D3PLOT 10.1







- Opening models
- User interface
- Plotting modes
- Animating
- DATA menu for contouring
- Max & min on plots
- Data Components
 - <u>2D/3D</u>
 - <u>Beam</u>
 - <u>Contact</u>
 - Principal
 - Other "LSDA"
- Other methods of extracting data

S-DYNA ENVIRONMENT

- Quick-pick
- Picking

- Part Tree
- <u>Measure</u>
- Display entities
- Labelling
- <u>Cut sections</u>
- Volume Clipping
- Deform
- Display Options
- <u>Multiple Models</u>
- Image & movie output
- Shortcuts

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- <u>Attached</u>
- <u>Groups</u>
- <u>Contour options</u>
- <u>Tuning Graphics Performance</u>
- Opening models (advanced options)
- <u>Control of settings & properties</u>
- Overlay & comparison of models
- <u>Reflecting Models</u>
- Faster animation
- D3PLOT T/HIS link
- <u>ALE Data Components</u>
- Trace node
- <u>XY Data</u>
- <u>External data "blob plots"</u>

- <u>Compressed (Cut-Down) PTF files</u>
- New d3plot file format
- Background image
- Background animation
- User-defined data
- D3PLOT scripting
- Pages
- Menu Attributes
- Preferences

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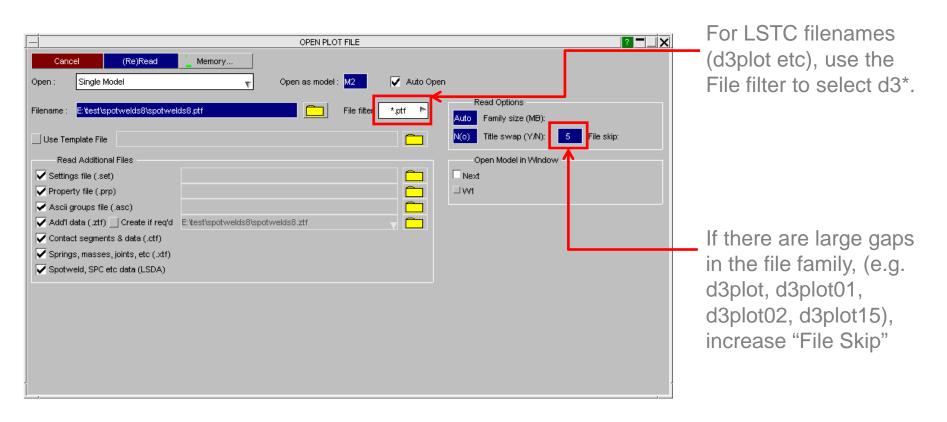




Opening Models



- The default "Open Model" menu allows a single model to be selected by either typing in a filename or browsing for a file.
- Multiple models can also be opened see advanced section.



[back to contents]

DYNA ENVIRONMENT

Opening Models



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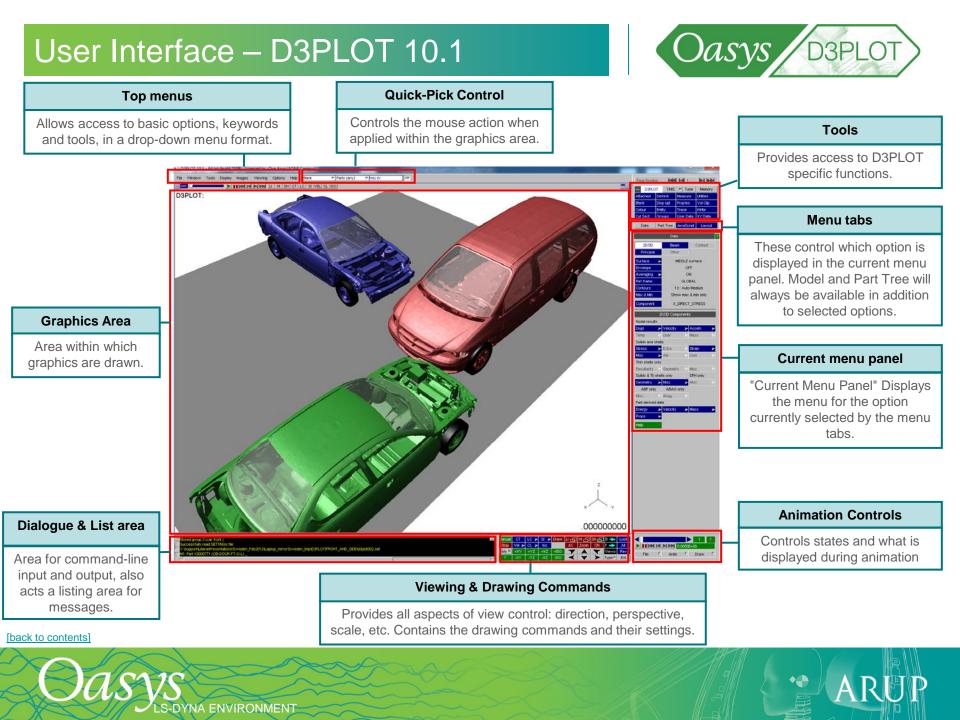
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 In addition to reading the PTF/d3plot file, a number of additional files can also be selected:

LS-DYNA ENVIRONMENT

Read Additional Files	
✓ Settings file (.set)	
✓ Property file (.prp)	
🗸 Ascii groups file (.asc)	
🔽 Add'l data (.ztf) 🔄 Create if req'd	
🔽 Contact segments & data (.ctf)	
🔽 Springs, masses, joints, etc (.xtf)	
Spotweld, SPC etc data (LSDA)	

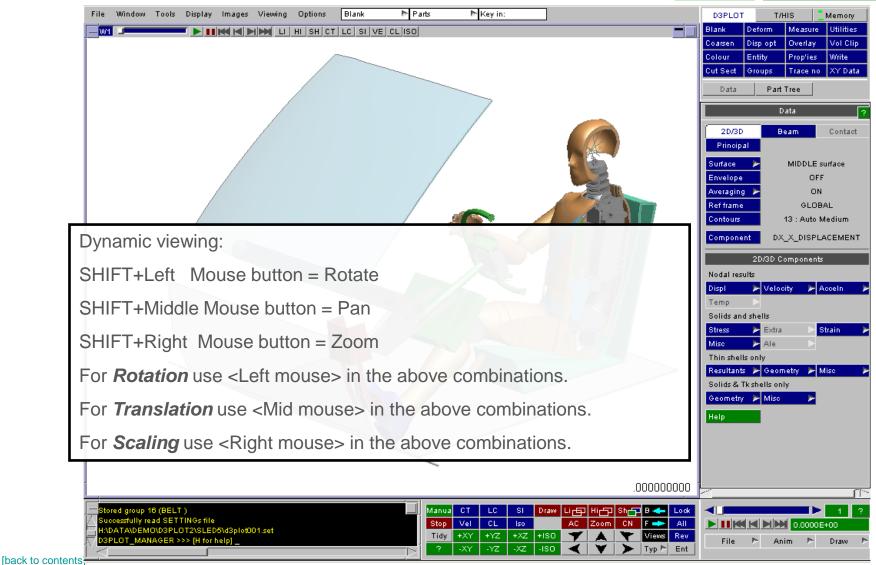
Settings File	Contains D3PLOT program settings for each model / window
Properties File	Contains model data; colours, blanking, transparency etc
Ascii groups	Group information
Add'l data (.ztf)	Contains additional data used by D3PLOT to plot items not in the PTF/d3plot file (created by PRIMER).
Contact data (.ctf)	Contains information on contact surface location and forces
Spring / mass (.xtf)	Contains information on springs, lumped masses, joints
Spotweld, SPC (LSDA)	Contains data for spotwelds, SPCs, seatbelts, X-sections.



User interface – Dynamic viewing

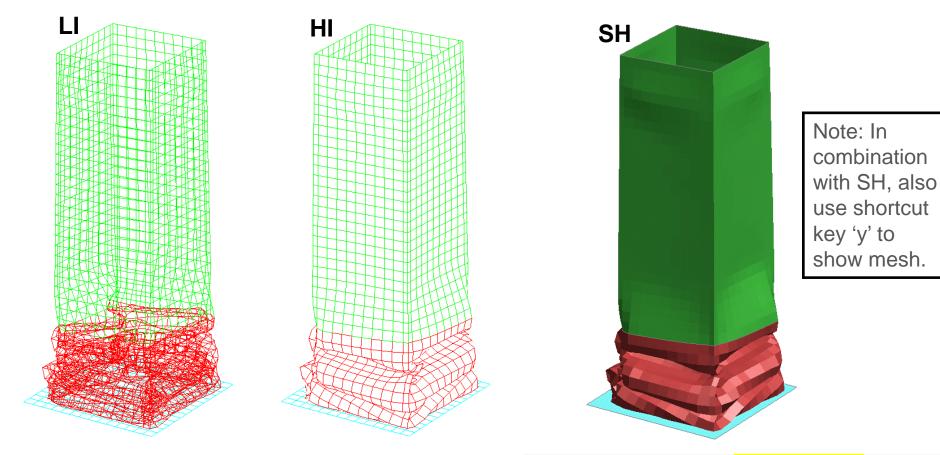
S-DYNA ENVIRONMENT





Plotting modes – LI, HI and SH

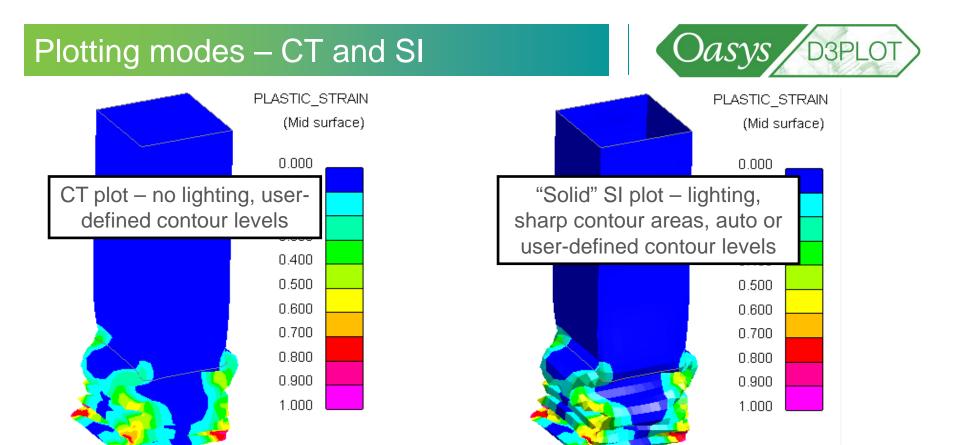




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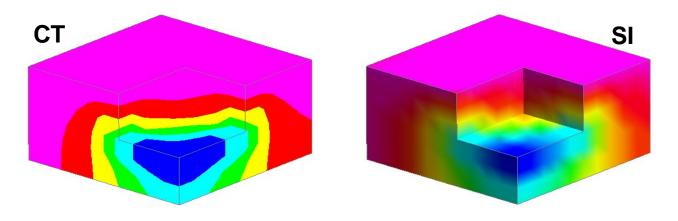


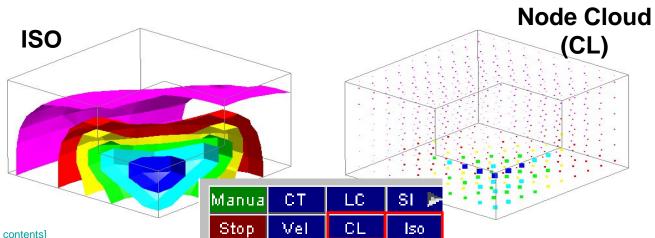
Plotting modes – Contour Plots

S-DYNA ENVIRONMENT









ISO surfaces and Node Cloud (CL) allow better display of results inside blocks of solid elements

ISO – shows surfaces of constant data value, within a solid element mesh

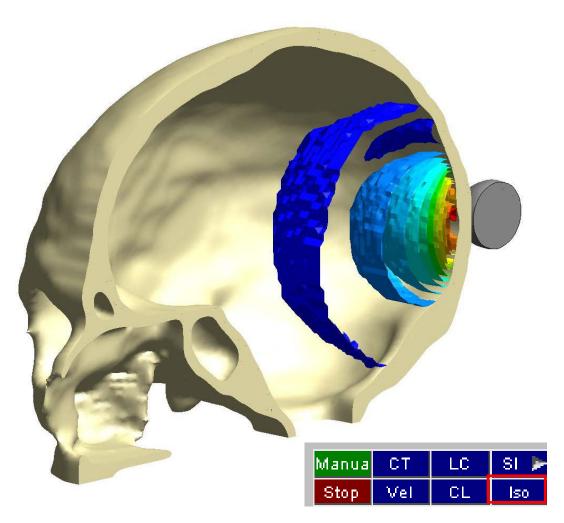
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Plotting modes - ISO



ISO plot is especially useful for fluid/structure models. In this example the display mode of the skull is set to SHADED, while the ISO surfaces are displayed for the fluid mesh that fills and surrounds the skull.

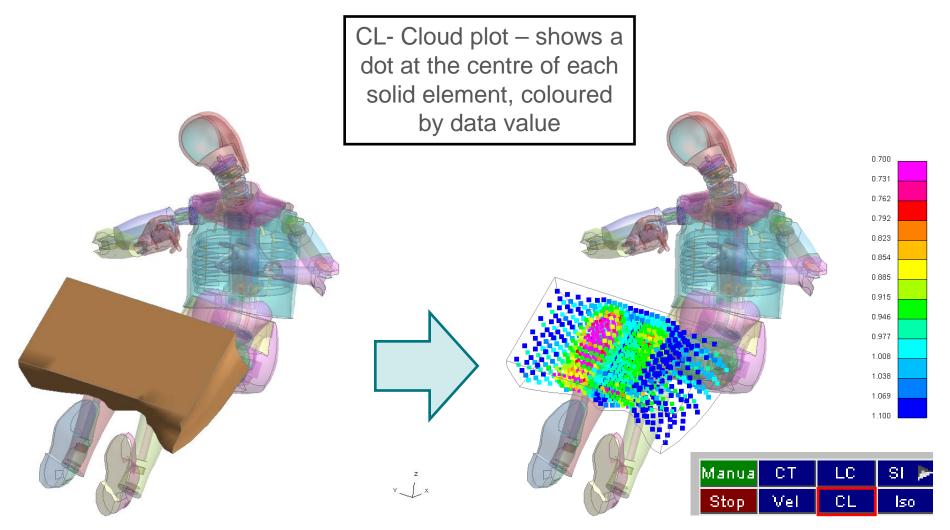
S-DYNA ENVIRONMENT





Plotting modes – Cloud Plot (CL)





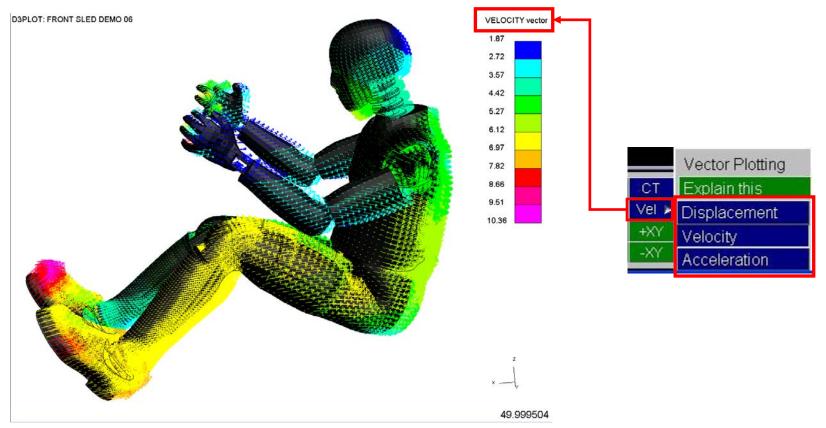




Plotting modes – Vector



 Velocity/Vector plot offers a choice of displacement, velocity or acceleration arrow-plots.



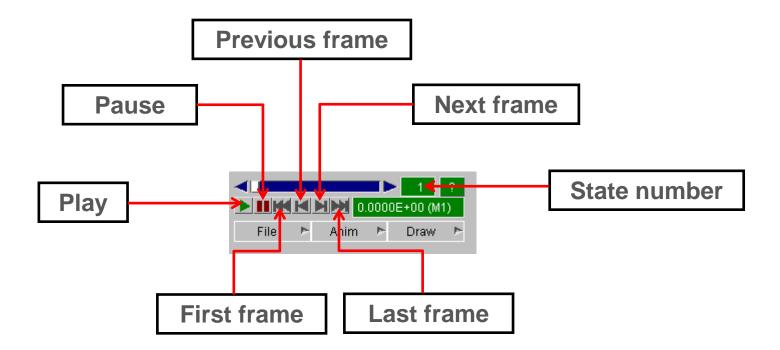






Α

• All windows can be animated using the controls in the bottom right corner:



... or animations can be controlled for individual windows using the controls in each window:

[back to contents]

DYNA ENVIRONMENT

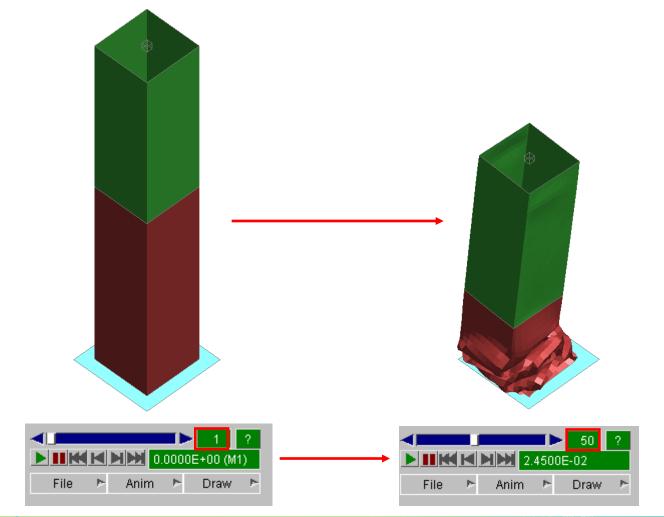
Animating



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• Plot state numbers can be entered to skip to a certain state:



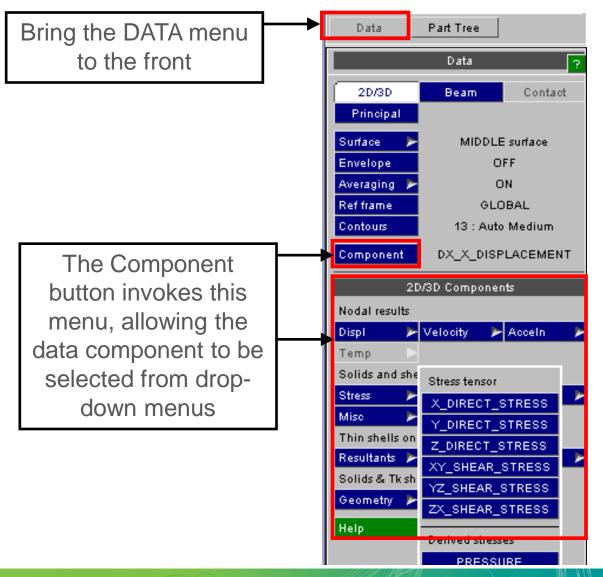
[back to contents]

S-DYNA ENVIRONMENT

The DATA menu for contouring

- The DATA menu controls the contents of result plots: which data component is contoured, contour levels, etc.
- Press CT or SI (or shortcut F) to create a contour/fringe plot

S-DYNA ENVIRONMENT



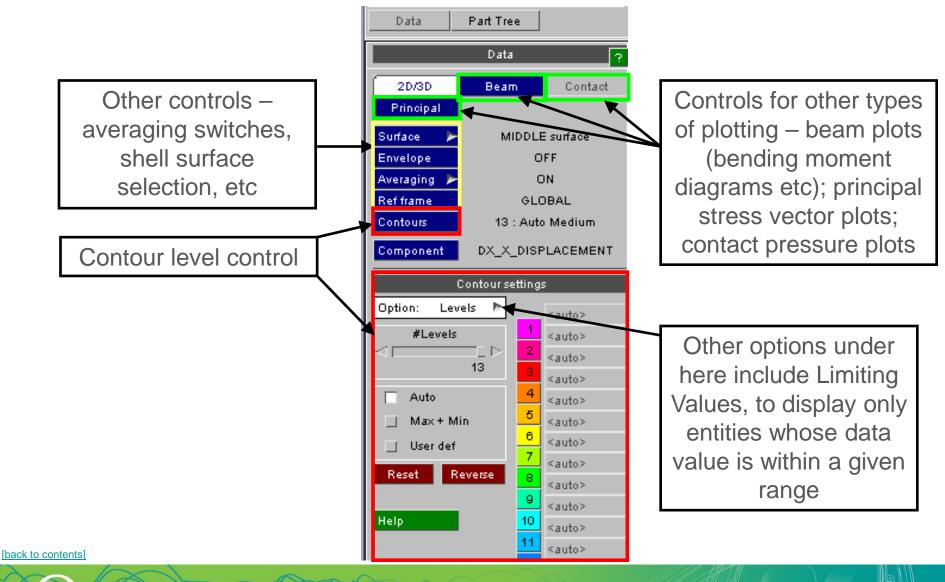


Oasys / D3PLOT

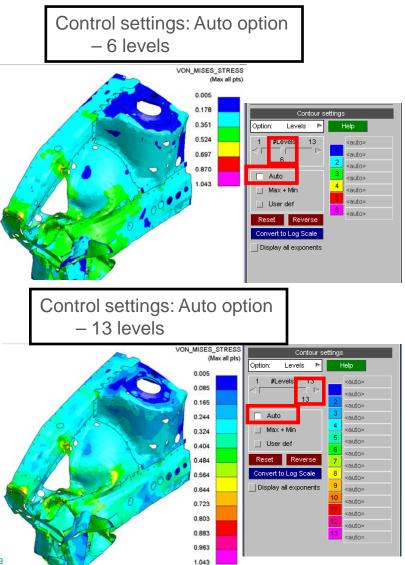
The DATA menu for contouring

S-DYNA ENVIRONMENT



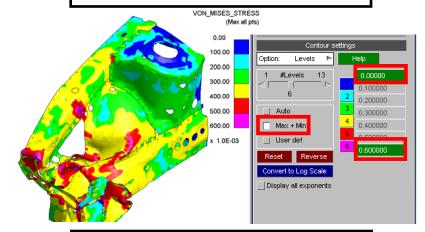


The DATA menu for contouring

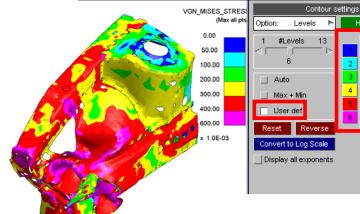


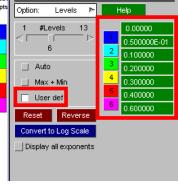
Oasys / D3PLOT

Control settings: Max + Min enter the max and min values



Control settings: User def – enter all the levels manually







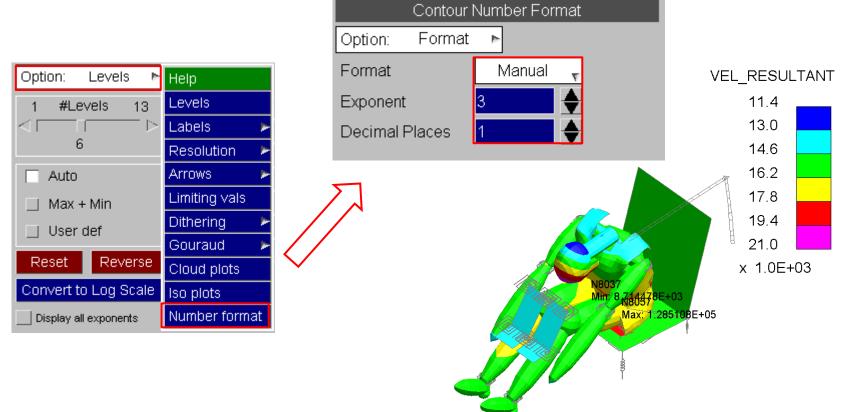
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LS-DYNA ENVIRONMENT

Contour Bar Number Format



• By default D3Plot will try to work out a sensible number format to display the contour bar numbers. However, the number format can be controlled manually.





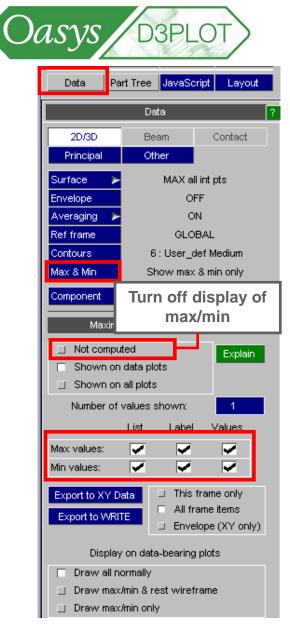


Max and min on plots

 Nodes or elements have the maximum and minimum values annotated on plots – this can be controlled or turned off.



S-DYNA ENVIRONMENT

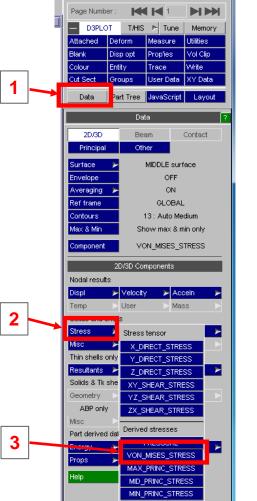


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S-DYNA ENVIRONMENT

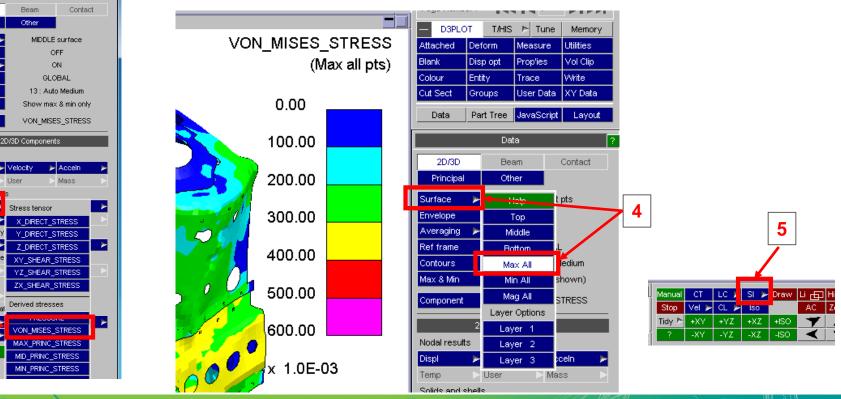


• Shells - example of plotting von Mises stress, steps 1-5:



[back to contents]

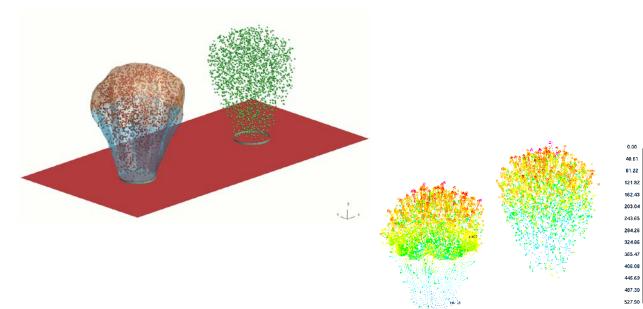
By default the results for the Middle integration point of a shell is shown; however, this can be changed, based on what was made available via MAXINT in *DATABASE_EXTENT_BINARY – for example "Layer 1",Layer 2",..., for each integration point, or "Max all" value can be read.





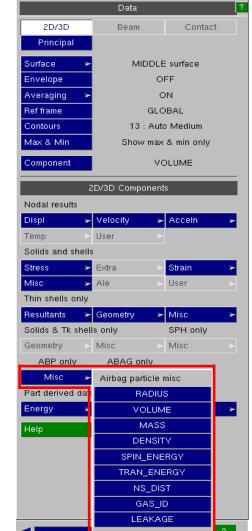


- Airbag Particle data from PTF / d3plot files is fully supported
- Airbag Particles can be included in vector plots
- Special data components just for Airbag Particles are available in normal contouring modes



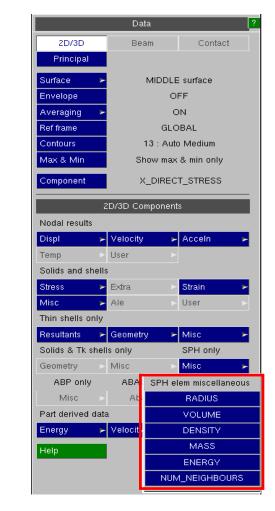
[back to contents]





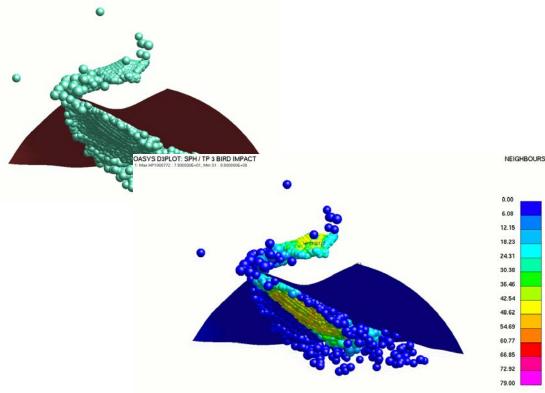
5.499485





SPH Elements

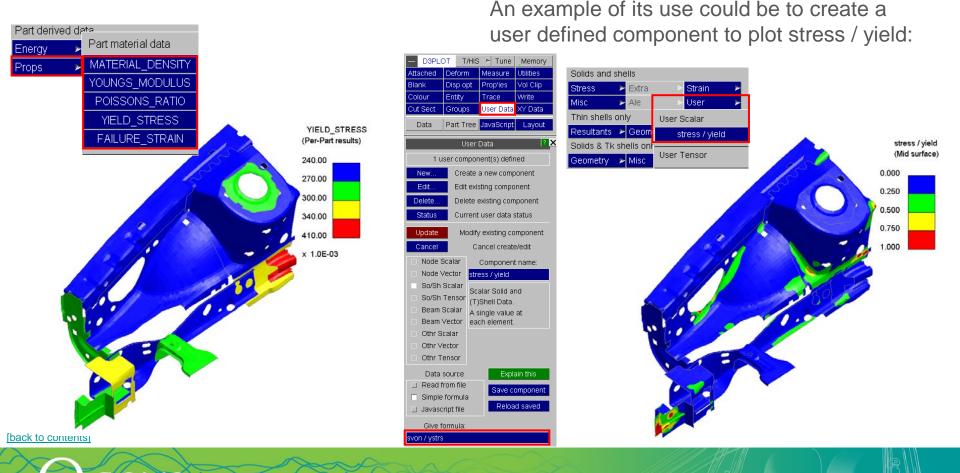
- SPH Elements are fully supported
- SPH data components may be plotted, written and graphed as XY data







- Material properties of parts can be contour plotted, used in user-defined components and written out from the WRITE menu.
- These come from the ZTF file created by Primer.



LS-DYNA ENVIRONMENT



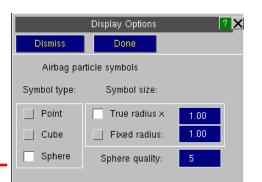
Airbag Particles / SPH Elements

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S-DYNA ENVIRONMENT

The symbol type and size of Airbag Particles and SPH Elements can be controlled in Display options

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Element S	witches	Element App	earance		
Back fa	aces	Spring symbols			
Internal	faces	Beam symbols			
Local t	riads	Belt symbols			
		SPH symbols			
Other sy	mbols	AB Pcle symbols			
Display S	witches	Display Attributes			
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The visual properties can be altered in the same way as other elements

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DYNA ENVIRONMENT



Plotting Beams

- Beam elements cannot be contoured in the same way as 2D and 3D elements, since they have no visual area on which to plot results. Therefore the special "Beam" plotting data display mode must be used to visualise results from beams.
- All beam types have the BASIC set of data components: 3 forces + 3 moments.
- Belytschko-Schwer beams using a resultant plastic formulation will have "extra" PLASTIC components.
- Hughes-Liu (integrated) beams can optionally write "extra" STRESS (and strain) values at integration points.
- D3PLOT supports both basic and "extra" data components for all these beam types.

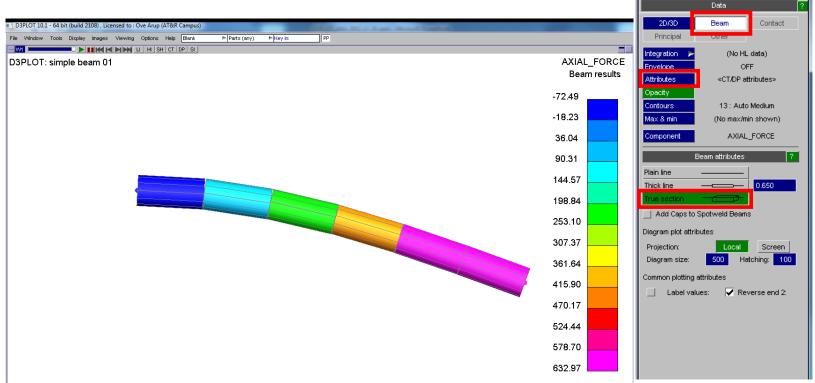
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Plotting Beams

 D3PLOT can plot the actual beam thickness, if a .ZTF file is output from PRIMER and available in the run folder; the thickness can be changed from "Attributes". If no .ZTF file has been read, a square section of the "Thickness" given below will be used.



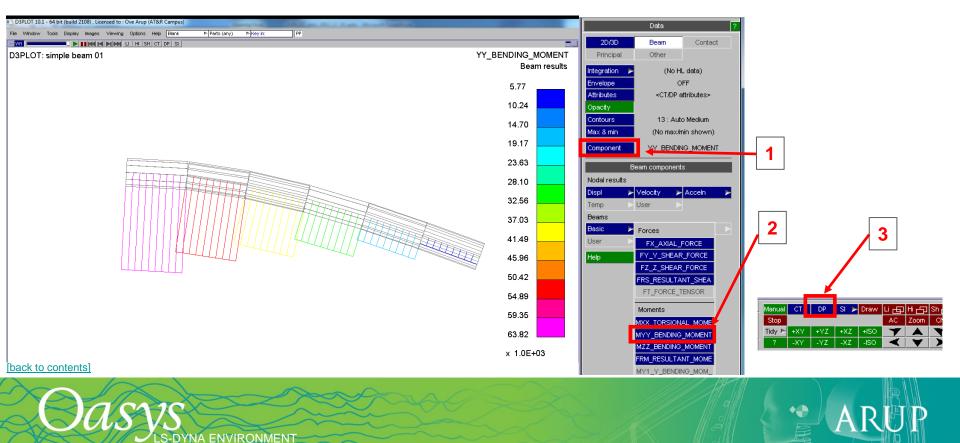






Plotting Beams

- There are two data plotting modes for the display of beam results:
 - **DP** (DIAGRAM_PLOT) This produces a "diagram" plot showing results hatched on the beam. Hatching size is proportional to data magnitude, and colour also follows the normal contour band limits. Directional data is displayed by default on the relevant local beam axis. Any data component can be displayed this way, not just bending moments.

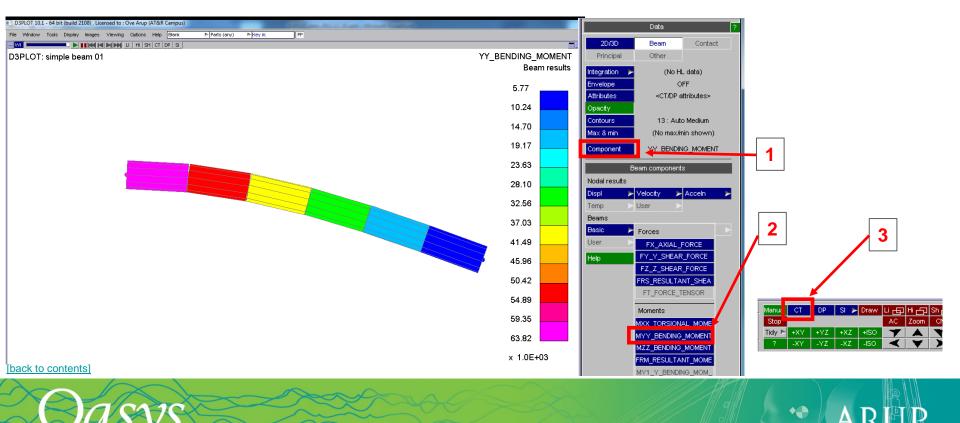


S-DYNA ENVIRONMENT



Plotting Beams

• **CT** (CONTINUOUS_TONE) The continuous-tone plot shows exactly the same results as in the diagram plot, but the results are drawn as thick blocks of colour on the beam centreline. This can give less cluttered plots, but no visual indication of the data or beam orientation is possible.





- In order to be able to plot the contact area, a .CTF file needs to be requested when the analysis is submitted, please see the LS-DYNA manual for details.
- If a CTF is found and read when the model is loaded in D3PLOT, then the Contact plotting menu will become active.

DYNA ENVIRONMENT

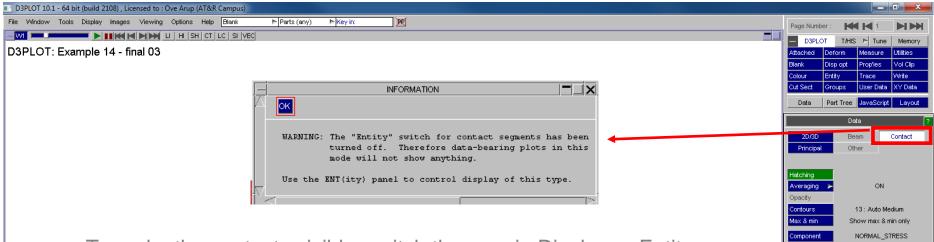
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As	cii groups file (.asc)				
Ad	d'I data (.ztf) 📃 Creat	e if req'd			
Co	ntact segments & data	(.ctf)			
🖊 Spi	rings, masses, joints, e	etc (.xtf)			
🖊 Sp	otweld, SPC etc data (LSDA)			
			<u> </u>		
		Data		?	
	2D/3D	Data Beam	Contact	?	
	2D/3D Principal		Contact	?	
		Beam Other	Contact E surface	?	
	Principal	Beam Other MIDDL8		?	
	Principal Surface	Beam Other MIDDLI	E surface	?	
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	Principal Surface > Envelope Averaging >	Beam Other MIDDL8 (GL4	E surface DFF ON	?	
	Principal Surface Envelope Averaging Ref frame	Beam Other MIDDLI (GL 13 : Au	E surface DFF ON OBAL	?	
	Principal Surface Envelope Averaging Ref frame Contours	Beam Other MIDDLI (GL 13 : Au Show ma	E surface OFF ON OBAL to Medium	2	







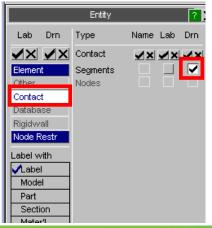
 Visualizing contact area in D3PLOT: Data -> Contact -> A warning will appear as the contacts are not visible by default:



• To make the contacts visible, switch them on in Display -> Entity

(shortcut 'e') -> Contact

-DYNA ENVIRONMENT

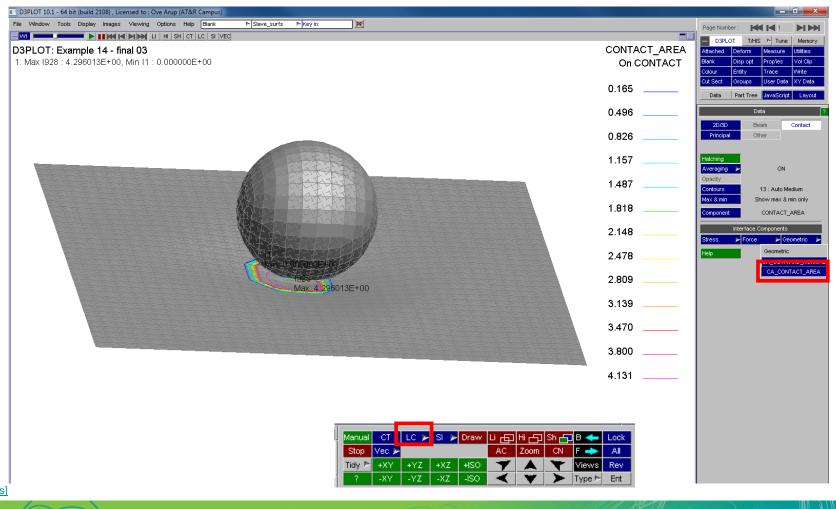


S-DYNA ENVIRONMENT



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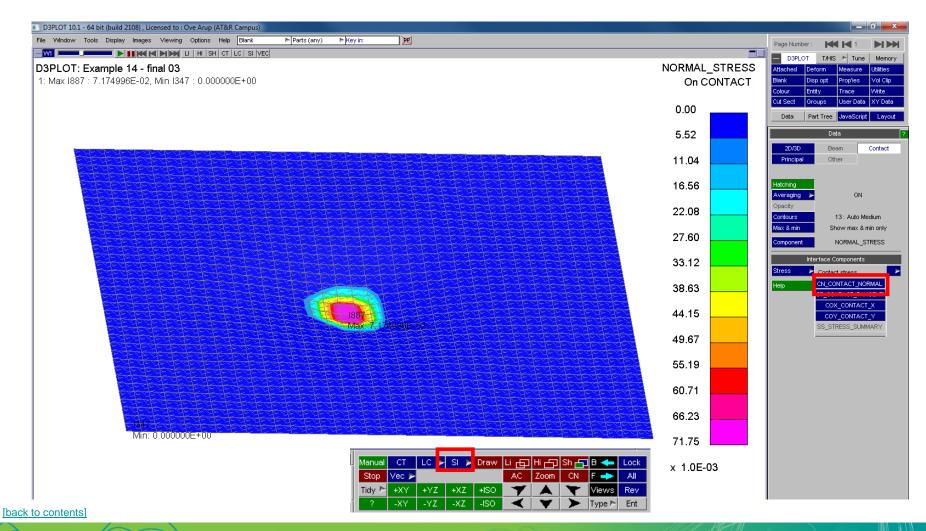
• Visualizing contact area in D3PLOT: Data -> Contact -> Geometric: CA_CONTACT_AREA



S-DYNA ENVIRONMENT



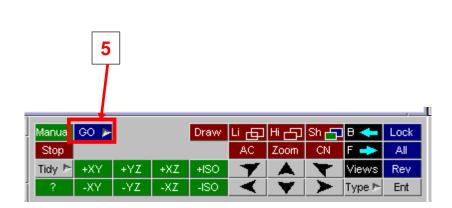
Visualizing contact stress in D3PLOT: Data -> Contact -> : CN_CONTACT_NORMAL

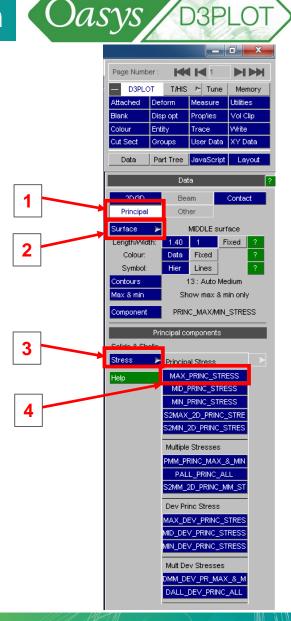


Data Components – Principal stress/strain

- The panel "Principal" controls the plotting of Principal stress and strain vector plots.
- These vectors can only be displayed on 2D and 3D elements (solids and shells), so if you have none of these in your model, it will be unavailable.
- STRESS and STRAIN categories are only made available if their respective tensors are present in the database file.

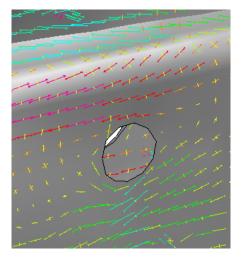
S-DYNA ENVIRONMENT



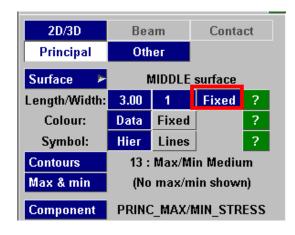


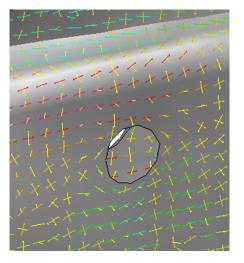
Data Components – Principal stress/strain Oasys / D3PLOT

- By default the arrow length is proportional to stress.
- 2D/3DBeam Contact Principal Other Surface MIDDLE surface Length/Width: 15.0 Fixed 1 Colour: Data Fixed Symbol: Hier Lines Contours 13 : Max/Min Medium Max & min (No max/min shown) Component PRINC_MAX/MIN_STRESS



 Alternatively the arrow length can be fixed.





Α

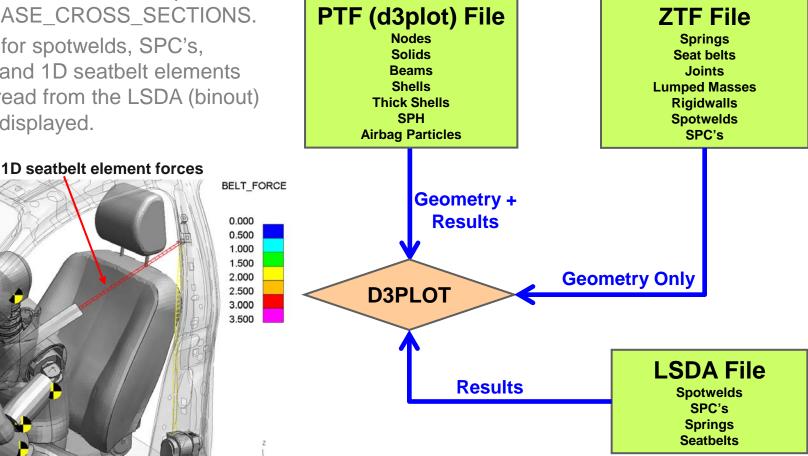




Data Components – Other (LSDA)



The ZTF file created by PRIMER includes data for SPC's, spotwelds, *DATABASE CROSS SECTIONS. Results for spotwelds, SPC's, springs and 1D seatbelt elements can be read from the LSDA (binout) file and displayed.

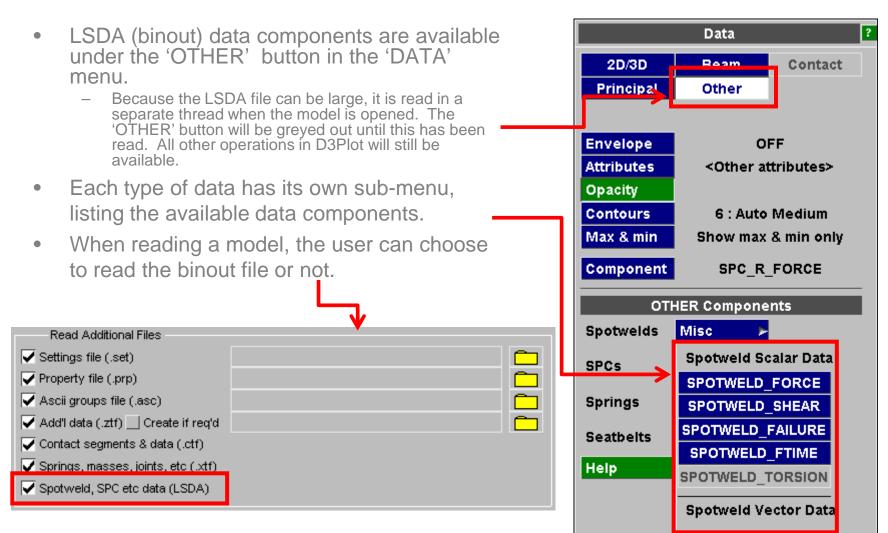






S-DYNA ENVIRONMENT



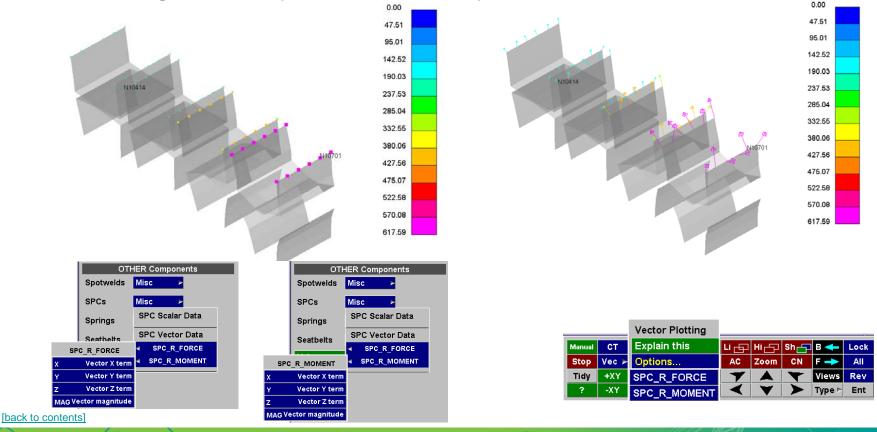


S-DYNA ENVIRONMENT



SPC Forces

- Force and moment reactions on restraints (SPC forces) can be plotted (requires *DATABASE_SPCFORC in the keyword file)
- All the force and moment components can be plotted as coloured squares
- The "magnitude" components can also be plotted as vectors



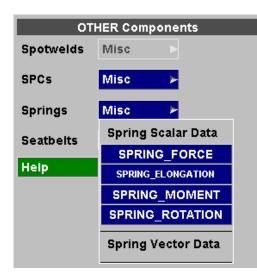
ARUP

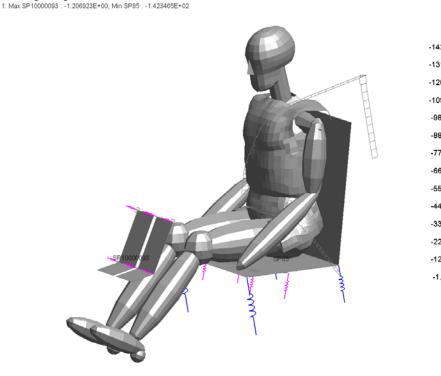
Spring Data

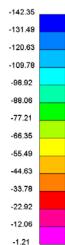
 The following Spring data components are available (requires *DATABASE_DEFORC in the keyword file):

D3PLOT: Ig09 : Large Test 9: Belted sled test

- Spring Force
- Spring Elongation
- Spring Moment
- Spring Rotation







SPRING_FORCE

Oasys / D3PLOT

v⊥ ×

0.004999

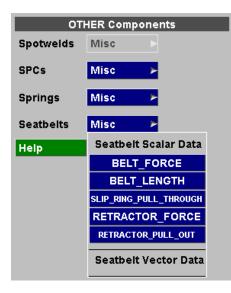
[back to contents]



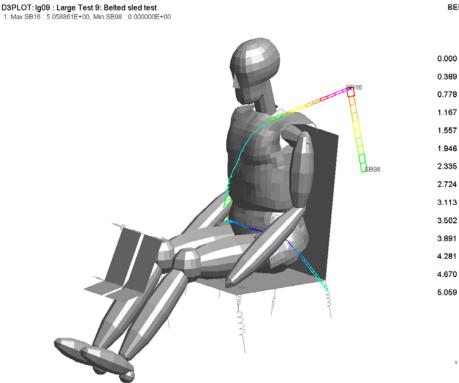
S-DYNA ENVIRONMENT



- The following Seatbelt data components are available (requires *DATABASE_SBTOUT In the keyword file):
 - Seatbelt Force
 - Seatbelt Length
 - Slip Ring Pull Through
 - Retractor Force
 - Retractor Pull Out



S-DYNA ENVIRONMENT



3.891 4.281 4.670 5.059

BELT_FORCE

0.004999







Α

Spotweld Data

- The following spotweld data components are available (requires *DATABASE_SWFORC in the keyword file):
 - Spotweld Force (axial)
 - Spotweld Shear (resultant shear)
 - Spotweld Failure (force state relative to failure surface, =1.0 at failure)
 - Spotweld Failure Time (time at which failure occurred)
 - Spotweld Torsion

OTHER Components				
Spotwelds	Misc >			
SPCs	Spotweld Scalar Data			
0.00	SPOTWELD_FORCE			
Springs	SPOTWELD_SHEAR			
Seatbelts	SPOTWELD_FAILURE			
	SPOTWELD_FTIME			
Help	SPOTWELD_TORSION			
	Spotweld Vector Data			

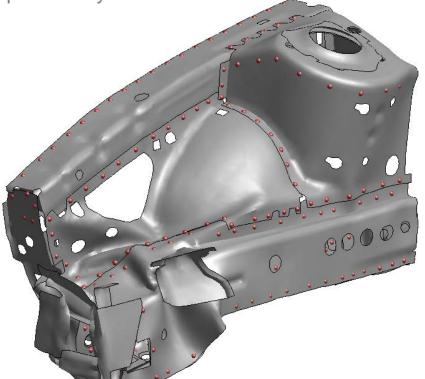
S-DYNA ENVIRONMENT



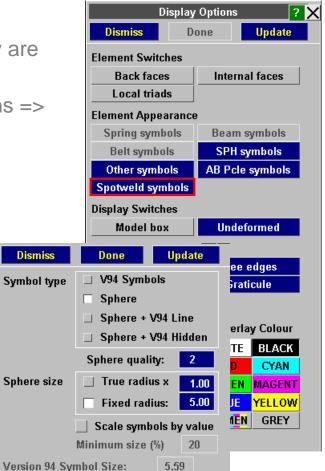




- Spotweld elements can be drawn as spheres, so that they are not obscured by the panels.
- Options for setting the size and style are in Display Options => Spotweld symbols.



S-DYNA ENVIRONMENT

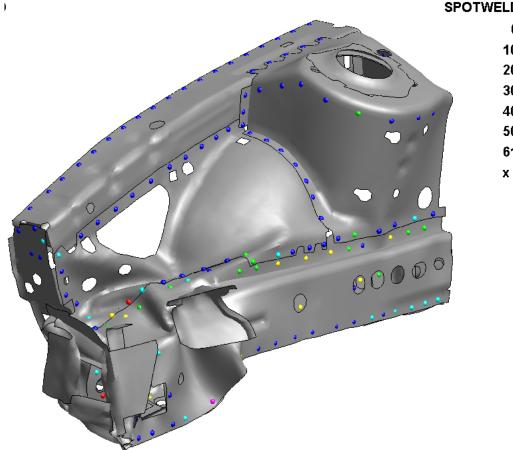


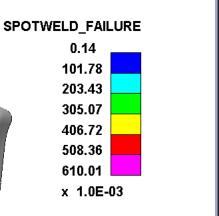
[back to content...



Spotweld Drawing Style

• The drawing style also applies to data plots.





	Data	?		
2D/3D	Beam	Contact		
Principal	Other			
Envelope	0	FF		
Attributes	<other attributes=""></other>			
Opacity				
Contours	6 : Auto	Medium		
Max & min	(No max/min shown)			
Component	SPOTWELD_FAILURE			
T0	HER Compone	nts		
Spotwelds	Misc 🗾 🕨	User 🛛 🕨		
SPCs	Spotweld Sc	alar Data 🚃		
51 65	SPOTWELD	FORCE		
Springs	SPOTWELD	SHEAR		
Seatbelts	SPOTWELD_FAILURE			
	SPOTWELD	_FTIME		
Help	SPOTWELD_	TORSION		
	Spotweld Ve	ctor Data		

ARUP

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Z

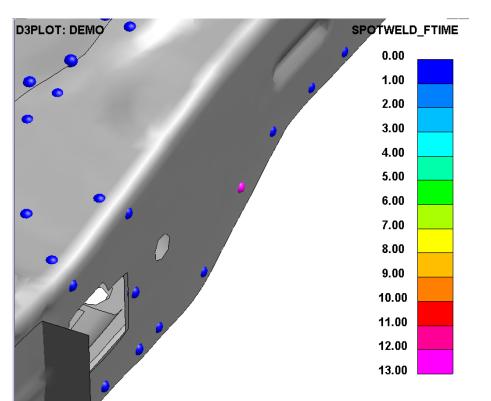


LS-DYNA ENVIRONMENT



Spotweld Failure Time

- When spotweld failure time is present in the binout file, D3PLOT scans through all the time-states in the binout file to find the failure time of each spotweld. These failure times will still be contoured even if D3PLOT is set to a time-state before the failure occurred.
- In the image opposite, D3PLOT is displaying time=zero and showing a spotweld that failed at 13ms.



x x x

.000000000





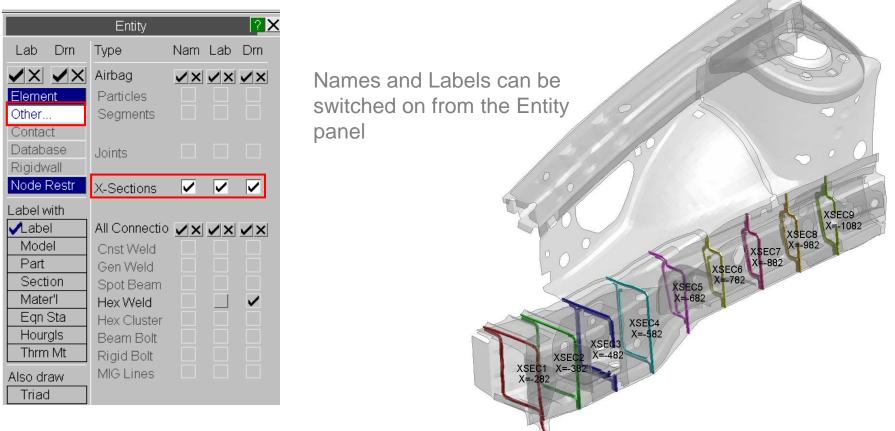


AR

*DATABASE_CROSS_SECTION data

S-DYNA ENVIRONMENT

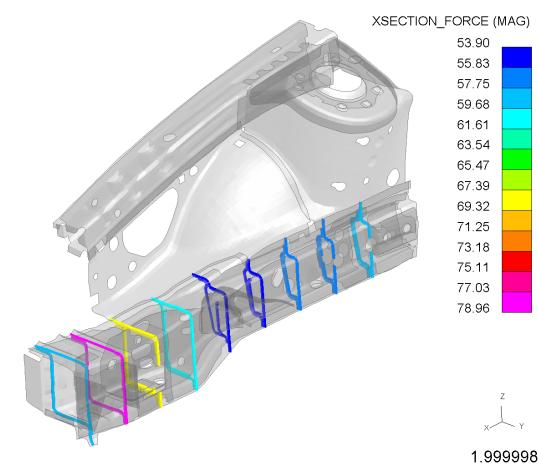
• *DATABASE_CROSS_SECTION definitions can be displayed in D3PLOT (requires a ZTF file generated by Primer).

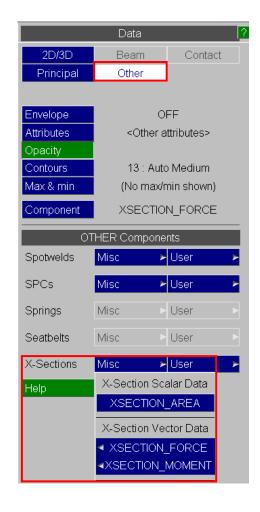




DATABASE_CROSS_SECTION data

• Cross Section Area, Force and Moments can be contoured.





ARI



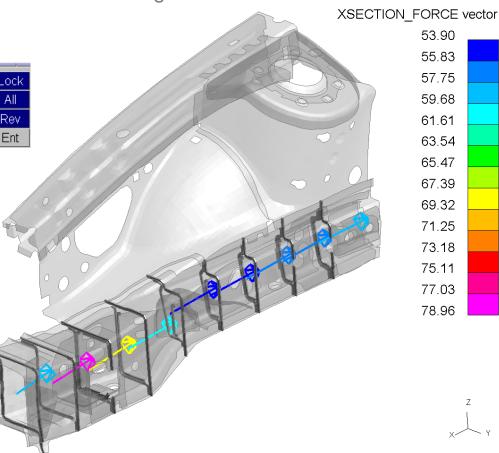


DATABASE_CROSS_SECTION data

• Vector plots of Forces and Moments can also be generated.

		Vector Plotting					
		Explain this					
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Stop	Vec 🕨	SPC_R_FORCE	AC	Zoom	CN	F 🔶	All
Tidy 🖻	+XY	XSECTION_FORCE	7			Views	Rev
?	-XY	XSECTION MOME	$\boldsymbol{\prec}$			Туре 🖻	Ent

S-DYNA ENVIRONMENT



[back to contents]



1.999998

Other methods of extracting data

- Data listing (screen or text file) from "Write" menu
- "XY Data" turns information from the d3plot file into curves that can be displayed in D3PLOT and exported to T/HIS.
 - Data-vs-time select the entities and data component;

D3PLOT

Deform

Disp opt

Attached

Blank

T/HIS 🖿 Tune

Measure

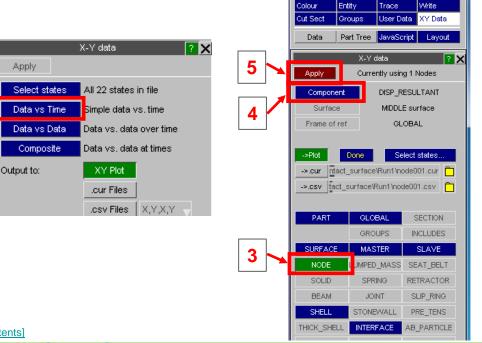
Prop'ies

Memory

Utilities

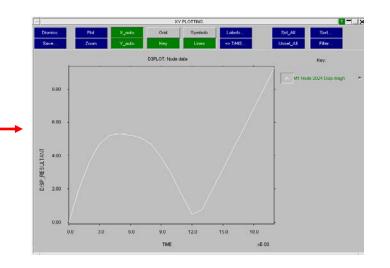
Vol Clip







D3PLOT	т,	HIS	Memory	1
Blank	Deform	Images	Utilities	
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Data	Par	Tree		





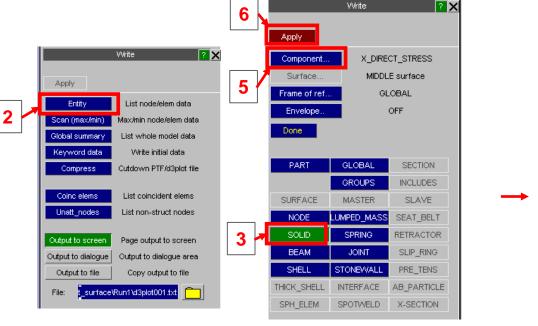


Other methods of extracting data

- Data listing (to screen or text file) from "Write" menu.
- The Entity option allows output of standard element and nodal data, eg. element stress, nodal acceleration, etc. The example below outputs x-stress for solids:



D3PLOT	T	7HIS	Memory	
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Colour	Entity	Prop'ies	s Write	
Cut Sect	Groups	Trace n	io XY Data	
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-DYNA ENVIRONMENT

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+++++	++++ Data at time 0.14000 ++++++++	
	ting of UNAVERAGED GLOBAL X_DIRECT_STRESS Data value	
Element No:	Data value	
Element No: H5394485		
Element No: H5394485 H5394486		
Element No: H5394485 H5394486 H5394507	 Data value 	
Element No: H5394485 H5394486 H5394507 H5394508 	Data value 	

4 → Select solids

Other methods of extracting data

- Data listing (screen or text file) from "Write" menu.
- With this option, the coordinates of nodes at a particular plot state can be output to a .key file, together with initial stress, as an example.

Can also output data values, for example X-displ for nodes.



D3PLOT	T/ł	iis 📘	Memory	
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Data	Part	Tree		

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Parts Beams Shells Thrick shells Solids Nodes Solids Nodes Solids Data component	
Thick shells Solids Nodes Image: All Hughes-Liu Beams Resultant beams present 263 2.000478E+00 2.000423E+00 9.187413E=04 0.0 0.0 Image: All Hughes-Liu Beams Nodel coordinate 266 2.000478E+00 2.000478E+00 1.212437E-03 0.0 0.0 0.0 Image: All Hughes-Liu Beams Image: All Hughes-Liu Beams 0.0	
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5,1	6%
File: surface/Run1/d3plot001.key 💼	

[back to contents]

Write

List node/elem data

Max/min node/elem data

List whole model data

Write initial data

Cutdown PTF/d3plot file

List coincident elems

List non-struct nodes

Page output to screen

Output to dialogue area

Copy output to file

_surface\Run1\d3plot001.txt

Apply Entity

Scan (max/min)

Global summary

Keyword data

Compress

Coinc elems

Unatt_nodes

Output to screen

Output to dialogue

Output to file

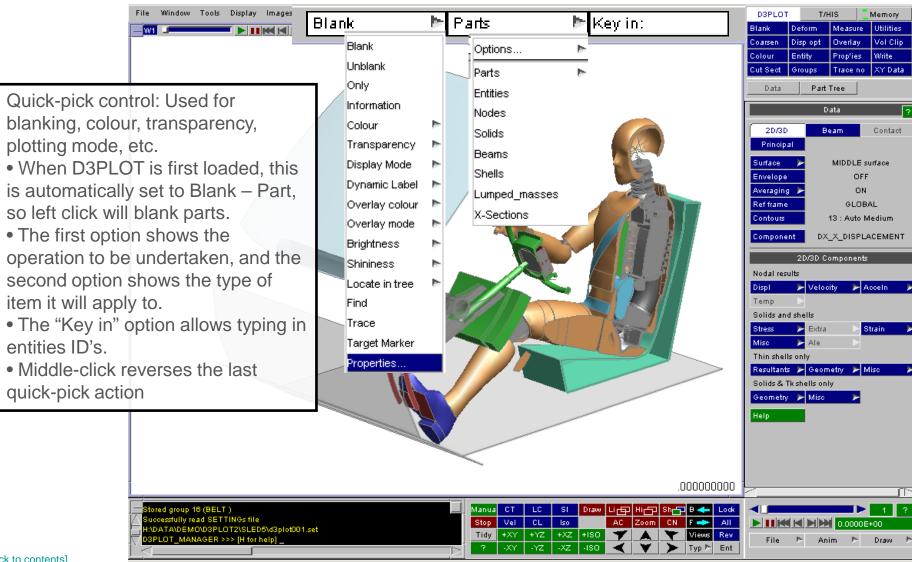
File:



? X



Quick pick



Oasys

D3PLO



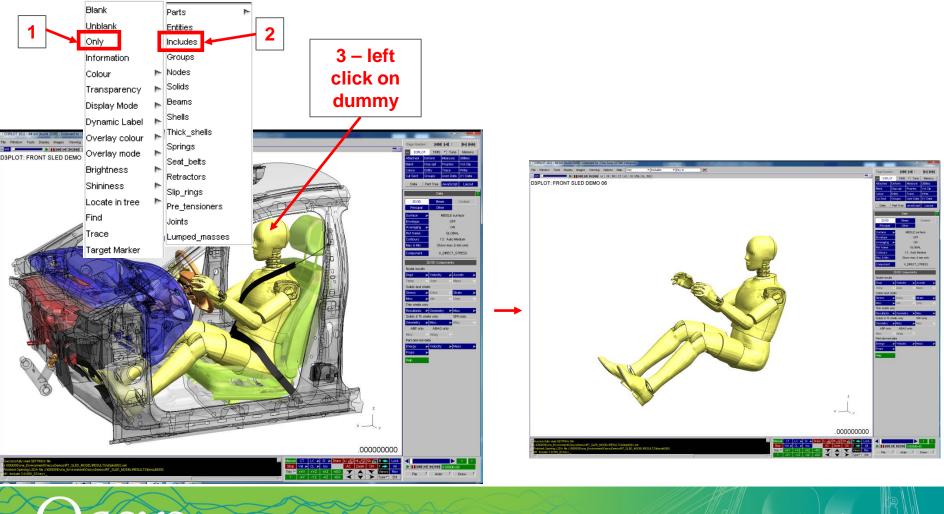
S-DYNA ENVIRONMENT

Quick-pick

LS-DYNA ENVIRONMENT



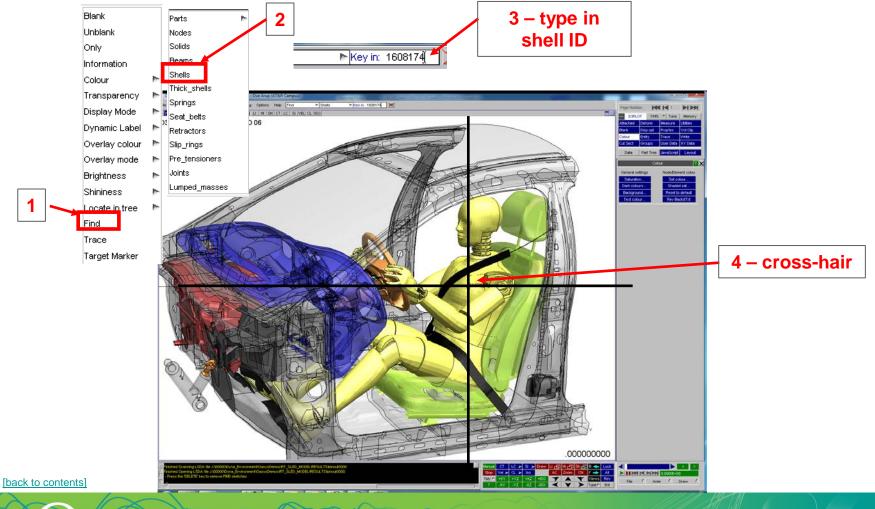
• For example, select Only, Include and click on the dummy in this example will only show the dummy include.



Quick-pick



• For example, select Find, Shells and type in a shell ID that you want to locate – D3PLOT will display a cross-hair at that location.



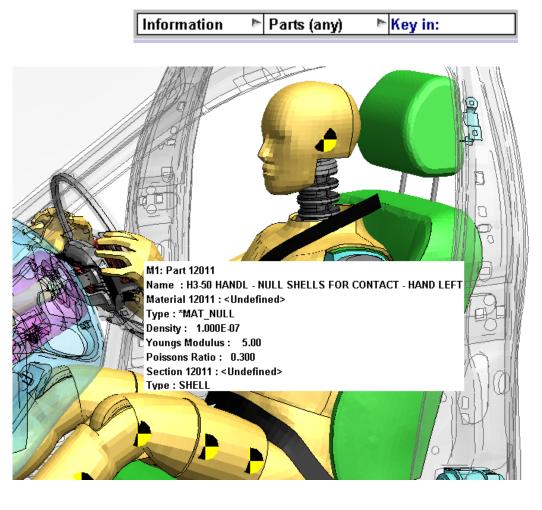
LS-DYNA ENVIRONMENT



Quick-pick: Information



- Quick-Pick option Information gives details about Parts or other entities: Part ID, Part title, thickness, material type, density, Young's Modulus, etc.
- Material data and material type are not included in LS-DYNA's output files, but are passed to D3PLOT by the ztf file that can be written by Primer.





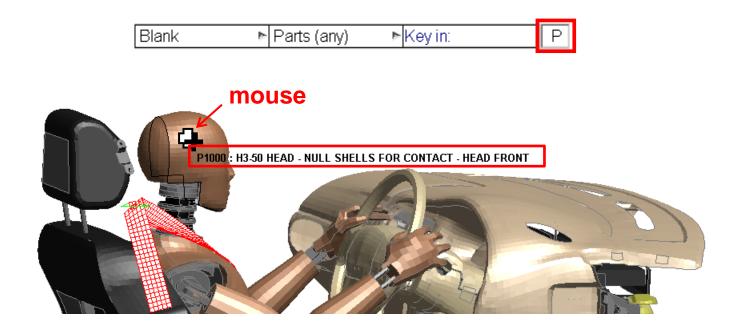


Quick-pick: Predictive Picking

S-DYNA ENVIRONMENT



- D3Plot highlights and labels the entity that will be selected if the user clicks the mouse. This is called "predictive picking".
- Predictive picking may be toggled on/off using the 'P' button, or using new keyboard shortcut P.



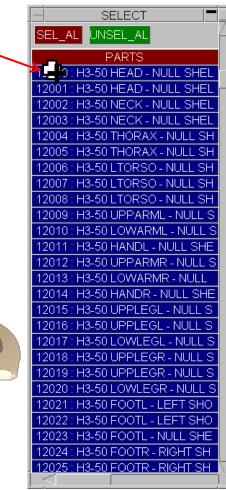
Quick-pick: Predictive Picking



mouse

• The same Predictive Picking sketch/label occurs when the user hovers over an entity in an Selection Menu





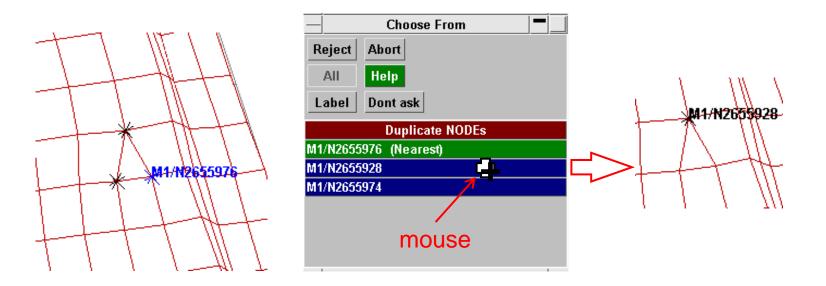




Quick-pick: Predictive Picking



• When a screen-pick is ambiguous, D3Plot highlights the closest entity (default selection) in blue. Hovering over an entity in the ambiguous menu causes that entity to be sketched.

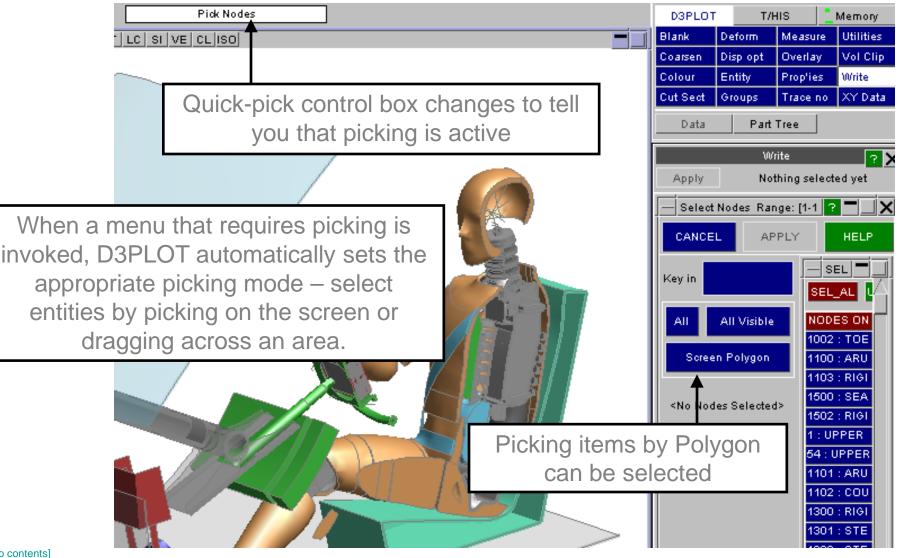






Picking Items





[back to contents]

S-DYNA ENVIRONMENT

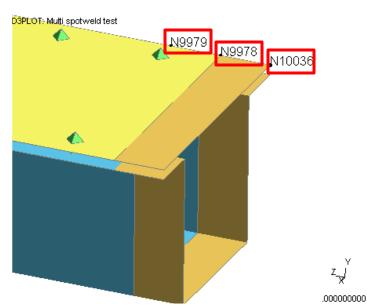
Annotation of Picked Entities

• In menus where items are picked interactively the entities are automatically labelled as they are picked.

	Pick & Select Options 🛛 📪 🗙
	Save settings to oa_pref file
	Ambiguous pick menu
	OFF Always choose close Explain
	ON Show menu of nearest
	Predictive picking
	Not active Explain
	☐ Sketch item(s)
	Sketch & label item(s)
	Area picking
	ALL (incl internal) Explain
	EXT (visible only)
	Label picked items
	OFF (pick symbol only) Explain
	□ ON (pick symbol & label)
	Selection menu hover
	□ Not active Explain
	□ Sketch item(s)
	Sketch & label item(s)
[back to conten	<u>IS</u>

6

-DYNA ENVIRONMENT

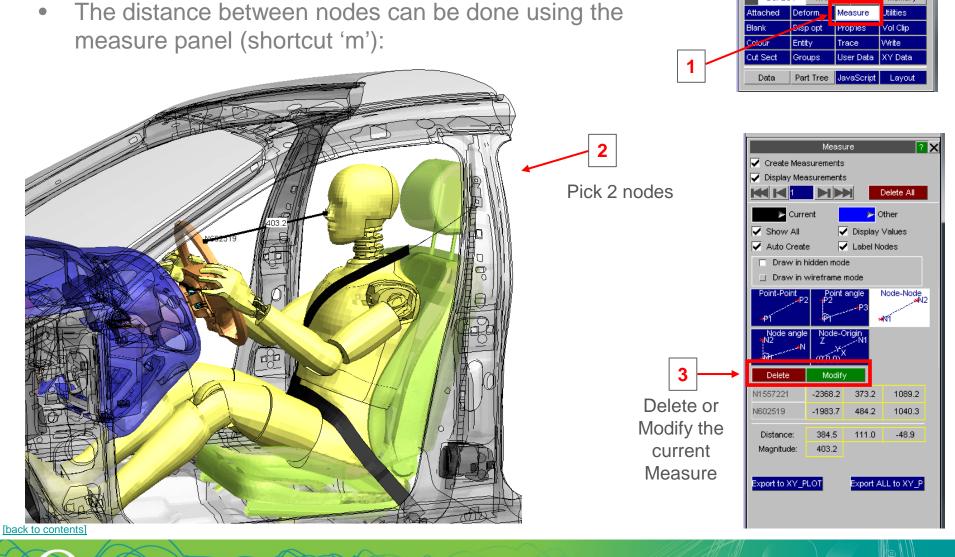


• This behaviour can be turned off in the new Pick & Select Options menu and set via a preference option.

File	Window	Tools	Display	Images	Viewing	Options Help Find	
- W	1					Pick & Select opts	
	_					Screen refresh	⊳
						Expand menus	⊳
						Edit prefs	
						Menu attributes	
						Vertical sync	⊳
						Shortcuts	







LS-DYNA ENVIRONMENT





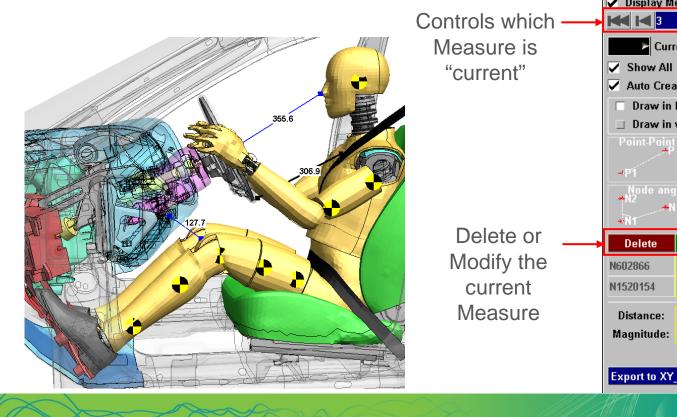
D3PLOT

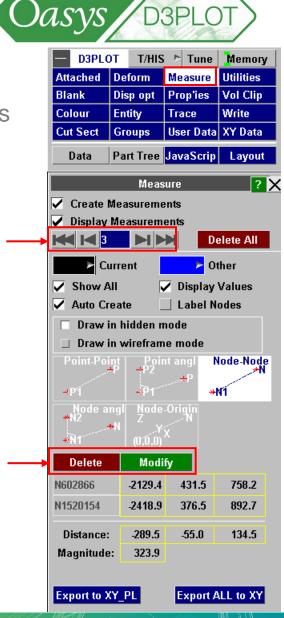
T/HIS 🖻 Tune Memory

[back to contents]

S-DYNA ENVIRONMENT

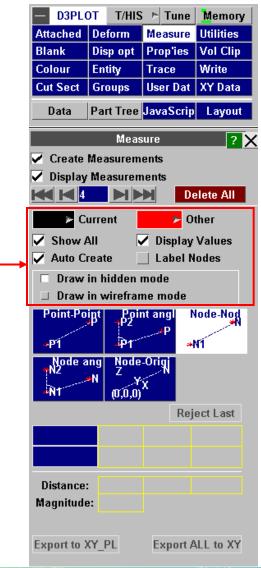
- Up to 100 "measures" may be defined. Each time the user clicks on another pair of nodes, a new "measure" is created.
- The panel shows the status of the "current" measure, which is drawn in a thick black line.



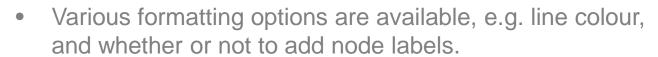


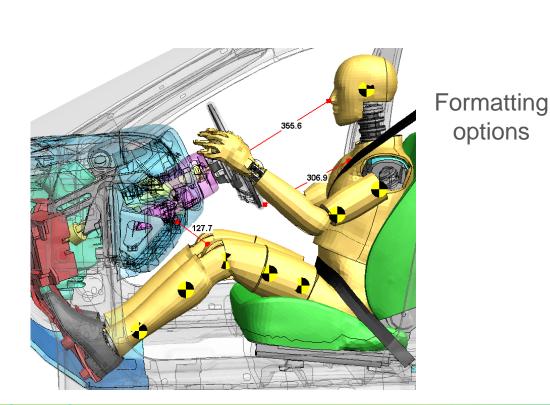
AR







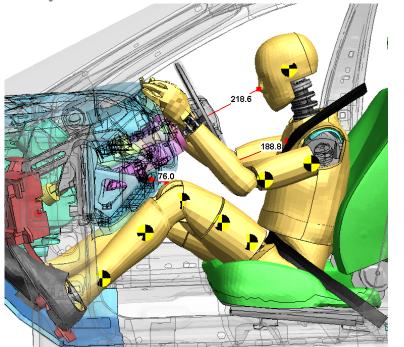




[back to contents]

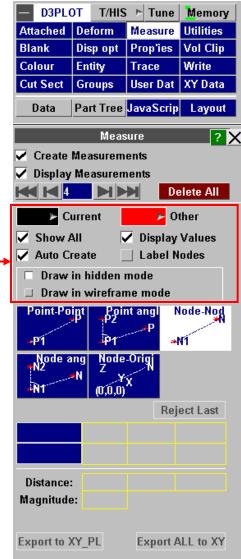
LS-DYNA ENVIRONMENT

- The "measure"s remain visible until deleted.
- The measurement data (distance) is updated automatically when a different time-state is loaded.
- To remove all the "measure"s from the screen, press Delete All in the Measure menu, or press the Delete key on the keyboard.



S-DYNA ENVIRONMENT

Oasys D3PLOT



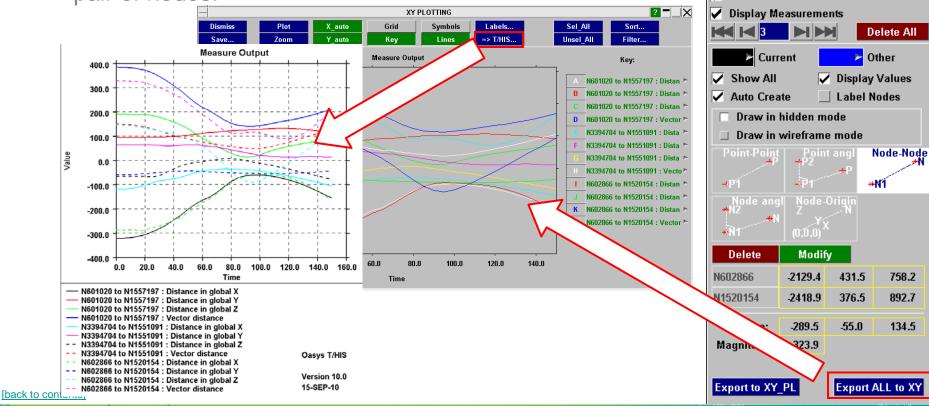
Formatting

options



- The measurements can be exported as time-histories to T/HIS via XY_DATA.
- Separate curves are written for difference in X, Y, and Zcoordinates, and distance magnitude: 4 curves for each pair of nodes.

S-DYNA ENVIRONMENT





Oasys

D3PLOT

Deform

Disp opt

Entity

Create Measurements

Groups

Attached

Blank

Colour

Cut Sect

Data

D3PI C

T/HIS 🖻 Tune Memory

Utilities

Vol Clip

Layout

? X

Write

User Data XY Data

Measure

Prop'ies

Тгасе

Part Tree JavaScrip

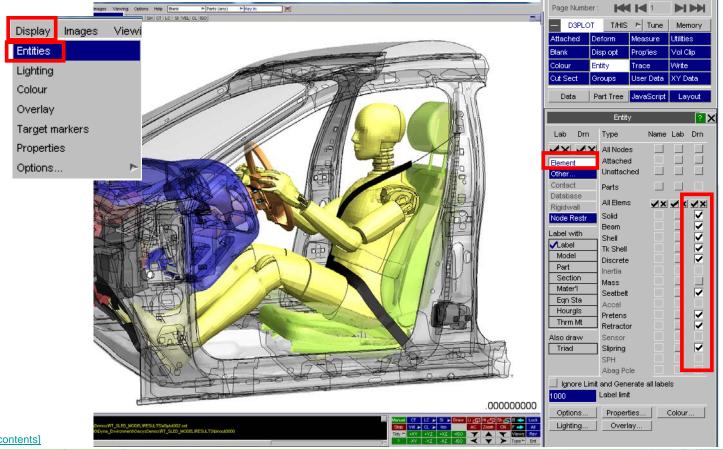
Measure

Displaying entities



AR

 To control what entities are displayed, select "Display"->"Entities" and in the panel that opens tick on/off entities – by default all elements are displayed (except mass elements):





LS-DYNA ENVIRONMENT

Displaying entities

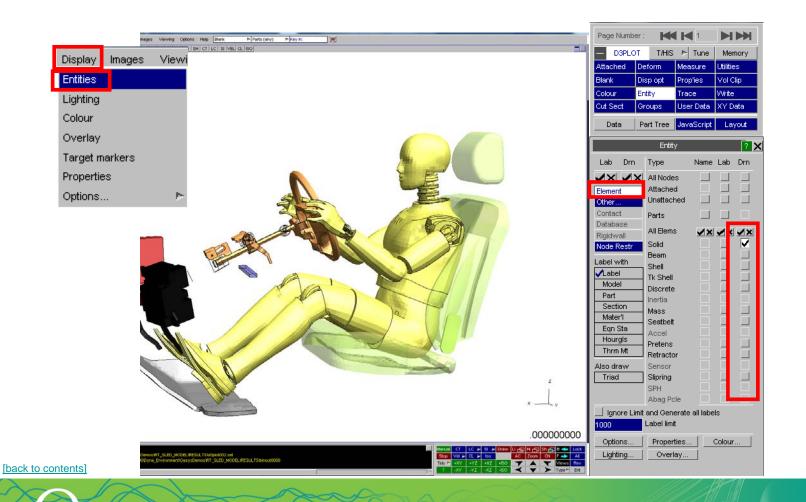
LS-DYNA ENVIRONMENT



•

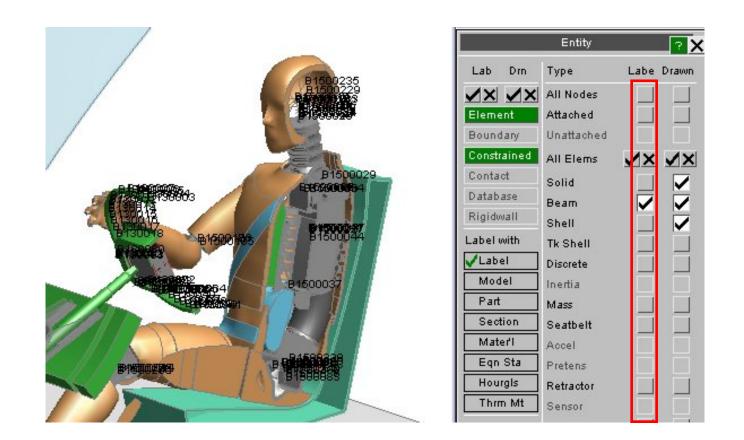
AR

• For example, here only the solid elements are displayed:





• STATIC labels (labels drawn on all visible entities of the selected type) are now switched on/off in the ENTITY panel (shortcut E)









 In addition to displaying entity labels, any names defined in the keyword file for the following can also be displayed using information in the ZTF file created by PRIMER.

Parts

Nodes(*DATABASE_HISTORY_NODE_ID) Elements (*DATABASE_HISTORY..._ID) Joints (*CONSTRAINED_JOINT_ID) RigidWalls (*RIGIDWALL_..._ID)



S-DYNA ENVIRONMENT

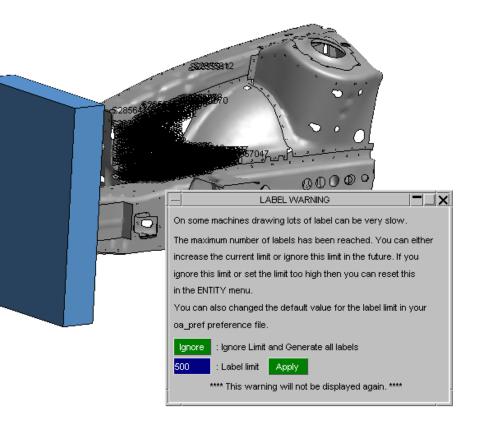
	Entity			? X
Lab Drn	Туре	Name	Lab	Drn
×× ××	All Nodes			
Element	Attached			
Other	Unattached			
Contact	Parts			
Database Rigidwall	All Elems	√ ×	∕l×I	√ ×
Node Restr	Solid			
	Beam			
Label with	Shell			V
✓Label	Tk Shell			
Model	Discrete			\checkmark
Part	Inertia			
Section	Mass		Ē.	
Mater'l	Seatbelt	H	П	
Eqn Sta	Accel	Ы	П	
Hourgis	Pretens	Ы	П	
Thrm Mt	Retractor			>
Also draw	Sensor			
Triad	Slipring			\checkmark
	SPH			
	Abag Pole			





- If node or element labels are switched on, drawing the whole model becomes very slow and the labels obscure the model.
- The maximum number of labels drawn can be controlled.
 A limiting number can be set either interactively or via a preference.

-DYNA ENVIRONMENT

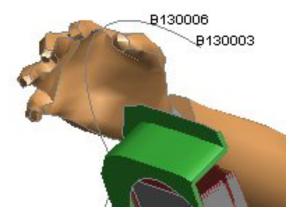




- DYNAMIC labels (labels drawn on screen-picked items) are activated via Quick-Pick
- Use key-in box in Quick-pick control to identify an entity by label in the graphics window
- Use key-in box in Quick-pick control to identify an entity by label in the graphics window

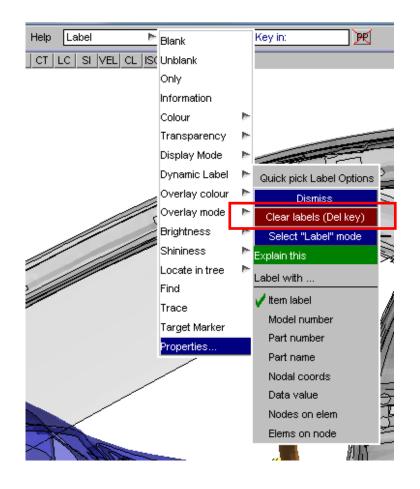
S-DYNA ENVIRONMENT

Label	🏲 Beams	🕨 Key in:
LC SI VE	CL ISO	





- Use drop-down to control what information is written when labelling
- Labels now stay drawn during animation and re-drawing, until the Clear Labels button is clicked (or the Del key is pressed).





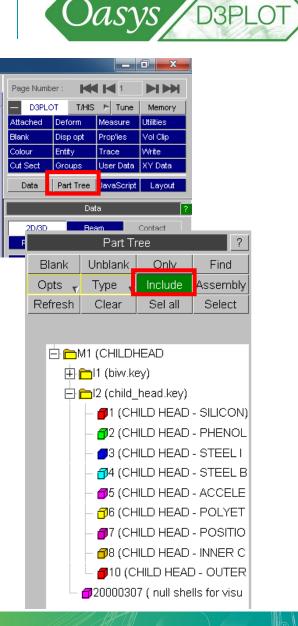


Part Tree

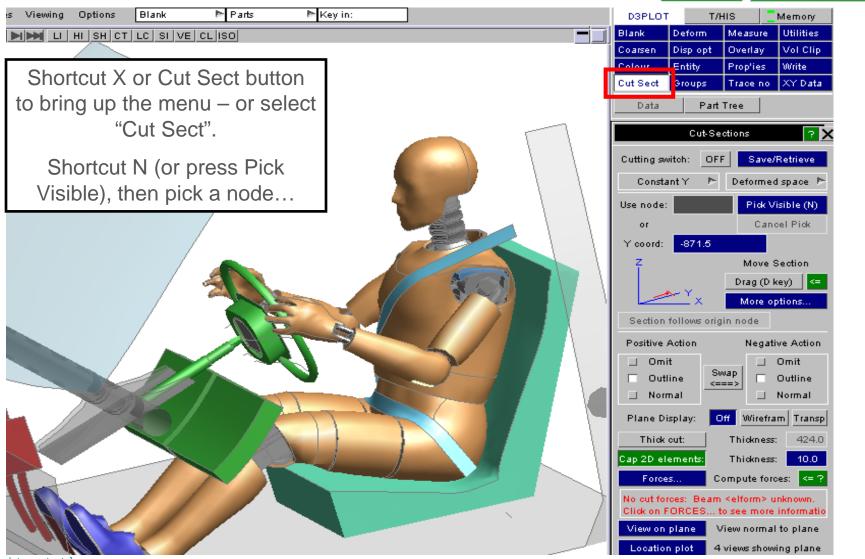
- Part Tree is available as in Primer used for blanking and modifying properties of parts.
- INCLUDE file and/or Assembly structure is not in LS-DYNA's output files, but can be made available to D3PLOT using the ztf file written by Primer. This happens automatically in batch mode when submitting LS-DYNA through the Oasys shell. If submitting LS-DYNA by another means, you can create a ztf file
 - Either run Primer, Model=>Utilities=>Write ZTF

S-DYNA ENVIRONMENT

 Or modify your LS-DYNA submission script to include ZTF file generation automatically – Oasys or your local Oasys distributor can advise.



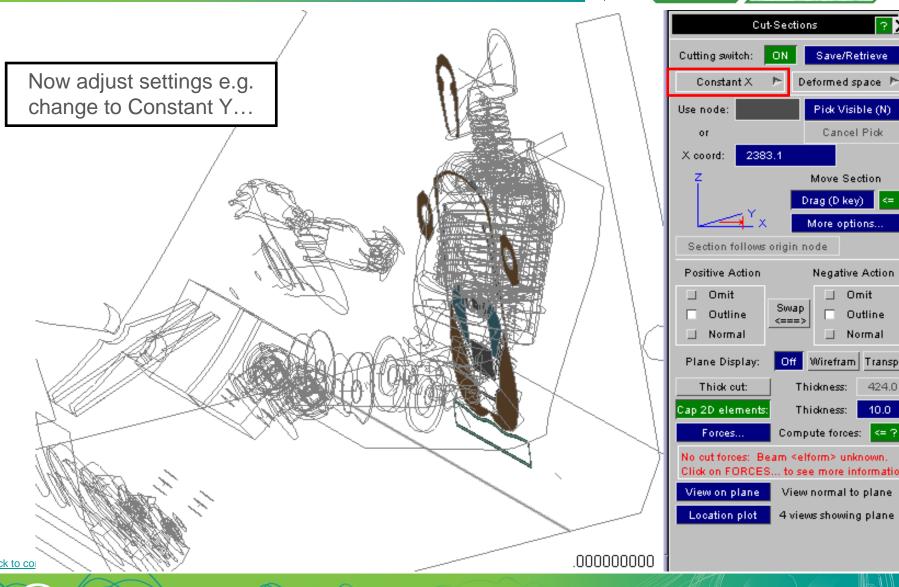




Oasys / D3PLOT

AR





+ ARUP

Oasys / D3PLOT

? X

Save/Retrieve

Deformed space 🖻

Pick Visible (N)

Cancel Pick

Move Section Drag (Dikey) More options...

Negative Action

Omit

Normal

Wirefram Transp

Thickness:

Thickness:

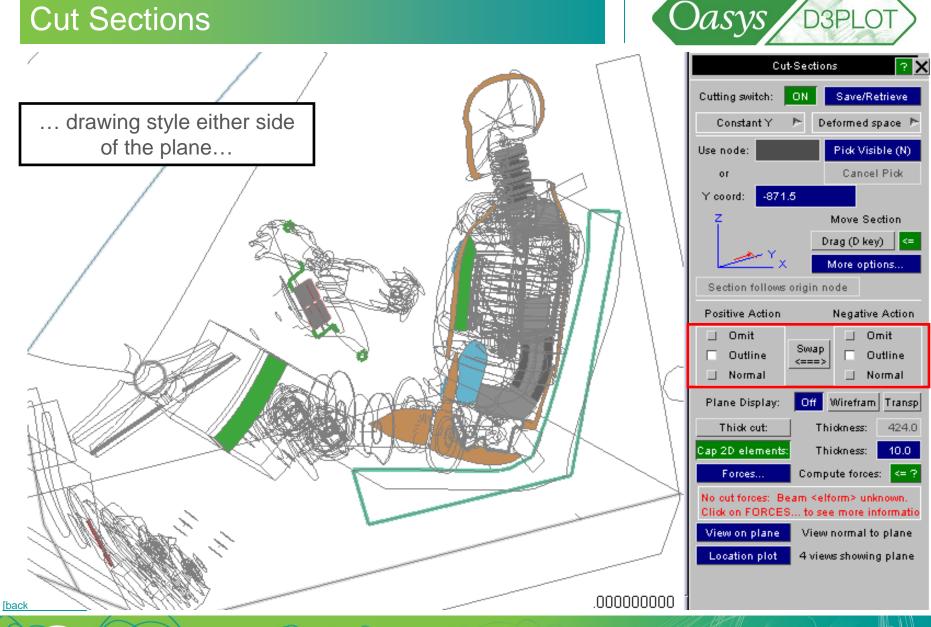
Outline

424.0

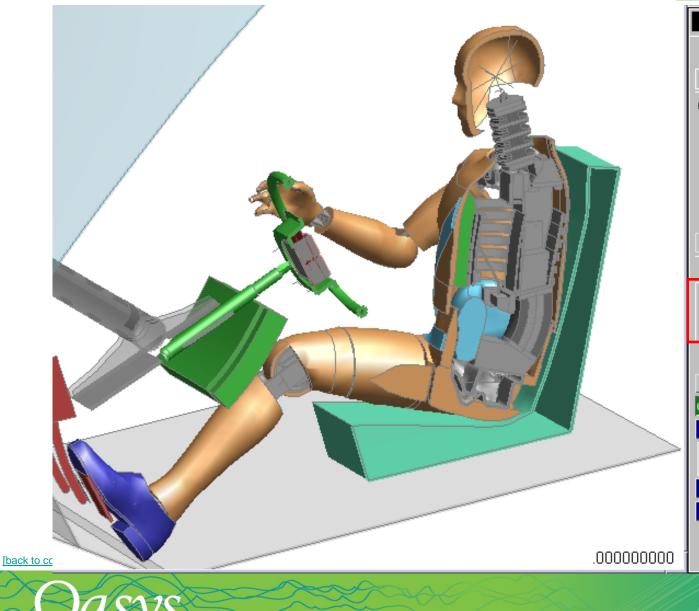
10.0

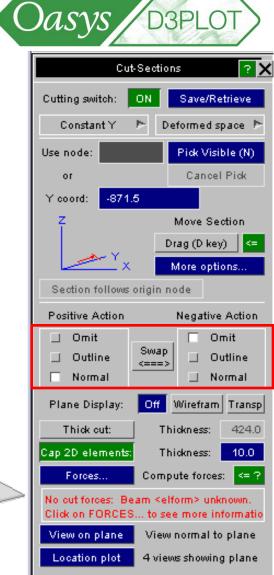
<= ?

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At any time, press D then use mouse to drag section through the model:

Left mouse = translate

Middle & right mouse: rotate

Can also choose a new point with shortcut N then pick a node.







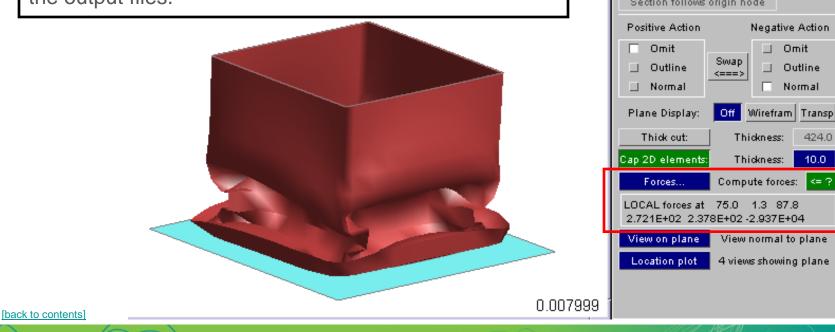
Cut	-Sections 📪 🗙
Cutting switch:	ON Save/Retrieve
Constant Y	🖻 Deformed space 🆻
Use node:	Pick Visible (N)
10	Cancel Pick
Y coord: -914.	0
Z	Move Section
	Drag (D key) <=
X	More options
Section follows	origin node
Positive Action	Negative Action
🗌 Omit	Swap o w
□ Outline	<===> Outline
Normal	
Plane Display:	Off Wirefram Transp
Thick out:	Thickness: 424.0
Cap 2D elements:	Thickness: 10.0
Forces	Compute forces: <= ?
	am <elform> unknown. to see more informatio</elform>
View on plane	View normal to plane
Location plot	4 views showing plane

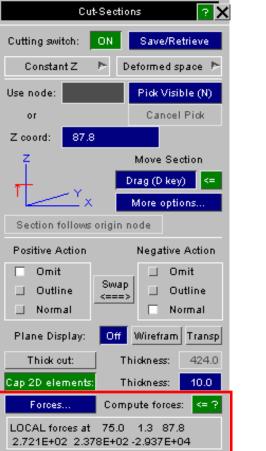
ARUF

Instant output of section forces. The forces change as you drag the section through the model.

If the model contains beam elements, this feature is unavailable until you first press Forces and tell D3PLOT what type of beams are present – the beam forces will contribute to the section force, and different types of beam use different sign conventions for shear force in the output files.

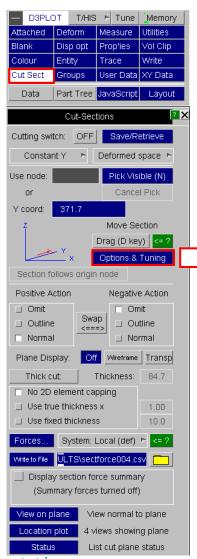
S-DYNA ENVIRONMENT





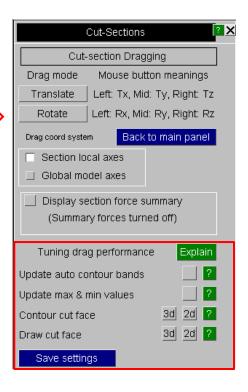
Oasys,





S-DYNA ENVIRONMENT

The dragging of cut sections through big models while displaying contours can be speeded up using the "Options & Tuning" panel.



Available options include :

- Update auto contour bands
- Update max and min values
- Draw the contours on the cut face
- Draw the cut face

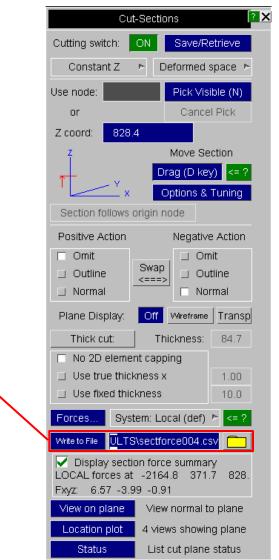
• The settings can be saved as preferences in the oa_pref file.



 Cut section forces and moments can be written to a csv file:

M1/W1: Cut-plane force and moment output at time, 4.99950E+00 PART, Fx, Fy, Fz, Mxx, Myy, Mzz 800, -7.9010E-03, 3.1136E-02, 1.7722E-01, 1.2989E+02, -1.8429E-01, 4.1719E+00, 801, -5.3758E-03, 2.7748E-03, 3.2521E-02, 1.7323E+01, 6.3289E+00, 3.9410E+00, 802, 3.5208E-02, 1.6776E-02, -2.7701E-02, -4.2919E+00, -1.0906E+01, -8.0308E+00, 804, -1.7741E-04, 3.1860E-05, -9.0481E-05, 1.1861E-03, -3.1389E-02, -2.5036E-02, 810, 1.0578E-02, -3.9736E-04, -7.6691E-02, -5.7626E+01, 1.5117E+01, -8.0408E+00, 2000242, -1.3652E-03, -4.4917E-03, -2.3154E-03, -3.0806E-01, 1.6120E-02, -1.7210E+00, 2000246, 1.2085E-02, 6.4670E-03, 2.2472E-02, 1.1535E+01, -1.6359E+01, -1.5320E+00, 2000252, 9.4278E-03, 3.5153E-04, 3.5429E-03, 7.1106E-01, -3.5469E+00, -1.6143E+00, 2000265, 8.7467E-04, -9.9446E-04, 2.0211E-03, 6.4750E-01, -1.3898E+00, -8.4476E-01, 2000266, -2.9885E-03, -4.8606E-04, 3.7147E-03, 4.9111E-01, -3.1330E+00, -6.8825E-02, Total. -8.0324E-01. 1.0326E-01. -7.9019E-01. -2.3442E+02. 5.9231E+02. 3.1704E+02.



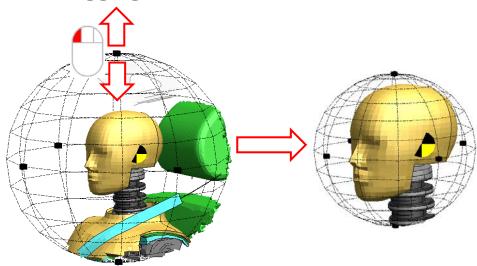


ARUP

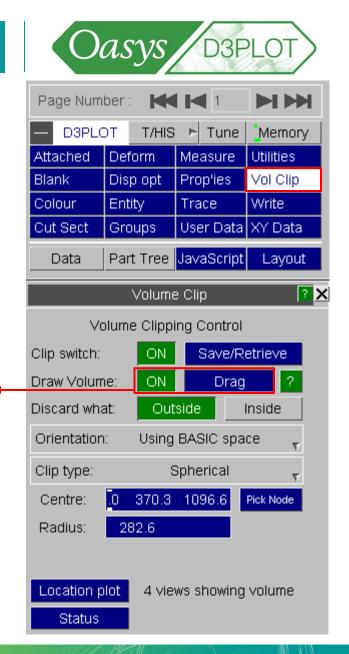
[back to contents]

Volume Clipping

- The Volume Clipping displays just the entities within the specified volume.
- Volumes can be resized by clicking on handles and dragging



- They can be repositioned by clicking in the graphics screen:
 - Translate in the X direction left button
 - Translate in the Y direction middle button
 - Translate in the Z direction right button





[back to contents]

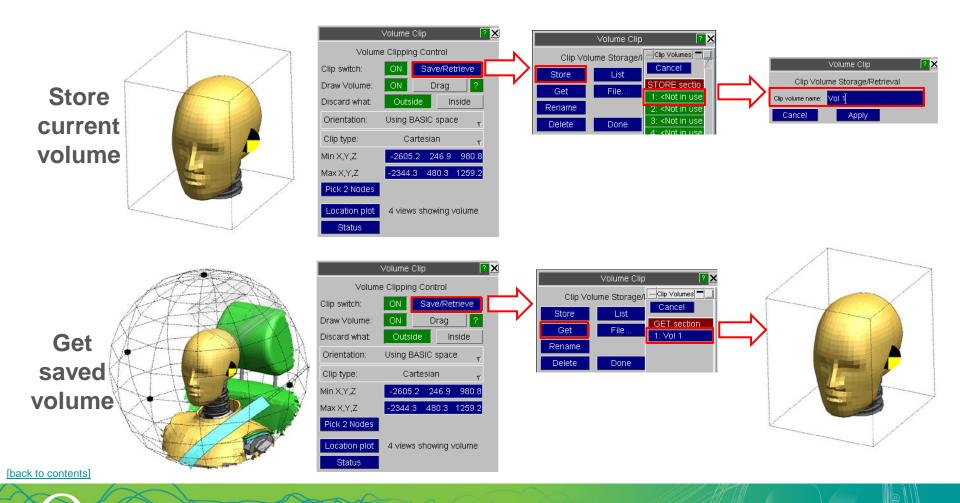
Volume Clipping

S-DYNA ENVIRONMENT



Α

• Volumes can be saved and retrieved in a <volume.clip> file containing the type of volume, orientation and dimensions



Deform functions

- The Deform menu has the following functions:
 - Explode Artificially separates parts by applying "explosion" vectors to them.
 - Magnify Allows scales other than 1.0 to be applied to graphical displacements.
 - Fix node Subtracts the displacement at a node from that at all others, effectively "fixing" it in model space.
 - Shift def Fixes three nodes, forming a local coordinate system, against which all displacements are drawn (see next slides for details).
 - Ref node Makes results relative to those at one or three nodes (see next slides for details).
 - Ref state Makes results relative to a "reference" state in this or another model.
 - Transform Apply translation, reflection, rotation and scale to a model as it is read in.



Page Numb	er:			1	Þ	►
- D3PLC	т	T/HIS	► T	une	Memo	ry
Attached	Det	form	Measure		Utilities	
Blank	Dis	popt	Prop'ies		Vol Clip	
Colour	Ent	ity	Trace		Write	
Cut Sect	Gro	oups	User Data		XY Data	a
Data	Pa	rt Tree	JavaScript		Layo	ut
		Defo	rm			? X
Explode		Fix no	ode R		ef node	
Magnify		Shift	def R		ef state	
Transform		Sta	atus			

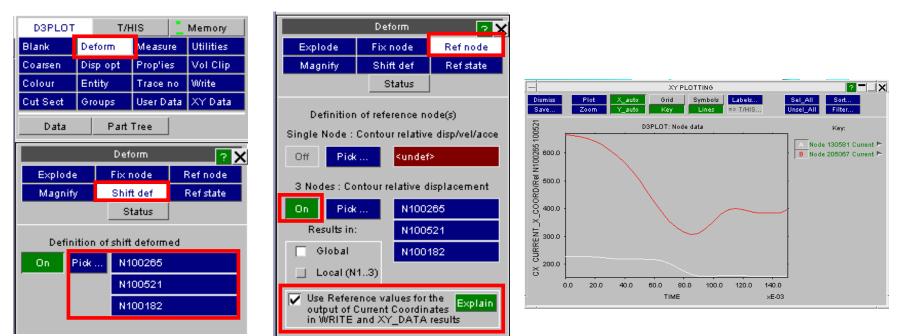


Deform – Shift Def & Ref node

S-DYNA ENVIRONMENT



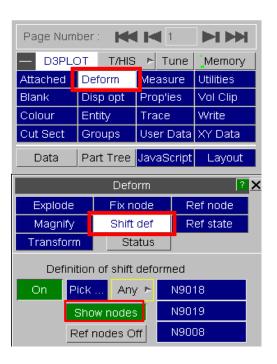
- When using Shift-Deformed reference system, D3PLOT can contour and output <u>displacements</u> relative to the local coordinate system (using Deform=>Ref node).
- D3PLOT can also output current <u>coordinates</u> (using WRITE, XY_DATA) in the local coordinate system. This option is switched on in the Deform=>Ref node menu.



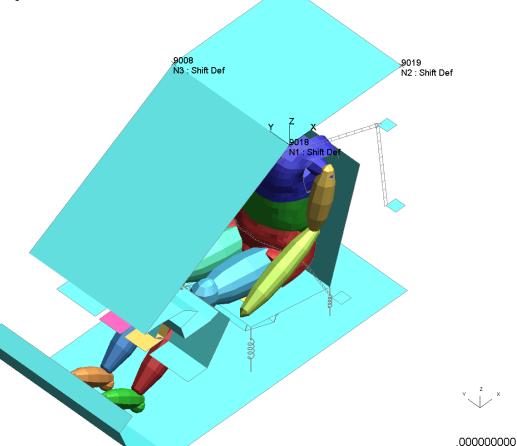
Deform – Shift Def Coordinate System



• The three nodes selected for Shift Deformed, and the local coordinate system, may now be displayed.



D3PLOT: Ig09 : Large Test 9: Belted sled test







Display options

• Display Options controls the appearance of each plot and many of the items drawn on each plot.

Element Switches

• These options control the display of back and internal faces of 3D elements and the display of element triads showing the local element axes.

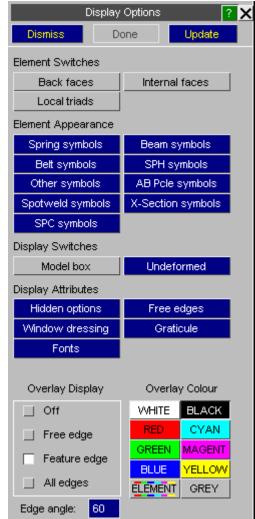
Element Appearance

• These options control how a number of different element types are drawn. Some types have alternate symbols while others have options to control their sizes.

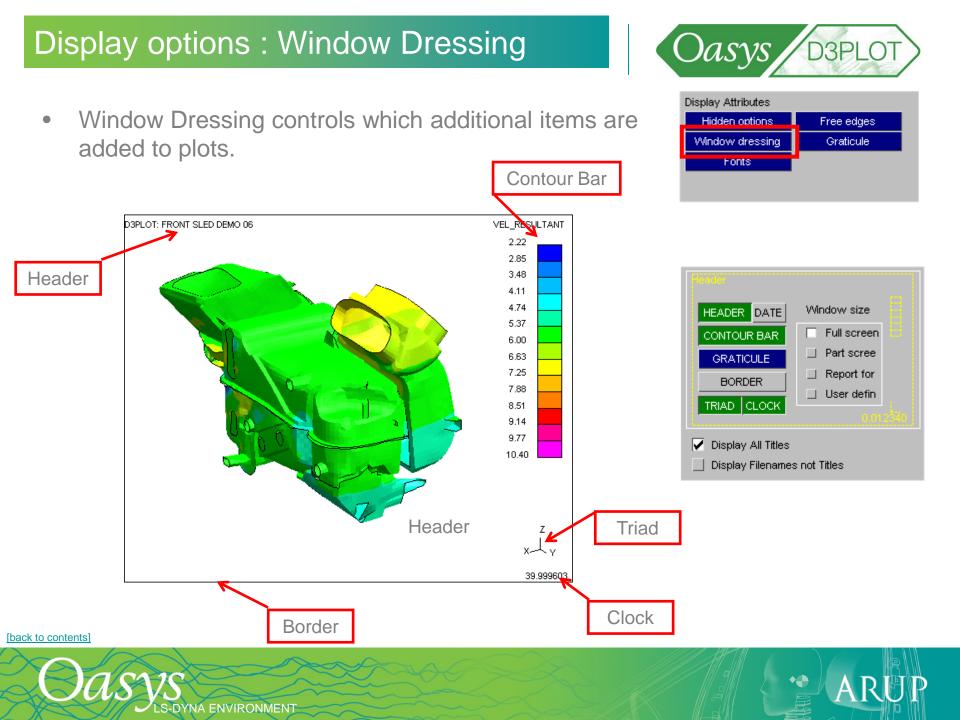
Display Switches

• These options can be used to display a box around the model and to display a models undeformed geometry.



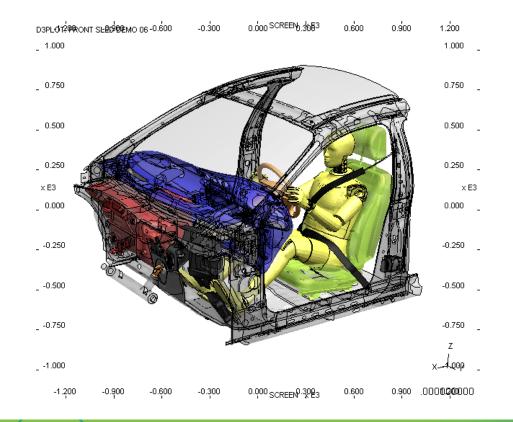


[back to contents]



Display Options : Graticule

- The Graticule Option can be used to display the current model dimensions.
- In 2D mode the graticule shows either model space or screen space depending on the view







Graticule Options							
	2D Graticule3D Graticule			ld Gi	rid		
🖌 X=	-325	0.0	X tick	Auto	D		
🖌 Y=	125	0.0	Y tick	Auto	D		
🖌 Z=	0.0		Z tick	Auto	D		
-3250.	0	Xmin	-750.0		Xmax		
-1250.	0	Ymin	1250.0		Ymax		
0.0		Zmin	1600.0	Zmax			
Number	Form	at Au	tomatic 🔻				
Exponer	nt	3		Ī			
Decimal	Place	is 3					
	Gratic	ule Plane	Colour				
Þ	Line C	Colour	E T	ext (Colour		
	9	% Transp	arency				
				10	10		

[back to contents]

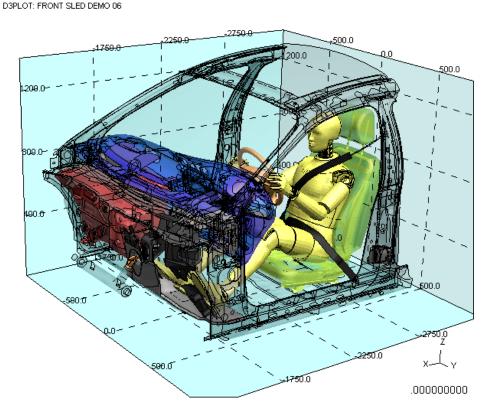
Display Options : Graticule

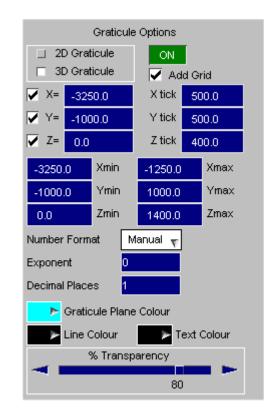
S-DYNA ENVIRONMENT

• In 3D mode the size and location of each plane can be set along with the grid spacing along each axis.









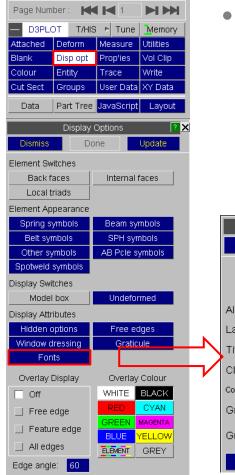


Display Options : Fonts

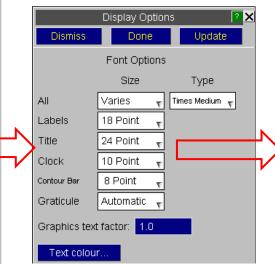
S-DYNA ENVIRONMENT

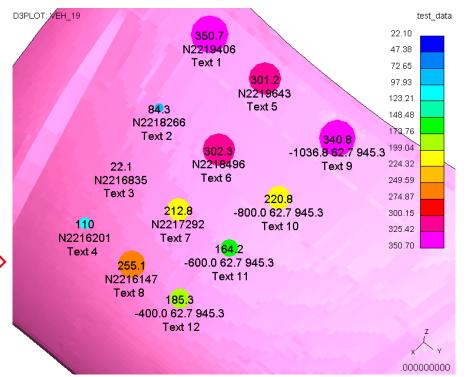


Α



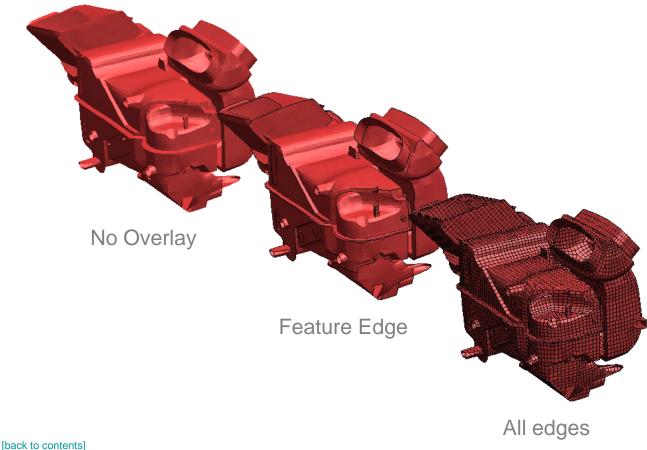
- Set text font size for
 - Labels
 - Title
 - Clock
 - Contour Bar
 - Graticule





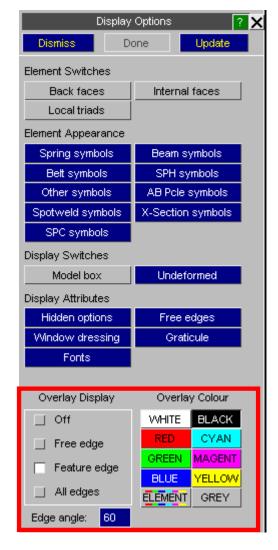
Display options: Element overlay

• The Overlay Options control how the hidden line overlay is drawn along with the colour used for the overlay (shortcut 'Y' cycles no/free/all overlay)



S-DYNA ENVIRONMENT





AR

Multiple Models / Windows



- D3PLOT can accept up to 32 models simultaneously, subject to memory limit on your computer.
- To open a new model use the "File" menu.

File Window Tools	Display Images	Viewing Options				
Open new model		IN HISHC				
Close model	BASE T = 1.50)				
Rescan model		,				
Reread model						
Page setup	-	<u> </u>		OPEN PLOT FILE		
Print		Cancel (Re)Read	Memory			
		Open : Single Model	Ŧ	Open as model: M2	🗸 Auto Oper	
Settings file		Filename : E:\test\spotwelds8\spotwe	lds8.ptf	File filter	*.ptf 🕨	Read Optio
Memory		Use Template File				N(o) Title swa
Status		Read Additional Files				Open Mode
Command file		Settings file (.set)				Next
Exit		Property file (.prp)				□vvi
	1	 Ascii groups file (.asc) Add'l data (.ztf) Create if req'd 	E:\test\spotwelds8\spot	welds8.ztf	╶╴╞╧╢	
		Contact segments & data (.ctf)				
		Springs, masses, joints, etc (.xtf)				
		🗸 🗸 Spotweld, SPC etc data (LSDA)				





Multiple Models / Windows

[back to contents]

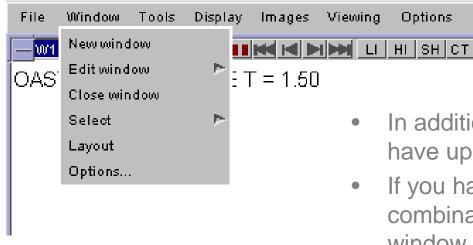


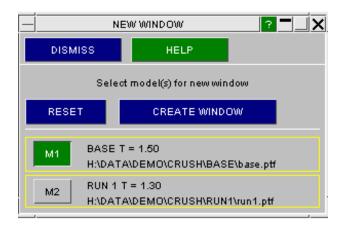
	OPEN PLOT FILE	? - _ X
Cancel (Re)Read Open : Single Model	Memory ▼ Open as model : M2 ▼ Auto Open	
Filename : E: ttest\spotwelds8\spotweld	Auto Family size (MB):	5 File skip:
Read Additional Files Settings file (.set) Property file (.prp) Ascii groups file (.asc) Add'I data (.ztf) Create if req'd Contact segments & data (.ctf) Springs, masses, joints, etc (.xtf) Spotweld, SPC etc data (LSDA)	E:\test\spotwelds8\spotwelds8.ztf	

• By default, D3PLOT opens a new window for each new model. This can be changed here when opening each model









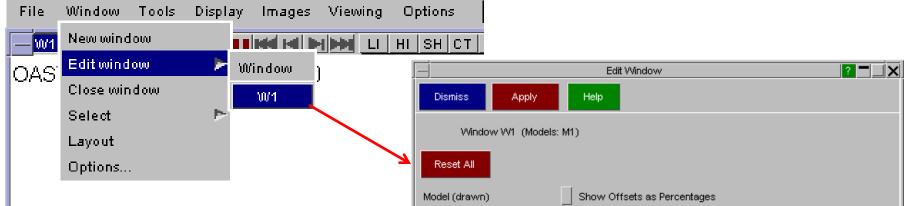
DYNA ENVIRONMENT

- In addition to multiple models D3PLOT can have up to 32 windows simultaneously.
- If you have loaded multiple models, any combination of Models M1, M2... in each window W1, W2, etc is permitted.

 If you have multiple models then when you open a new window, D3PLOT asks which models should be put into it.







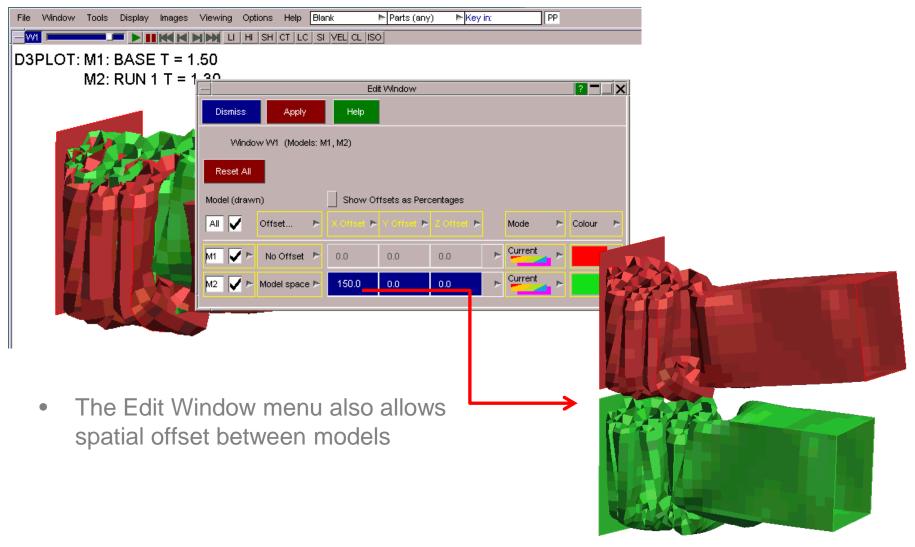
- The Edit Window menu allows the Model/Window combination to be changed
- This menu offers colour by model to help identify models when overlaid

S-DYNA ENVIRONMENT

Dismiss	Apply	Help								
Wind	Window W1 (Models: M1)									
Reset All										
Model (draw	n)	Show Of	ffsets as Perc	entages						
	Offset 🕨	X Offset 🕨	Y Offset 🕨	Z Offset 🕨		Mode	⊳	Colour	•	
M1 🗸 Þ	No Offset 🕨	0.0	0.0	0.0	⊳	Current	٨	Def	۲	
M2 🗸 Þ	Screen spac 🖻	0.0	0.0	0.0	⊳	Wire	⊳		⊳	
мз 🗌 Þ	No Offset D	0.0	0.0	0.0	⊳	Current		Def		

Multiple Models / Windows

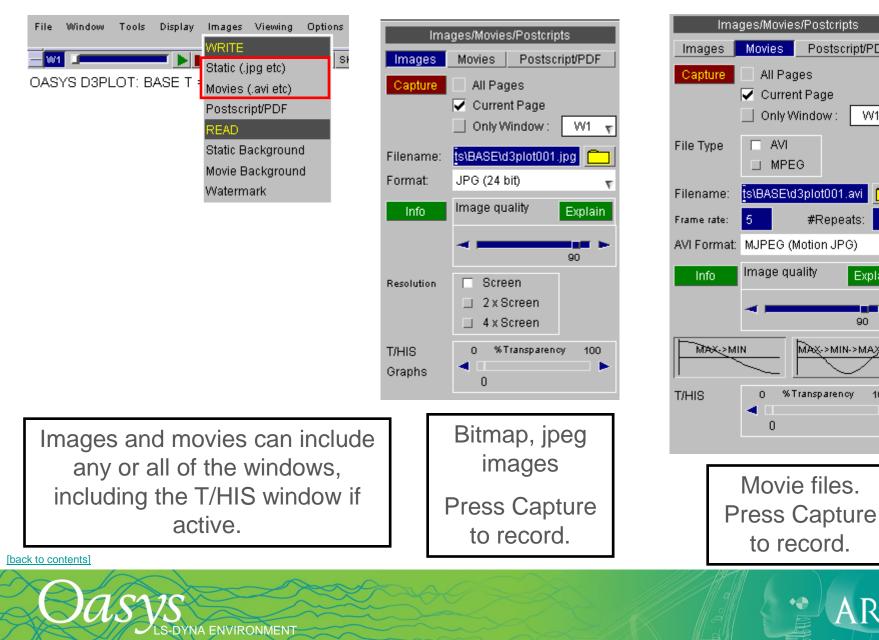




[back to contents]



Image and movie output





AVI

Postscript/PDF

#Repeats:

W1 ∇

Explain

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MA&->MIN->MAX/

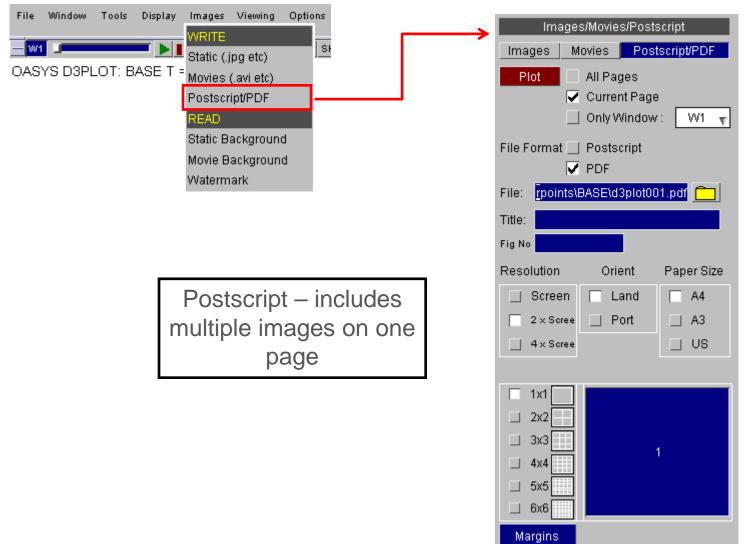
%Transparency

Ω

Image and movie output

LS-DYNA ENVIRONMENT







Shortcuts - customising

DYNA ENVIRONMENT

• Shortcuts are customisable and can be saved to different keys.

• Set the keys in the shortcuts menu accessed through Options (see menu on next slide).



Images Viewing	Options Blank	Þ
	Area Pick	►
	Screen refresh	
	Expand menus	►
	Edit prefs	
	Menu attributes	
_	Vertical sync	
	Shortcuts	

A

Shortcuts - customising



			Progra	mmable Shortcut Keys			?	×		
		references Dismi	ss		hortcut	Javascr	ipt			
Relo	ad Preferences Clea	ar All		C	ommand F	ïle				_
	Save setup in		0 Export vie 1 +XY view	W	,	Clear Command files	Measure menu ► Part Tree		+XZ view +ISO view	
l h	nome oa_pref file	4	2 +YZ view		,	Javascripts	Preferences menu		-XY view	
		~	3 +XZ view		,	Restart Quick Pick	Properties menu		-YZ view	
F5					,	Autoscale	Settings File menu		-XZ view	
F6		lav	ascripts	and	,	Zoom	Shortcut menu		-ISO view	
F7					,	Zoom in	Target Marker menu		Export view	
F8		Comr	nand File	es can	,	Zoom out	Trace Nodes menu		Lock toggle	
F9		be as	signed to	o kevs	,	Blanking menu	User defined components	menu	Centre toggle	
F10	P:\oasys94\d3plot_librscripts\failure_pl	lot.js	eignea t	s noje	,	Unblank all	Utilities menu		Cycle View Back	
F11	P:\oasys94\d3plot_libscripts\read_swfe	orc.js 🖻 Sp	ace Toggle ani	imation on/off	1	Reverse all blanking	View menu		Cycle View Fwd	
F12	C:\Models\test1.tcf					Cut sections menu	Visualisation menu		Open Window	
А	C:\Models\test2.tcf	*	a Autoscale			Drag cut plane	Volume Clip menu		Iconise/De-iconise	
в	Blanking menu	K	b 📕 lanking n	nenu		Cut plane node pick	Write menu		Close All	
с	Close All		c Close All		,	Coarsen menu	Read Watermark		Toggle animation on/off	
D	Drag cut plane		d Drag cut p	lane		Colour menu	XY Data menu			
Е	Entities menu			nu	,	Compress PTF menu	Hidden Line Plot			
F	Shaded Contour Plot	Note: Capita	als and	tour Plot		Data components menu	Line mode plot			
G	Open Window	lower case of		w	1	Deform menu	Shaded Plot			
н	Hidden Line Plot			Plot	,	Die Closure menu	Shaded Contour Plot		·	
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к		►	k		,	External Data menu	Vector plot		•	٥p
L	Line mode plot	►	I Line mode	plot		Failure Options menu	Cloud plot		up menu	
М	Measure menu	► 1	m Measure n	nenu		Groups menu	ISO Surface plot			
Ν	Cut plane node pick	►	n Cut plane	node pick		Write Image File	Beam plot			
0	Display Options	►	o Display Op	tions		Read Image File	Principal plot			
Ρ	Properties menu	►	p Properties	menu	,	Javascript menu	Cycle through no/free/all o	overlay		
Q	Restart Quick Pick	►	q Restart Qu	lick Pick		Layout menu	+XY view			
R	Reverse all blanking	►	r Reverse a	ll blanking	1	Lighting menu	+YZ view			
S	Shaded Plot	►	s Shaded Pl	ot	,	}	4			-
т	Close All	~	t Close All		,	~	۲			
U	Unblank all	►	u Unblank al	I	,	-				
۷	View menu	►	v View menu	ı	,	•				
w	Write Image File	•	w Write Imag	je File	,	*				
х	Cut sections menu	•	x Cut sectio	ns menu		h				
Y	Cycle through no/free/all overla	ay 🕨	y Cycle thro	ugh no/free/all overlay	,	•				
z	Zoom	►	z Zoom		,	•		_		



Oasys LS-DYNA ENVIRONMENT

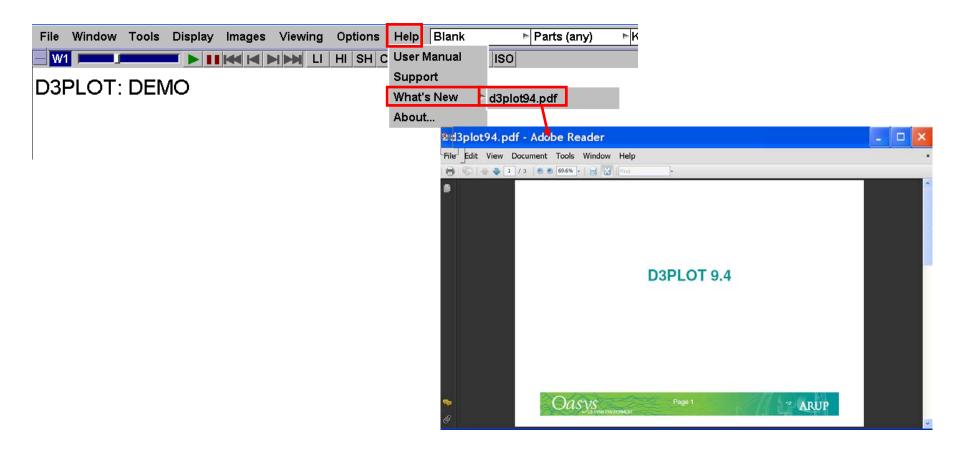
Documentation - What's new?

S-DYNA ENVIRONMENT



Α

 A PDF document describing the latest features can be accessed from within D3PLOT at any time:





Advanced Options

[back to contents]

LS-DYNA ENVIRONMENT

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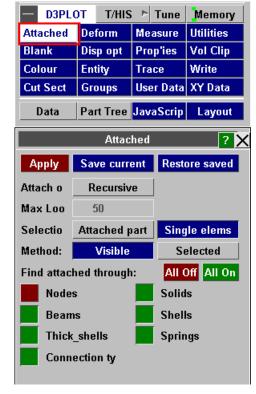
Find Attached

- The Attached menu can be used to find entities that are physically attached together. Each time you press Attached, D3PLOT does the following:
 - Looks at what you want to find attached (beams, shells etc.),
 - Find what is immediately "attached to" what is currently visible.
 - Unblanks these newly found items

NA ENVIRONMENT

- Redraws the image.
- The result is progressively more and more of the model being drawn until nothing attached to what is currently visible (which is not necessarily the whole model) remains to be unblanked and drawn.

NOTE: This is slightly simpler than the Attached function in Primer as it only finds items attached at nodes.

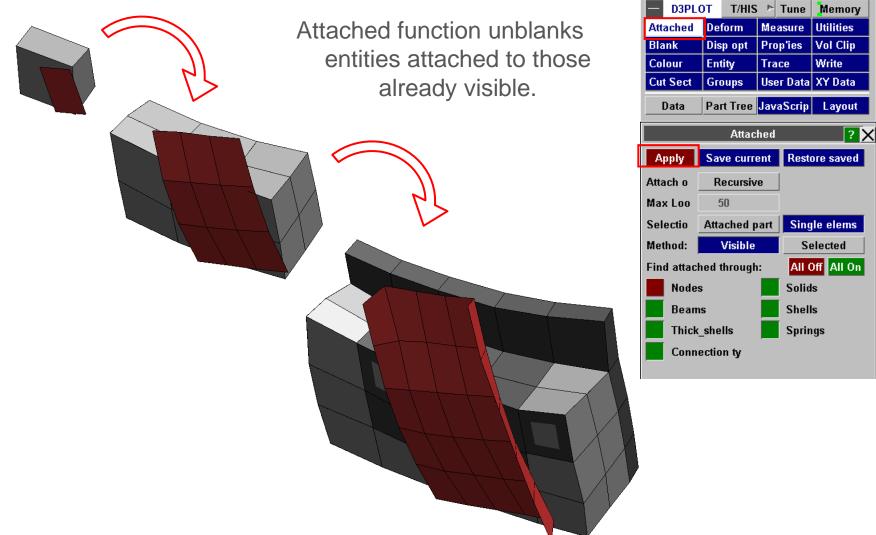


D3PLO1

Oasys

Find Attached



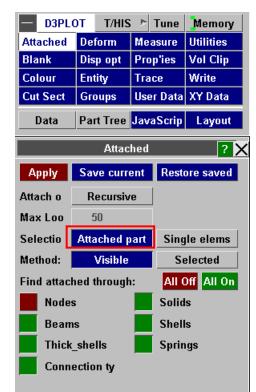






Find Attached





Attached can unblank whole attached parts instead of element-by-element



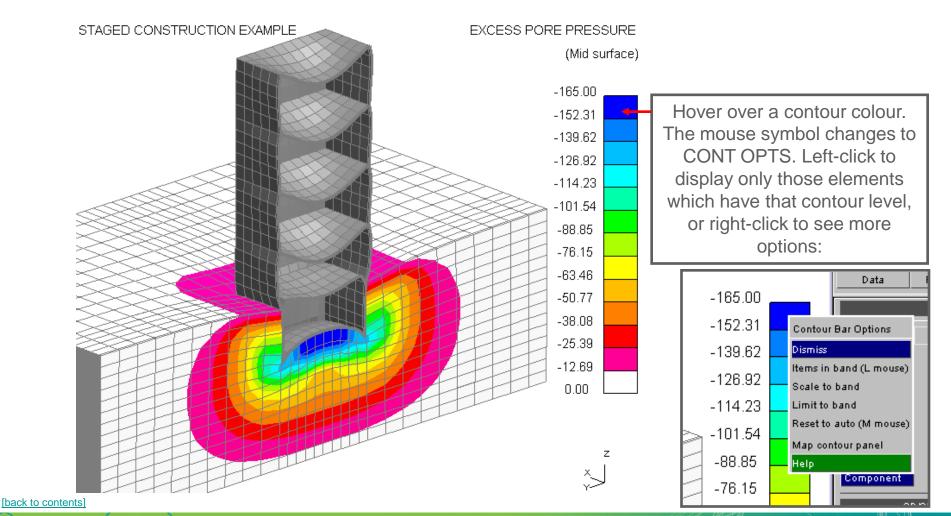


Contour options

S-DYNA ENVIRONMENT



• Finding which elements have a particular contour level:



ARUP

Contour options



• Finding which elements have a particular contour level:

Result of left-click on contour bar: only the elements with that contour level are displayed.

DYNA ENVIRONMENT



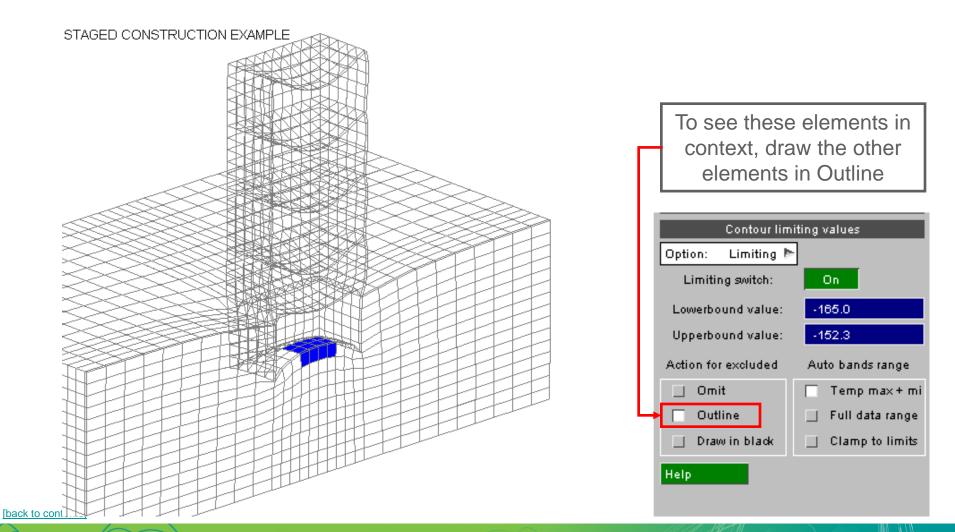
These options use the existing "Limiting Values" capability; this menu appears automatically when you click on a contour bar.

Contour lim	iting values
Option: Limiting 🖻	•]
Limiting switch:	On
Lowerbound value:	-165.0
Upperbound value:	-152.3
Action for excluded	Auto bands range
🗌 Omit	🔲 Temp max + mi
Outline	🔄 🛛 Full data range
🔄 Draw in black	🔲 Clamp to limits
Help	





AR









- D3PLOT allows the creation of groups, which then can be used in a number of menus, including:
 - Quick-pick
 - Blanking
 - Write
 - XY-Data
 - Part tree

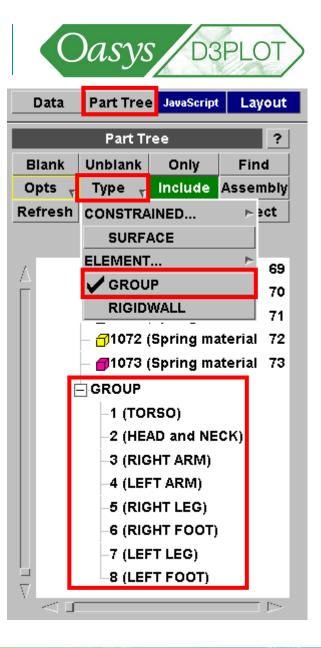
S-DYNA ENVIRONMENT

D3PLC	T/HIS	Þ		Memory	
Blank	Deform	Measure		Utilities	
Coarsen	Disp opt	Prop 'ies		Vol Clip	
Colour	Entity	Trace no		Write	
Cut Sect	Groups	User Data		XY Data	
Data	Part Tree	JavaScript		Layout	l
	Grou	ıps		?	×
Create	Rena	ame		Read	
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Modify	Sav	/e			

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Groups

- Groups can be added to the Part Tree
 - Blanking and visual attributes can be set from here by right-clicking on the group



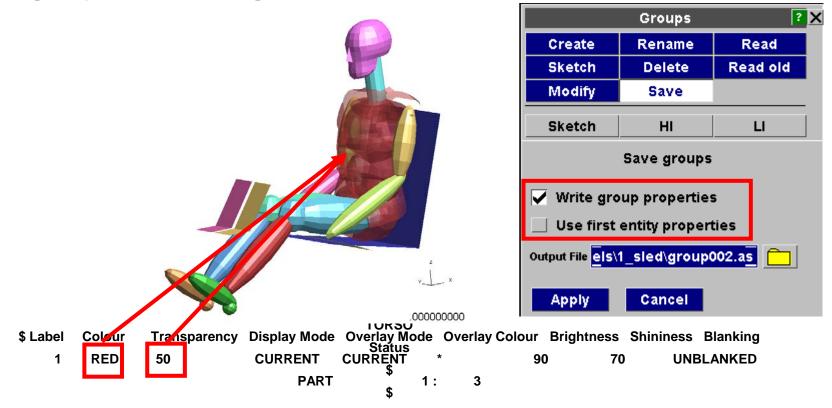








• The visual properties of groups can be written to and read from the groups ascii file, e.g.



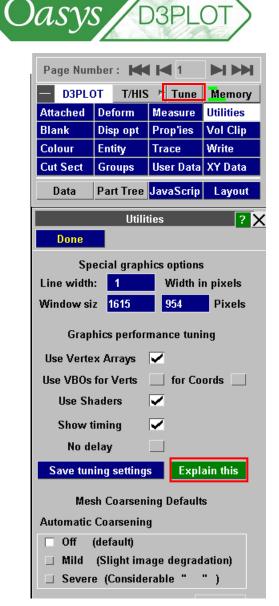
[back to contents]

S-DYNA ENVIRONMENT

Tuning Graphics Performance

DYNA ENVIRONMENT

- D3PLOT can be tuned to take advantage of the capabilities of new graphics cards typically for hardware manufactured from about 2007 onwards.
- Speed of animation of large models can be increased up to 5x or more on some graphics cards
- Instructions for doing this are given in the "Explain this" button.
- After tuning the performance, the settings can be saved to the preference file.





Open models from directory

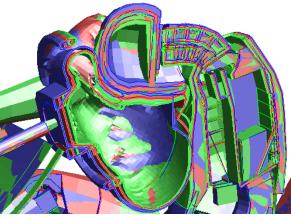
-DYNA ENVIRONMENT



• Open multiple models simultaneously, by browsing for a directory. Any LS-DYNA plot files in that directory or in subdirectories will be found and displayed.

	· · · · · · · · · · · · · · · · · · ·
Cancel Open Model(s) Memory	
Open : Multiple Models (Search Directories) T New Models : Append Model Numbers T	
Directory: Ettest Read Options	
Use Template File	5 File skip:
Read Additional Files Open Models in Window	W
🖌 Settings file (.set) <	new Window
✓ Property file (.prp) < <model dependent="">: ✓ ☐ Open all Models in Wind</model>	dow 1
Ascii groups file (.asc) <	
Add'i data (.ztf) Create if req'd < <model dependent="">:</model>	
Contact segments & data (.ctf)	
✓ Springs, masses, joints, etc (.xtf)	
Spotweld, SPC etc data (LSDA)	
Spotweld, SPC etc data (LSDA)	Date
	Date
✓X Filename	
Filename	Dec 15 10:48:26 2008
Filename Etest\Airbag_test\combined_airbag.ptf Etest\Airbag_test_2\combined_airbag.ptf	Dec 15 10:48:26 2008 Dec 15 10:48:26 2008
Filename EtestVairbag_testVcombined_airbag.ptf EtestVairbag_test_2vcombined_airbag.ptf EtestVairbag_test_2vcombined_airbag.ptf EtestVairbag_test_2vcombined_airbag.ptf EtestVairbag_test_2vcombined_airbag.ptf	Dec 15 10:48:26 2008 Dec 15 10:48:26 2008 Jul 19 09:04:27 2010
Filename EttestVairbag_test/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVbig_ptfV320_lpo1_us_b002_coarse13_rhs_fixed_contact.ptf	Dec 15 10:48:26 2008 Dec 15 10:48:26 2008 Jul 19 09:04:27 2010 Nov 11 12:53:21 2003
Filename EttestVairbag_test/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVbig_ptfV320_lpo1_us_b002_coarse13_rhs_fixed_contact.ptf EttestVbird_A_03WPP_421Vbird_eul_A_03mpp_421.ptf	Dec 15 10:48:26 2008 Dec 15 10:48:26 2008 Jul 19 09:04:27 2010 Nov 11 12:53:21 2003 Jan 24 12:13:51 2011
Filename EttestVairbag_test/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVairbag_test_2/combined_airbag.ptf EttestVbig_tfV320_lpo1_us_b002_coarse13_rhs_fixed_contact.ptf EttestVBird_A_03WPP_421Vbird_eul_A_03mpp_R5p0.ptf	Dec 15 10:48:26 2008 Dec 15 10:48:26 2008 Jul 19 09:04:27 2010 Nov 11 12:53:21 2003 Jan 24 12:13:51 2011 Jan 24 12:13:53 2011

- 1. Select the directory option
- 2. Browse for directory
- 3. Select models
- Decide whether each model should have a separate window
- 5. Press "Open Models"





Opening Models – Model Database

[back to contents]



• Multiple models can be selected from a model database.

	_		OPEN PLOT FILE		
	Cancel Open Model(s)	Memory			
1	Open : Select models from Databa	ase T	New Models :	Append Mode	el Numbers 🛛 🔻
2	Database E:\test\model_database_te	xt.xml		Open	Read Op Auto Family
	Use Template File				N(o) Title sv
	Read Additional Files				Open Mo
	Settings file (.set)	< <model dependent="">></model>		- C	🔽 Open ead
	Property file (.prp)	< <model dependent="">></model>		🚽 🗀 🚽	Open all I
	🔽 Ascii groups file (.asc)	< <model dependent="">></model>		🚽 🗀 🚽	
	🔽 Add'l data (.ztf) 🔄 Create if req'd	< <model dependent="">></model>		🚽 💼 👘	
	🔽 Contact segments & data (.ctf)				
	Springs, masses, joints, etc (.xtf)				
	Spotweld, SPC etc data (LSDA)				
	Δ				

- 1. Select the database option
- 2. Browse for the database file

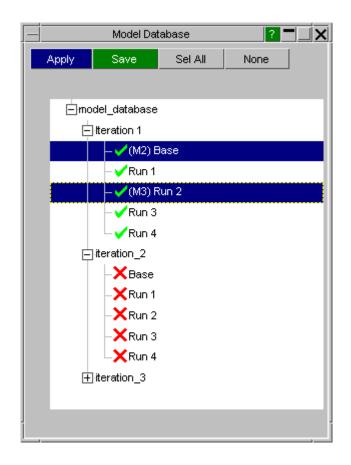
• The same database of models is used for D3PLOT and T/HIS.



Opening Models – Model Database

- After selecting the database a new window will be displayed showing the contents of the database.
- As models are selected they are highlighted. M1, M2, etc indicates the D3PLOT model number after reading in.
- Models that cannot be found are marked with a red cross.
- Entries can be modified and deleted by rightclicking on them.
- New models can be added to the database interactively and the database saved for future use.
- The database file is XML based and can easily be edited by hand.





Opening Models – Template File

DYNA ENVIRONMENT



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• An optional "Template" file can be specified when opening models:

		OPEN PLOT FILE			?
Cancel Open Model(s) Open : Select models from Databa	Memory se	New Models :	Append Mode	I Numbers 🔻	
Database E:\test\model_database_te:	t.xml		Open	Read Options Auto Family size (MB): N(o) Title swap (Y/N): 5 File skip:	
✓ Use Template File E:ttest\d3plot.tpl Read Additional Files ✓ Settings file (.set)	< <model dependent="">></model>			N(o) Title swap (Y/N): 5 File skip: Open Models in Window ✓ Open each Model in a new Window	
 Property file (.prp) Ascii groups file (.asc) Add'l data (.ztf) Create if req'd 	< <model dependent="">> <<model dependent="">> <<model dependent="">></model></model></model>			Open all Models in Window 1	
Contact segments & data (.ctf)	ssimpler dependentaa		1		
Spotweld, SPC etc data (LSDA)					

• The "Template" file controls which window each model is loaded into.

Opening Models – Template File



- All of the options available in the "EDIT Window" menu can be defined in the template file.
- The template file can contain settings for undefined models that are automatically applied after a model is opened.

Help

S-DYNA ENVIRONMENT

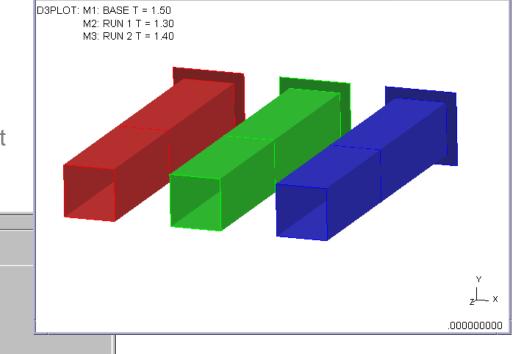
Apply

Window W1 (Models: M1, M2, M3)

Dismiss

[back

Edit Window



l	Reset All								Ĺ		
	Model (drawn	1)		V Show Of	fsets as perc						
		Offset	⊳	X Offset 🕨	Y Offset 🕨	Z Offset 🕨		Mode	⊳	Colour	۲
	M1 🗸 M	Model space	⊳	0	0	0	% Þ	Current	⊳		4
	M2 🗸 Þ	Model space	⊳	150	0	0	% Þ		⊳		٨
	мз 🗸 М	Model space	⊳	300	0	0	% ⊳	Current	⊳		۲

Control of settings and properties

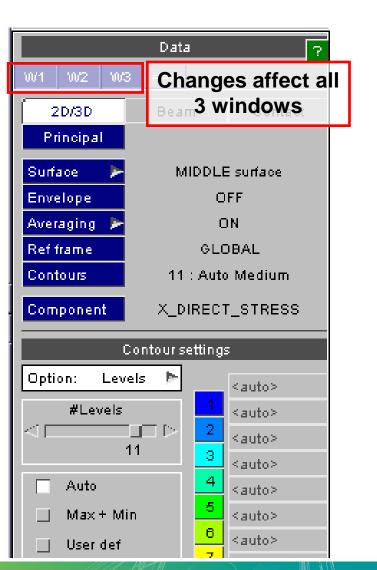
- Some functions operate on a per-window basis. For example, cut sections may be applied to one or more or all windows; similarly for contour components, contour levels, etc.
- These menus have Window Tabs to show which windows should be affected when you work in that menu. Click the tabs to activate/deactivate.

			Data	
W1	W2	W3	==>	Changes affect
2	2D/3D		Beam	only W1
Pr	incipa			
Quef		1	MID	

 Can also deactivate a window by clicking here:

DYNA ENVIRONMENT





[back to contents]



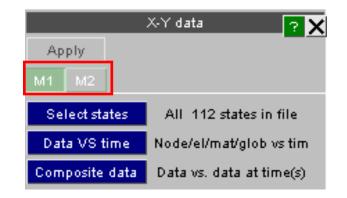
ARUP

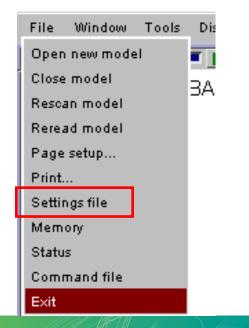
Control of settings and properties

- Colour, transparency and blanking are stored per Model, not per Window. Similarly, output from WRITE and XY_DATA is for a specific model. In these menus the tabs show M1, M2 etc instead of W1, W2. These control which model is being worked on.
- The Settings (non-model-specific, such as window layout, background colour, view, etc) may be saved to a settings file (e.g. d3plot001.set). The model-specific properties (blanking etc) may be saved to a Properties file (modelname001.prp). Both these files may be written or read back in from the File menu.
- Settings/properties files are automatically read in if the same model is read into another session of D3PLOT

DYNA ENVIRONMENT



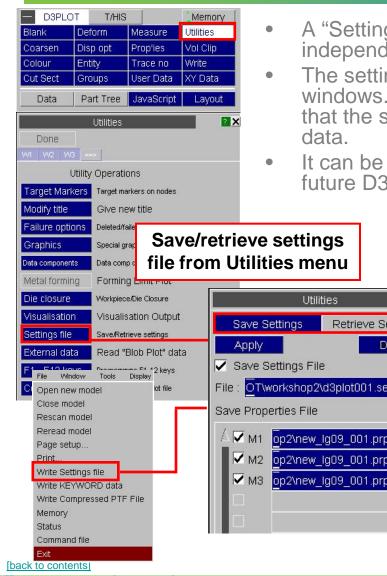






Settings files



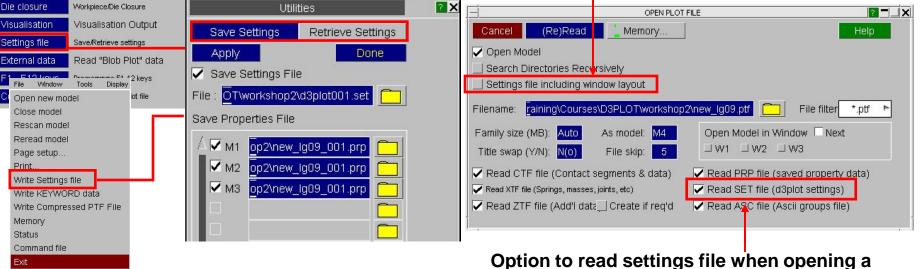


-DYNA ENVIRONMENT

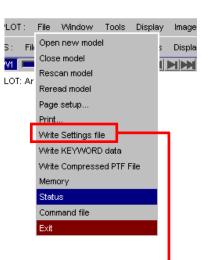
- A "Settings" file can be saved containing all the modelindependent parameters of all the windows in a D3PLOT session.
- The settings file also includes layout and contents of any graph windows. FAST-TCF scripts are included in the settings file so that the same curves may be re-created using different model data.
- It can be used to restore all your settings, views and graphs in a future D3PLOT session.

This option is useful when the settings file references multiple models – the user can browse separately for Model 1, Model 2, etc.

model



Settings files



- A "Settings" file can be saved containing all the modelindependent parameters of all the windows in a D3PLOT session.
- The settings file also includes layout and contents of any graph windows. FAST-TCF scripts are included in the settings file so that the same curves may be re-created using different model data.
- It can be used to restore all your settings, views and graphs in a future D3PLOT session.

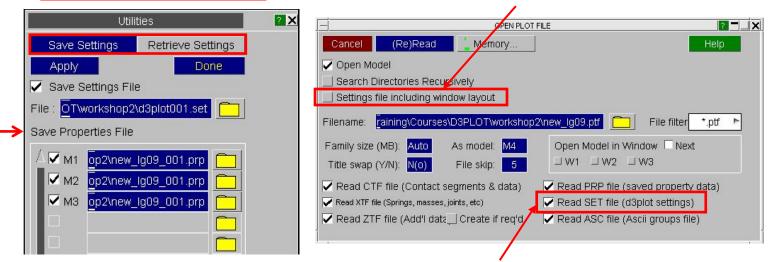
Save/retrieve settings file from Utilities menu

-DYNA ENVIRONMENT

This option is useful when the settings file references multiple models – the user can browse separately for Model 1, Model 2, etc.

Oasys /

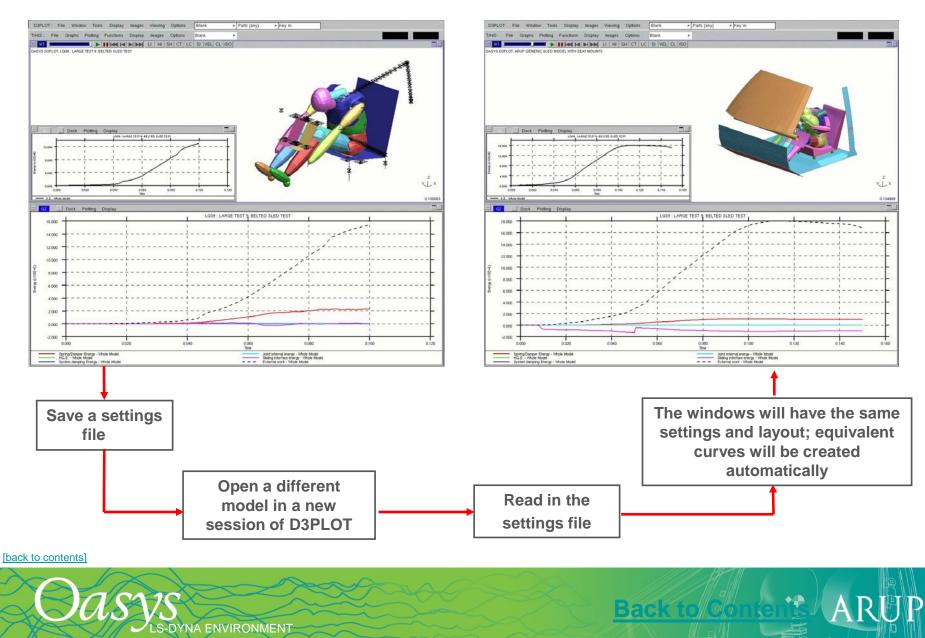
D3PLO



Option to read settings file when opening a model

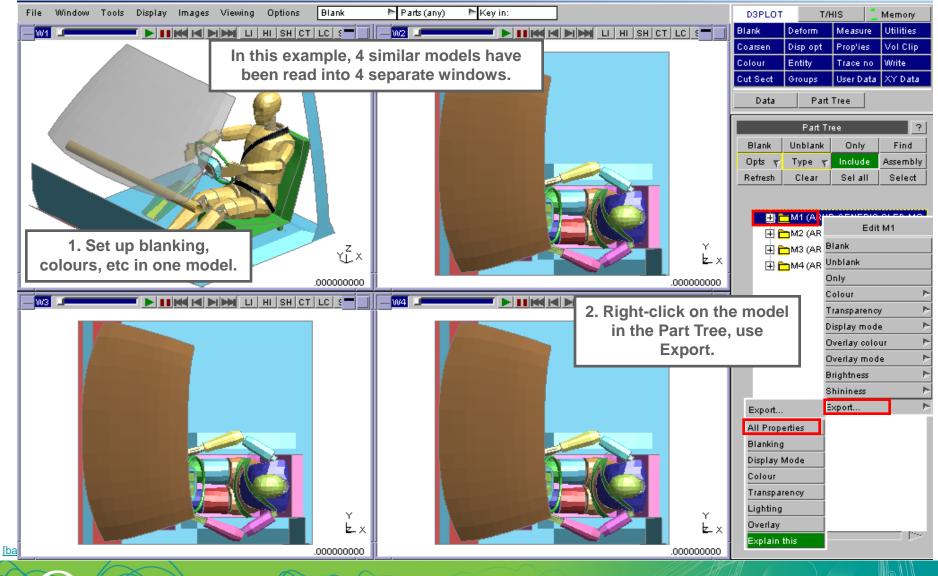
Settings files





Exporting properties between models





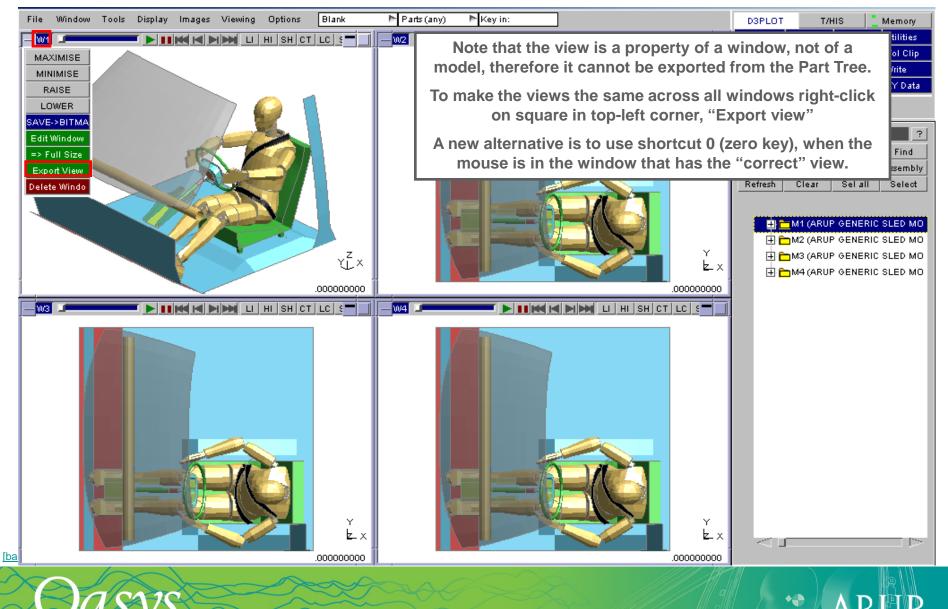


ULS-DYNA ENVIRONMENT

Exporting properties between models

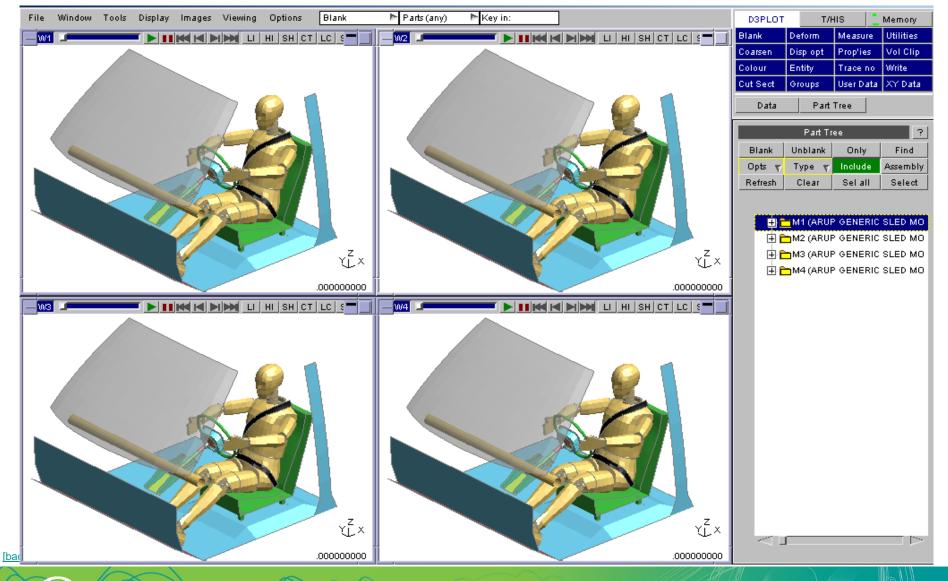
S-DYNA ENVIRONMENT





Exporting properties between models



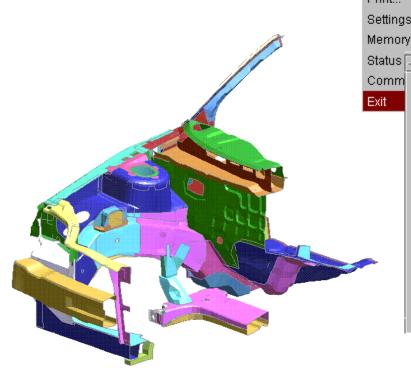


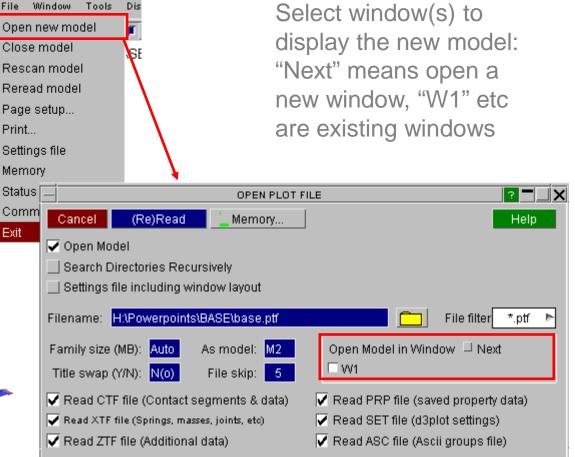


ULS-DYNA ENVIRONMENT

File

Now we wish to compare a similar model in the same window.





Oasys / D3PLOT



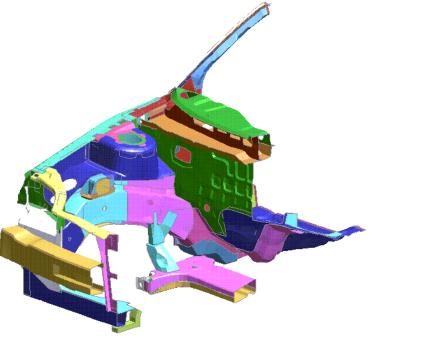




OASYS D3PLOT: NEON CUTDOWN

If two or more models are superimposed on one another, it is difficult to differentiate and compare.

S-DYNA ENVIRONMENT



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New window			Ec	lit Window					?	×
Edit window 🖻 Window	Dismiss	Apply	Help							
Close window	Window W.	3 (Models: I	(1. M2)							
Select		``								
Layout	Reset All									
Options	Model (drawn)		Show Off	sets as Percer	ntages					
1	All 🗸 Offse	et 🕨	X Offset 🕞	Y Offset 🕨	Z Offset	>	Mode	► Co	olour ^j	
	M1 🗸 🖻 No) Offset 🖻	0.0	0.0	0.0	►	Current	Þ		•
1	M2 🗸 ► No) Offset 🖻	0.0	0.0	0.0	Þ	Current	P-		►
					(dist	e mod inguis ling ea	she	ed by	y C



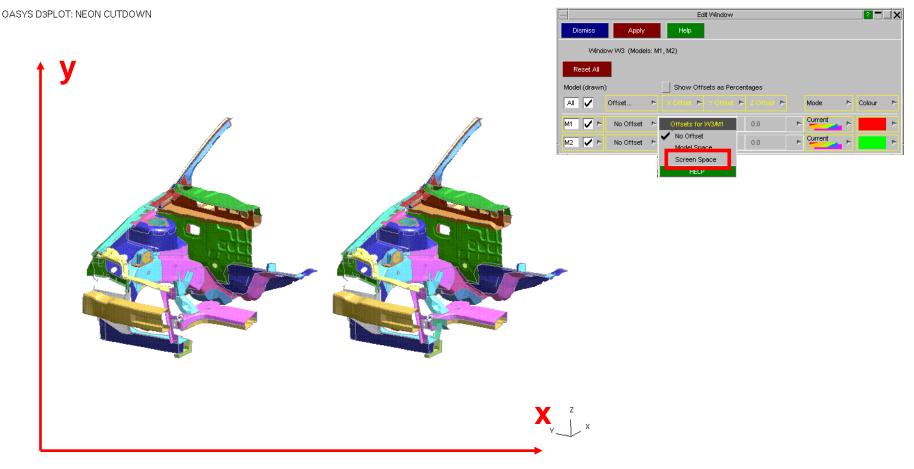


S-DYNA ENVIRONMENT



Α

"Screen space" will offset the models in the coordinate system shown in red



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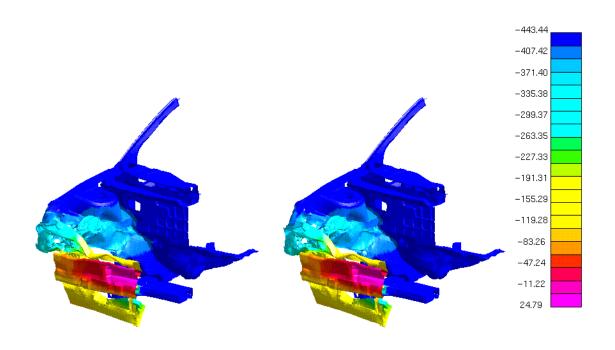


Differences in results between similar models can be hard to see...

OASYS D3PLOT: NEON CUTDOWN

S-DYNA ENVIRONMENT

X_DISPLACEMENT

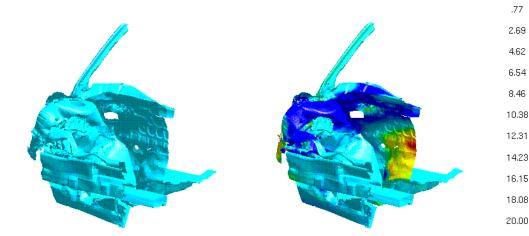




.029999

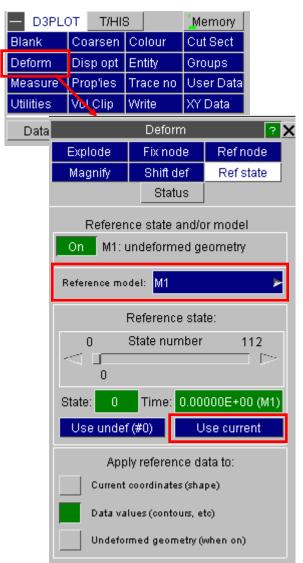


"Use Current" means: plot the difference in the output variable <u>relative to the</u> <u>current time state of the reference model</u> (shown on the left). In other words, the reference state is the one shown in the picture, and will be updated during animation. As seen the reference model results relative to itself is zero.



DYNA ENVIRONMENT



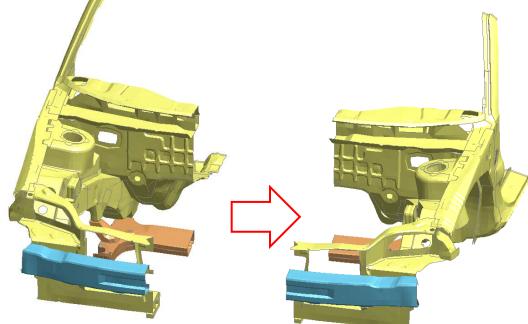


-5.00

-3.08

Reflecting Models and Results

- Deform=>Transform applies a geometrical transformation to the model geometry and results.
- A typical application would be to change a right-half model into a left-half model.
- The transformation does not change a half-model into a full model – you get just the reflected half.





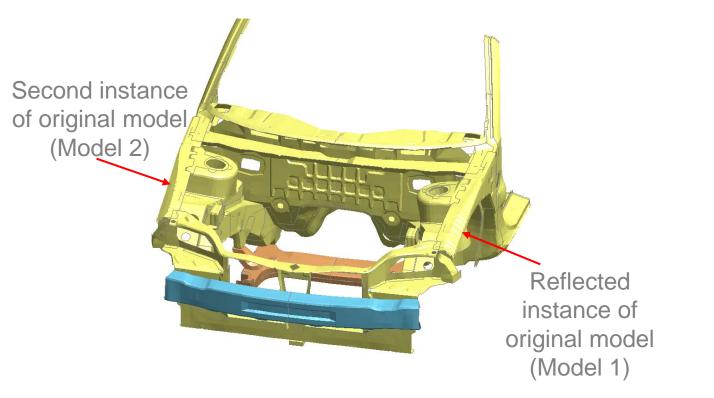
D3PLC	т	T/HIS	🖻 🗠 Tu	ine	Memory		
Attached	De	eform	Meas	ure	Utilities		
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Apply		Explain	this				
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Axis	s: [X Y	Z				
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ROTATE		Rota	te abo	ut gl	obal axes		
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Centre	»: [0.0 0.	0 0.0				
SCALE		Scal	le alon	g gla	obal axes		
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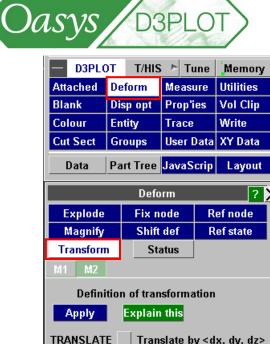


Reflecting Models and Results

S-DYNA ENVIRONMENT

• To see both halves together, read the original model again into the same window (this will become Model 2).



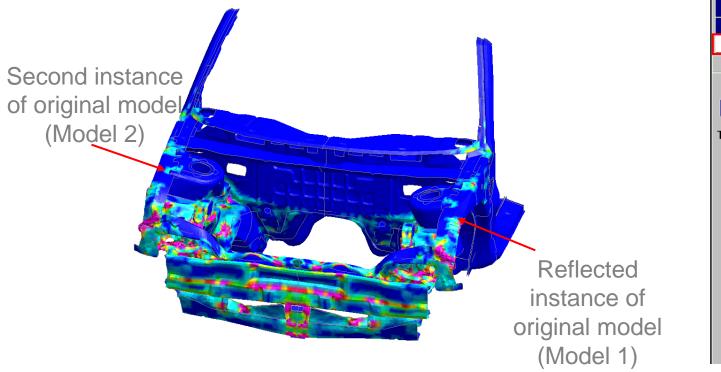


Translate by <dx, dy, dz> 0.0 0.0 0.0 Distance: ✔ Reflect about global axis REFLECT Ζ Axis: X Y 0.0 Distance: Rotate about global axes ROTATE Angles: 0.0 0.0 0.0 0.0 0.0 0.0 Centre: Scale along global axes SCALE Factors: 1.00 1.00 1.00

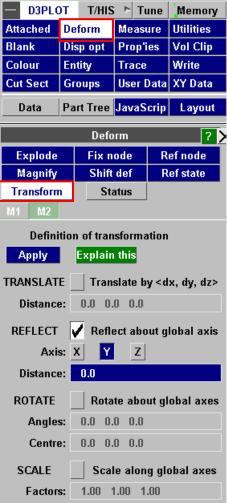


Reflecting Models and Results

• Results are also transformed, so the pair of models can be animated and results plotted as if it were a single full model.







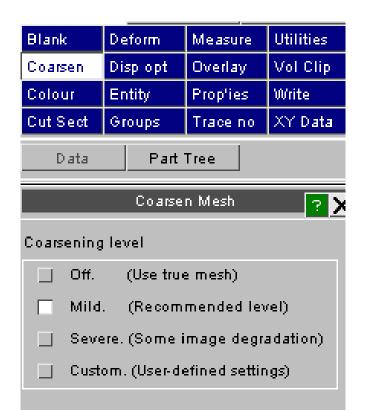




Faster animation

 The COARSEN feature can be used to speed up the animation. This works on models containing large numbers of quadrilateral shell elements by reducing mesh resolution in areas where the mesh is relatively flat.

DYNA ENVIRONMENT



Oasys

D3PLOT

Faster animation - Coarsen



No coarsening

B E





Faster animation - Coarsen



13 5

Mild coarsening – typical 30% speed-up, can be 2-3 times faster for multi-million element models.





Faster animation - Coarsen





Severe coarsening – typical 50% speed-up, can be 4-5 times faster for multi-million element models.





- Click on the T/HIS tab to start T/HIS inside D3PLOT
- Full T/HIS menu system available switch between D3PLOT and T/HIS menus using the tabs
- Supports multiple models, T/HIS automatically opens all models; results from either or both models are continuously available. Here, the entity display type is set to "Common Ids", allowing comparison of results for the same node across the two models.



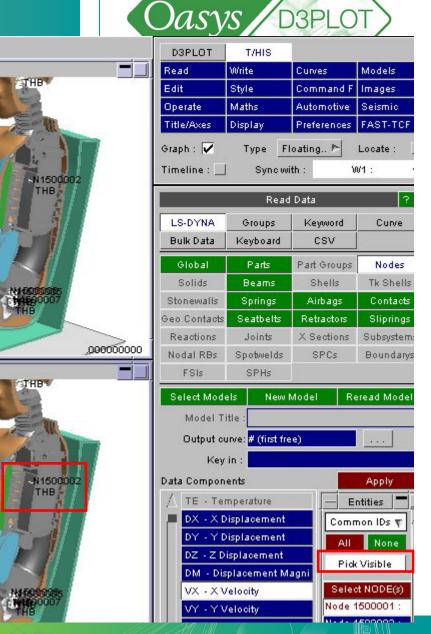




- When picking entities in T/HIS, a Pick Visible option is available, allowing entities to be picked from the D3PLOT windows
- Visibility of time-history data entities, and labels of these, are turned on/off in D3PLOT's Entity menu

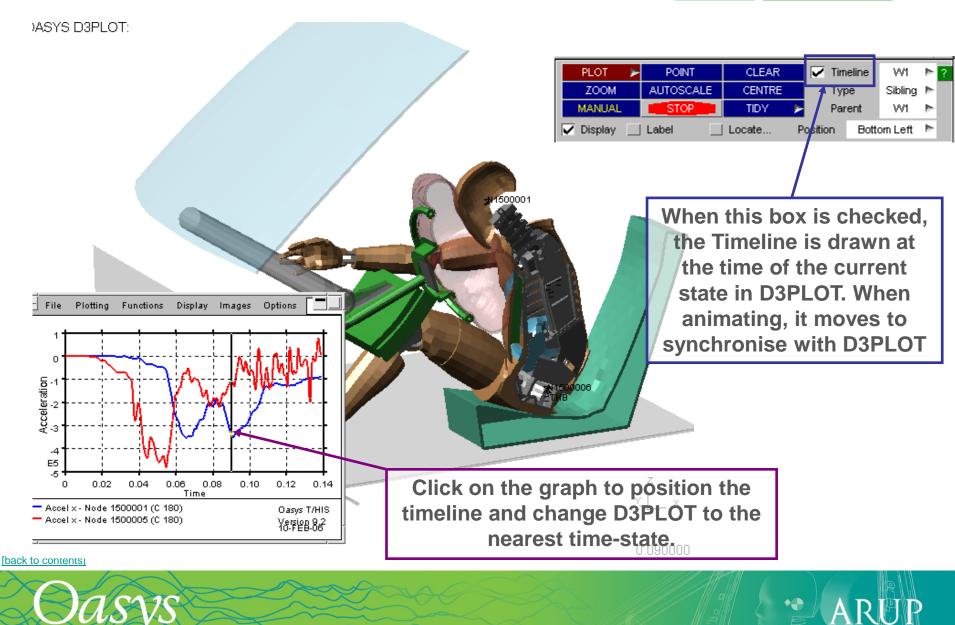
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Contact	Hist Solid		
Database	Hist SPH		
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Label with	Hist Spring		
✓Label	Hist S.Belt		
Model	Hist Joint		
Part	Hist R.Wall		
O a attace			







Oasys D3PLOT

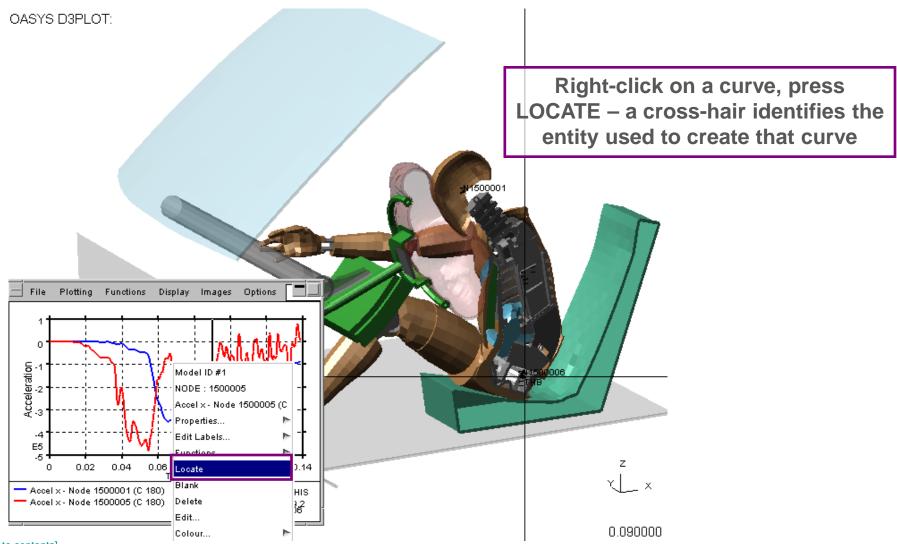


LS-DYNA ENVIRONMENT



•

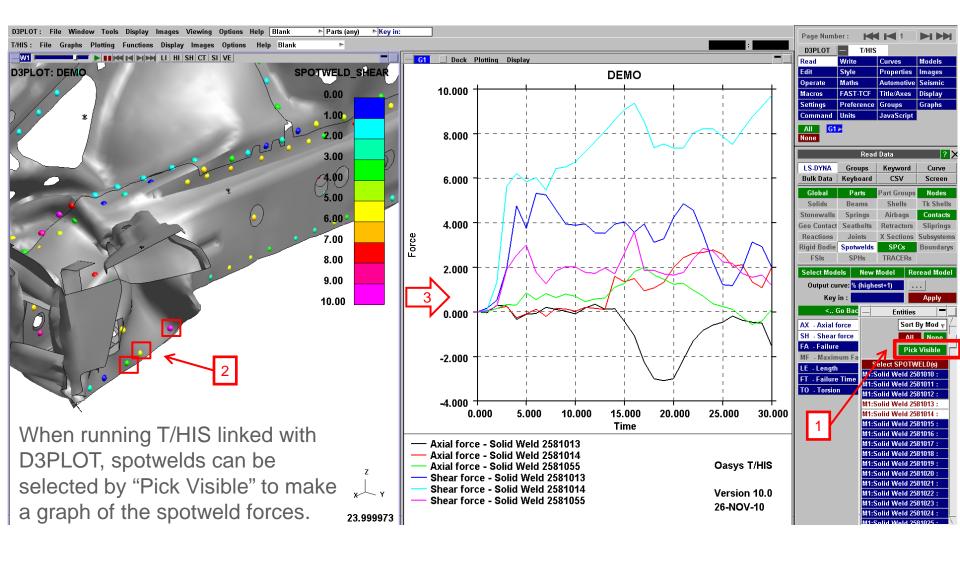
ARUP



[back to contents]

LS-DYNA ENVIRONMENT

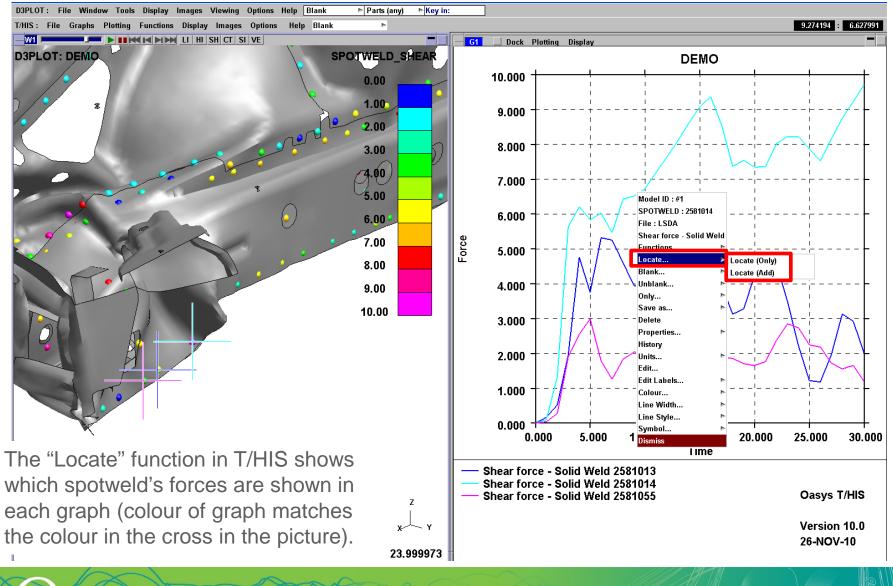




SYS LS-DYNA ENVIRONMENT

Slide





LS-DYNA ENVIRONMENT

Slide

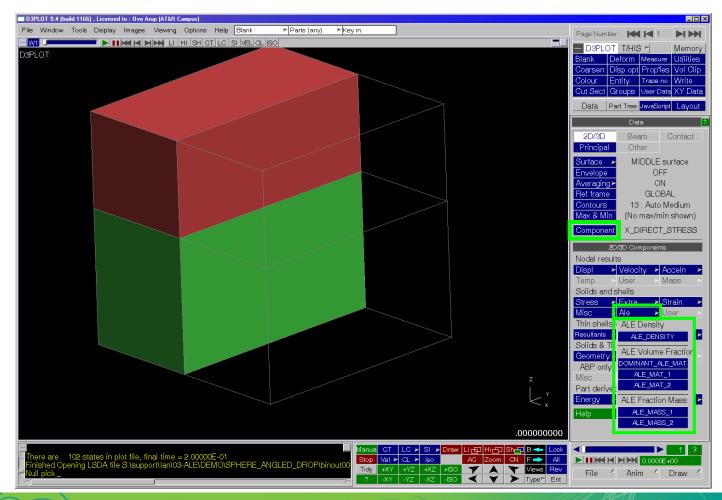
S-DYNA ENVIRONMENT



•

Α

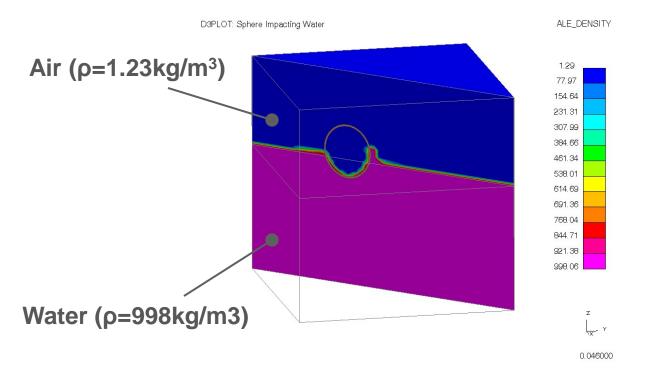
LS-DYNA outputs a number of specific ALE data components that can be plotted in D3PLOT





Fluid Density

This show the density of the fluid in each element which can vary during an analysis

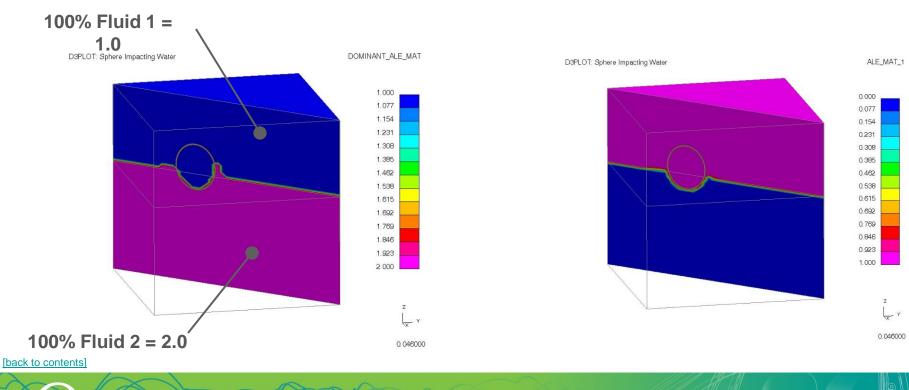






ALE Volume Fraction:

One option allows you to show all the fluids (1 = Fluid 1, 2 = Fluid 2 etc) or you can show the volume fraction for each fluid in your model.



Dominant ALE Fraction

S-DYNA ENVIRONMENT

ALE Fluid 1



ARUP



ALE Mass Fraction:

This allows you to show mass fraction for each fluid in your model.

D3PLOT: Sphere Impacting Water

S-DYNA ENVIRONMENT

0.00 12.53 25.07 37.60 50.13 62,66 75.20 87.73 100.26 112.80 125.33 137.86 150.40 162.93 x 1.0E-09 Ζ <u></u>γ

ALE_MASS_1

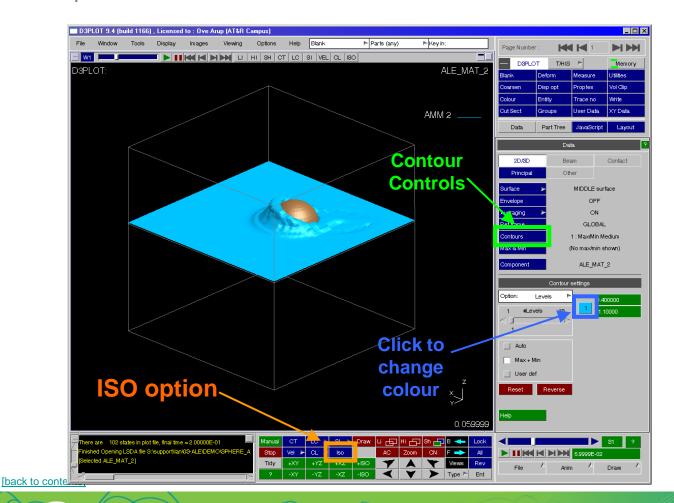
0.046000



S-DYNA ENVIRONMENT



The ISO contour plot method in D3PLOT can be used with the volume fraction data component to visualize the interface between two fluids.

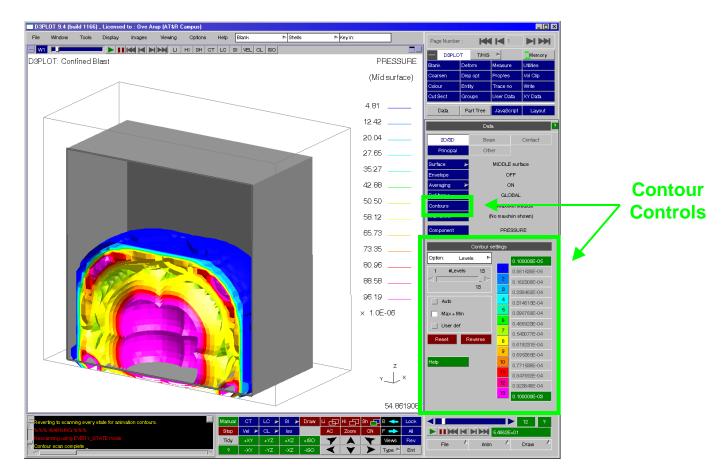


S-DYNA ENVIRONMENT



A

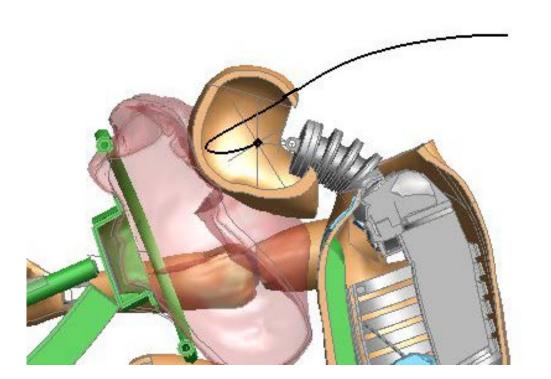
An ISO plot is also useful for visualizing the pressure wave in a blast analysis.



The max/min contour levels may need to be set manually to achieve a good image.

Trace Node

• The trajectory of selected nodes can be drawn



[back to contents]



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	🔲 Draw	in wirefram	ie mode					

Select nodes



Trace Node

• The trajectory of selected nodes can be drawn



ISVS D3PLOT							
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Trace Node – save to curve file

S-DYNA ENVIRONMENT



Deform

Disp opt

Entity

Measure

Prop'ies

Trace no

Utilities

Vol Clip

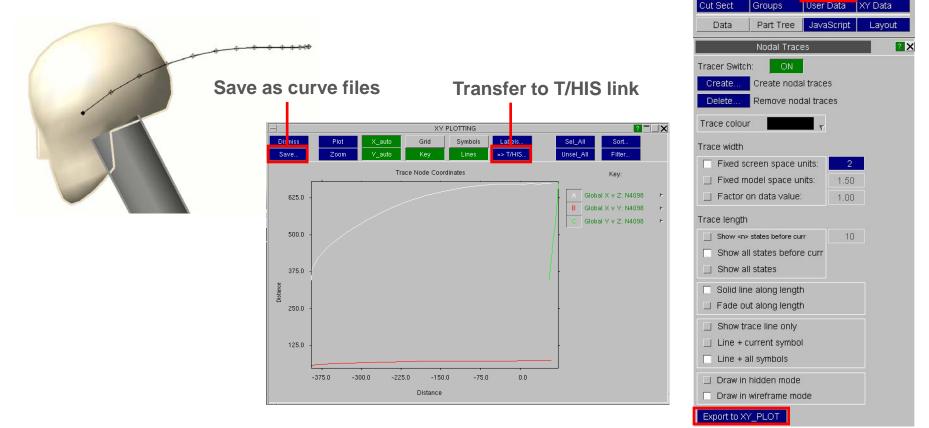
Write

Blank

Colour

Coarsen

• The trajectories of selected nodes can be XY plotted and transferred to T/HIS

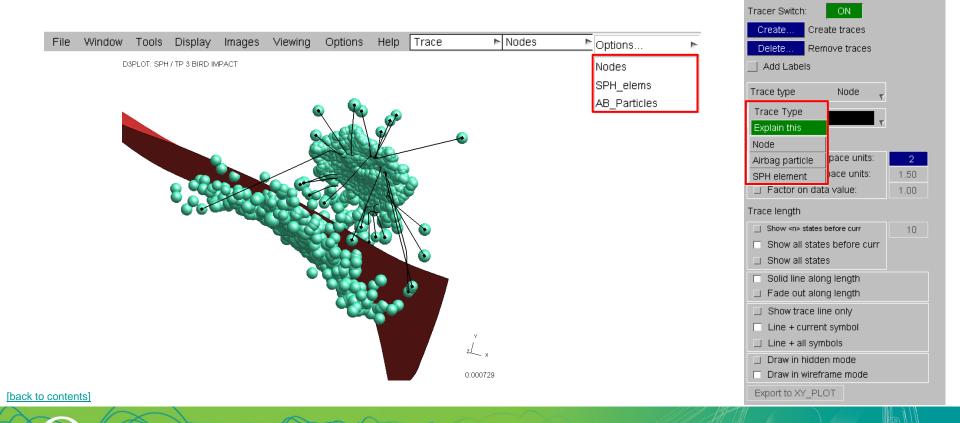


Trace Node

- Trace Node can also be applied to airbag particles or to SPH elements.
- Multiple items can be selected in one operation.

S-DYNA ENVIRONMENT

• Traces can also be selected through the Quick Pick menu





D3PLOT

Deform

Entity

Groups

Disp opt

Attached

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T/HIS 🕨 Tune

Measure

Prop'ies

Part Tree JavaScript Layout

Trace

Memory

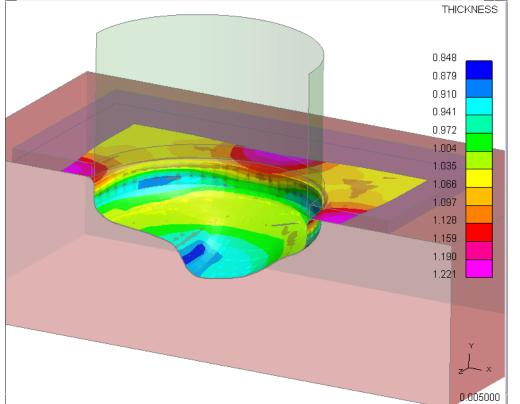
Utilities

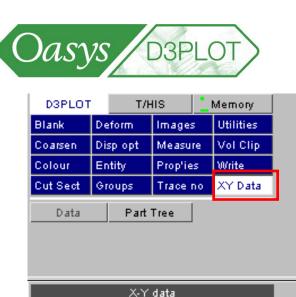
Vol Clip

Write

User Data XY Data

• Using the XY_Data Composite option, certain combination of data can be extracted, for example, shell thickness versus x-coordinate on the symmetry-plane at a number of time-states.



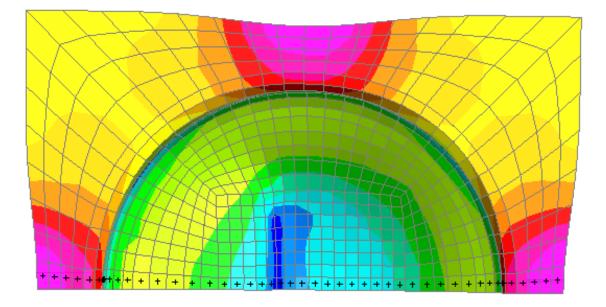


Apply							
Select sta	tes	Selected 6 stat	Selected 6 states				
Data vs Ti	me	Simple data vs	. time				
Data vs D	ata	Data vs. data over time					
Composi	te	Data vs. data a	t times				
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Max #curves	in fil	10000000	Rules				
Output type	tput type Next filename to use						
Global:	glob001.cur						
Part:	part001.cur						
Surface:		curf004 our					





• Screen-pick a line of elements (or nodes), e.g. by dragging out an area:





X-Y data						
Арр	ly	Nothin	ig sel	ected yet		
Com	X	Thickness	Y	Thickness		
Surf:	Х	MID surface	Y	MID surface		
Fof	Х	GLOBAL	Y	GLOBAL		
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PART	GLOBAL	SECTION
	GROUPS	ENTITIES
SURFACE	MASTER	SLAVE
NODE	LUMPED_MA	SEAT_BELT
SOLID	SPRING	RETRACTOR
BEAM	JOINT	SLIP_RING
SHELL	STONEWALL	PRE_TENS
THICK_SHELL		







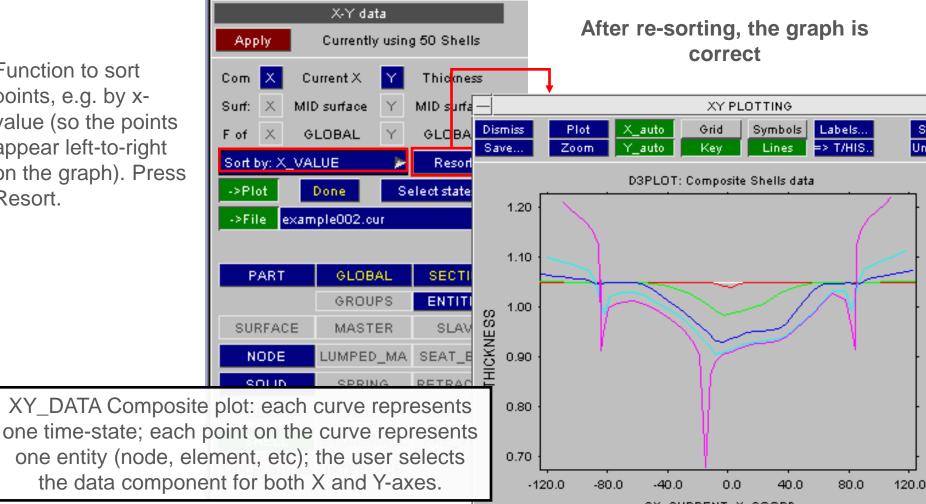
The order of elements picked X-Y data is random (not in order of x-Apply Currently using 50 Shells Select data coordinate), so the graph component for Current X Thickness Com х appears wrong X and Y-axes MID surface MID surfa XY PLOTTING Surf: Х Dismiss X_auto Grid Labels... Plot Symbols. GLOBA X GLOBAL F of Ur Zoom Save.. Y_auto Key Lines ⊨> T/HIS.. Sort by: NO SORT Resort D3PLOT: Composite Shells data Select time states (*)-->Plot Select state: Done 1.20 Curve file name (*) \rightarrow ->File example001.cur 1.10 PART GLOBAL SECTI GROUPS ENTITI 1.00 THICKNESS SLAV SURFACE MASTER NODE LUMPED_MA SEAT_B 0.90 (*) - in previous SOLID SPRING RETRAC versions of D3PLOT, this could be done only 0.80 BEAM JOINT SLIP_R from the main SHELL STONEWALL PRE_TE XY DATA menu 0.70 THICK_SHELL INTERFACE -120.0-80.0 -40.0 0.0 40.0 80.0 120.0

CX_CURRENT_X_COORD

[back to contents]



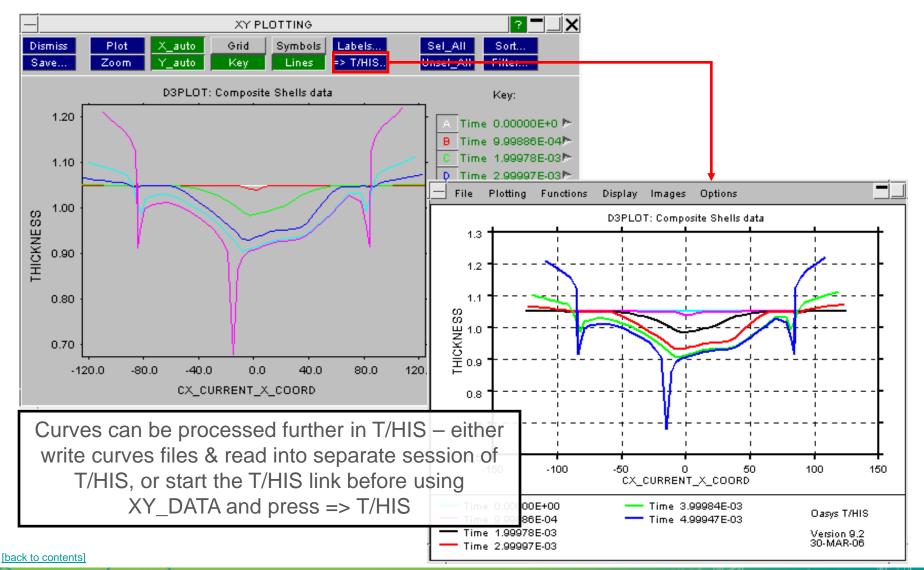
Function to sort points, e.g. by xvalue (so the points appear left-to-right on the graph). Press Resort.



CX_CURRENT_X_COORD

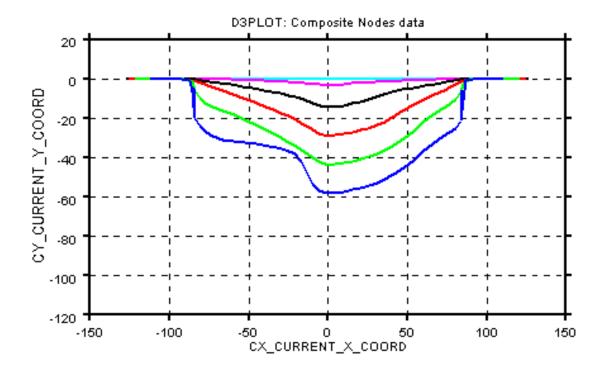
[back to contents]









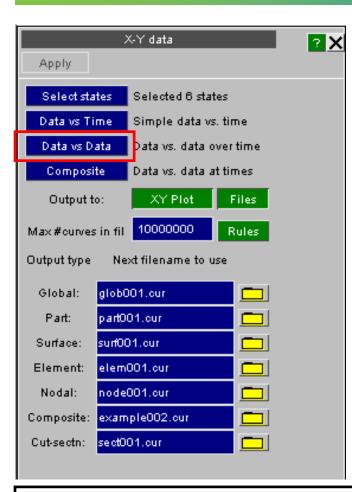


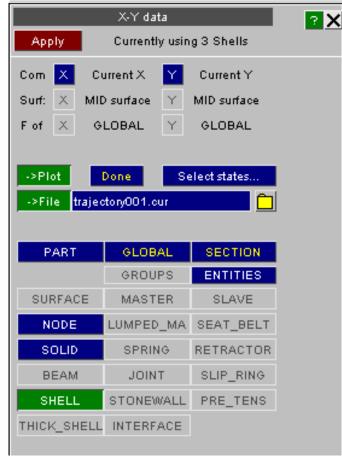
Another example of Composite data – X-coord vs Y-coord shows how the shape evolves with time



LS-DYNA ENVIRONMENT

ARUP





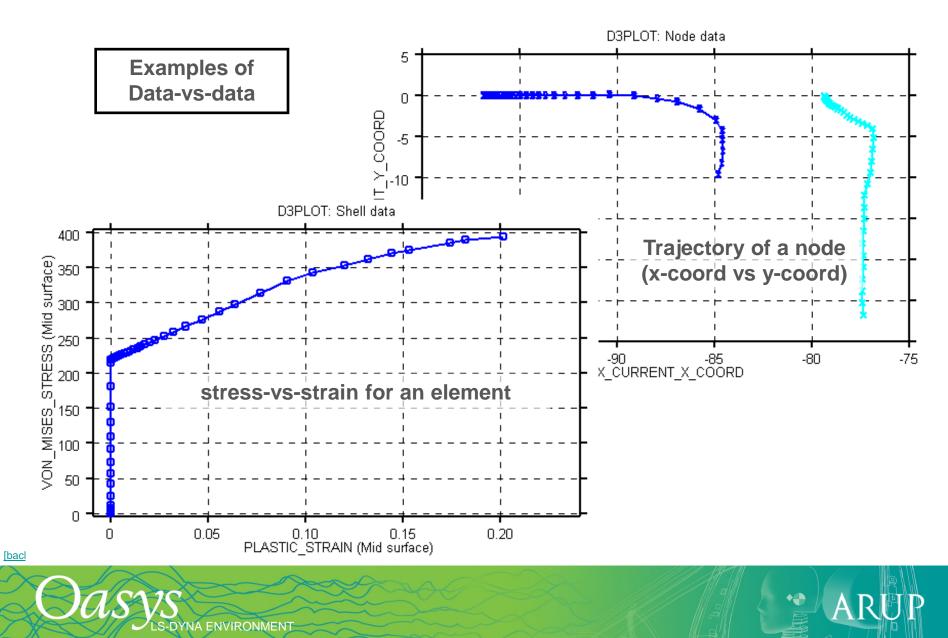
Data-vs-Data is almost identical to Composite, except that a new curve is written for each selected Entity (node, element, etc), with each point on a curve representing one time state.





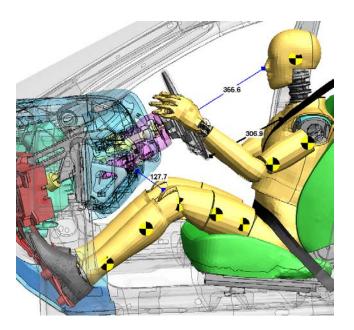






XY_DATA - Output of Measure

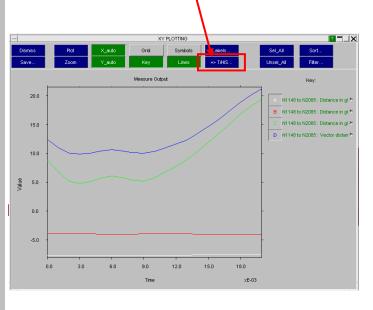
The measurements created by "Measure" can be output to T/HIS:



D3PLC	DT T/HIS	🕞 Tune	Memory						
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Blank	Disp opt	Prop'ies	Vol Clip						
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N1520154	-2418.9	376.5	892.7						
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Magnitude	9: 323.9								
Export to XY_PL Export ALL to XY									
Empore to 7		emporer							



The XY_DATA graph menu can start a linked T/HIS session: the "=> T/HIS" button is always live.







External Data – "Blob plots"

 A list of points, each with XYZ coordinates and a data value, can be read from an external file

Contents of typical file:						
"data"	Χ	Y	Ζ	value		

data 899.984 1393.17 895.182 4682.63 data 841.037 1276.24 896.854 1055.947 data 694.404 1399.28 851.726 343.4052 data 703.138 1308.79 861.869 627.7126 data 804.945 1171.9 898.937 476.1642 data 788.008 1057.62 903.647 467.8154 ...(etc)...

DYNA ENVIRONMENT

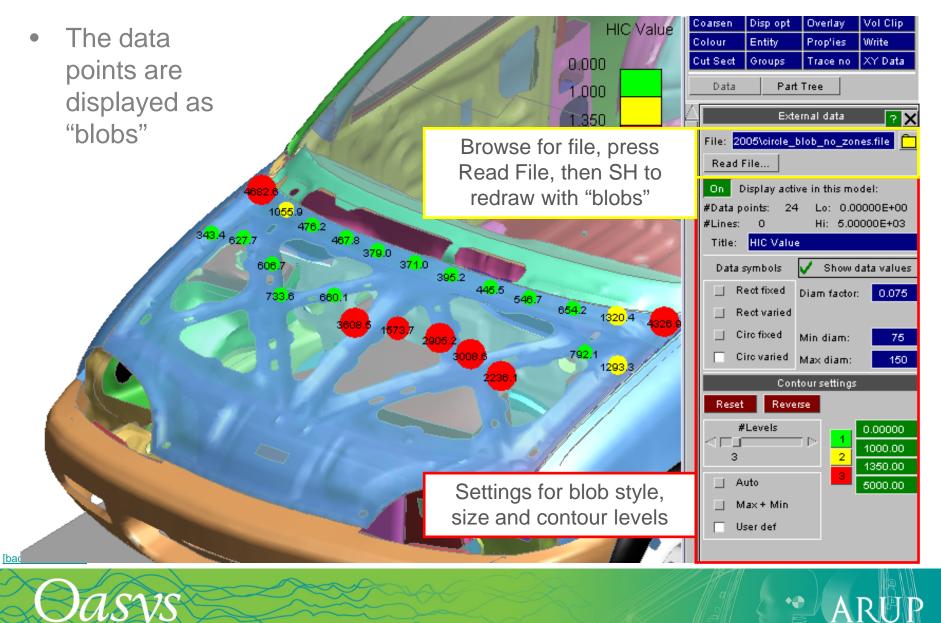
Oasys D3PLOT

D3PLOT		T/H	lis	1	Memory		
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Done							
	Utility	/ Ор	erations	:			
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Failure opt	tions	Deleted/failed element					
Graphics		Special graphics option					
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Settings fil	Save/Retrieve settings						
External data			Read "Blob Plot" data				
F1 - F12 keys			gramm	me	F1-12 ke		

ARUP

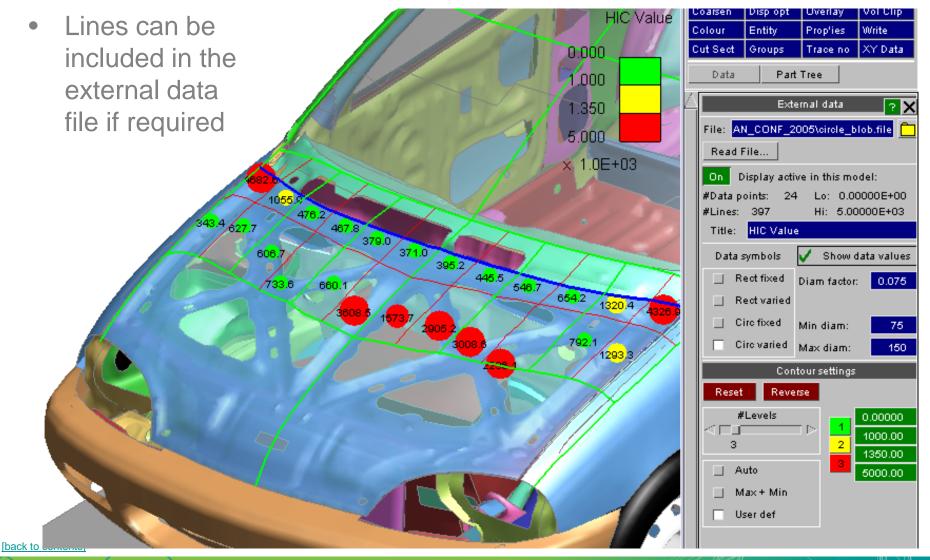
External Data – "Blob plots"





External Data – "Blob plots"







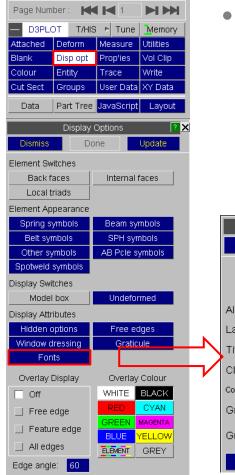


Text font size and type

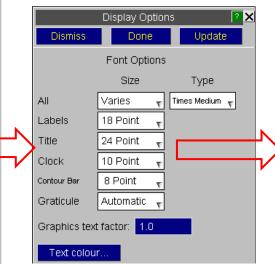
S-DYNA ENVIRONMENT

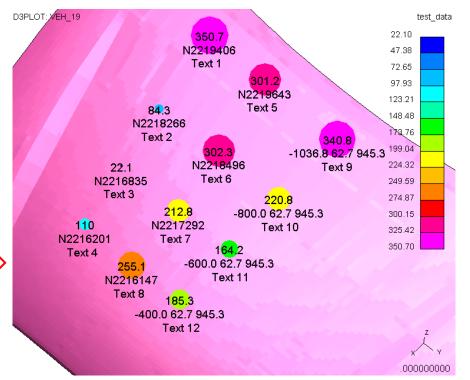


Α



- Set text font size for
 - Labels
 - Title
 - Clock
 - Contour Bar
 - Graticule





Compressed (cut-down) PTF File



? **-** X

Springs

Apph

SPCs

2.54KB

72340

• Cut-down PTF / d3plot files can be generated containing a subset of the data in the original files

Output Type

Select Parts

Select States

- Reduction in the size of files is possible by:
 - Reducing the number of PARTS
 - Reducing the number of STATES
 - Removing data components

Window

Open new model Close model Rescan model Reread model Page setup...

Write Settings file Write KEYWORD da Write Compressed

Tool

File

Print...

Memory Status

Command file Exit

the	Write File(s)									
STATES			Nodes	Solids	Shells	T-Shells	Beams	SPH	A irbag Particles	Spotwelds
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nts	Velocities									
115	Accelerations									
	Temperatures									
ls Display	Stress Tensor	✓×		$\mathbf{\overline{A}}$						
	Plastic Strain	ХV		$\mathbf{\overline{A}}$						
	Strain Tensor	ХV								
	Forces and Moments									
_	Thickness + Energy									
	Extra Variables	✓×								
	All Data									
	Von Mises Stress	∕×								
ata	Von Mises Strain	∕×								
PTF File	Eng Major and Minor	✓×								
	Include nodes for Z	TF ite	ems	•	Emb	ed ZT	F data	in file	•	
	Write Selection: TA\DE	MO/F	₹T_SL	ED\RE	SULTS	\d3plo	ot_sel	ection	.txt	
	Read Selection:									

Cutdown PTF/d3plot file

Reordered

No Parts Selected

No States Selected

Filename: \DATA\DEMO\RT_SLED\RESULTS\d3plot_cutdown001.ptf

PTF File Output

PTF State Size

Max Family Size

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Target Ma	rkers	Target markers on nodes					
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Failure op	tions	Dele	eleted/failed elements				
Graphics	_	Spec	Special graphics options				
Data compone	ents	Data	Data comp diagnostics				
Metal form	iing	For	Forming Limit Plot				
Die closur	е	Worl	Workpiece/Die Closure				
Visualisati	on	Visualisation Output					
Settings fil	е	Save	Save/Retrieve settings				
External d	ata	Rea	ad "Blob Pl	ot" data			
F1 - F12 k	æys	Prog	Programmme F1-12 keys				
Compress		Cutd	down PTF/d3plot file				
	1.1						

Compressed (cut-down) PTF File

• File family member file size can be set

— Cutdown PTF/d3plot file										
PTF File Output										
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Velociti	ies									
Acceleratio	ins									
Temperatu	res									
Stress Tens	sor 🗸 🗙				Ζ					
Plastic Stra	ain 🗸 🗙				Ζ					
Strain Tens	sor 🗸 🗙									
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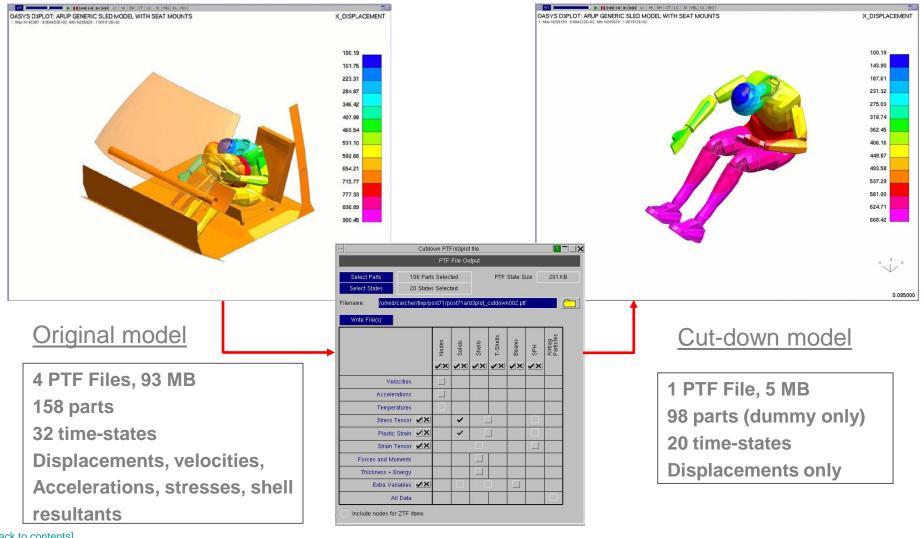


File Window Tools Displa	y Images Viewing
Open new model	
Close model	
Rescan model	
Reread model	
Page setup	
Print	
Write Settings file	
Write KEYWORD data	
Write Compressed PTF File	
Memory	
Status	
Command file	
Exit	



Compressed (cut-down) PTF File







New File Format for Quicker Response



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File Window Tools Dis	play Images Viewing
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Reread model	Select the ne
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Write Compressed PTF File	animation of
Memory	atraga and at
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Command file	
Exit	

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Batch mode operation:

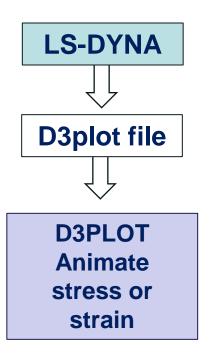
- First time select the data interactively, record this file
- Next time run D3PLOT in batch with *-ptfcut=filename.txt*

DYNA ENVIRONMENT

		Cı	itdown	PTF/d	3plot f	ile					?	X
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	Output Type Re	ordere	d,	-								
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Ч	Write Selection:	O\RT_S	ILED\RE	SULTS	5∖d3pl	ot_sel	ectior	n.txt		Ар	ply	?
-	Read Selection:									Ap	ply	?

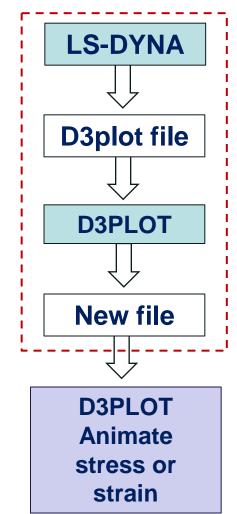
New File Format for Quicker Response





Slow Reading stress or strain data is slow because of the structure of LS-DYNA's d3plot file

-DYNA ENVIRONMENT



Reading data is 4-8x faster

This process can be done interactively or in batch. LS-DYNA submission function could be modified to do this automatically when LS-DYNA terminates The new file format is called "reordered"

File Format for Batch Mode

[back to contents]



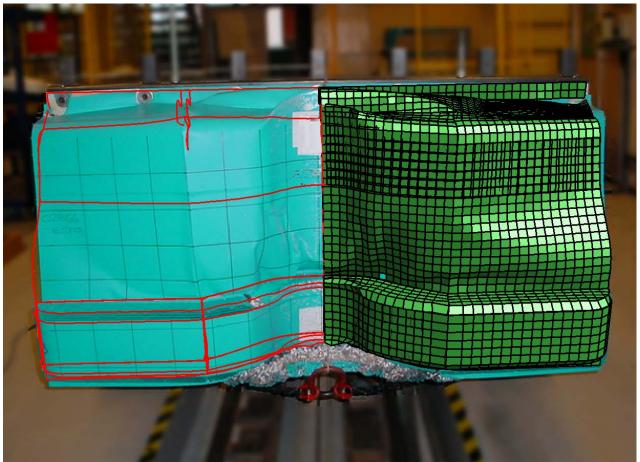
The file that can be used to create a reordered database in batch mode is a command file with the following format. It can be created manually, or recorded from the "Compressed PTF" menu.

*TEXT_ONLY /UTILITIES PTF_COMPRESS \$ OUTPUT_TYPE REORDERED \$	\rightarrow	Select the PTF_COMPRESS menu Set the output type to 'REORDERED'
FILENAME C:\Models\sled\d3plot_cutdown001.ptf	\rightarrow	Specify the output filename
\$ PART ALL \$	\rightarrow	Select the parts to output
STATES 1 TO 9	\rightarrow	Select the states to output
\$ FAMILY_SIZE 1444	\rightarrow	Set the family size in KB
<pre>\$ ALL_OFF VELOCITIES PLASTIC SHELL_THICKNESS SHELL_VM_STRESS SPC SPRING SEATBELT</pre>	→	Select the data components to output
SERVICE S NODES_FOR_ZTF S EMBED_ZTF S APPLY	\rightarrow \rightarrow \rightarrow	Include nodes for ZTF items Embed the ZTF file in the file Write the Reordered database
ASYS LS-DYNA ENVIRONMENT		

Background Image



 All Oasys programs can read an image file, for use as background

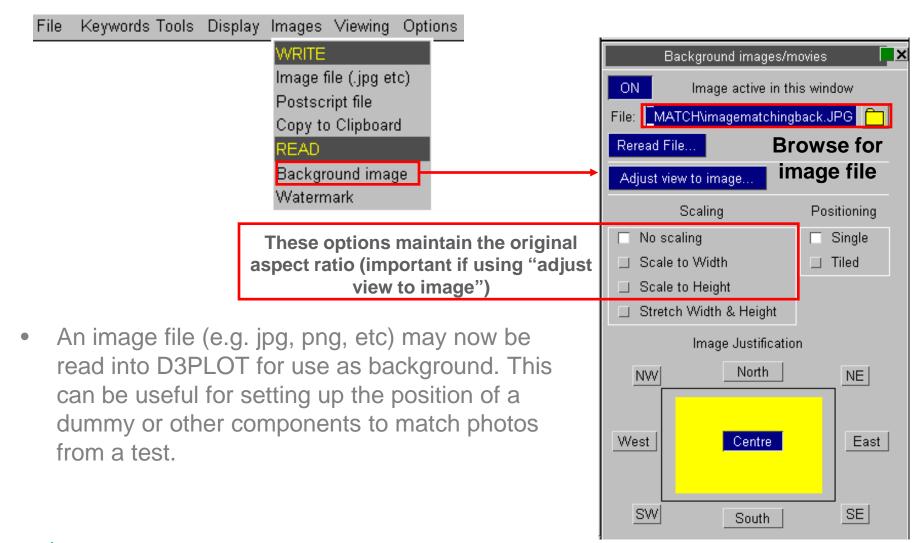






Background Image

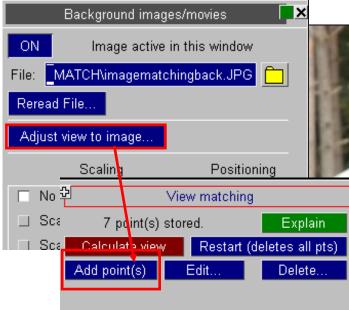




[back to contents]

Background Image : view matching





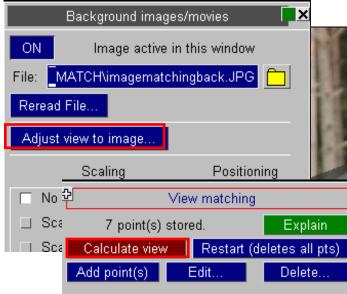
Pick a node in the model, then click on the equivalent point in the background image. Repeat to create several nodepoint pairs – we recommend at least 5 pairs. Choose some pairs close to the camera, and others further away, to capture the depth of the image.



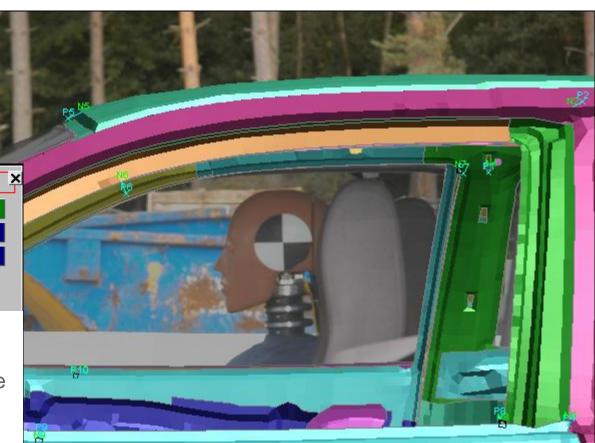


Background Image : view matching





Press "calculate view" – model viewing angle and perspective changes to minimise screen distance between picked nodes and their equivalent points in the image.





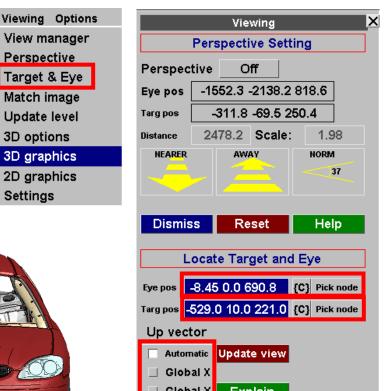
Background Image : Target and Eye

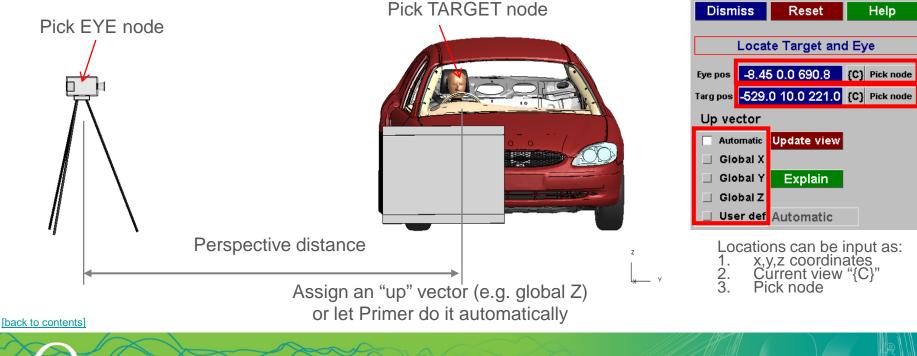


- Define camera ("eye") and target locations
- D3PLOT calculates view angle and • perspective automatically

S-DYNA ENVIRONMENT

Saves time when comparing to test photos

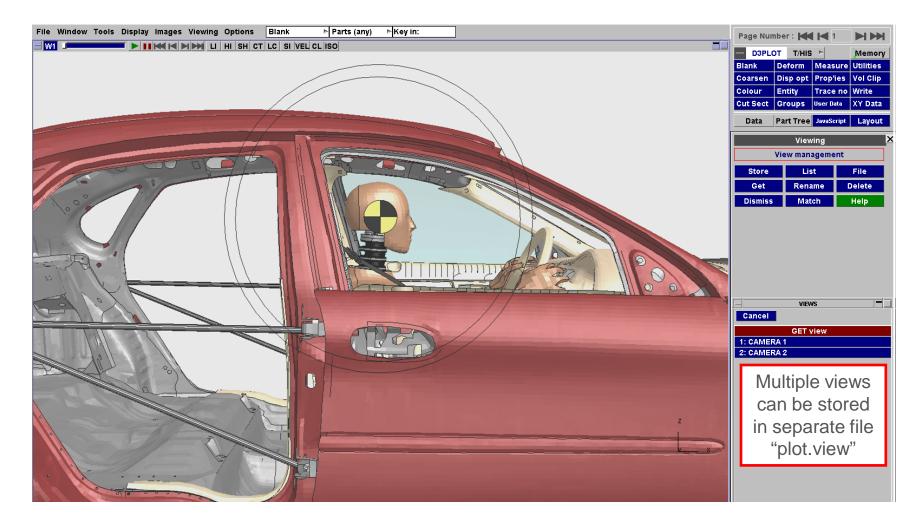




Settings

Background Image : Target and Eye







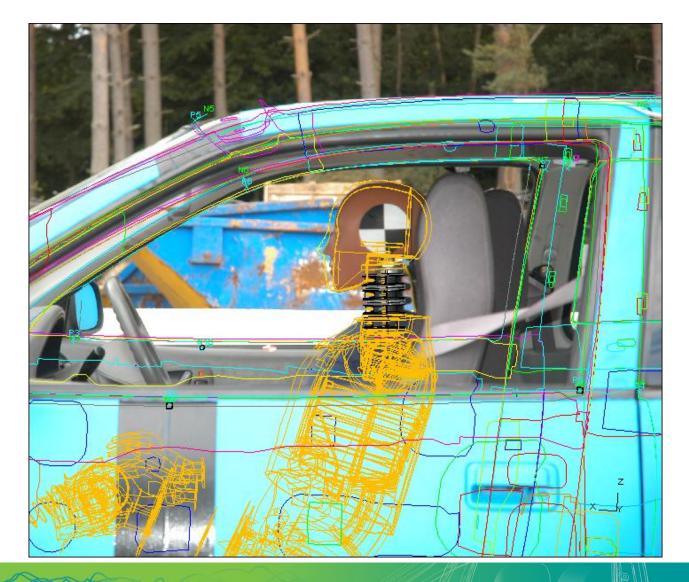


Background Image : Target and Eye



 Can be used to help line up the model with a background image or movie

LS-DYNA ENVIRONMENT





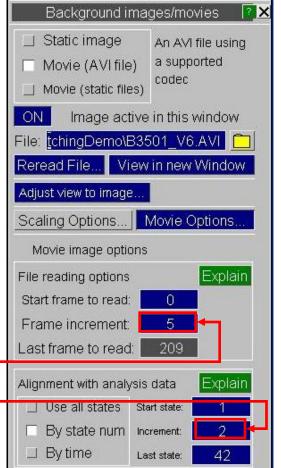
Background Animation

- Oasys D3PLOT
- Animation files may be read into a D3PLOT window (same window as model, or different window).
- Align model view to movie in the same way as image
- Use Movie Options to synchronise view and timing with model

e.g. Movie at 0.002s per frame vs. Simulation at 0.005s per frame.

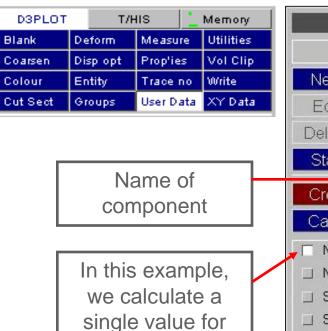
To match, we need every 5 frames of the movie and every 2 frames of the simulation.

DYNA ENVIRONMENT



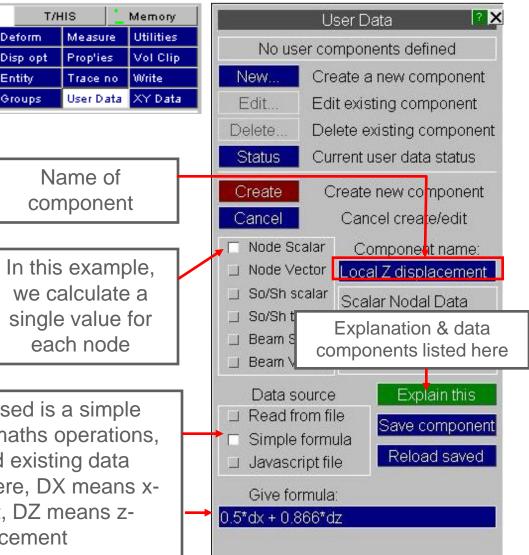


- User-defined data components for contour plots
- Example displacement in a local axis system
- The local Z displacement will be calculated by a formula from the global X and Z displacements.



The method used is a simple formula, using maths operations, numbers and existing data components. Here, DX means xdisplacement, DZ means zdisplacement

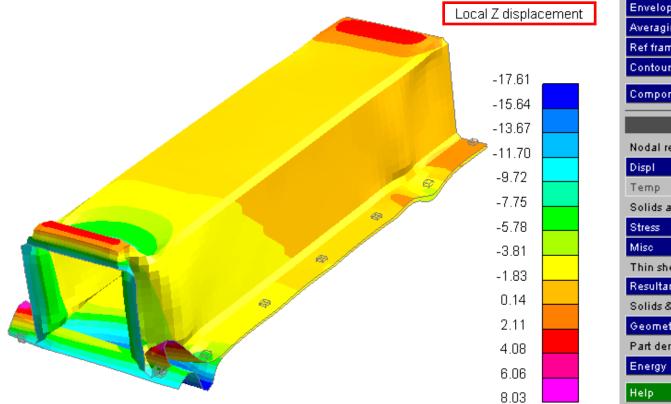




[back to contents]

S-DYNA ENVIRONMENT

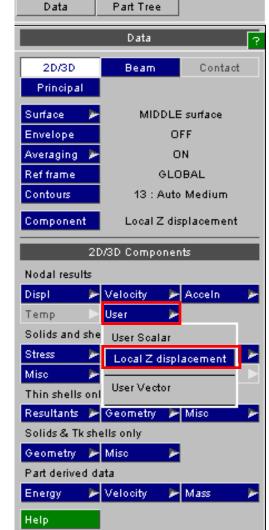
• Having defined the data component, we can now select it in the Data menu.



[back to contents]





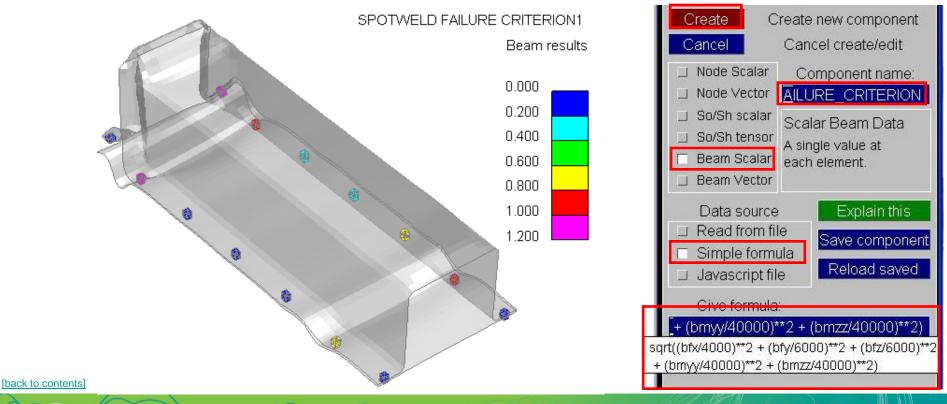


AR

S-DYNA ENVIRONMENT



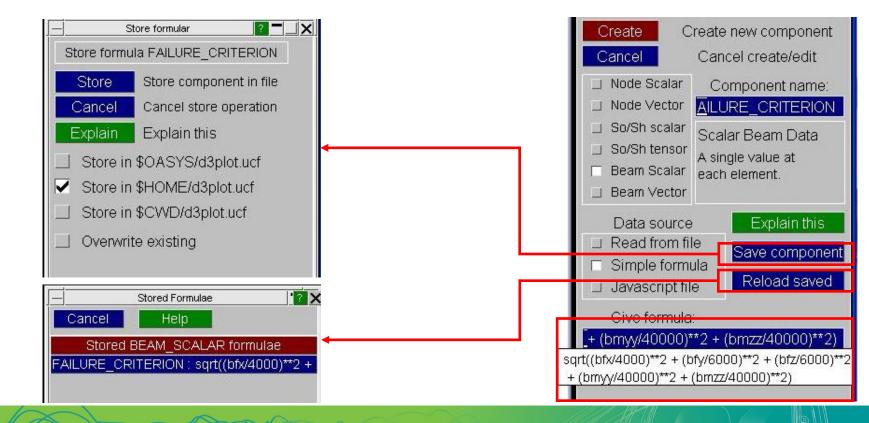
- Another example failure criteria, in this case for beam-element spotwelds. We have calculated a failure criterion using a formula based on the beam force resultants.
- The formula can include mathematical operations such as SQRT or **





Α

- Components that were simple formulae or read from file can be saved as .ucf files.
- The user-defined data components will then be available automatically in subsequent sessions of D3PLOT.



[back to contents]

S-DYNA ENVIRONMENT

D3PLOT JavaScript

[back to contents]



- JavaScript is a fully-featured programming language, widely used for web programming, and similar to C++, C, Perl, etc.
- Allows users to program their own functions for D3PLOT, by writing a script (program) that the JavaScript interpreter understands.
- JavaScript Interpreter has been embedded in Oasys PRIMER, D3PLOT, T/HIS and Reporter. No special software or system setup is required.
- JavaScript has "Core" (standard) capabilities described in textbooks, e.g.
 - variables, arrays, strings, objects, functions, regular expressions.
 - Statements if, do, for, while, switch etc.

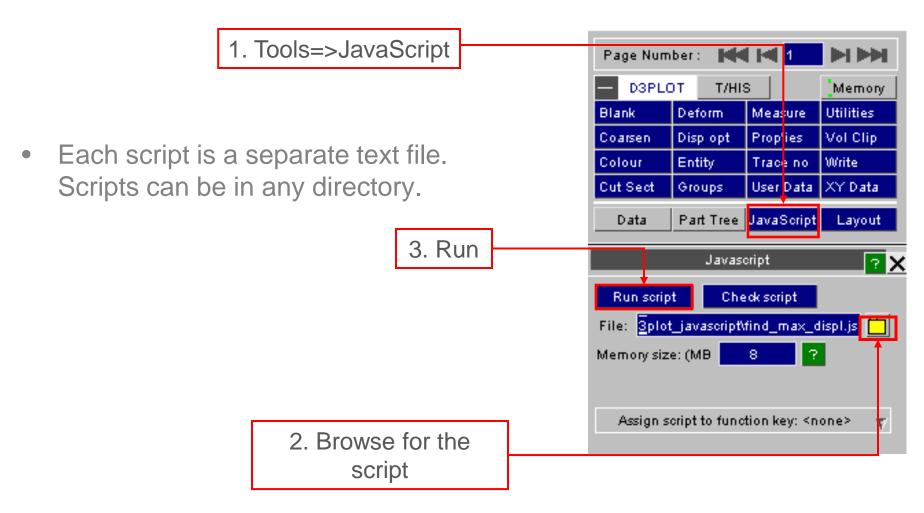
JA ENVIRONMENT

- Operators + / * ++ -- && || etc (like C and Perl)
- The Oasys software development team have extended JavaScript by adding new functions to access D3PLOT's data and store new results ready for plotting. Users' scripts can include both Core functions and Oasys extensions.
- The compilation step is done inside the interpreter the script is source code and works on any computer platform.

S-DYNA ENVIRONMENT



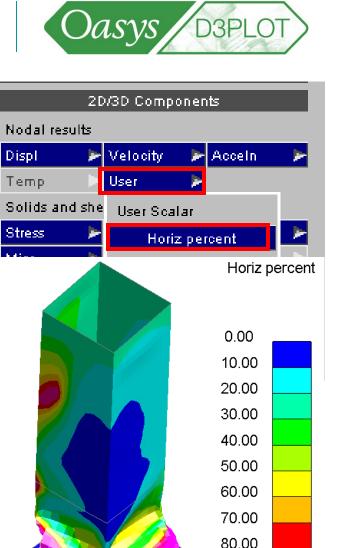
Α



Plotting data created by a JavaScript

- If a JavaScript has been programmed to create results data for plotting, these will be stored as User-defined Binary (UBIN) Data Components
- The new data components will appear under User in the Data Component menu.
- Nodal data components will be under Nodal Results=>User, Solid or shell data will be under Solids and shells=>User, etc
- The data is also stored automatically on disk in files named jobname_1.ubd, jobname_2.ubd, etc. Next time the model is read into D3PLOT, the same data components will be present because D3PLOT will read them from the *.ubd files.

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Making your scripts available to others



- Any script can be run by browsing for the script file.
- To make a script available more easily, copy it into the directory \$OASYS\d3plot_library\scripts. For each script in this directory, a button appears in the script menu. Pressing the button runs the script.
- The same system applies in PRIMER

Help

-

Name

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х

C:\Program Files\oasys93\d3plot_library\scripts

Address 🗁 C:\Program Files\oasys93\d3plot_library\scripts

-DYNA ENVIRONMENT

Edit View Favorites Tools

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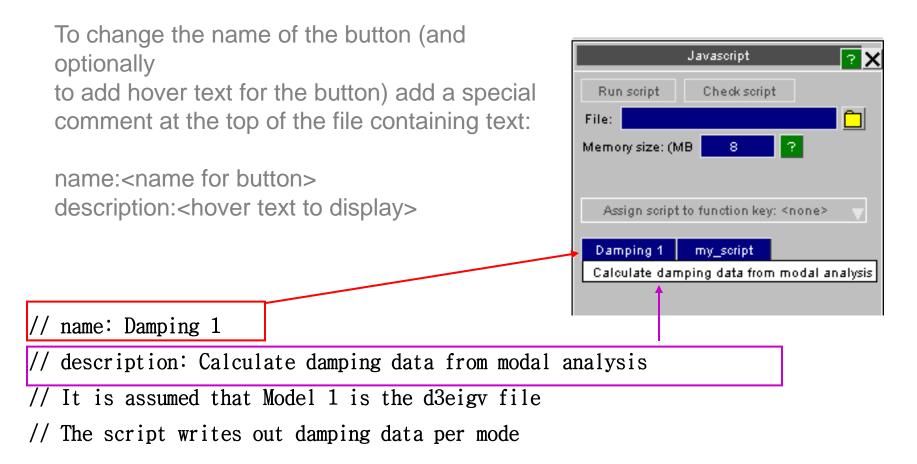
[back to contents]

File

Folders

NA ENVIRONMENT





D3PLOT Scripting



- Advantages of writing a JavaScript to create a new capability:
 - Quick turnaround don't have to wait for new version of D3PLOT
 - Can keep your application confidential
 - Under your control can do it yourself if you wish.
- Possible applications
 - Read data from an external file and plot it, e.g. spotweld forces from the swforc file
 - Calculate and plot failure-related data, e.g. stress/yield stress
 - Complex calculations involving comparisons of results across time-states
- Resources for programmers
 - Training material is available to download at <u>http://www.oasys-software.com/dyna/en/training/tutorials.shtml</u>.
 - Core JavaScript functions are described in textbooks, e.g. "JavaScript The Definitive Guide" (5th edition) by David Flanagan, published by O'Reilly. ISBN 0-596-10199-6
 - Also try Web search for "core JavaScript reference"
 - D3PLOT's JavaScript extension functions are described in Appendix VI of the D3plot manual
 - Example scripts are provided in the \$OASYS/d3plot_library/examples and \$OASYS/d3plot_library/scripts directories



LS-DYNA ENVIRONMENT

JavaScript v User-defined data?

A ENVIRONMENT



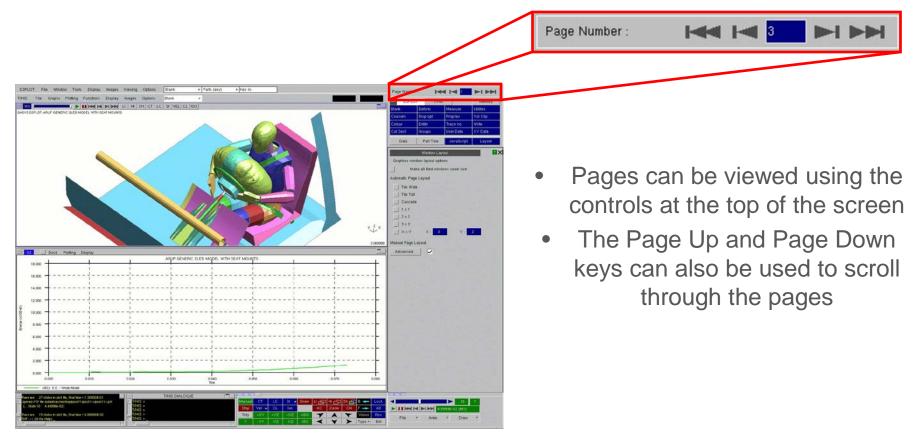
- User-defined data components can be defined directly in D3PLOT, e.g. using "simple formula" method. This is easier than writing a JavaScript to calculate results. When is a JavaScript needed?
 - "Simple formula" can be applied when the user-defined result for node n at time t depends only on data that exists in the ptf/d3plot file (e.g. displacements, velocities) for node n at time t. Similarly for elements – if the user-defined data at time t depends only on existing data for that element at time t.
 - If the user-defined data requires knowledge of results across multiple nodes/elements, or across multiple time-states, then "simple formula" cannot be used and a JavaScript is needed.
 - If the user-defined data is calculated using branching logic (i.e. is not a one-line mathematical formula), a JavaScript is needed.
 - If the user-defined data is calculated using data from an external file, in combination with the data in the results file, a JavaScript is needed.

Page Control



Α

• D3PLOT allows windows to be arranged on multiple pages. One page is visible at any time.



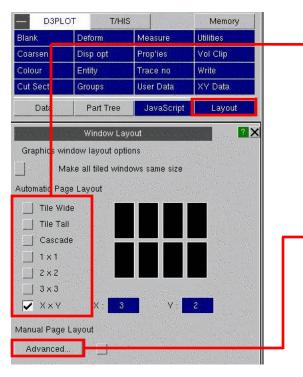
[back to contents]

S-DYNA ENVIRONMENT

Page Layouts



- Windows are displayed on 'pages'
- The layout and number of windows per page is controlled in the layout panel



-DYNA ENVIRONMENT

• Defined layouts can be selected to automatically set the page layout

_	Page Layout																? -									
Update																										
Layout	Page	12	3	4 5	6	7	8	9 1	0 1	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
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Tile Tall	/ W1 💟									1 8														1		
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Y : 2																										

- Manual page layouts can be defined using the 'Advanced...' button
- Windows can be placed on different pages



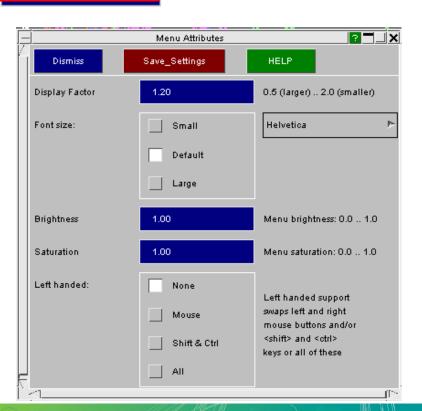
Window Tools Display Images Viewing Options Blank Area Pick CL IS Screen refresh

Expand menus

Menu attributes

Edit prefs

- New Menus function offers lefthanded settings, font size and display factor
- These are also available as preferences, under "menu_attributes".
- Interactive setting of display factor helps with wide screens, when the same preference may not suit all users.



Oasys,

[back to contents]





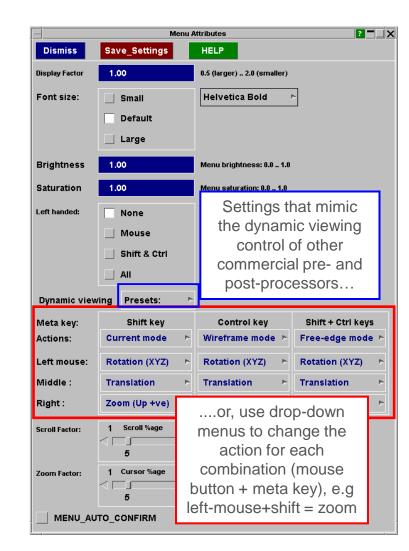
D3PLOT

Menu Attributes - Dynamic Viewing



- Customisable dynamic viewing (i.e. control over which mouse buttons and keyboard keys are used to rotate, zoom and pan) can help users who are familiar with the dynamic viewing controls of other pre- and post-processors.
- Dynamic viewing behaviour may be set using the Options=>Menu Attributes menu.
- The settings may then be saved to the Preference file for use in future D3PLOT sessions.

-DYNA ENVIRONMENT





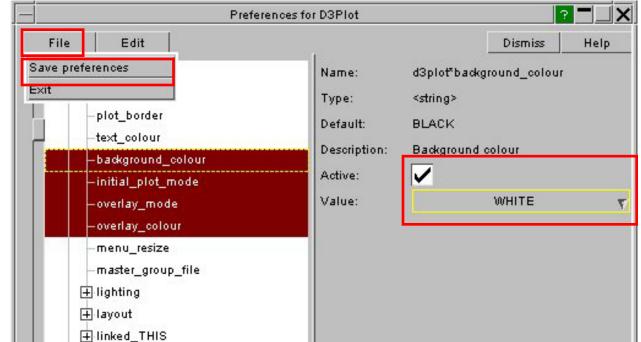
A

• Users can change their preferences (customisable settings) from within D3PLOT.



 Remember to Save
 Preferences
 before
 dismissing the
 menu.

S-DYNA ENVIRONMENT



Shortcuts



- Shortcut keys: buttons on keyboard that access commonly used functions. Not case sensitive.
 - ? = list of available shortcut keys
 - ESC = dismiss the menu that the mouse is over
 - 1,2,3,4,5,6,7,8 = XY, XZ, etc standard views; V = View menu
 - A = Autoscale
 - B = blanking menu; R = reverse all blanking; U = unblank all
 - **E** = **e**ntity visibility menu
 - H, L, S and F = perform Hidden line, Line, Shaded and Fringe (SI) plots
 - M = measure node-to-node
 - O = Display Options panel; P = Properties panel
 - Q = Return to Quick-pick mode
 - X = Cut Sections menu; D = Drag cut section; N = pick node on cut section
 - Z = zoom (drag across rectangular area)
 - + and = zoom in and out
 - I = Iconise all menus; T = tidy all menus; C = close all menus
 - Arrow keys ← , → : back/forward one state; Home = first state; End = last state
 - Space Bar start/stop animating



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