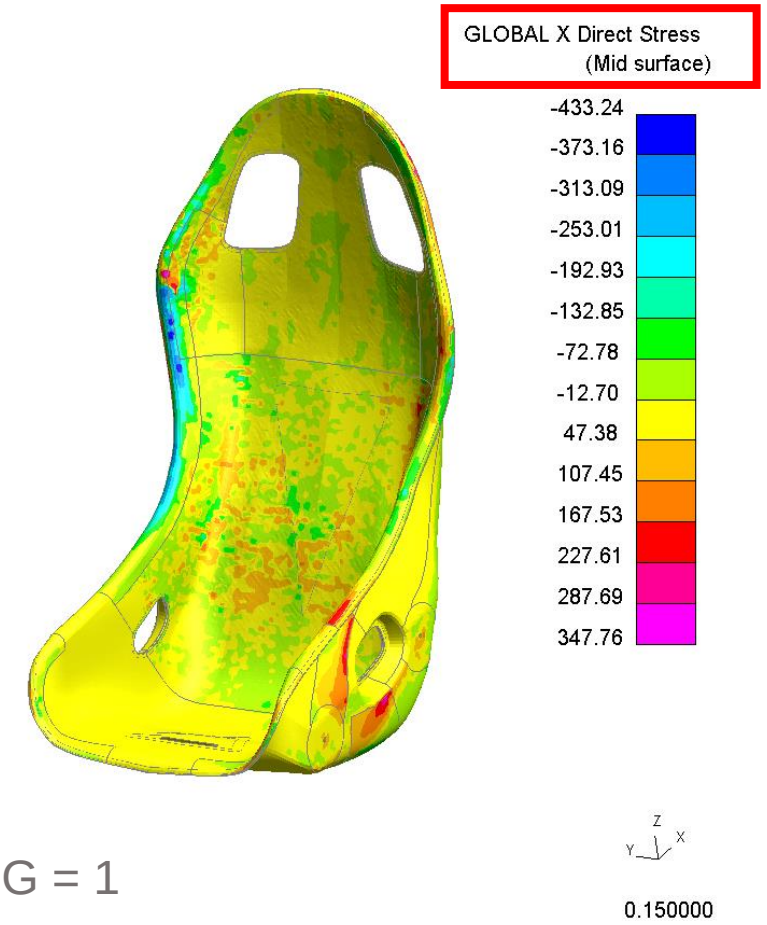


Material Axes

The default output can be changed on *DATABASE_EXTENT_BINARY by setting CMPFLG=1.



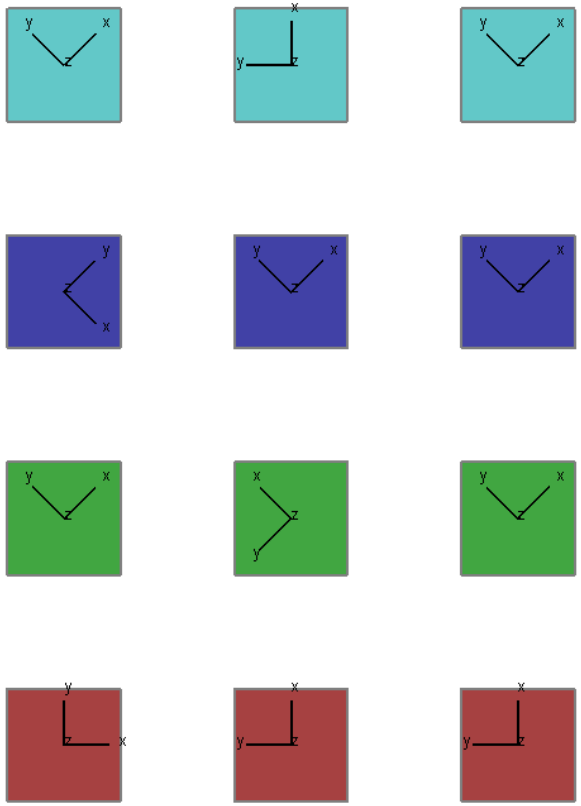
CMPFLG = 0

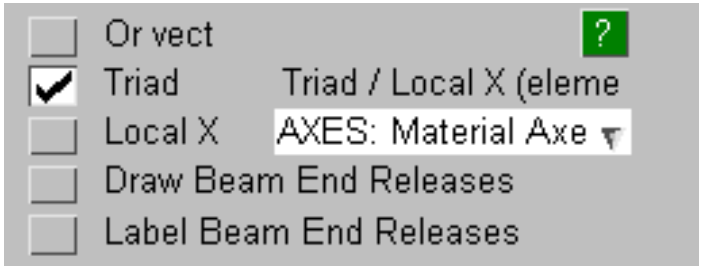


CMPFLG = 1

Material Axes

PRIMER 15 supports the complex rules for calculating the material coordinate system and can sketch them via the entities panel.



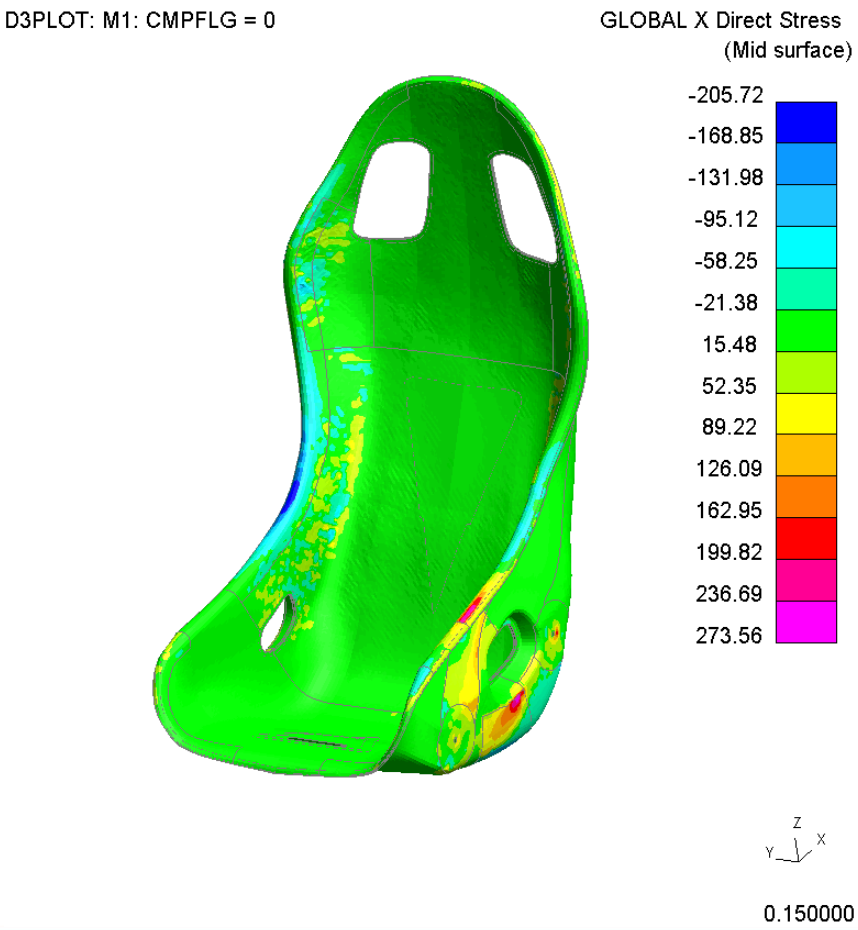


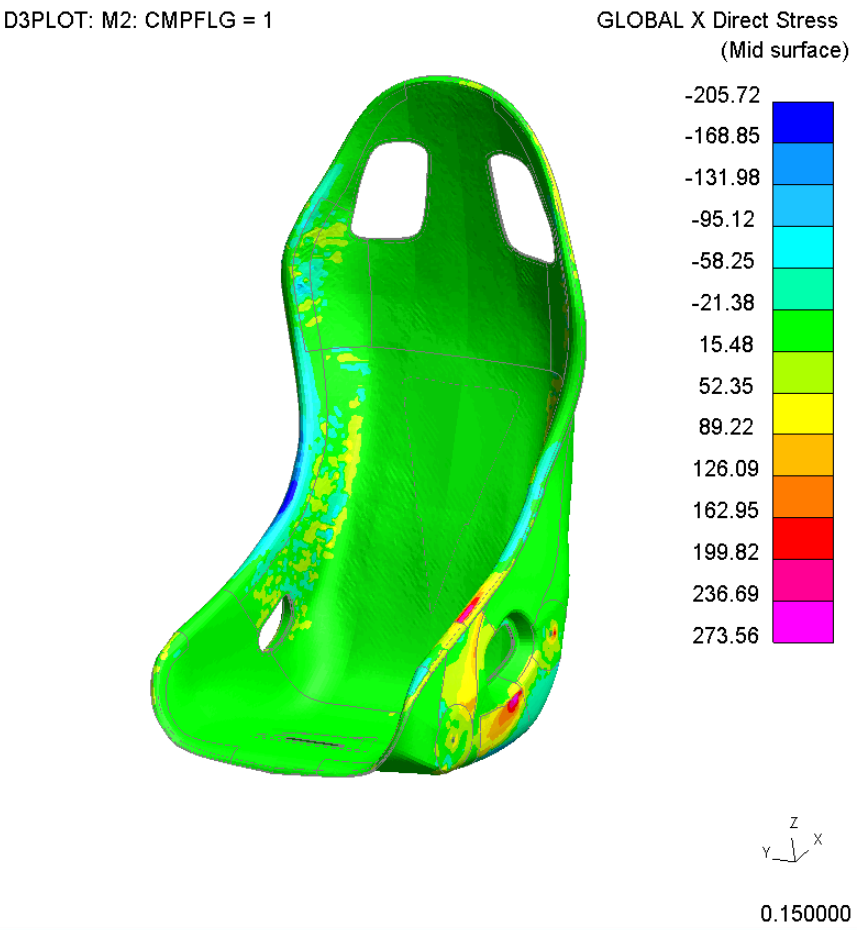
PRIMER v15 writes to the ZTF file information necessary for D3PLOT to correctly interpret material axes:

- CMPFLG value
- Material axis systems
- Material for each element and integration point

Material Axes

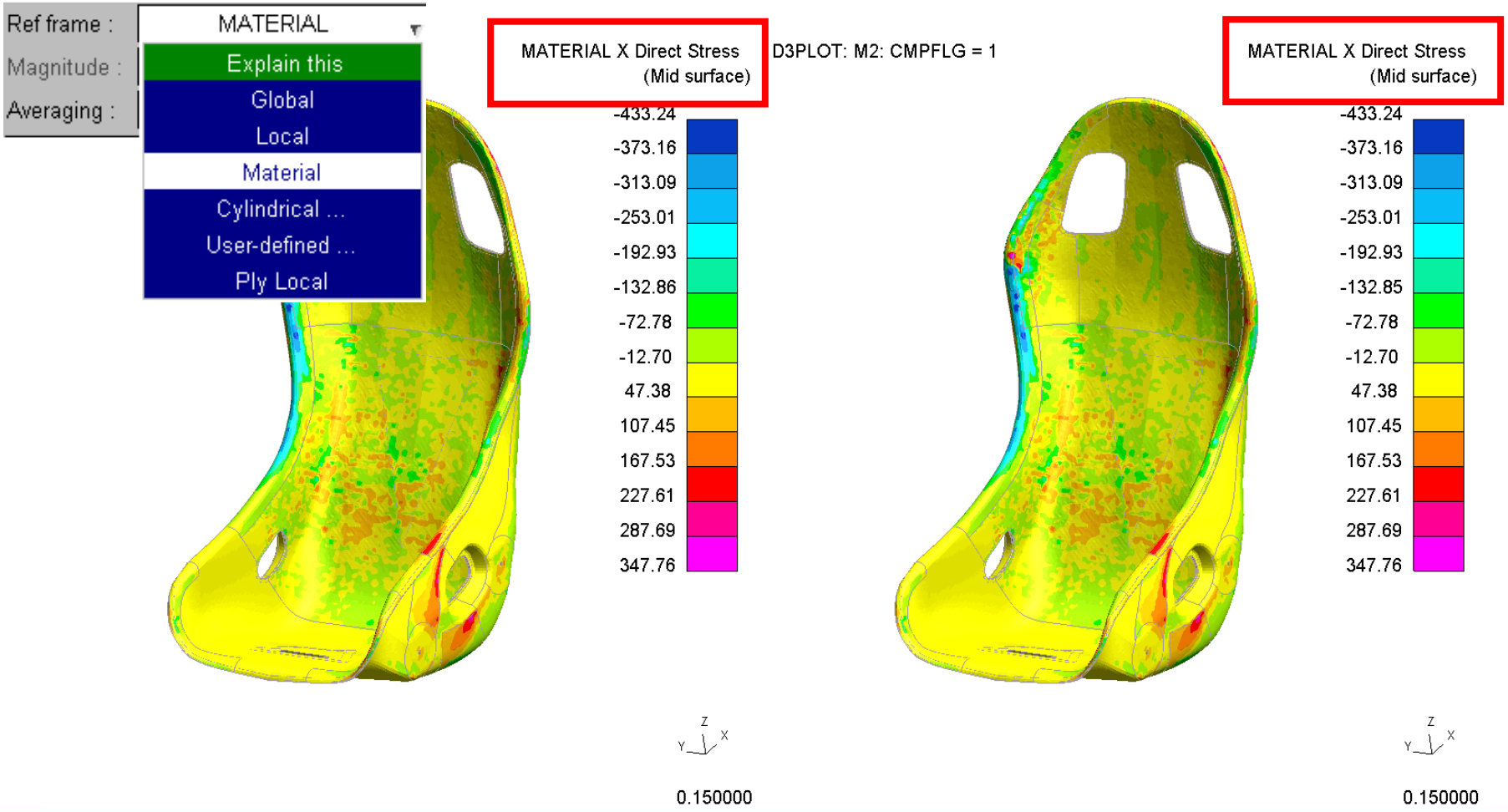
With a V15 ZTF file D3PLOT can correctly identify CMPFLG and will automatically transform the stress and strain values to the global coordinate system.





Material Axes

When D3PLOT detects a model with orthotropic material properties a new option to plot results using the material axes coordinate system is available.

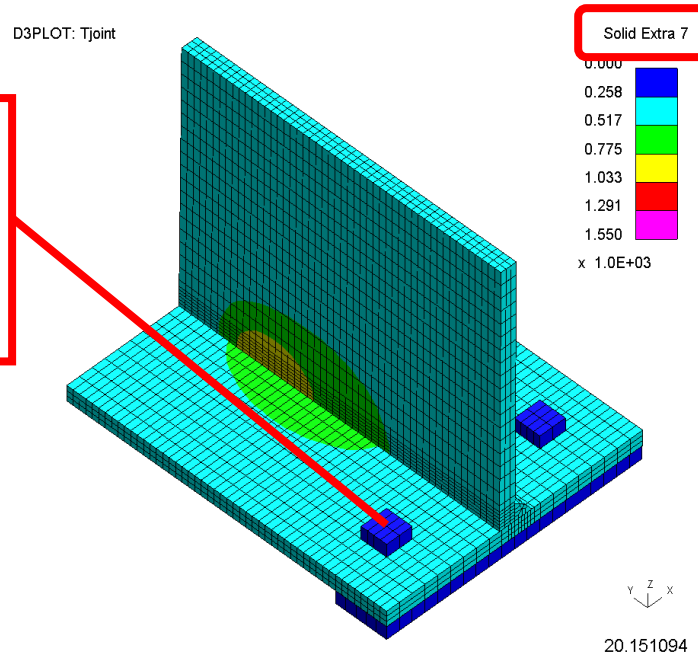


Material Extra Data

Material Extra Data

Extra variables written to PTF file for some materials by setting NEIPH or NEIPS on *DATABASE_EXTENT_BINARY. D3PLOT supports these with some limitations.

Elements of material (rigid) that does not output extra variable are contoured with 0.0



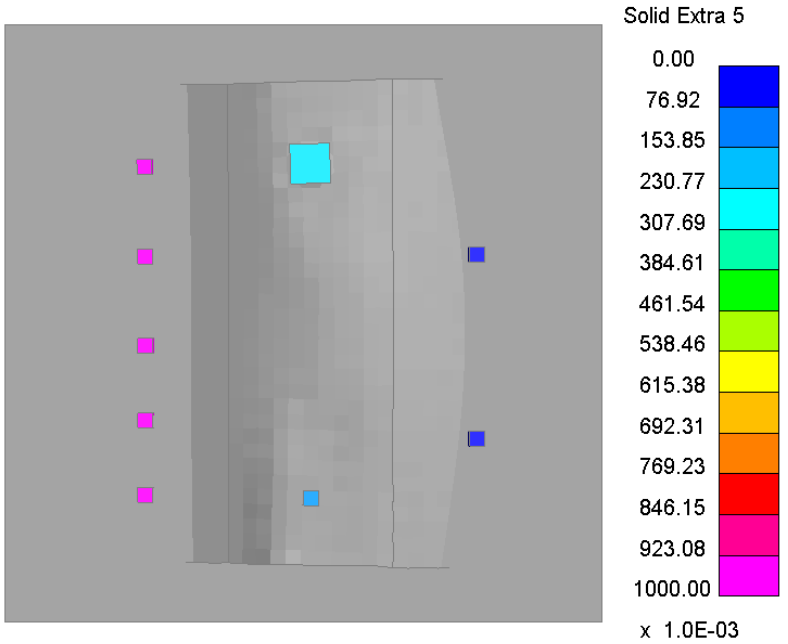
Component name is generic (Solid Extra 7)

Material Extra Data

Extra variables written to PTF file for some materials by setting NEIPH or NEIPS on *DATABASE_EXTENT_BINARY. D3PLOT supports these with some limitations.

Different variables on same plot can be confusing. For example plot on right shows Solid Extra 5 for 3 different materials:

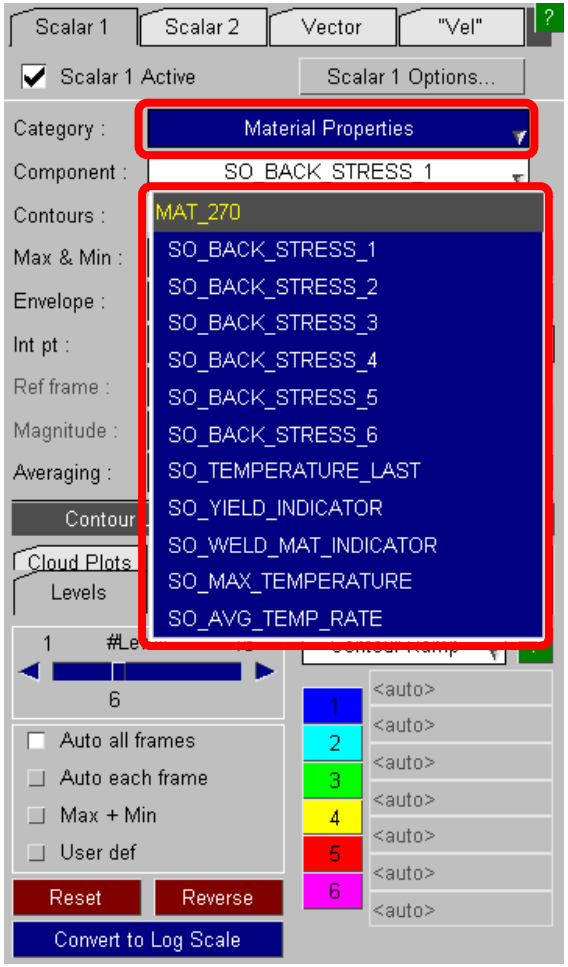
- Current Yield Stress for MAT_024 (cyan)
- Deformation Gradient for MAT_002 (pink)
- Back Stress for MAT_003 (blue)



Material Extra Data

Support for extra variables enhanced in D3PLOT v15.

1. New “Material Properties” category with descriptive component names for extra variables, organised by material and element type if applicable



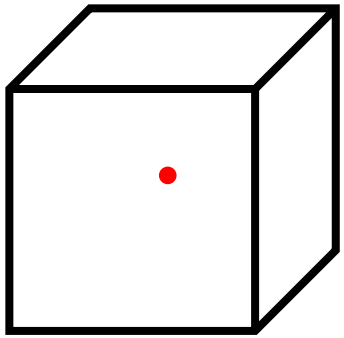
DEMO

Multi-Integration Point Solid Elements

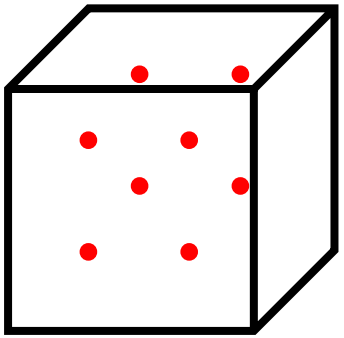
Multi-Integration Point Solids

When NINTSLD on the *DATABASE_EXTENT_BINARY card is set to 8, values for individual integration points are written for multi-integration point solid elements.

NINTSLD = 1



NINTSLD = 8

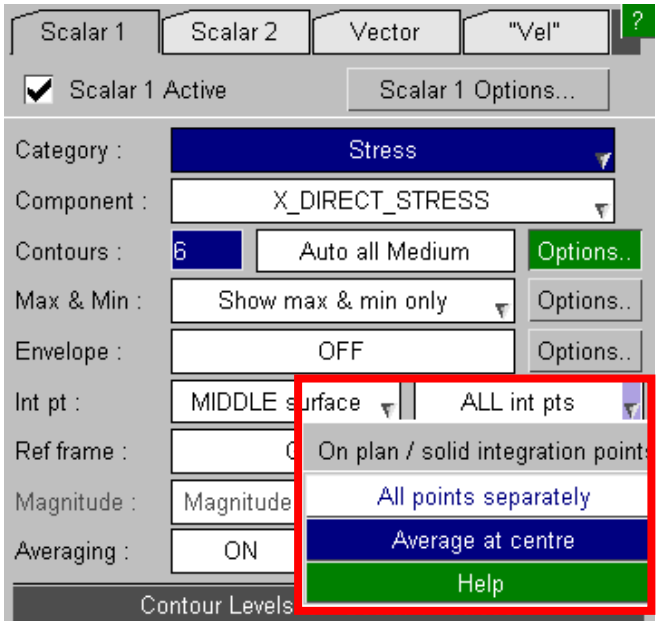


Previous versions of D3PLOT averaged multi-integration point solid element data to a single point, so it was not possible to plot each one at the same time to see the variation of data over an element.

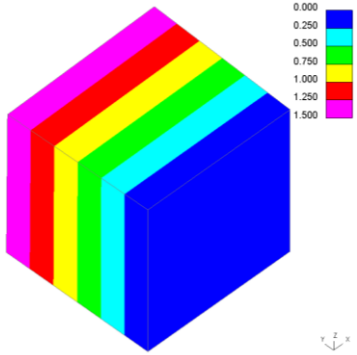
In V15 D3PLOT this is now possible if a ZTF file has been written from PRIMER.

Multi-Integration Point Solids - Plotting

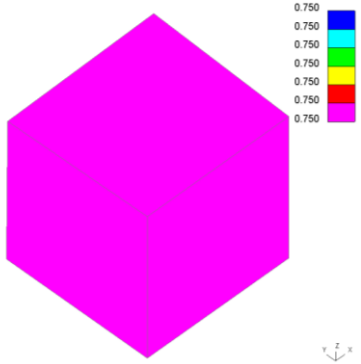
How the integration point data is plotted is controlled via the existing popup on the DATA menu, which previously only controlled on plan integration points for thin shells



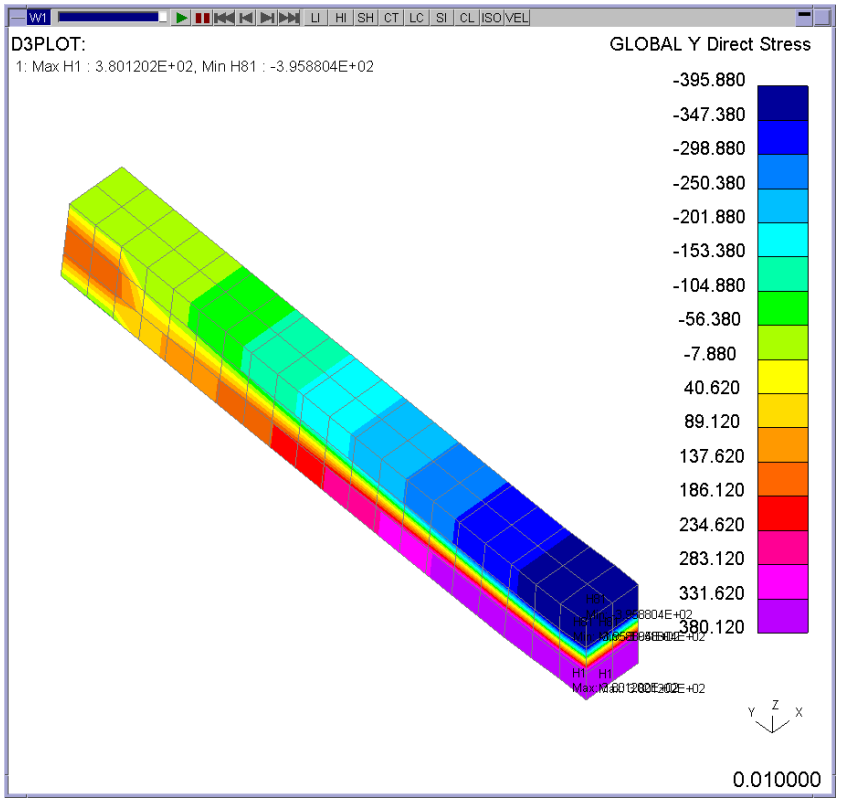
'**Plot all points separately**' (*default*) to see the data variation over the element:

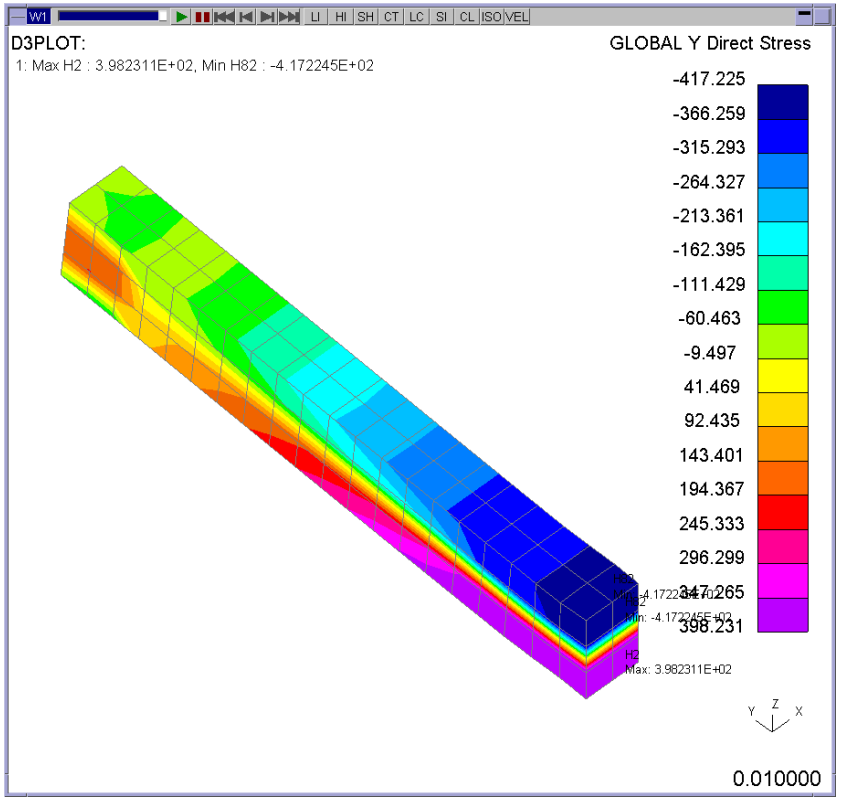


'**Average at centre**' to average the data to a single point on the element:



Multi-Integration Point Solids - Plotting

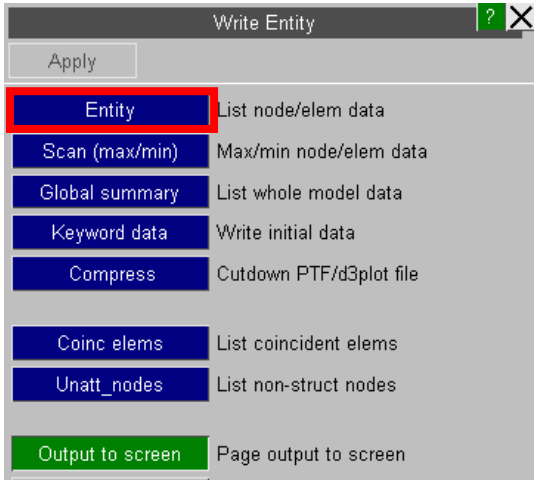


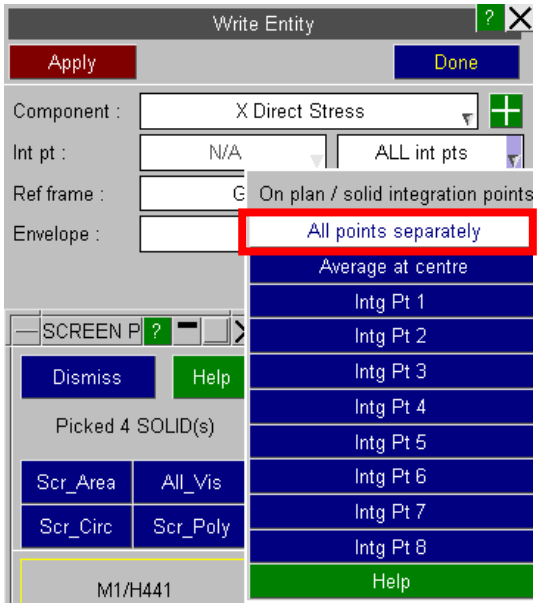


Averaged : min = -396

All : min = -417

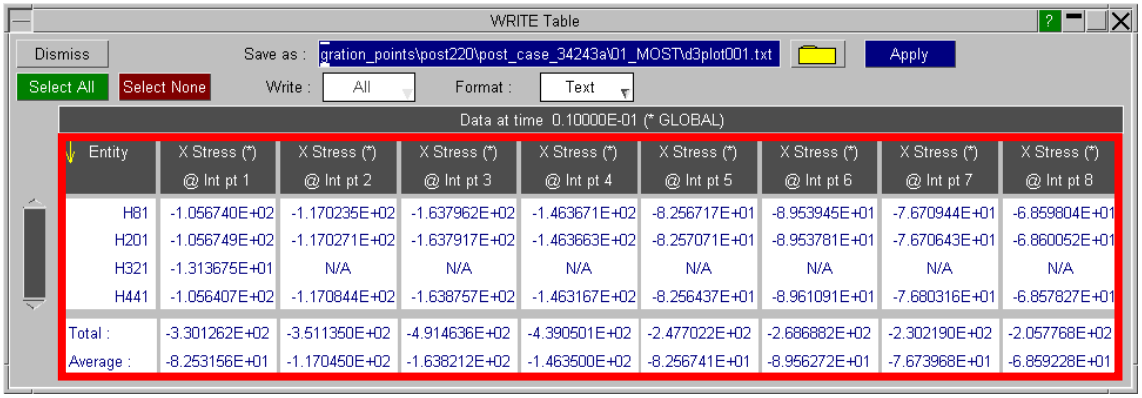
Multi-Integration Point Solids - Write Menu





In the Write -> Entity menu the integration point data values can be output by selecting:

- All points separately (multiple values are output, one for each valid point). ‘N/A’ is written if the point does not have any valid data.
- Average at centre (single value).
- Individual integration point (single value).

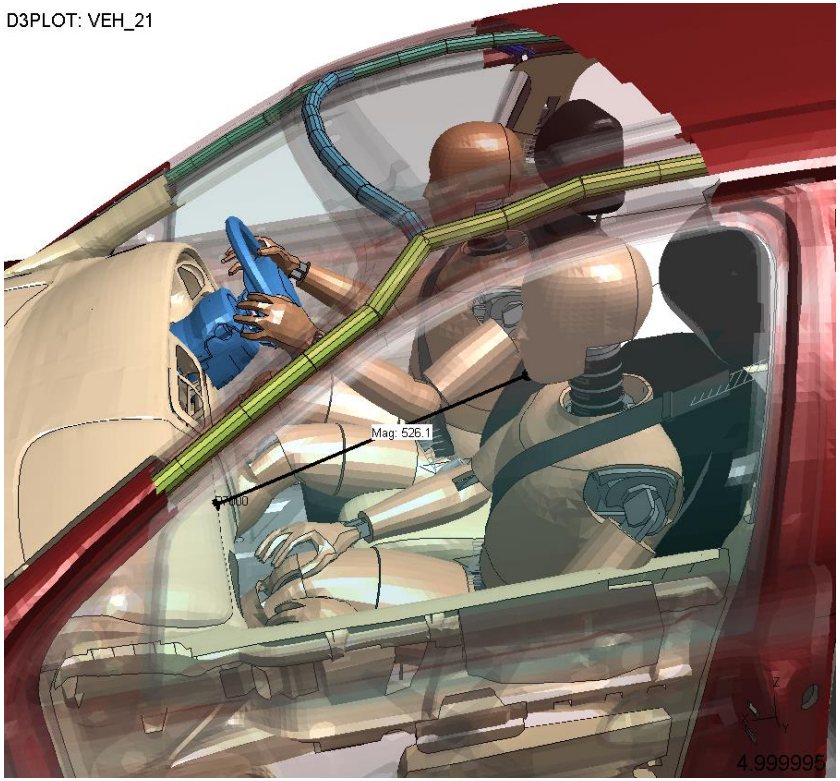


Entity	X Stress (*) @ Int pt 1	X Stress (*) @ Int pt 2	X Stress (*) @ Int pt 3	X Stress (*) @ Int pt 4	X Stress (*) @ Int pt 5	X Stress (*) @ Int pt 6	X Stress (*) @ Int pt 7	X Stress (*) @ Int pt 8
H81	-1.056740E+02	-1.170235E+02	-1.637962E+02	-1.463671E+02	-8.256717E+01	-8.953945E+01	-7.670944E+01	-6.859804E+01
H201	-1.056749E+02	-1.170271E+02	-1.637917E+02	-1.463663E+02	-8.257071E+01	-8.953781E+01	-7.670643E+01	-6.860052E+01
H321	-1.313675E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
H441	-1.056407E+02	-1.170844E+02	-1.638757E+02	-1.463167E+02	-8.256437E+01	-8.961091E+01	-7.680316E+01	-6.857827E+01
Total :	-3.301262E+02	-3.511350E+02	-4.914636E+02	-4.390501E+02	-2.477022E+02	-2.686882E+02	-2.302190E+02	-2.057768E+02
Average :	-8.253156E+01	-1.170450E+02	-1.638212E+02	-1.463500E+02	-8.256741E+01	-8.956272E+01	-7.673968E+01	-6.859228E+01

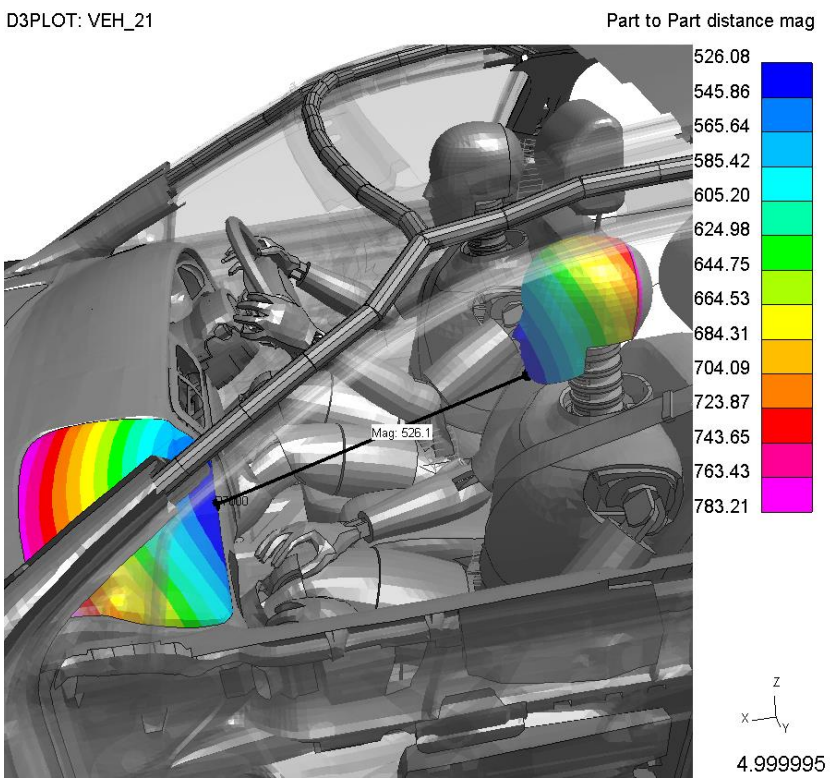
Part-to-Part Measure

Material Extra Data

D3PLOT v14 can measure part-to-part distance. In D3PLOT v15 this can now be contoured.



v14



v15

DEMO

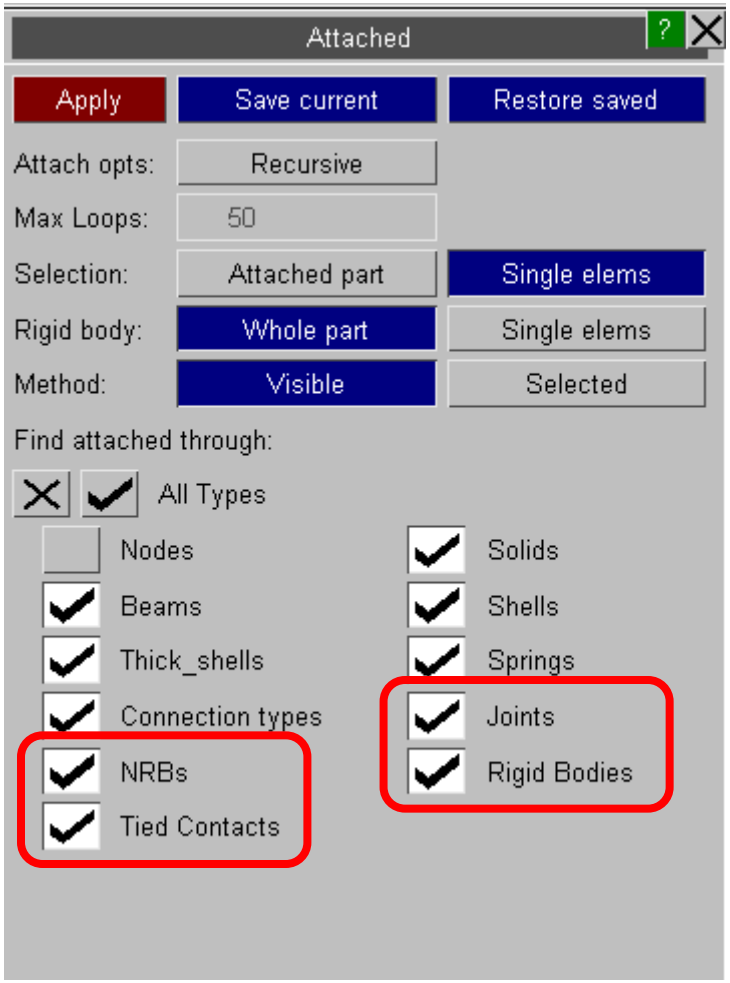
Attached

Attached – Types added

In Version 15 attached elements and parts can now be found through the following additional types:

- Nodal rigid bodies
- Constrained joints
- Constrained rigid bodies
- Tied contacts

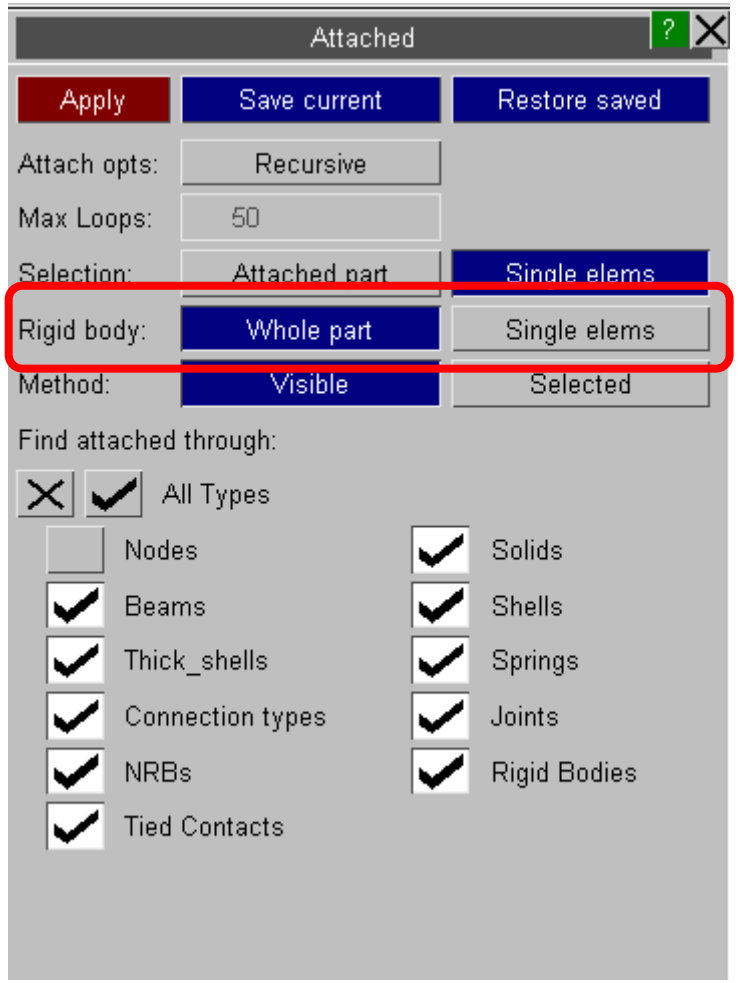
In order for these types to be available a ZTF file must be generated with PRIMER v15



Attached – Types added

When rigid parts are found the user can select to either find “Single elements” or “Whole part”. “Whole part” will find non-contiguous rigid parts. It is necessary to have a ZTF file for this option.

Shortcut key “j” has been set to default to Attached->Apply using whatever the current settings in the attached panel are, similar to PRIMER. This can be changed in the oa_pref file.



Support for *SET in D3PLOT

*SET_XXXX

Support for *SET_XXXX definitions of the following types has been added to D3PLOT Version 15:

- *SET_PART
- *SET_BEAM
- *SET_SHELL
- *SET_DISCRETE
- *SET_NODE
- *SET_SOLID
- *SET_TSHELL

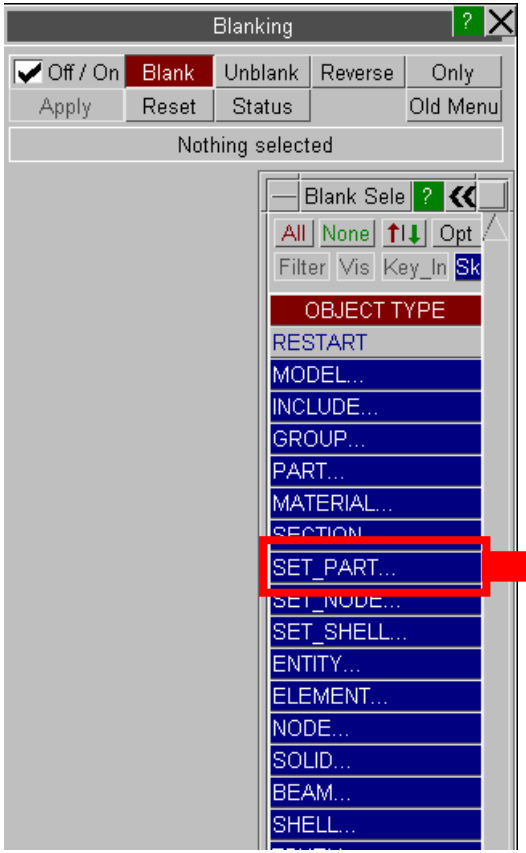
These set definitions can be used to select items in the following menus:

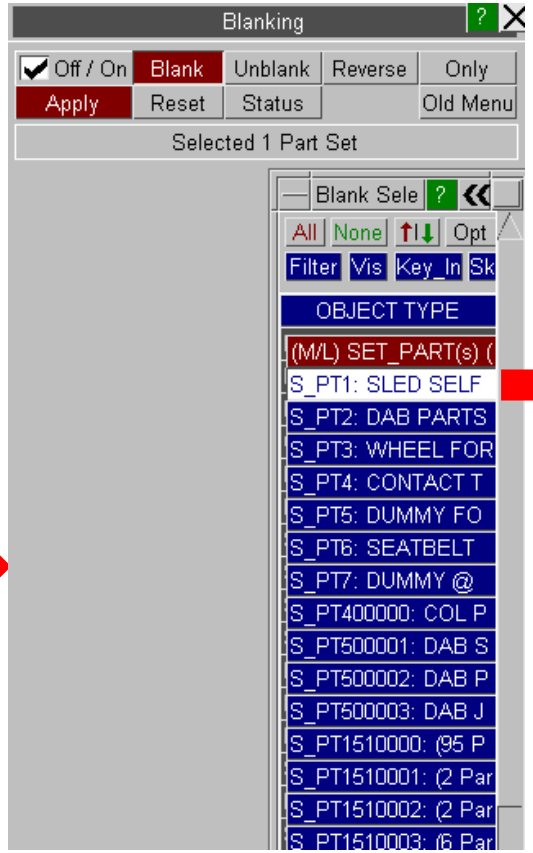
- Quick Pick
- Write
- Part Tree
- Blank
- XY Data

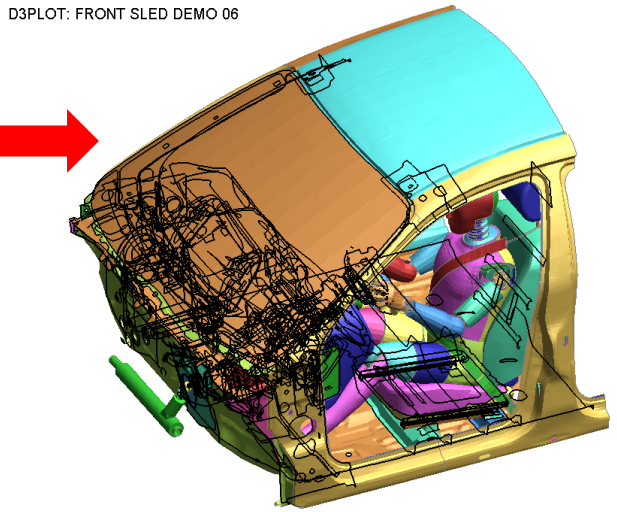
Set definitions are read from the ZTF, which must be generated in v15

*SET_xxxx – Blank / Write / XY-Data

In the new style object menus *SET definitions can be selected via the menu list or interactively by picking them on the screen.

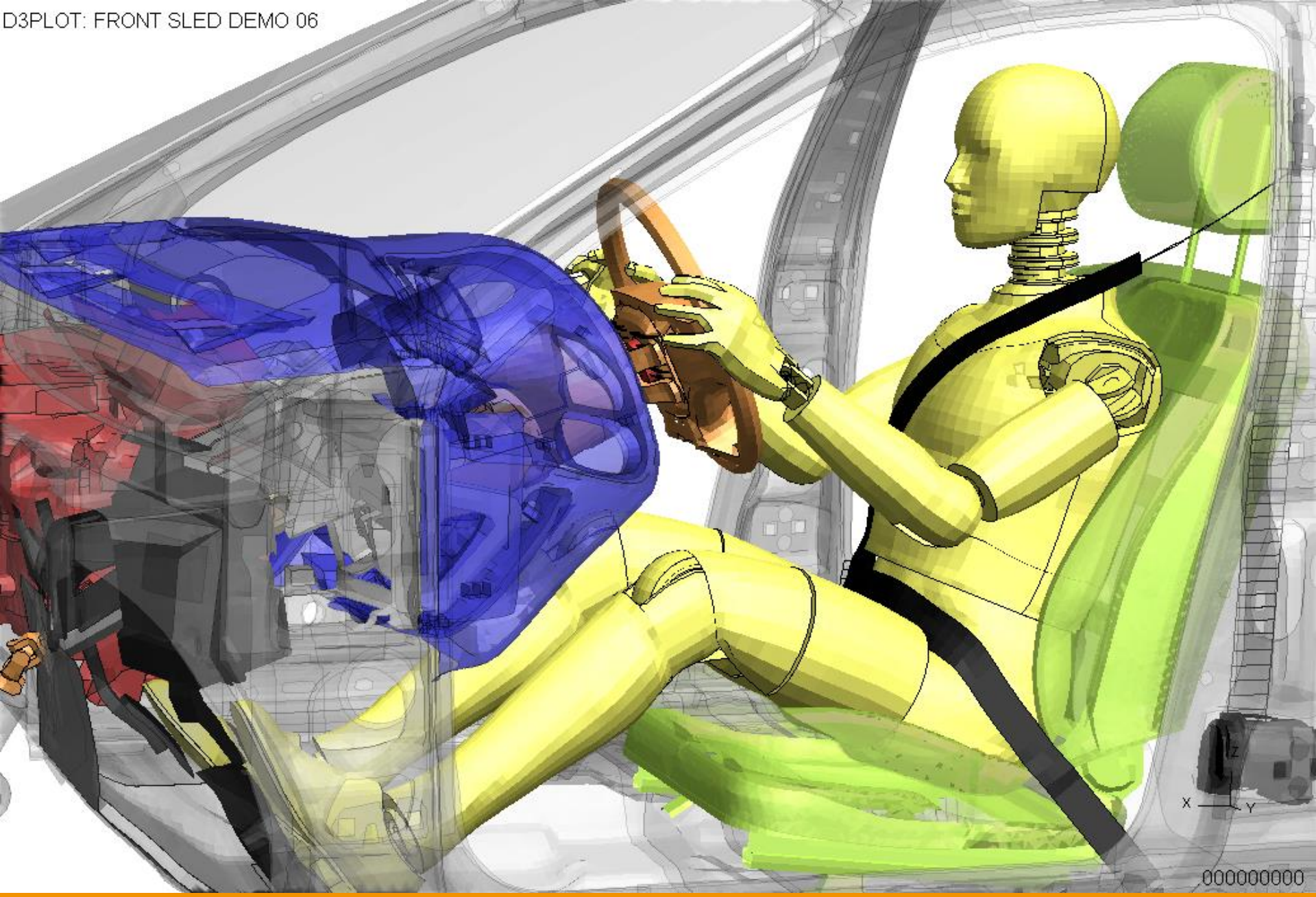


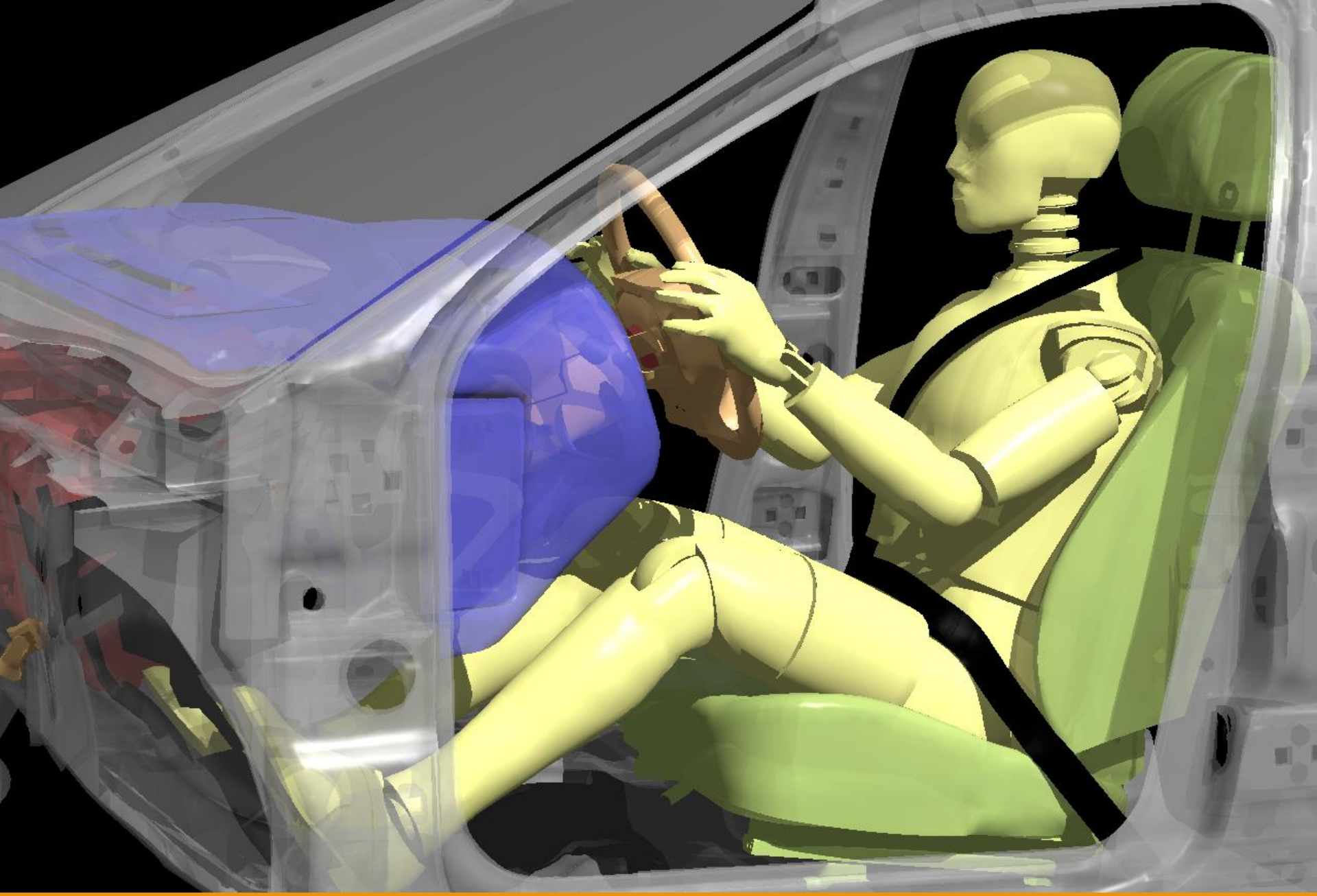




DEMO

Enhanced Rendering


Z
X
Y
000000000



T/HIS 15.0

Quick Find

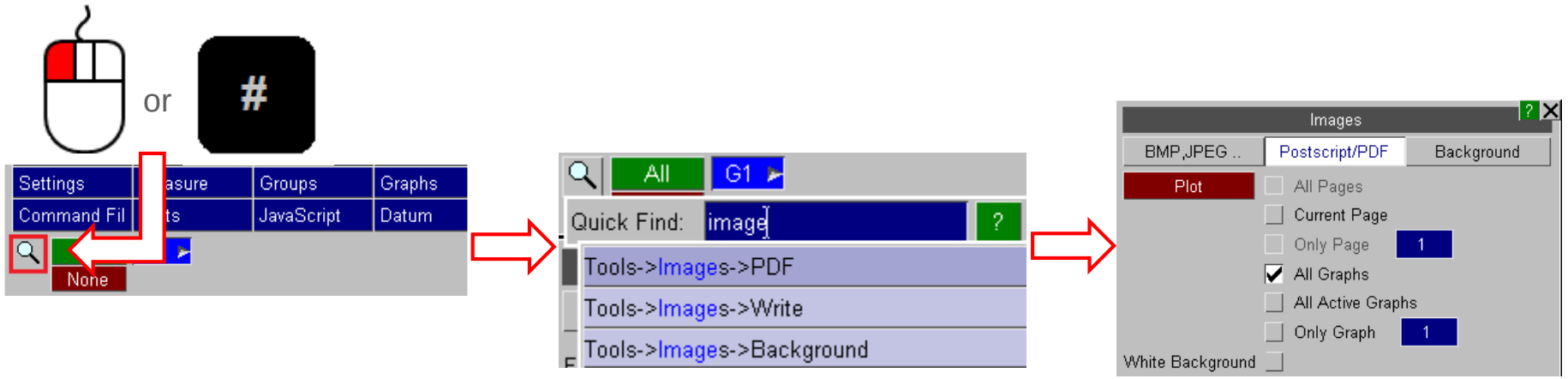
Quick Find

A ‘Quick Find’ feature has been added to allow users to search for and then quickly:

- Go to menus / functionality in T/HIS.
- Open tutorials

It can be accessed by clicking on the magnifying glass under the tools buttons or by pressing the ‘#’ key.

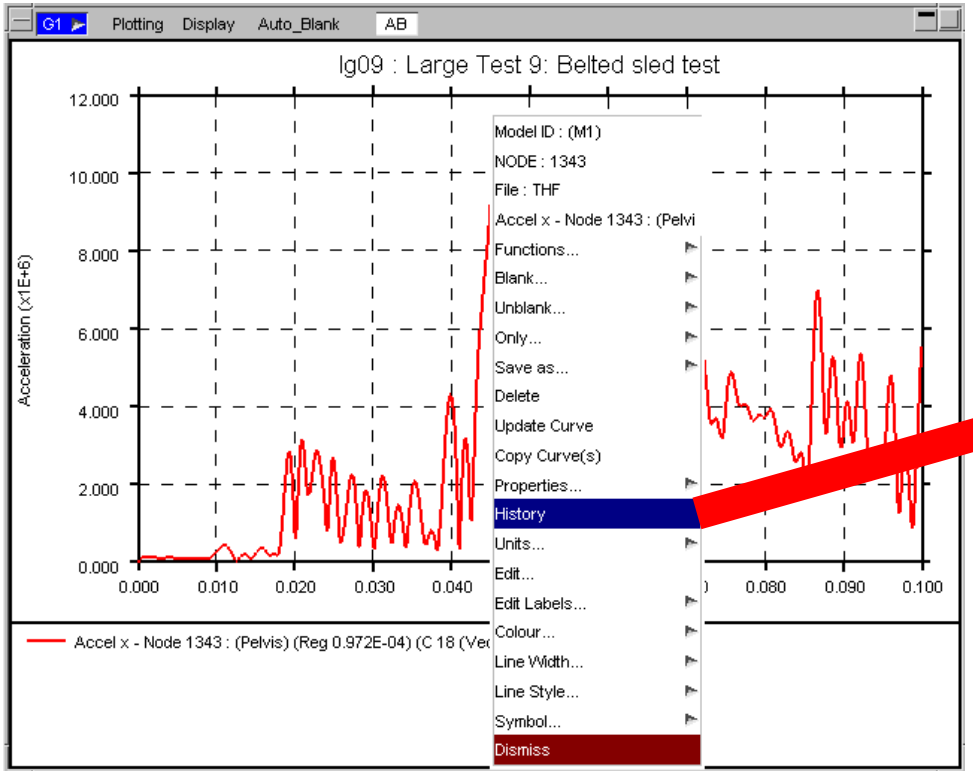
Typing in the textbox brings up a list of found items that match the entered text. Items in the list can be selected by clicking on them or by using the up and down arrow keys and pressing enter. The selected item will then perform the task, e.g. open a menu.

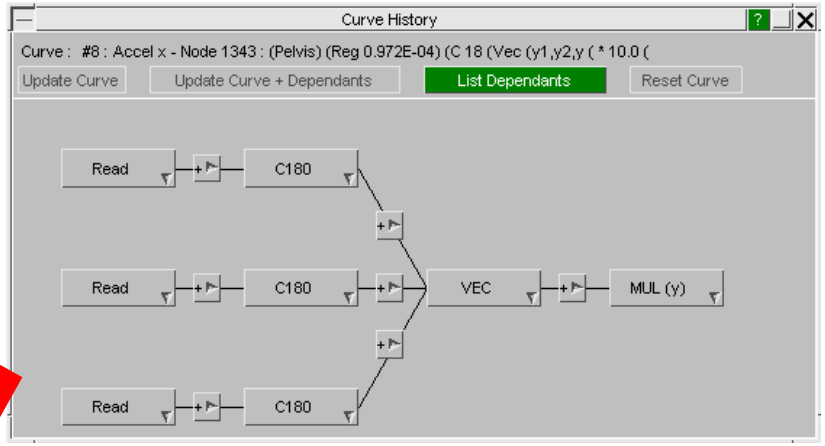


Curve History

Curve History

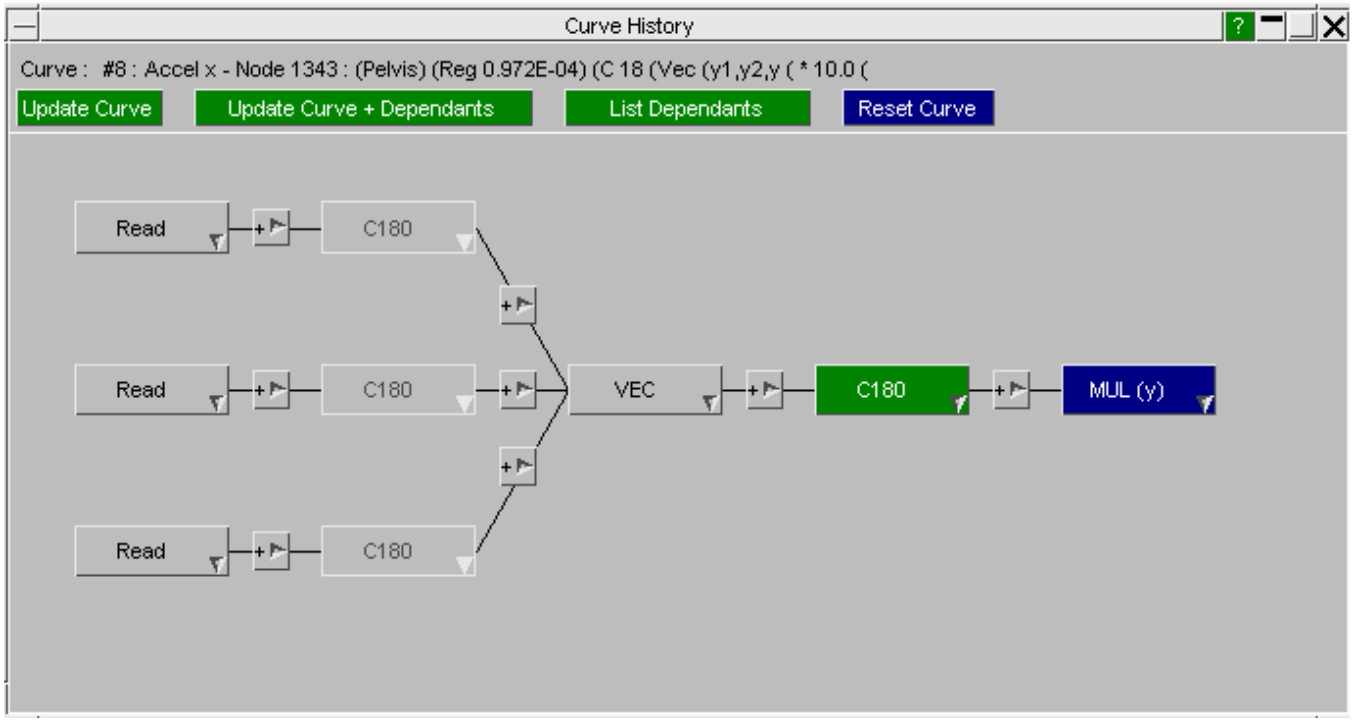
If a curve has been created in T/HIS by combining multiple curve operations then for some time it has been possible to view the curve history and modify it by right clicking on the curve and selecting “History”.





Curve History

From version 15 onwards the button colours within the curve history window are now colour coded.



Read Unmodified

C180 Deleted

C180 Inserted

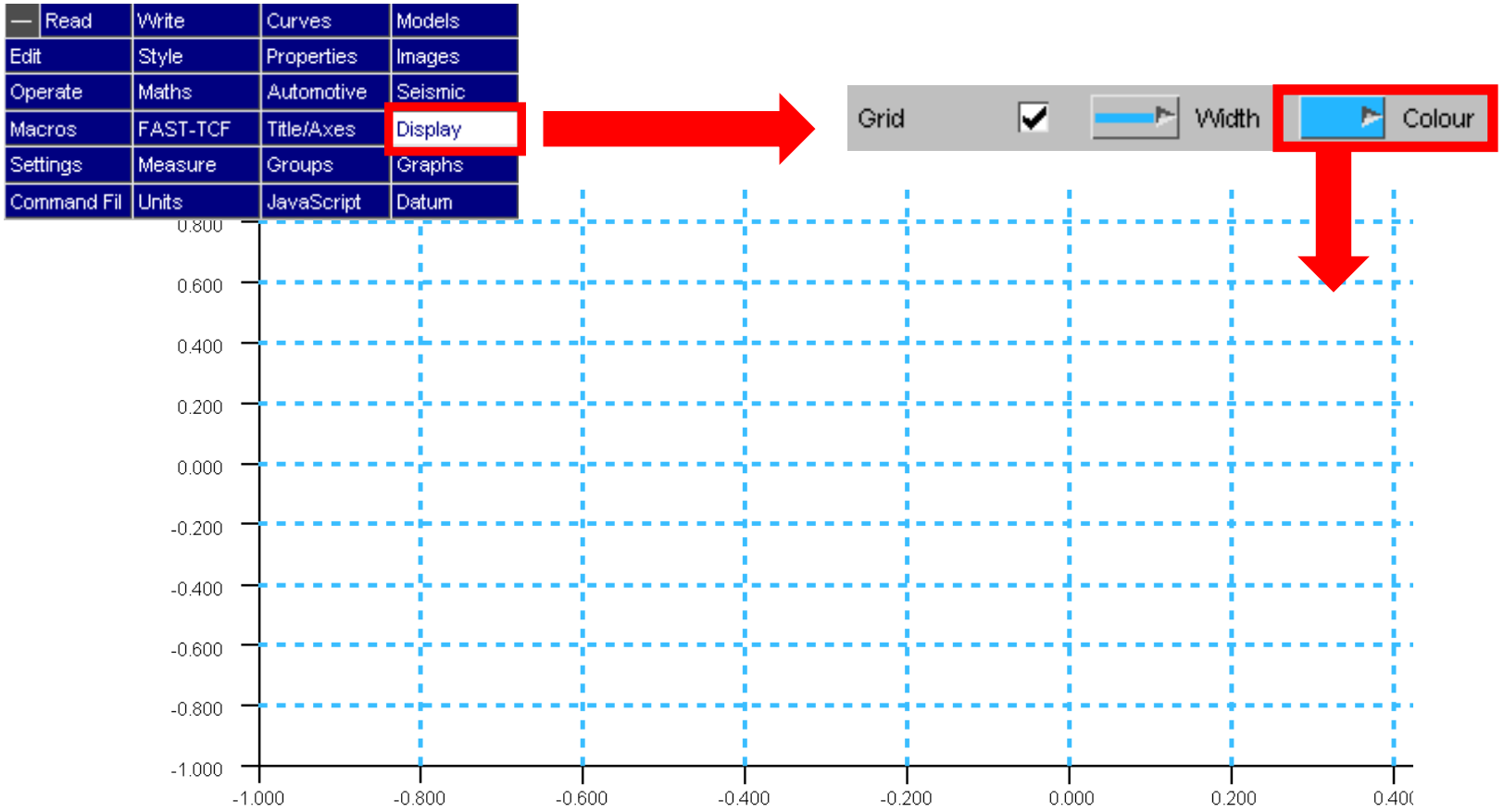
MUL (y) Modified

DEMO

Display Changes

Grid Colour

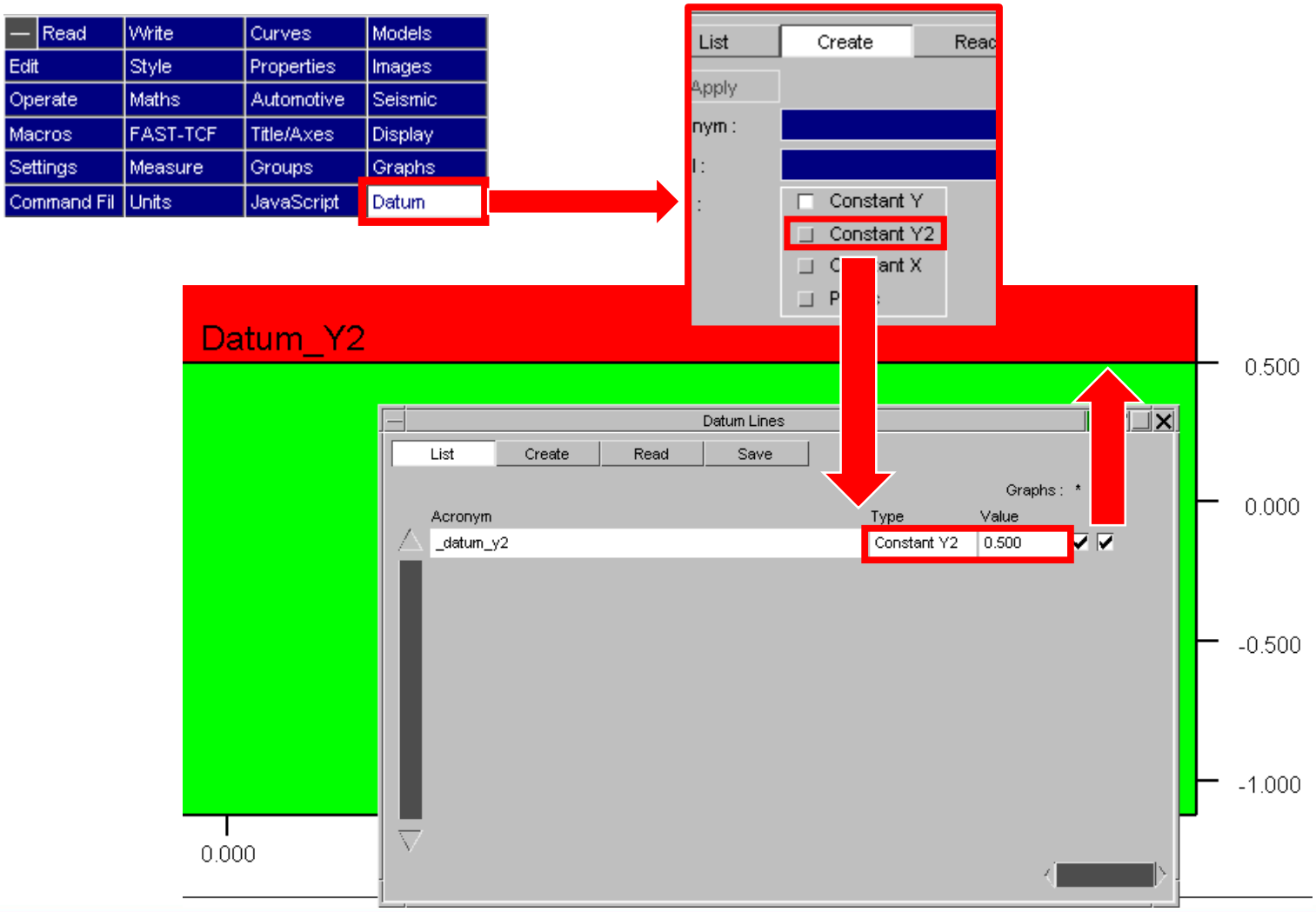
There's now the option to adjust the grid colour independently from the axis colour allowing for more visualisation options.



Datum Lines

Constant Y2 Datum Line option

There's now an additional option in the Datum Line menu for "Constant Y2"



Preference Saving

New Preferences

The following preferences have been added to T/HIS:

curve_property_number_format	Number format option for curves
curve_property_dec_places	Number of decimal places to display for curves
x[y,y2]_axis_type	Logarithmic or Linear Axis type
X[y]_grid_spacing_off	Offset for manual grid spacing (if chosen)
X[y]_grid_spacing_int	Interval of manual grid spacing (if chosen)
X[y]_grid_spacing_auto	Toggle for manual/automatic grid spacing
y2_align_zero	Align Y2 with Y=0
legend_display_lines	Toggle for Display User Lines
legend_layout	Layout of the legend
legend_columns	Number of columns for the legend
legend_background_colour	Background Colour of the legend
legend_background_trans	Transparency value for the legend

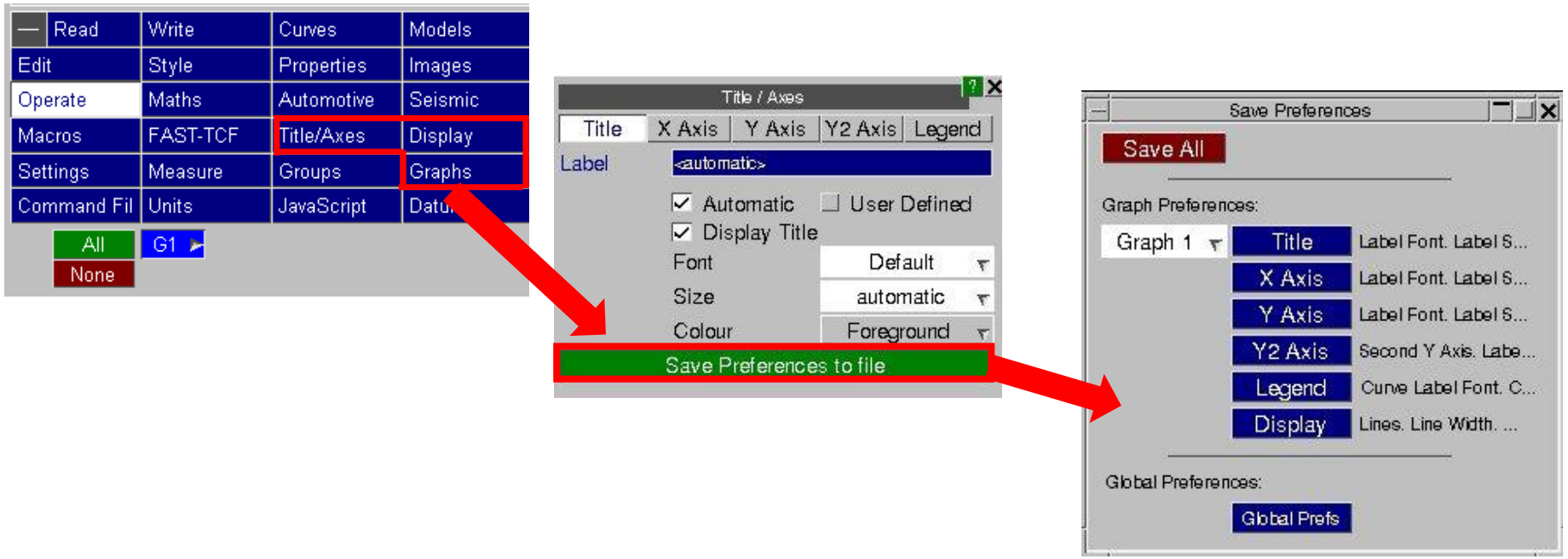
New Preferences contd.

fix_styles	Toggle for fixing display styles
bg_img_on	Toggle for turning a background image on
bg_img_path	Setting the path of a valid background image (if chosen)
bg_img_scale	Scaling option for background image
bg_img_pos	Tiled/Single image positioning for the background image
bg_img_just	Background image justification
symbols_on	Toggle for symbols
symbol_freq	Symbol frequency (if chosen)
lines_on	Toggle for lines
page_width	Page width (pixels)
page_height	Page height (pixels)
window_layout	Layout of the automatic page layout
x_layout	Number of graphs on columns (if X*Y Layout)
y_layout	Number of graphs on rows (if X*Y Layout)
grid_colour	Set the colour of the grid (if on)

Preference Saving

In version 14 saving preferences can be quite a laborious task as each preference has to be saved individually. New to version 15 is the Preference Saving popup added to the Title/Axes, Display and Graphs menus.

The feature will evaluate the preferences of the selected graph and it will print non-default preferences to your oa_pref file with just one click.



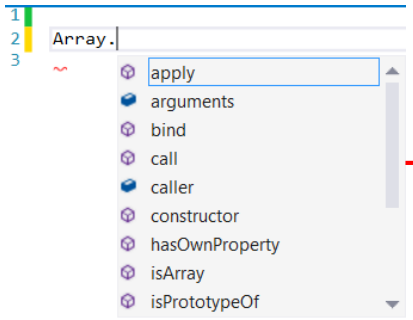
Scripting

JavaScript API – Visual Studio Intellisense

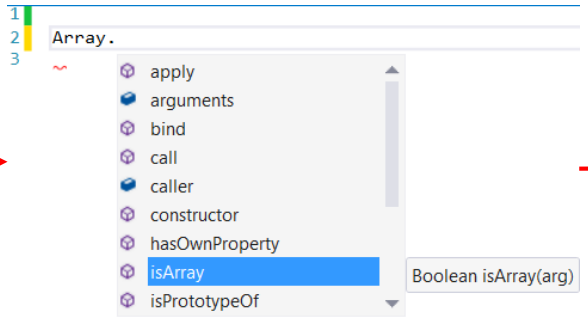
Writing JavaScripts can be time consuming when trying to remember which functions are available in which classes and the number and order of arguments in the functions. To find out, you would normally have to go searching for it in the manual and doing this over and over again is frustrating and time consuming.

One way to speed up writing scripts is to use software that provides information as you write your script. One such program is Visual Studio (produced by Microsoft) which uses something called 'Intellisense' to list objects, functions and parameters as you type, e.g.

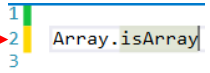
List of functions/properties



Select the function



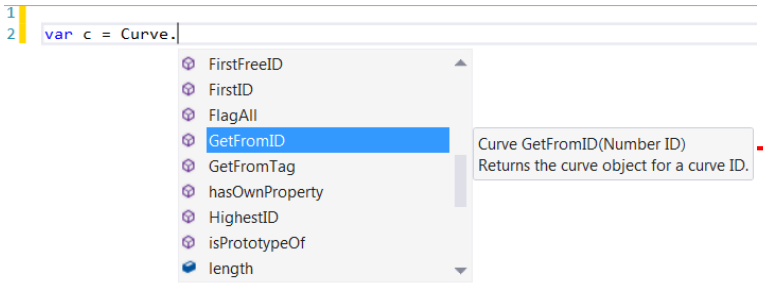
Press the 'Tab' key to select



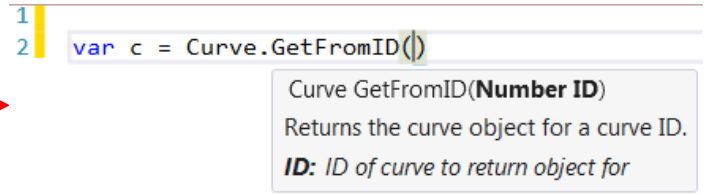
JavaScript API – Visual Studio Intellisense

In v14 a ***this.intellisense.js*** file located in the '***Oasys 14/Intellisense***' directory could be used to provide Intellisense for the T/HIS JS API, e.g.

Show static functions



Show a description of the function and parameters, list the parameters and show the return type



The latest version of Visual Studio can no longer use this file; it now uses a Typescript declaration file (*.d.ts) instead. In v15 this is provided as well as the old file, so either version of Visual Studio can be used.

Note that Visual Studio downloads are large (a few GBytes) and an alternative is to use ***Visual Studio Code***. This is a lightweight code editor with excellent support for JavaScript editing. We would recommend using this instead of Visual Studio. A word document in the ***Oasys 15/Intellisense*** directory gives instructions on how to download it and set things up to use the Intellisense file.

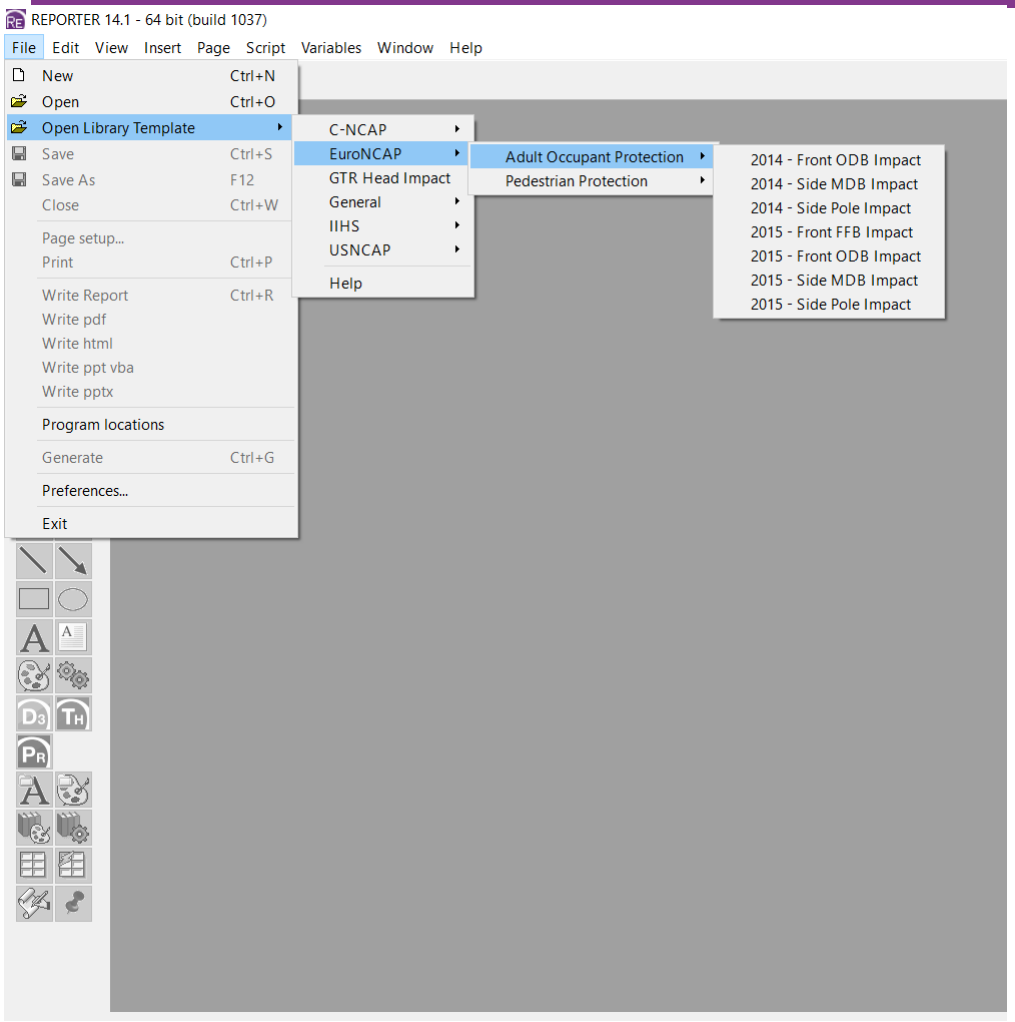
New JavaScript additions

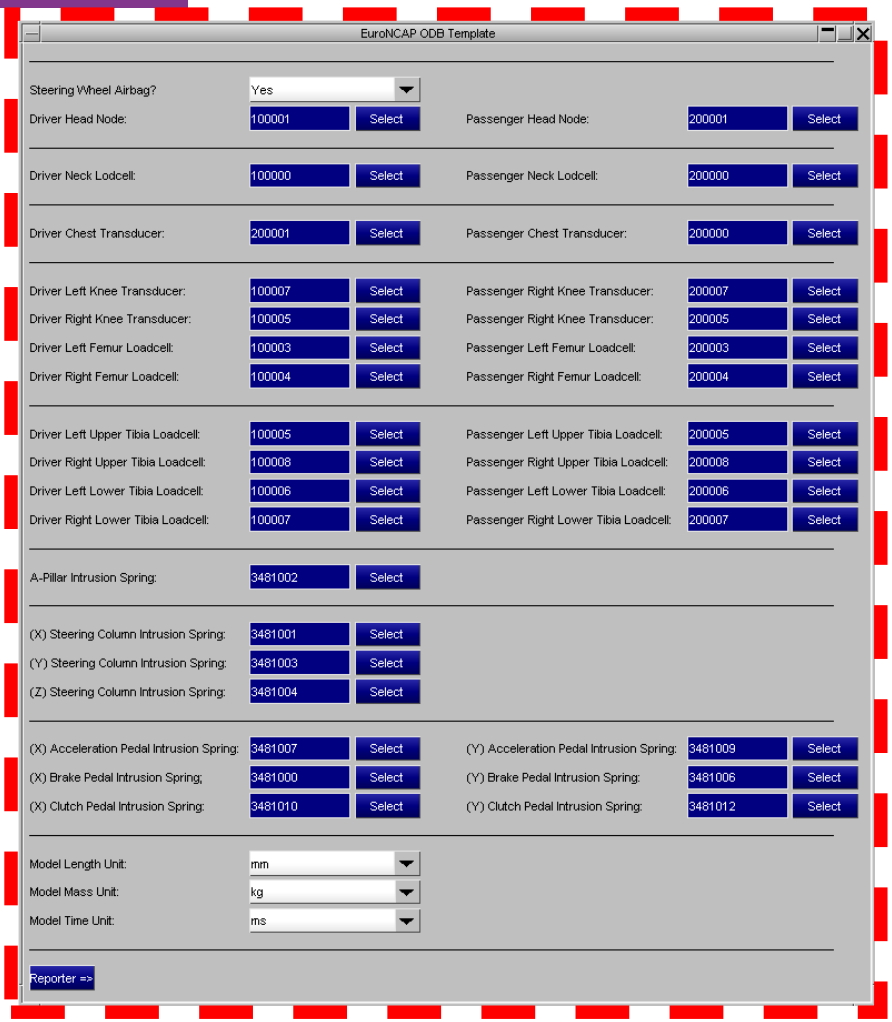
Function	Description
Curve.YatX ()	Finds Y value for specified X value.
Curve.Nor2()	Manual Normalise function (y)
Curve.Nox2()	Manual Normalise function (x)

REPORTER 15.0

Standard Templates

Standard Loadcase Templates





Standard Loadcase Templates

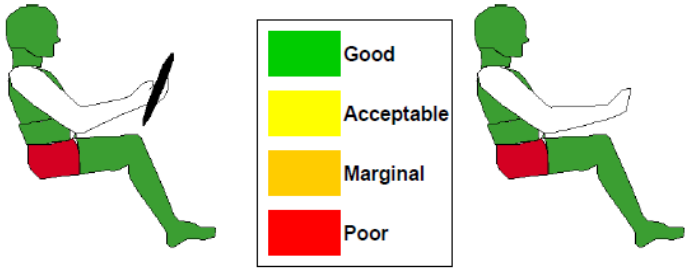
The following new templates will be issued with Reporter Version 15:

- EURO-NCAP Front FFB Impact 2017
- EURO-NCAP Front ODB Impact 2017
- EURO-NCAP Side MDB Impact 2017
- EURO-NCAP Side Pole Impact 2017
- EURO-NCAP Head Impact 2017
- EURO-NCAP Leg Impact 2017

- IIHS Front Impact (ODB) 2017 (Version XVIII)
- IIHS Front Impact (SOB) 2017 (Version V)
- IIHS Side Impact (MDB) 2017 (Version X)

IIHS Side Impact (MDB) 2017 (Version X)

IIHS Side MDB Impact – 2017 (Test), 2016 (Rating)



	Driver	Passenger
Head and Neck Rating	GOOD	GOOD
Brust and Torso Rating	GOOD	GOOD
Pelvis and Left Femur Rating	POOR	POOR
Head Protection Rating	GOOD	
Structural Rating	GOOD	

The final rating is calculated by summing the individual scores and comparing it to the sliding scale defined in the protocol.

Overall	ACCEPTABLE

IIHS Side MDB Impact – 2017 (Test), 2016 (Rating)

Qualitative Observations

Some observations are subjective and cannot be calculated automatically from the analysis results.

The user needs to look at the results and decide what values should be applied.

Use the button below to change the values.

Refer to the protocol for guidelines on rating the head protection.

Restraint	Value
Head Protection Rating	GOOD

Refer to the protocol for guidelines on structural donwgrade for fuel spill and high voltage battery asspects.

The structural rating should be lowered by one level for structural failure of B-pillar.

Structural	Value
Structural Downgrade	Downgrade 0 Level(s)
Structural Rating	GOOD

IIHS Side MDB Impact – 2017 (Test), 2016 (Rating)

Head and Neck Assessment

	Driver		Passenger	
HEAD	Value	Rating	Value	Rating
HIC15	399.78	GOOD	399.78	GOOD
HIC15 start time - s	0.064		0.064	
HIC15 end time - s	0.068		0.068	
Head Rating	GOOD		GOOD	

	Driver		Passenger	
NECK	Value	Rating	Value	Rating
Tension - kN	0.381	GOOD	0.432	GOOD
Compression - kN	0.876	GOOD	0.724	GOOD
Tension level exceeded - kN	0.381	GOOD	0.432	GOOD
duration of exceedence - ms	0.00		0.00	
Compression level exceeded - kN	0.876	GOOD	0.724	GOOD
duration of exceedence - ms	0.00		0.00	
Shear level exceeded - kN	0.305	GOOD	0.333	GOOD
duration of exceedence - ms	0.00		0.00	
Neck Rating	GOOD		GOOD	

The overall rating is the lowest of the individual ratings.

Head and Neck Rating	GOOD	GOOD

IIHS Side MDB Impact – 2017 (Test), 2016 (Rating)

Torso Assessment

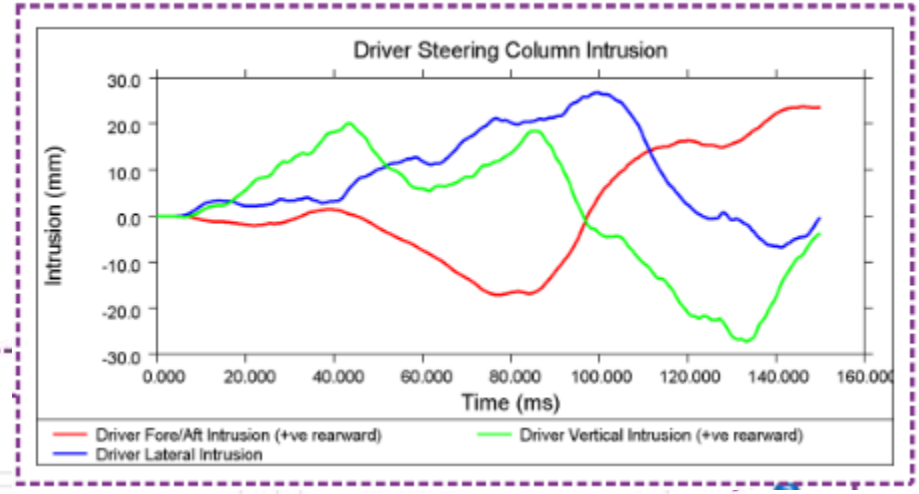
	Driver		Passenger	
CHEST	Value	Rating	Value	Rating
Rib deflection - mm	4.781	GOOD	4.781	GOOD
Deflection Rate - m/s	1.046	GOOD	1.046	GOOD
Viscous criterion - m/s	0.043	GOOD	0.043	GOOD
Max. Shoulder deflection	2.517		2.517	

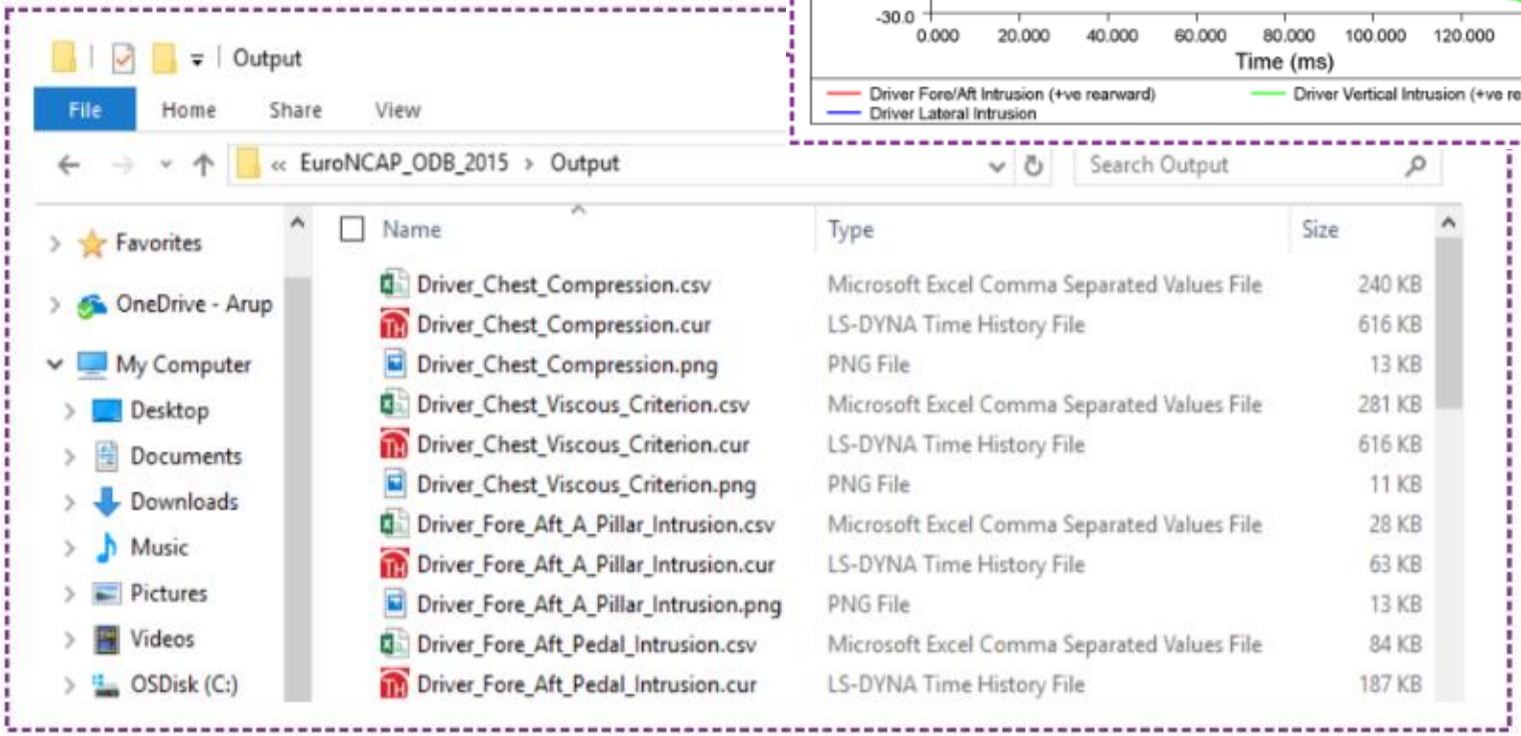
The overall rating for the Chest is the lowest of the individual ratings.

Chest Rating	GOOD	GOOD

Standard templates

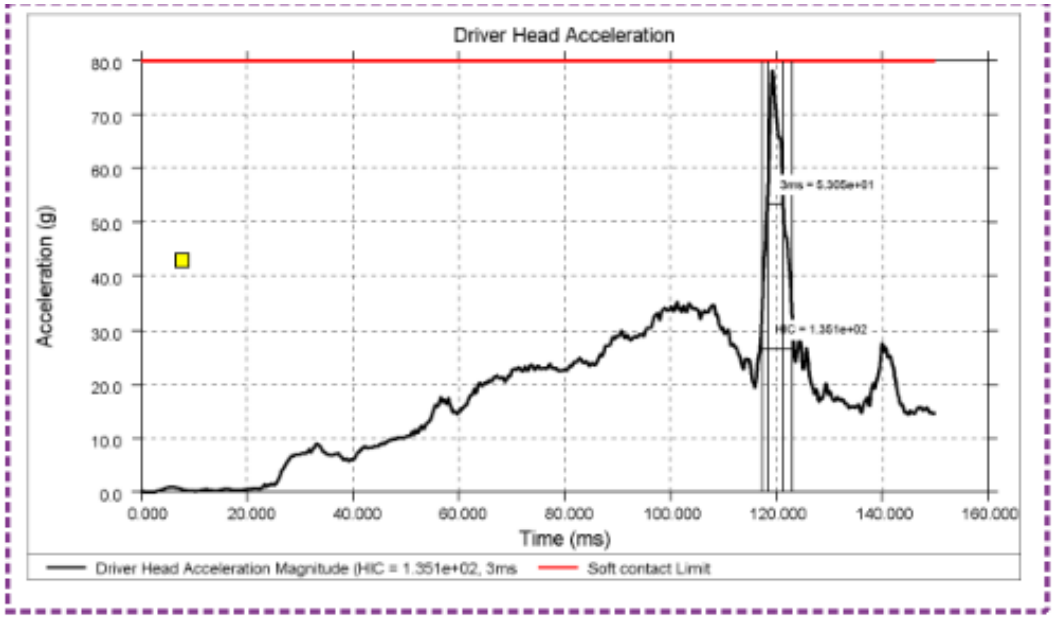
Curve data now written along with images

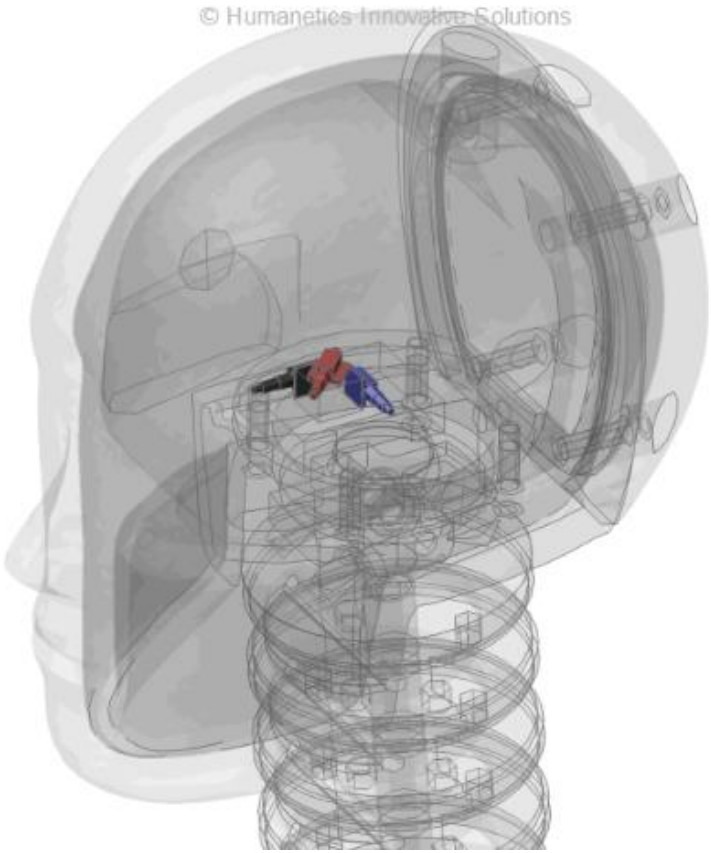




Standard templates

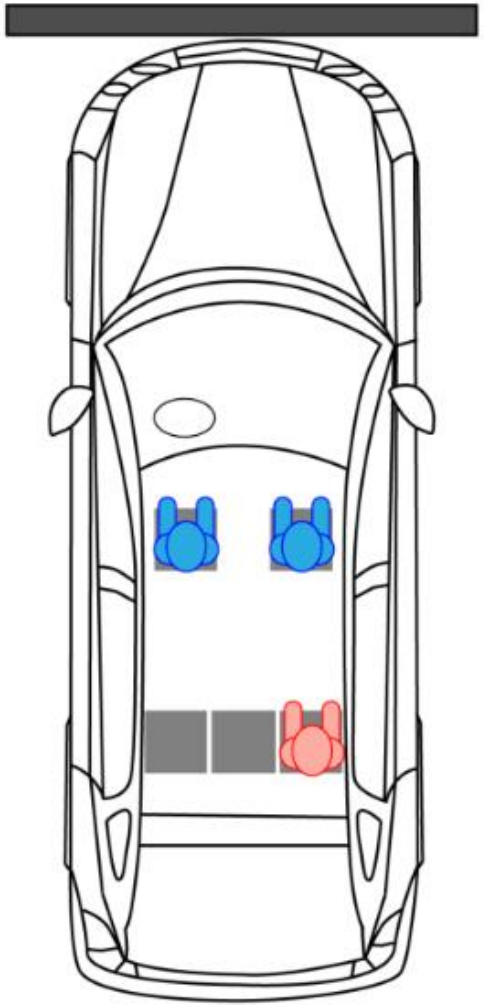
The input for occupant head nodes can now accept three accelerometers rather than one



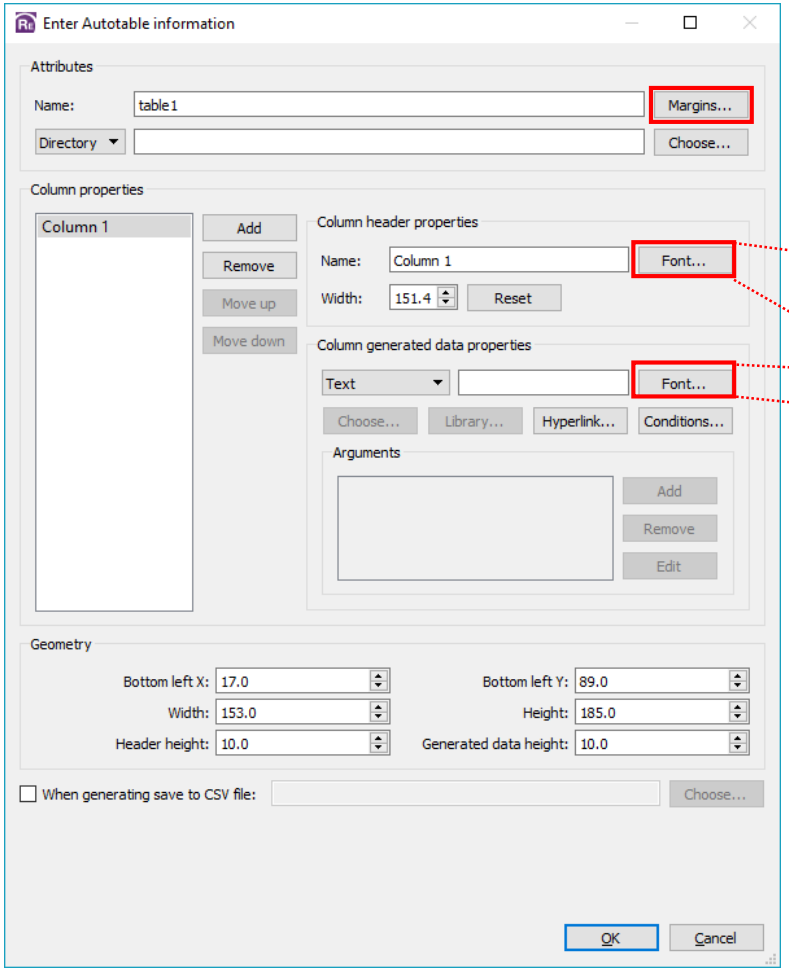


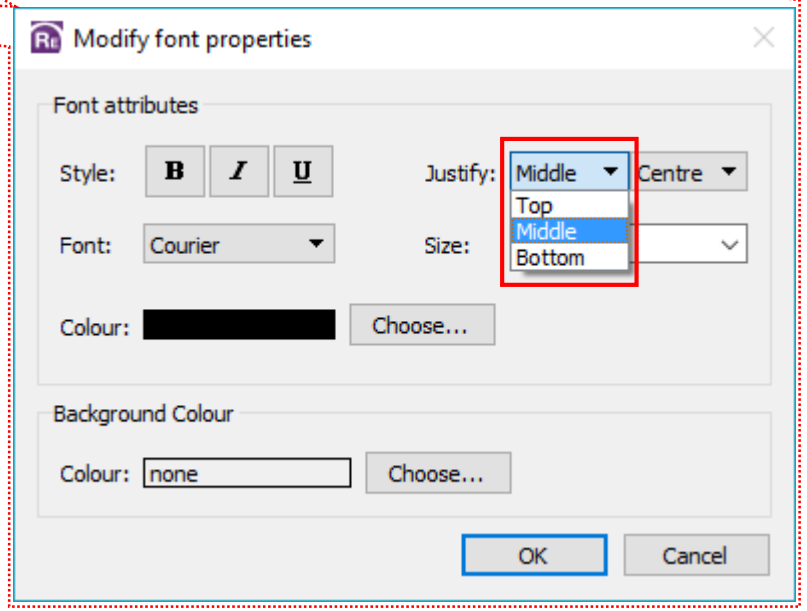
Standard templates

Adult Occupant Protection will include rear passengers



Margins and justification in Autotables

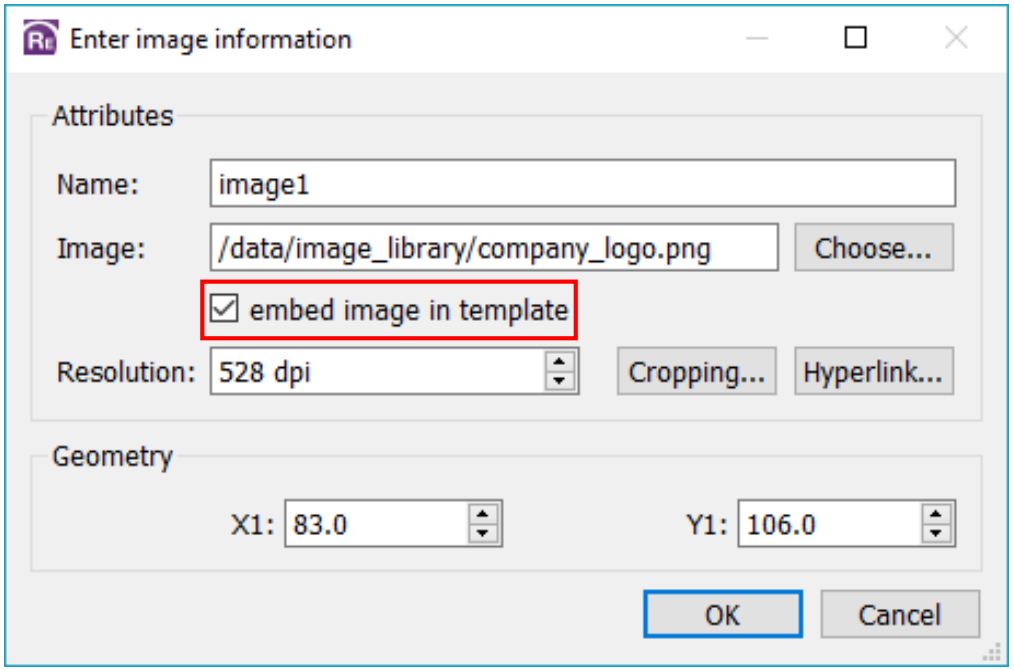


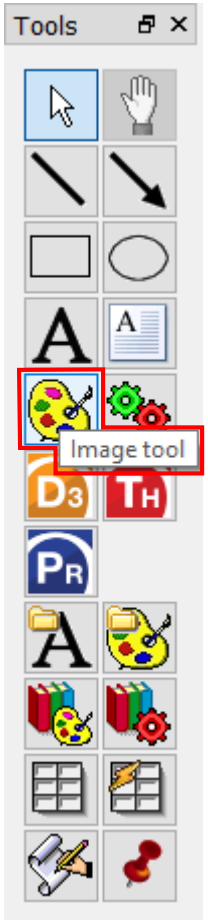


Editing margins and vertical (as well as horizontal) justification of text were already available in Table items. They are now also available in Autotable items.

Embedded images

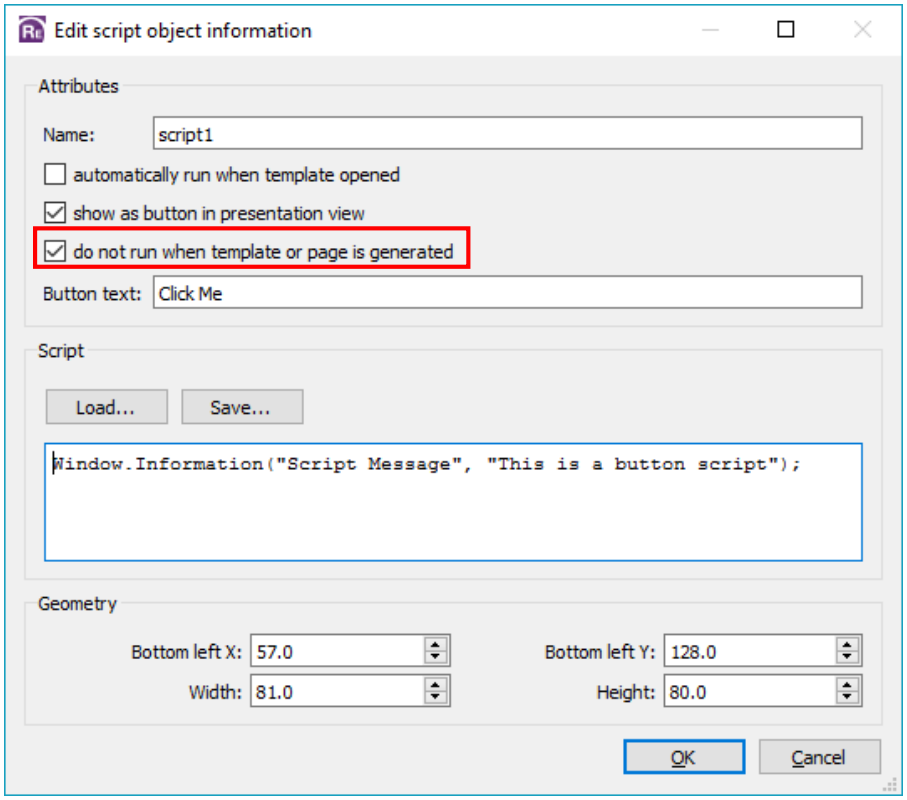
A checkbox has been added in the Image item dialog. When selected, the image file is embedded directly into the template.





Button Scripts

A checkbox has been added in the Script item dialog to skip the generation of button scripts when a template or page is generated. This means that button scripts can now be configured to run only when clicked.



DEMO

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