T/HIS Top-tips







- Extracting Curves to Match Model
- <u>Auto Blank</u>
- <u>Changing Model Prefix</u>
- <u>Creating More Graphs</u>
- <u>Curve Management</u>
- Fast-TCF & Multiple Models
- Digitizing Curves
- Editing Curves
- <u>Curve History</u>
- Datum Lines
- Shortcuts & Quick Pick
- Graph Settings
- <u>Units</u>
- Line Style
- Ergonomics



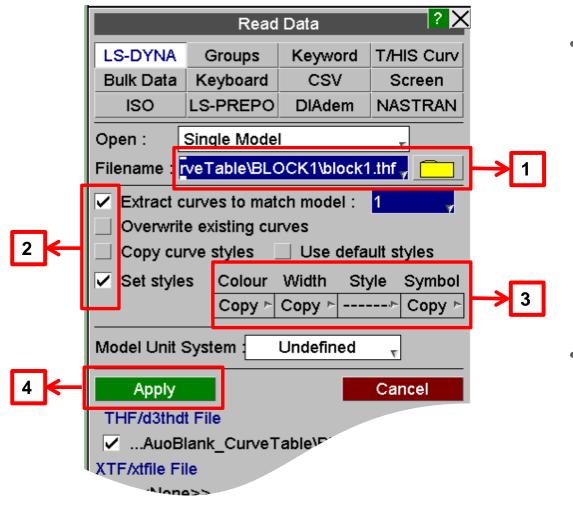




EXTRACTING CURVES TO MATCH MODEL



Slide 3



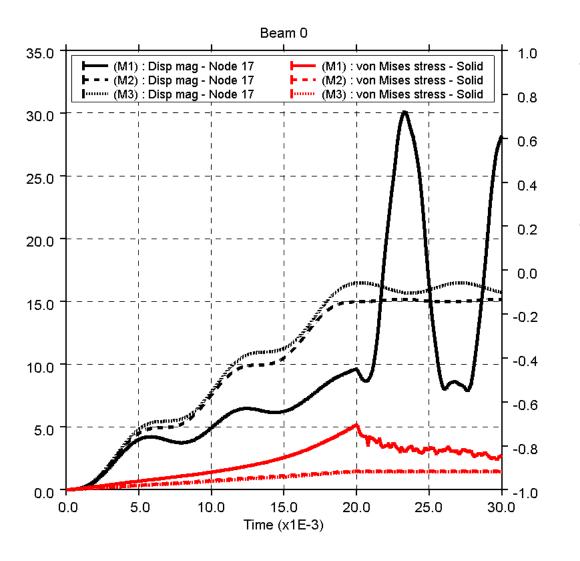
Back to Contents

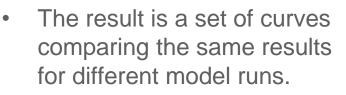
After reading in a model and picking the curves you wish to plot, click on New Model. You can then read in results from other runs and plot the same variables by following these steps.

T/HIS

• The set styles option allows the user to define the properties of the next set of curves.

Extract curves to match model





T/HIS

• Each has its own line style as set in step 3.

Back to Contents

Slide 5

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AUTO-BLANK

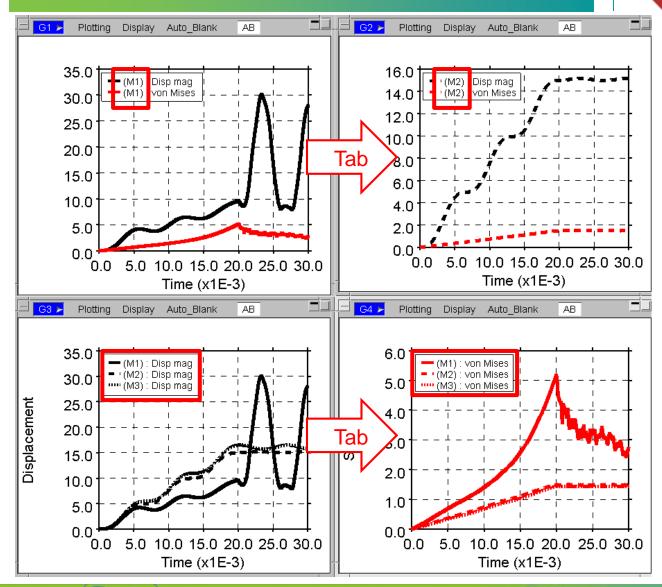






The Auto Blank menu controls G1 🗲 Plotting Display Auto Blank AB Tab key cycles through the variable which the Tab key 🖊 Models cycles through. 1.000 Components Entity Types 0.800 Entity ID Component Types 0.600 Surface/Int Point Pressing the tab key will Curve IDs. change the blanking of curves 0.400 Help according to the criterion 0.200 selected in the popup menu. 0.000

Auto Blank



 E.g. use Tab key to cycle between Models and Components.

ARUP

T/HIS

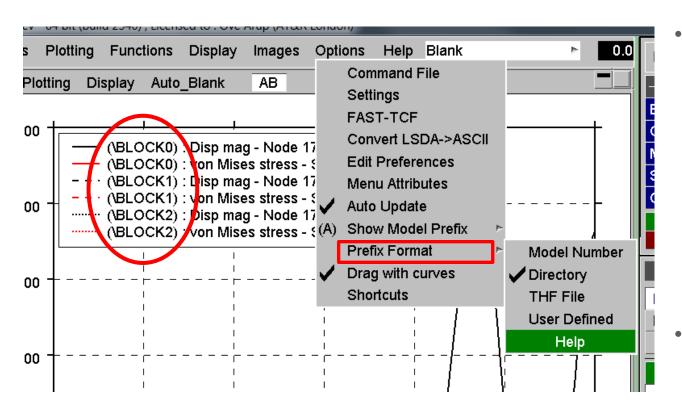
Back to Contents



CHANGING MODEL PREFIX







Back to Contents

Under Options -> Prefix Format the user can change the prefix from the default (Model Number) to the directory, the filename, or add a custom name.

T/HIS

This makes it easier to differentiate between each curve.

T/HIS TOP TIPS

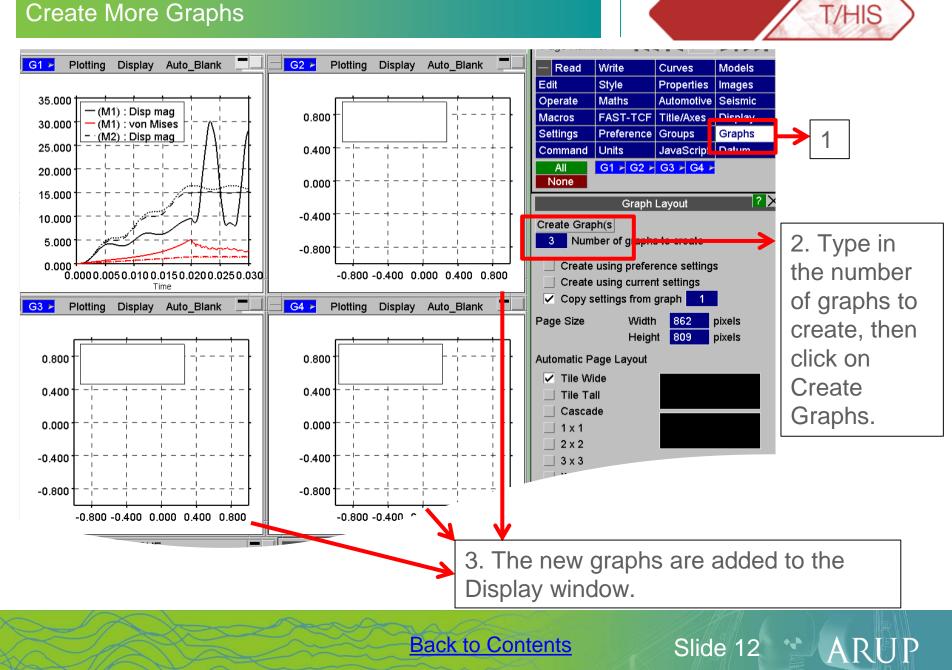


CREATING MORE GRAPHS

Back to Contents

Slide 11

Create More Graphs





CURVE MANAGEMENT







Slide 14

 The curve table can be accessed from the Curve Manager by clicking on "Table":

Curve Table								
Disn	niss	View v Update	Filter by : Mod	el _v Label	туре	v Component,	r	
Sel	ect :	All None	(Clear All Filter Options				
	ID	Label/Group Name	√ Model/File	Туре	Entity ID	Component	Style	* 1 2 3 4
	1	Disp mag - Node 17	1	Node	1/	Disp mag	<u> </u>	
	2	von Mises stress - Solid 57	1	Solid	57	von Mises stress		
	3	Disp mag - Node 17	2	Node	17	Disp mag	&	
	4	von Mises stress - Solid 57	2	Solid	57	von Mises stress		
	5	Disp mag - Node 17	3	Node	17	Disp mag	····×····	
	6	von Mises stress - Solid 57	3	Solid	57	von Mises stress	·····@·····	
	1	Model_1	N/A	GROUP	*	*	Mixed	
	2	Model_2	N/A	GROUP	*	*	Mixed	
	3	Model_3	N/A	GROUP	*	*	Mixed	

- Rows can be sorted by clicking on the column headers.
- Columns can be moved to different positions in the table by dragging column header to the desired position.





Slide 15

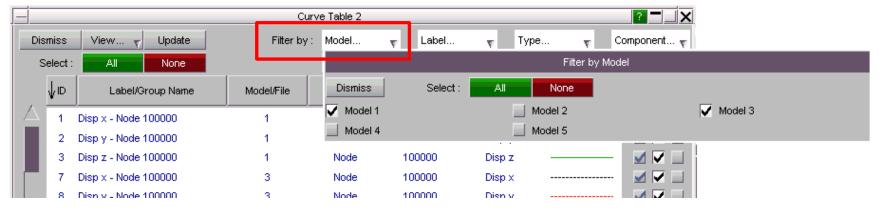
ARUP

Dismi	iss	View 🗸 Update	Filter by : Mo	del 💡 Label	туре	The Component Th	,	
Sele	ct :	All None		Clear All Filter Options				
	ID	Label/Group Name	√ Model/File	Туре	Entity ID	Component	Style	* 1 2 3 4
	1	Disp mag - Node 17	1	Node	17	Disp mag	<u> </u>	
	2	von Mises stress - Solid 57	1	Solid	57	von Mises stress	-8-	
	3	Disp mag - Node 17	2	Node	17	Disp mag	&	
	4	von Mises stress - Solid 57	2	Solid	57	von Mises stress		
	5	Disp mag - Node 17	3	Node	17	Disp mag	····×····	
	6	von Mises stress - Solid 57	3	Solid	57	von Mises stress		
	1	Model_1	N/A	GROUP	*	*	Mixed	
	2	Model_2	N/A	GROUP	*	*	Mixed	
	3	Model_3	N/A	GROUP	*	*	Mixed	

- Graphs can be populated by ticking and un-ticking each curve or group in the right hand side menu.
- Each column represents a graph in the T/HIS window.



• The contents can be filtered using different options



Back to Contents

 The user can select which columns should be displayed in the table. For example, you can choose to view directory.

	Curve Table									
Dismi	ss View 🔻 Update 👘	Filter by : Model	v Label	₹ Ту	ое _v	Component 🔻				
Selec	t : Select Columns	Display	Show Models By	?						
, VI	D Label/Group Name	☐ All Items ☐ Group Bγ Model/File	 Model number Directory 	√lodel	Entity ID	Туре	Component	Style *	* 1 V	
	1 Model/File	☐ Group Common Items	☐ THF File	1	1	Model	K.E.			
	2 🗸 Type	Include	🔲 User Defined	2	1	Model	K.E.		11	
:	3 🖌 Entity ID	Curves and Group		3	1	Model	K.E.	→ ↓	/ /	
4	4 Component	Curves Only		4	1	Model	K.E.	<u>———</u>	~ ~	
	5 🖌 Style	☐ Groups Only		5	1	Model	K.E.	\rightarrow	/ /	
	5 V Directory			1	1	Model	T.E.			
	Save to pref		Dismiss	2	1	Model	T.E.			
		плацироплоеннасти ос		3	1	Model	T.E.			
	9 T.E Whole Model	Y:\support\JennaG\POS	T\CRUSH\RUN3	4	1	Model	T.E.	<u>-</u>		
1	0 T.E Whole Model	Y:\support\JennaG\POS	T\CRUSH\RUN4	5	1	Model	T.E.			
1	1 I.E Whole Model	Y:\support\JennaG\POS	T\CRUSH\BASE	1	1	Model	I.E.			
1	2 I.E Whole Model	Y:\support\JennaG\POS	T\CRUSH\RUN1	2	1	Model	LE.			
1	3 I.E Whole Model	Y:\support\JennaG\POS	T\CRUSH\RUN2	3	1	Model	I.E.	$\rightarrow \leftarrow$		
<u> </u>	4 I.E Whole Model	Y:\support\JennaG\POS	T\CRUSH\RUN3	4	1	Model	I.E.			
[™] 1	5 I.E Whole Model	Y:\support\JennaG\POS	T\CRUSH\RUN4	5	1	Model	I.E.	— —— [

Slide 16

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Curve Table

-			Curve Table						? -)
Dismiss	View _v Update	Filter by : Model	v Label	т Тур	ое v	Component 🔻			
Select :	Select Columns	Display	Show Models By	?					
, ↓ID	✓ ID ✓ Label/Group Name	☐ All Items ☐ Group By Model/File	 Model number Directory 	vlodel	Entity ID	Туре	Component	Style	* 1
	🗸 Model/File	Group Common Items	THF File	N/A	*	GROUP	*	Mixed	
2	🗸 Туре	Include	🔲 User Defined	N/A	*	GROUP	*	Mixed	
3	🖌 Entity ID	Curves and Group		N/A	*	GROUP	*	Mixed	
4	🗸 Component	☐ Curves Only		N/A	*	GROUP	*	Mixed	
5	🗸 Style	Groups Only		N/A	*	GROUP	*	Mixed	
	Directory Save to pref		Dismiss						
	Save to prei		Dismiss						
$\overline{\nabla}$									



- T/HIS automatically includes Curves and Groups to the curve table by default. It is now possible to select 'Curves Only' and 'Groups Only'.
- These options can also be saved to preferences.

 Curves can be deleted, grouped or modified once selected in the table.

_			Curv	e Table 2			? 🗖 🔤 🗙 📕 FAS
Di	smiss	View _V Update	Filter by :	Model	T Label	🔻 Type.	
	Select :	All None		Clear	r All Filter Options		e Uni
	¢ı⊳	Label/Group Name	Model/File	Туре	Entity ID	Component	Style * 1 2
Δ	1	Disp x - Node 100000	1	Node	100000	Disp x	
	2	Disp y - Node 100000	1	Node	100000	Disp y	
	3	Disp z - Node 100000	1	Node	100000	Disp z	Create Group
	7	Disp x - Node 100000	3	Node	100000	Disp x	Add to Group
	8	Disp y - Node 100000	3	Node	100000	Disp y	Delete
	9	Disp z - Node 100000	3	Node	100000	Disp z	Colour ►
	16	K.E Whole Model	1	Model	1	K.E.	Line Width 🕨 m
	17	I.E Whole Model	1	Model	1	I.E.	Line Style
	20	K.E Whole Model	3	Model	1	K.E.	Symbol 🕨
	21	I.E Whole Model	3	Model	1	I.E.	Dismiss

Slide 17

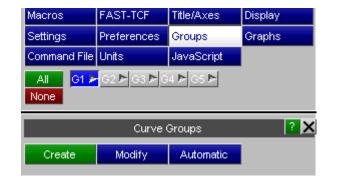
ARUP

Automatic Curve Groups

- The Curve Groups menu contains an option to control the creation of automatic curve groups. These groups can then be used to select curves used in operations or to control the blanking and unblanking of curves.
- By default T/HIS will automatically create a curve group for each model and place any curves from that model in the group.
- Groups can also be created based on
 - Entity Type
 - Component
 - Index in curve file
- Groups can be created after curves have been read in by using "Update Groups"

Back to Contents

Preference options can be used to set the default groups that are created.



[/HIS

Autor	natic Curve Group Settings	? X						
Done Create groups autor	natically based on :							
Model ID								
Entity Type								
Component	Name using:							
	component_entity_type							
Curve File Index	Curve File Index							
Update Groups								

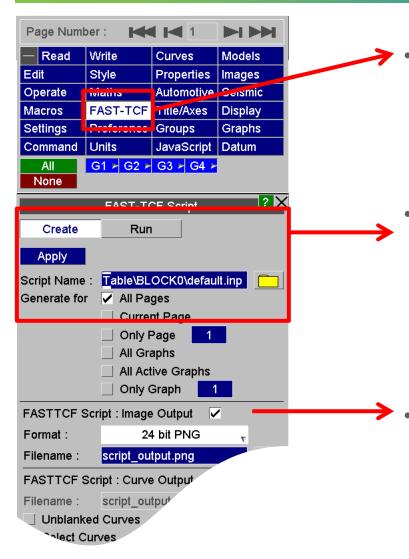


FAST-TCF & MULTIPLE MODELS



Slide 19

FAST-TCF



FAST-TCF creates a .inp file which allows the user to regenerate all curves.

T/HIS

Press Create and give the script a name, then press apply.

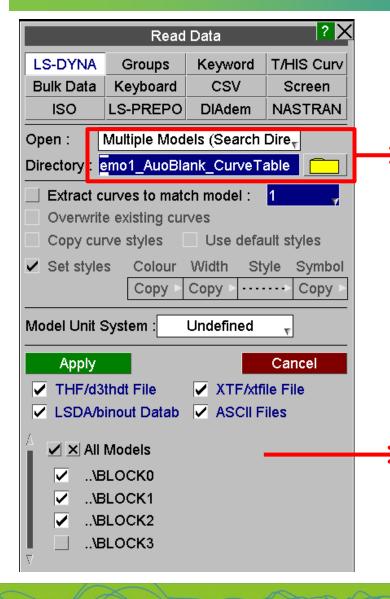
• Other options can be set in order to generate image files with the results from the script.

Slide 20

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Opening Multiple Models.



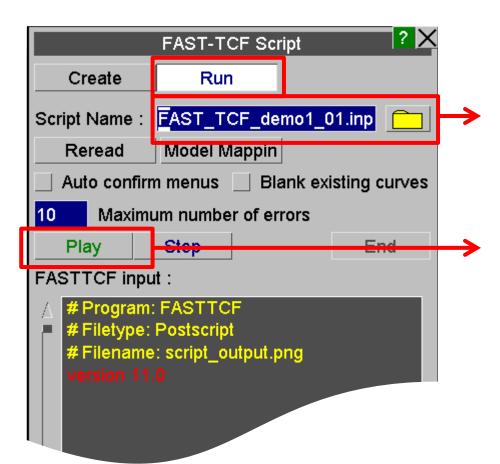


- Open a new session of T/HIS.
 - In the READ menu, it is possible to open several models at once by selecting "Multiple Models (Search Directory)" in the drop down menu. Then searching for the directory that contains all the models you wish to open.

Then select the models needed. In the example above only 3 models are in use so Block 3 is not selected.







• Click on "Run" and then select the .inp script you saved in the previous step.

Slide 22

ARUP

 Press Play and watch T/HIS regenerate all the curves as before!





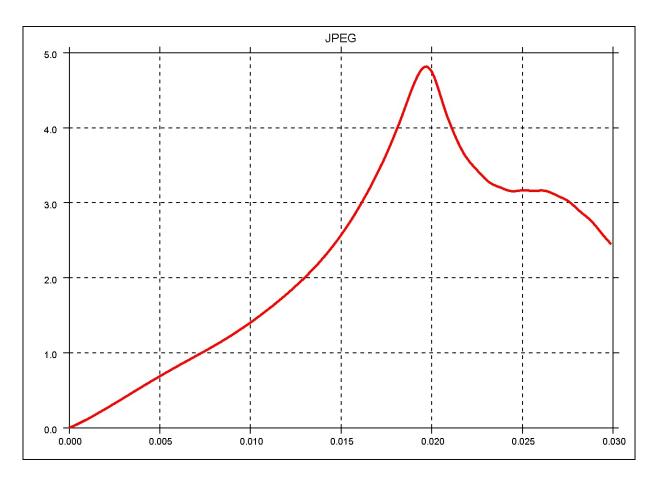
DIGITIZING CURVES







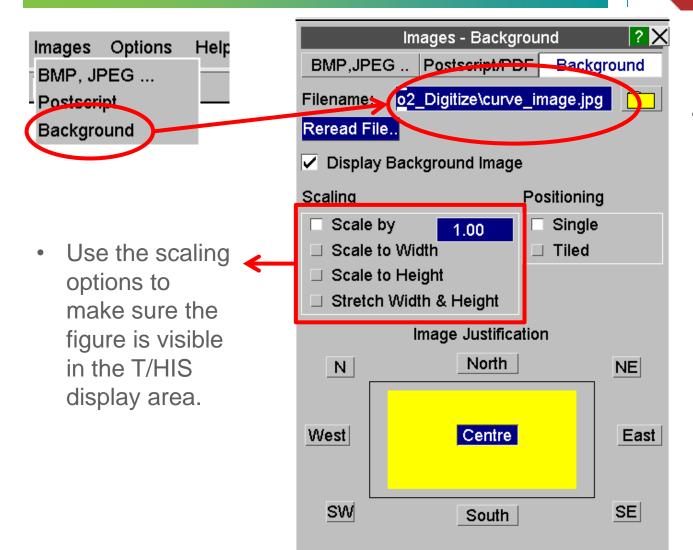
Image File:



Back to Contents

 It is possible to digitize a curve taken from a image file (like the one to the left) by using T/HIS "Background" and "Read->Screen" options.

ARUP



Back to Contents

• Pick the curve that is to be Digitized as the background.

Slide 25

T/HIS

X Axis

Title

Label

Minimum

Maximum

Axis Type

Units

Reset All

Title / Axe

<automatic>

Automatic

🗸 Add Units

Automatic

0.0000E+00

3.0000E-02

0.0000E+00

0.0000E+00

Decimal Places

Add Exponent to Label

🖌 Linear

Format

Font

Size

Colour

Axes

Fonts

Sizes

Solid Axes at X=Y=0

Colours

Grid Spacing 🗸 Automatic

Font

Size.

Colou

Display Label

Y Axis

User Defined

User Defined

Default

automatic

Blue

Autoscale Locked

Locked

Interval

Offset

3 🔶

Automatic

| Logarithmic

User Defined

Automatic

Default

automatic

Blue

Default

automatic

Blue

Locked

 $\overline{\mathbf{v}}$

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<automatic>

1.

2.

Go to

then X

(Repeat

Match

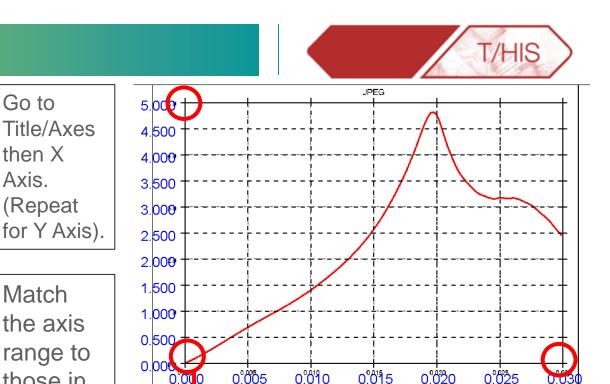
the axis

those in

Image.

the

Axis.

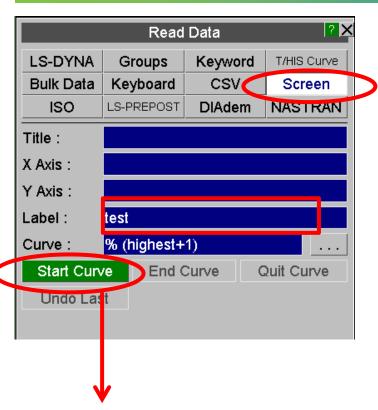


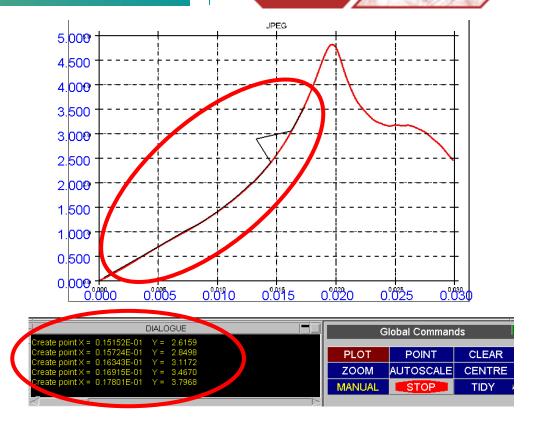
5. With the cursor move the location of the T/HIS axis to match those of the background image.

Slide 26

ARUP

3. Make both axis a distinctive colour.





T/HIS

- Using the Screen option in the Read menu, give your curve a Label and click on Start Curve.
- Click on points inside the axis (along the curve), T/HIS creates these points in as a new curve. When done, click on End Curve in the Read menu. If a mistake is made it's possible to click on Undo Last to remove the point.

Slide 27

T/HIS TOP TIPS



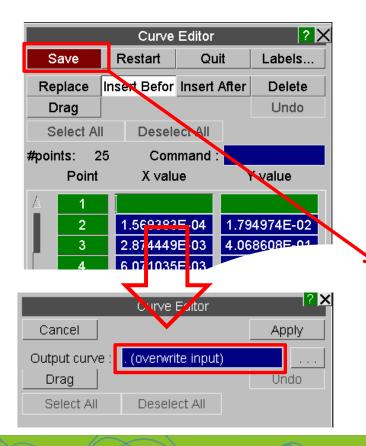
EDITING CURVES

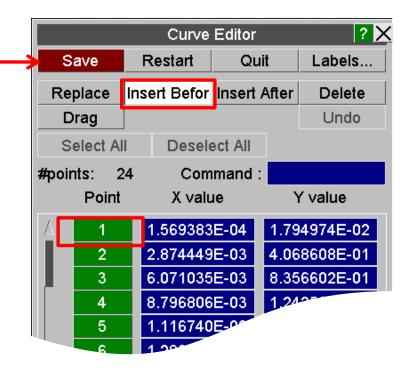




EDIT – Adding Points

 To add the (0,0) point, select "Insert Before" and then click on the first point. This will create a new line and shift all the other points down.





T/HIS

2. After inserting the new points click on "Save" and Output the curve to "Overwrite input" so that it is not saved as a new curve (or type "." and enter in the text box).

Slide 29

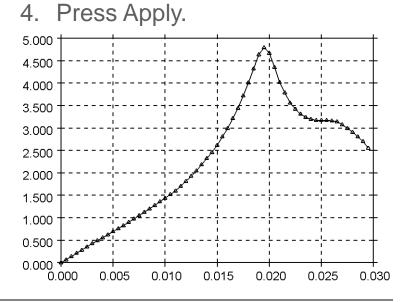
3. Remember to click on Apply.



Regularize Curve

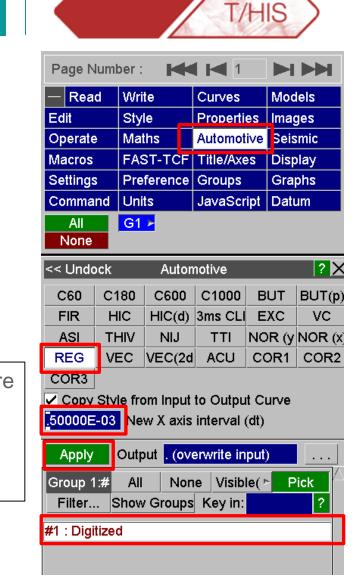
When picking points on the screen it is likely they are not evenly distributed.

- 1. In order to regularize the curve use the "Automotive" function "REG".
- 2. Set the desired interval for points in the x-axis
- 3. Pick the curve to be Regularized.



The old points are deleted and new ones are evenly distributed along the x-axis.

Back to Contents

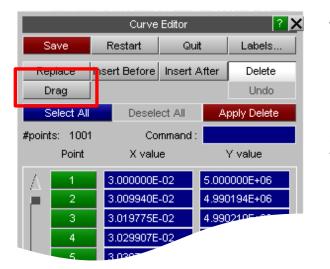


Slide 30

ARL

⁻ Digitized (Reg)

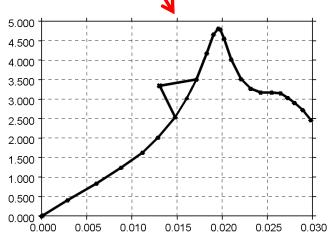
EDIT – Drag Points



5.000 4.500 4.000 3.500 3.000 2.500 Modify (Drag Point ► Drag Point(s) X,Y 2.000 Insert (Between) ... Drag Point(s) X Delete (Point) ... Drag Point(s) Y 1.500 Locate Drag Curve X,Y 1.000 Restart Drag Curve X Save (Overwrite) Drag PCurve Y 0.500 Save (Highest used Quit from Edit 0.000 0.005 0.010 Dismiss Menu 0.025 0.030 0.000

The Edit menu has an option to "Drag" points manually.

- 1. Click on "Drag" and with the right-hand button select the points to be moved.
- 2. Move the points to their new location. It's then possible to "Undo", "Restart" or "Save" the new curve.



T/HIS

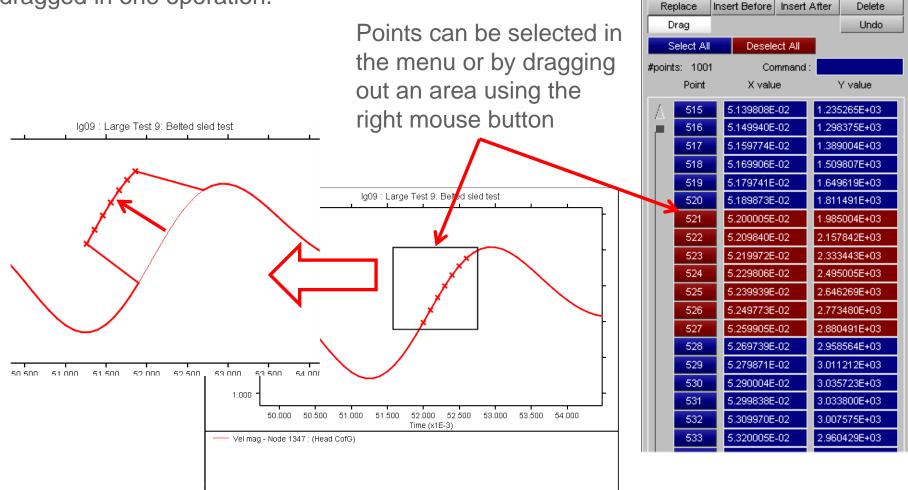
ARI

Right-clicking on the points also brings up a menu to specify the direction of dragging, such as only in the Y-direction.



EDIT – Dragging Multiple Points

Multiple curve points can now be selected and dragged in one operation.



T/HIS

Quit

Curve Editor

Restart

Save

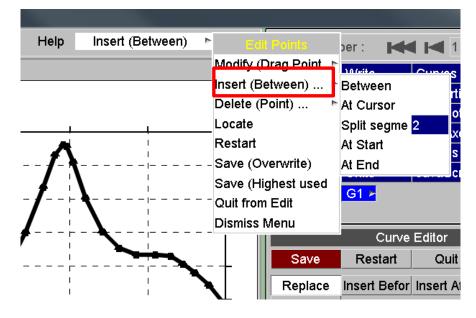
Slide 32

? X

Labels.

A quick way of inserting new points into a curve is using the Quick Pick Menu. In the drop down list select Insert, then pick one of the five options:

- <u>Between</u>: Click on the screen and T/his will insert a point as close to where the cursor is, but within the curve.
- 2. <u>At Cursor</u>: T/his will insert a point wherever the cursor is.
- 3. <u>Split Segme</u>: T/his will split a segment of the curve in as many parts as specified by the user.
- 4. At Start.
- 5. <u>At End.</u>



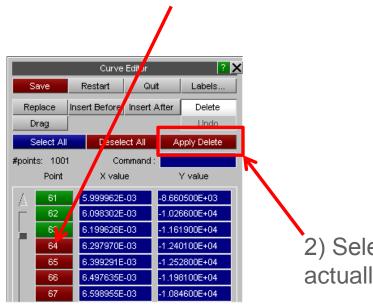
Slide 33



EDIT – Deleting Points

Deleting curve points within the EDIT menu has been modified so that multiple points can be selected and then deleted.

1) As points are selected they are highlighted in red and marked on the screen



2) Select "Apply Delete" to actually delete the points

		1	7/ł	HIS	>
	Curve	Editor		?	×
Save	Restart	Quit		Labels	
Replace	Insert Before	Insert A	fter	Delete	٦
Drag			Ľ	Undo	
Select Al	Desele	ect All	A	oply Delete	
#points: 100	1 Co	mmand :			1
Point	X valu	le	1	Y value	
A 1	3.000000E	-02	5 000	000E+06	
	3.009940E)194E+06	
	3.0197755)210E+06	
4	3.029907E		4.990)248E+06	
5	3.039741E	-02	4.990)314E+06	
6	3.049873E	-02	4.990420E+06		
7	3.059708E	-02	4.990580E+06		
8	3.069840E	-02	4.990832E+06		
9	3.079972E	-02	4.991	196E+06	
10	3.089806E	-02	4.991	676E+06	
11	3.099938E	-02	4.992	292E+06	
12	3.109773E	-02	4.992	2974E+06	
13	3.119905E	-02	4.993	697E+06	
14	3.129739E	-02	4.994	328E+06	
15	3.139872E	-02	4.994	808E+06	
16	3.149706E			5028E+06	
17	3.159838E			1954E+06	
18	3.169971E			1586E+06	
19	3.179805E			014E+06	
20	3.189937E			326E+06	
21	3.199771E			2707E+06	
22	3.209903E			262E+06	
23	3.219738E			2122E+06	
V 24 √ 25	3.229870E			2314E+06	
V 25	3.2397048	-02	4.992	2781E+06	

Slide 34

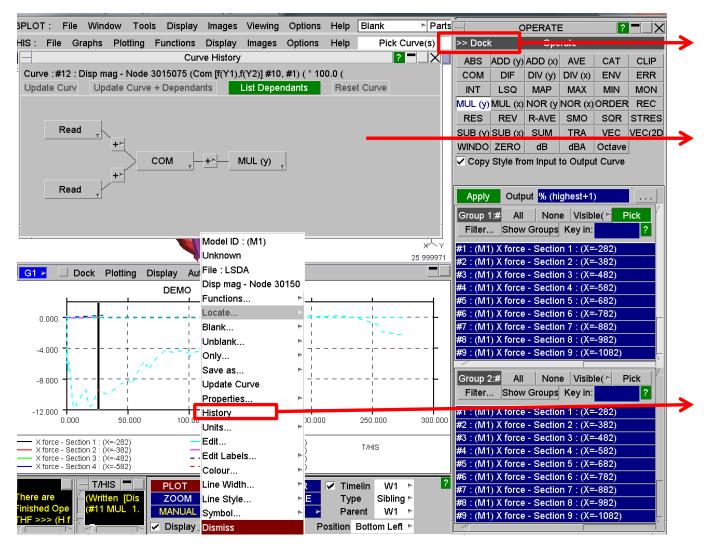


CURVE HISTORY





T/HIS – Curve History



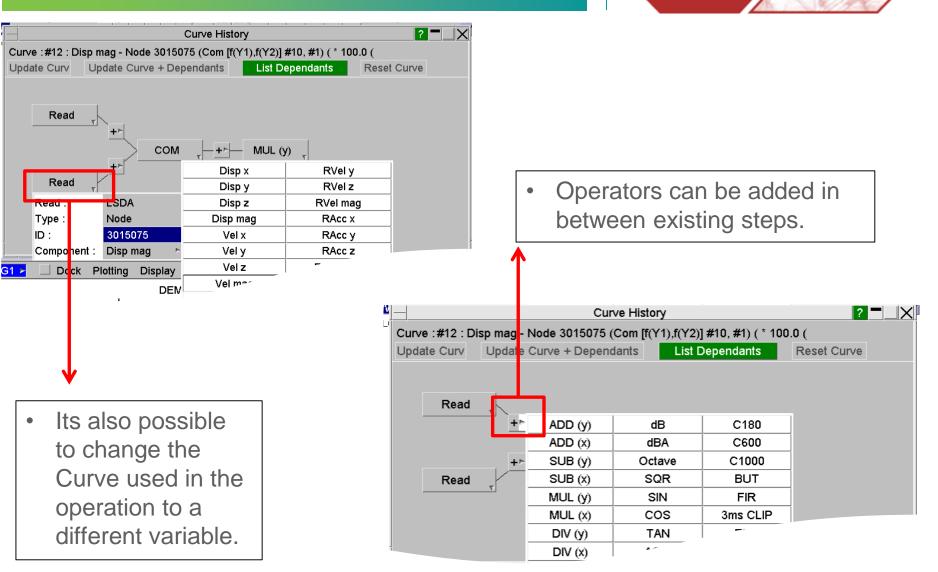
Back to Contents

 Dock/Undock Menus

T/HIS

- Curve History Panel allows user to see/change operations on curves. Just right click on operation (eg."COM") and change operation.
- Bring up "History" of curves by right clicking on the curve in display area.

T/HIS – Curve History



Back to Contents

Slide 37

Α

T/HIS

T/HIS TOP TIPS



DATUM LINES





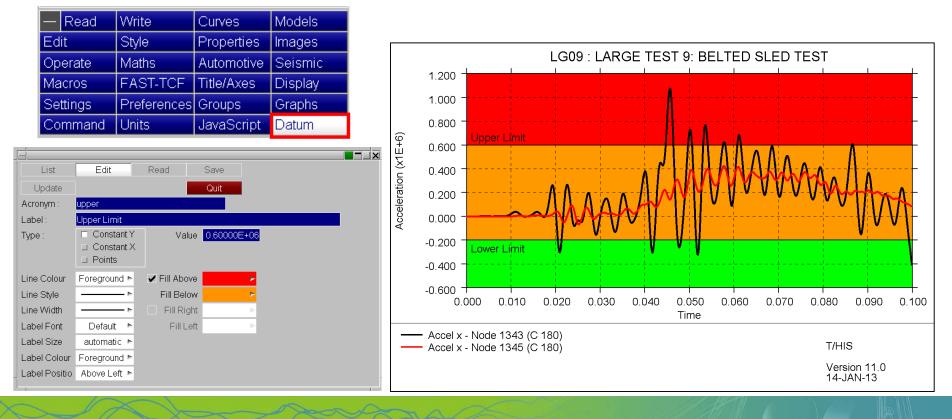
Datum Lines



Slide 39

Datum lines can be added to graphs to show limits and reference curves.

- Constant X or Y values
- Curves of X,Y points
- Shade between lines by filling above and below the lines
- Change the individual features of the lines and labels



Datum Lines

List

Acronym

Line Colour

Line Style

Line Width Label Font

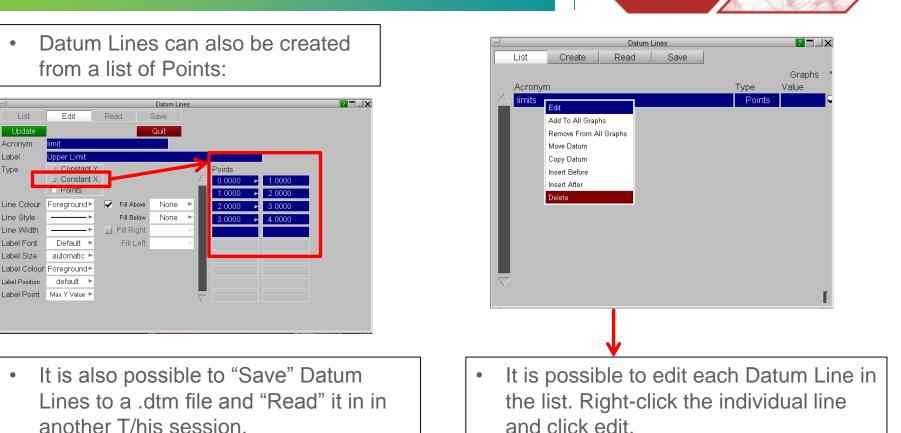
Label Size

Lahel Position

•

I abel

Type



T/HIS

If a graph contains multiple Datum lines then they are plotted in the order they are defined. Care should be taken when using the fill options so that you don't obscure other Datum line definitions.



T/HIS TOP TIPS



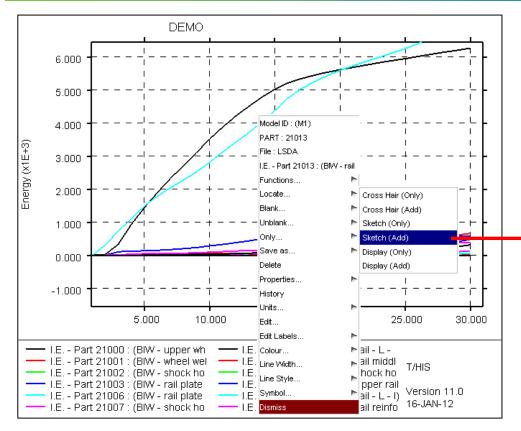
SHORTCUTS & QUICK PICK



Slide 41

ARUP

D3PLOT > T/HIS Link - Locate



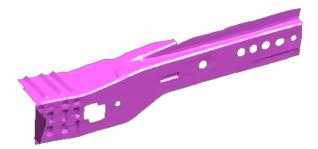
- Locate option in the T/HIS Quick Pick menu now offers options to Sketch items.
- Alternatively "Display" can be used to display just the selected item.

 Press Delete to get rid off sketching.

RU

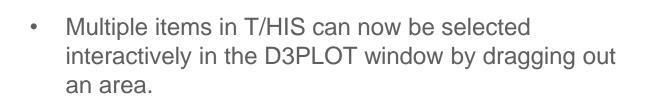
A

T/HIS



Back to Contents

D3PLOT > T/HIS Link – Pick Parts





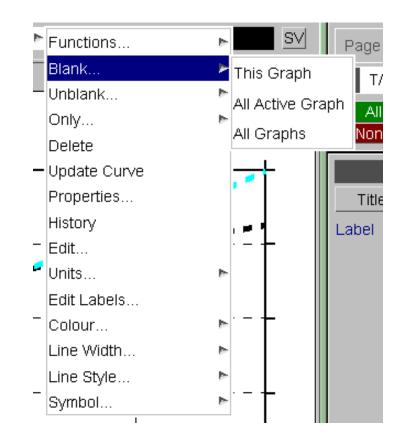
ARUP

/HIS

Back to Contents

There are many ways to Blank on T/HIS:

- By clicking on any curve on the graph when the "Quick Pick" option is set to Blank.
- By clicking on one of the lines in the legend (also with "Quick Pick" set to Blank).
- The letter "b" blanks all the curves.
- The letter "u" un-blanks all the curves.



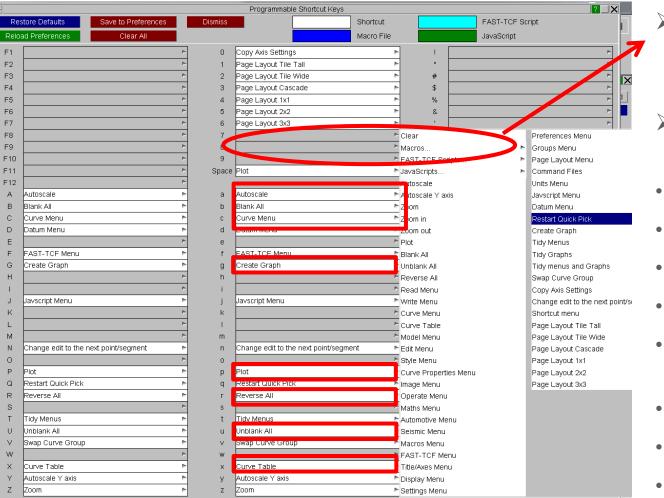
Slide 44

T/HIS



Go to "Options" -> "Shortcuts" to open the Programmable Shortcuts Menu.

Back to Contents



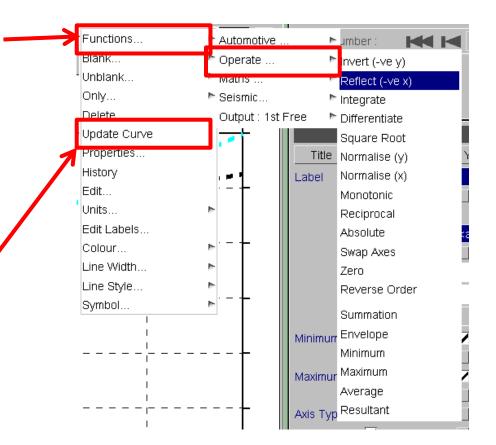
- Use one of the free keys to add your own custom shortcuts.
- Some of the most useful shortcuts are:
- "a" Autoscale
- "b" Blank All
- "c" Curve Menu
- "g" Create Graph
- "p" and Space Bar to plot, i.e. refresh screen

ARI

- "r" Reverse All
- "u" Unblank All
- "x" Curve Table

 Other useful shortcuts in the "Quick Pick" Menu are found under Functions->Operate. It is possible to select Invert or Reflect, etc. and click on a curve to create a new one.

 The "Update Curve" option is useful when a model is still running and results are changing. This will update the curve selected with any new data.



Slide 46

T/HIS

T/HIS TOP TIPS

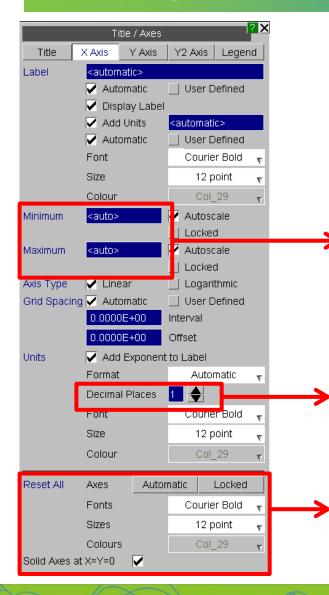


GRAPH SETTINGS



Slide 47 ARUP

Graph Settings – Title/Axes



- The Title/Axes menu • allows the user to change the display settings for the graphs.
 - As mentioned before, it is possible to set the range for each axis
- It is also possible to set the amount of decimal places shown on the graph.
- The Reset All section allows the user to set the Fonts, Sizes and Colours for all axes.

A second Y-axis can be added by ticking this option

T/HIS

Y2 Axis Legend

User Defined

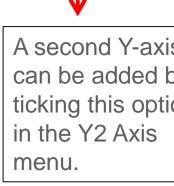
User Defined

Courier Bold

<automatic>

10

? X



Title / Axes

Title X Axis Y Axis

Font

Size

Slide 48

Colour

<automati

Automatic

🗸 Add Ulits

Automatic

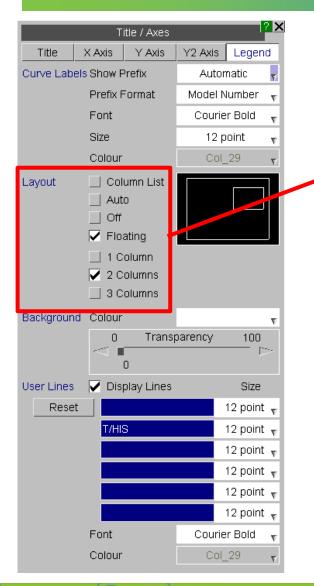
Display Label

Add Second Y Axis

Label

Graph Settings – Legend



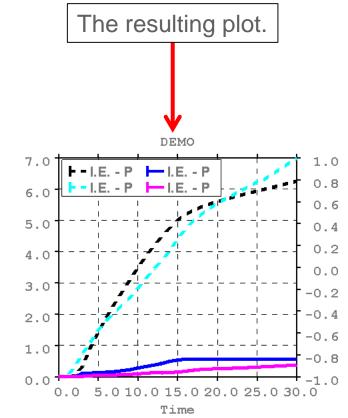


- The Legend menu allows the user to define the location and number of columns in
 the legend.
- The floating legend can be moved and resized manually to the desired location.

Back to Contents

(x1E+3)

Energy



**

Graph Settings – Saving Settings

- 2. Select a directory and file name for the settings file to save, or find the one to reload.
- Pick the properties that should be saved in your settings file.

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 In Settings -> Layout it is possible to save your current settings or reload a pre-saved settings file.

4. Remember to press APPLY when done.

Slide 50

Graph Settings – Saving Settings



Page Numb	er : 🛛 🛏	1							
- Read	Write	Curves	Models						
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Save F) Display setting	s in nreferen	ce file						
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 If the Graph settings are your preference for all projects you can also save the settings to the oa_pref file by pressing the "Save Display settings in preference file" button at the bottom of the Display menu.



T/HIS TOP TIPS

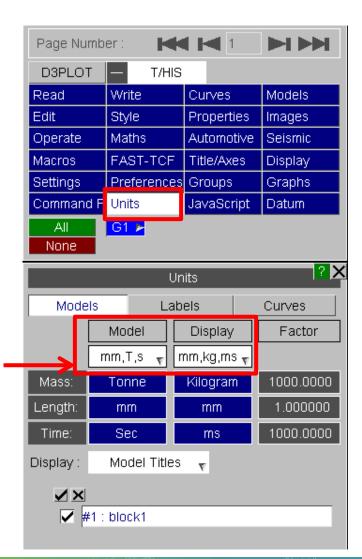


Slide 52 ARUP

UNITS



- In a linked session of D3Plot and T/HIS the Units menu allows the user to plot results with different units. (Note: If data was loaded from a .cur file the user must specify the units of each axis in Units->Curves, see section 5.22.3 of the T/HIS manual for more details).
- If the original model was defined in: mm, T, s and curves are to plotted in: mm, kg, ms, it is possible to automatically convert the T/HIS curves to the new set of units.



T/HIS TOP TIPS

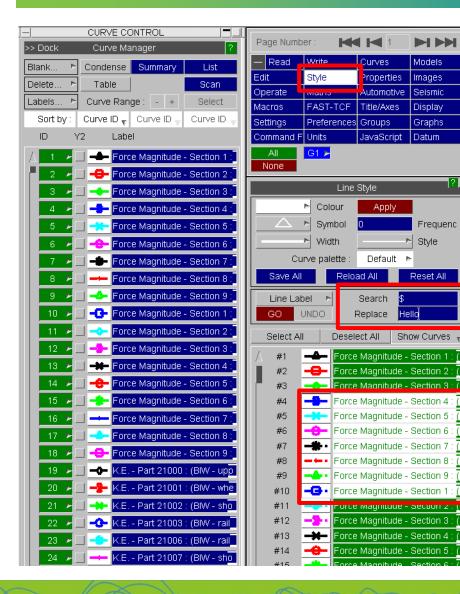


LINE STYLE



Slide 54 ARUP





- 1. Undock the Curve Manager, select the Style Menu.
- 2. Select curves to be re-styled.
- In the Search box type "\$". This will 3. append text to the end of the label.
- In the Replace box type in the text to 4. be appended.
- Press GO. 5.

Models

Images

Seismic

Display

Graphs

? X

Back to Contents

Frequenc

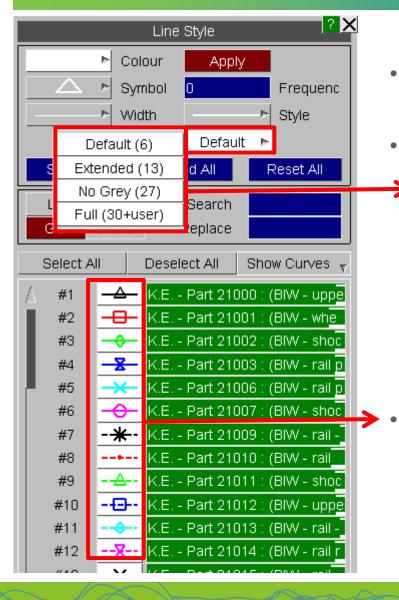
Style

Reset All

Datum

- It is possible to type a word in the Search box, such as Magnitude and T/HIS will replace any instance of it with your text.
- Use "^" in the Search box to append text to the beginning of the label.

Colour Palette



- By default T/HIS uses 6 colours for all the curves in any given Graph.
- The number of colours used can be increased in the Style Menu by clicking on the "Curve Palette" drop down menu. Then, choosing one of the three other options available.

T/HIS

Six repeating colours over all curves (Default).

Slide 56



ERGONOMICS





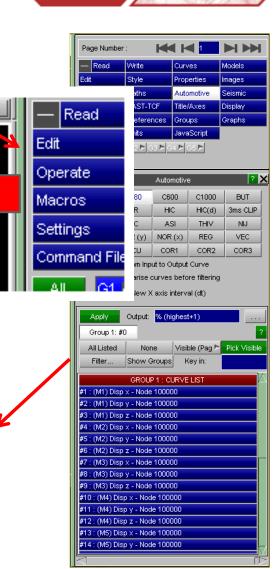
ARUP

Resizing Right Hand Menu

 The width of the right hand menu bar can be adjusted by clicking on the green vertical bar and dragging – e.g. used to reveal longer curve IDs in the Curve Manager.

 Adjusting the width of the main menu also reformats the Operate, Maths, Automotive and Seismic menus and allows more curves to be displayed.

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COR3											
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Always regularise curves before filtering											
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Slide 58

T/HIS



Slide 59

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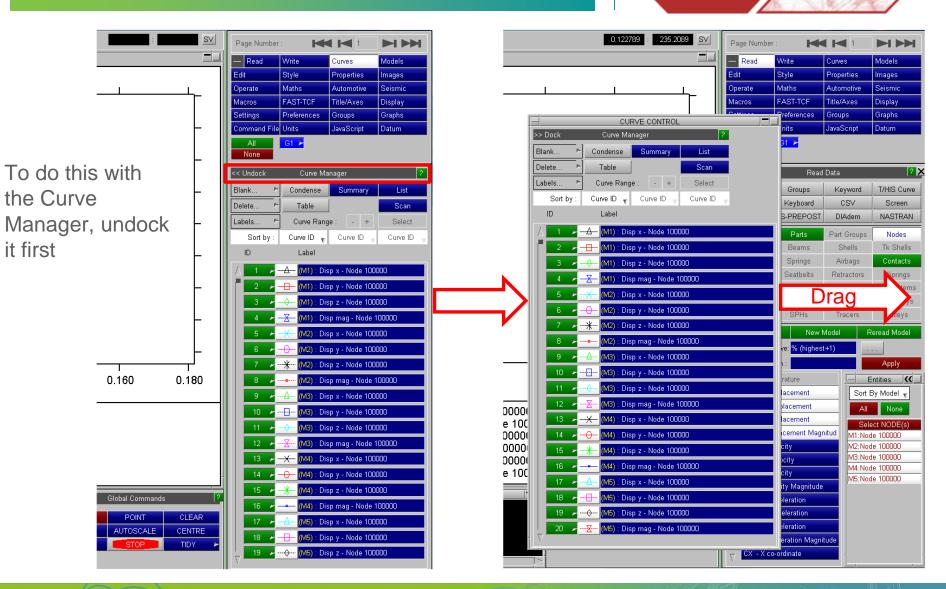
Floating menus can be dragged outside the main T/HIS window.

Useful with wide-screen or dual-screen monitors.

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Ergonomics



Back to Contents

Slide 60 ARUP

T/HIS

Ergonomics



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	- Read	Write	Curves	Models	>> Dock
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	Solids	Beams	Shells	Tk Shells	7
	Stonewalls	Springs	Airbags	Contacts	8
	Geo Contacts	Seatbelts	Retractors	Sliprings	9
- II	Reactions	Joints	X Sections	Subsystems	10
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Now the Curve Manager is always available without obscuring other menus

Slide 61

ARUP

Ergonomics



V10

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V11 + Wide Menu

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#3 : (M1) Disp z - Node 100000
#4 : (M1) Disp mag - Node 100000
#5 : (M2) Disp x - Node 100000
#6: (M2) Disp y - Node 100000
#7 : (M2) Disp z - Node 100000
#8 : (M2) Disp mag - Node 100000
#9 : (M3) Disp x - Node 100000
#10 : (M3) Disp y - Node 100000
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#2 : (M1) Disp y - Node 100000
#3 : (M1) Disp z - Node 100000
#4 : (M1) Disp mag - Node 100000
#5 : (M2) Disp x - Node 100000
#6 : (M2) Disp y - Node 100000
#7 : (M2) Disp z - Node 100000
#8 : (M2) Disp mag - Node 100000
#9 : (M3) Disp x - Node 100000
#10 : (M3) Disp y - Node 100000

Back to Contents

More curves can be displayed in curve operation menus.

V11 + Desktop Menu

_			OPER	ATE			?	×		
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RES	REV	R-AVE	SMO	SQR	STRESS	SUB (y)	SUB (x)			
SUM	TRA	VEC	VEC(2D)	WINDOW	ZERO	dB	dBA			
Octave		VLO	*=======	**II4DO**	ZERO	- 00	- 004			
	l Style from I	nput to Out	tput Curve							
Арр	ly	Output:	% (high	nest+1)				1		
Group 1:	#0 All	None	e Visible		lick			14		
Filter	Show	/ Groups	Key in:		?					
	Disp x - No									
#2 : (M1) [Disp y - No	de 100000								
#3 : (M1) [Disp z - No	de 100000								
#4 : (M1) [Disp mag -	Node 1000	00							
	Disp x - No									
	Disp y - No									
	Disp z - No									
		Node 1000	00							
	Disp x - No									
		ode 10000								
		ode 10000								
		- Node 100								
		ode 10000								
#14 : (M4)	Disp y - N	ode 10000	1					$\overline{\nabla}$		
Group 2:	#O All	None	e Visible	(P) > E	ick			À		
· · ·				() ·] ·	2					
Filter	Show	/ Groups	Key in:							
#1 : (M1) Disp x - Node 100000										
#1 : (W1) Disp x - Node 100000 #2 : (M1) Disp y - Node 100000										
#3 : (M1) [Disp z - No	de 100000								
#4 : (M1) [Disp mag -	Node 1000	00							
#5 : (M2) [Disp x - No	de 100000								
#6 : (M2) [Disp y - No	de 100000								
#7 : (M2) [Disp z - No	de 100000								
		Node 1000	00							
	Disp x - No									
		ode 10000								
		ode 10000								
		- Node 100								
		ode 10000								
#14 : (M4)	Disp y - N	ode 10000	1					$\overline{\nabla}$		

Slide 62

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