

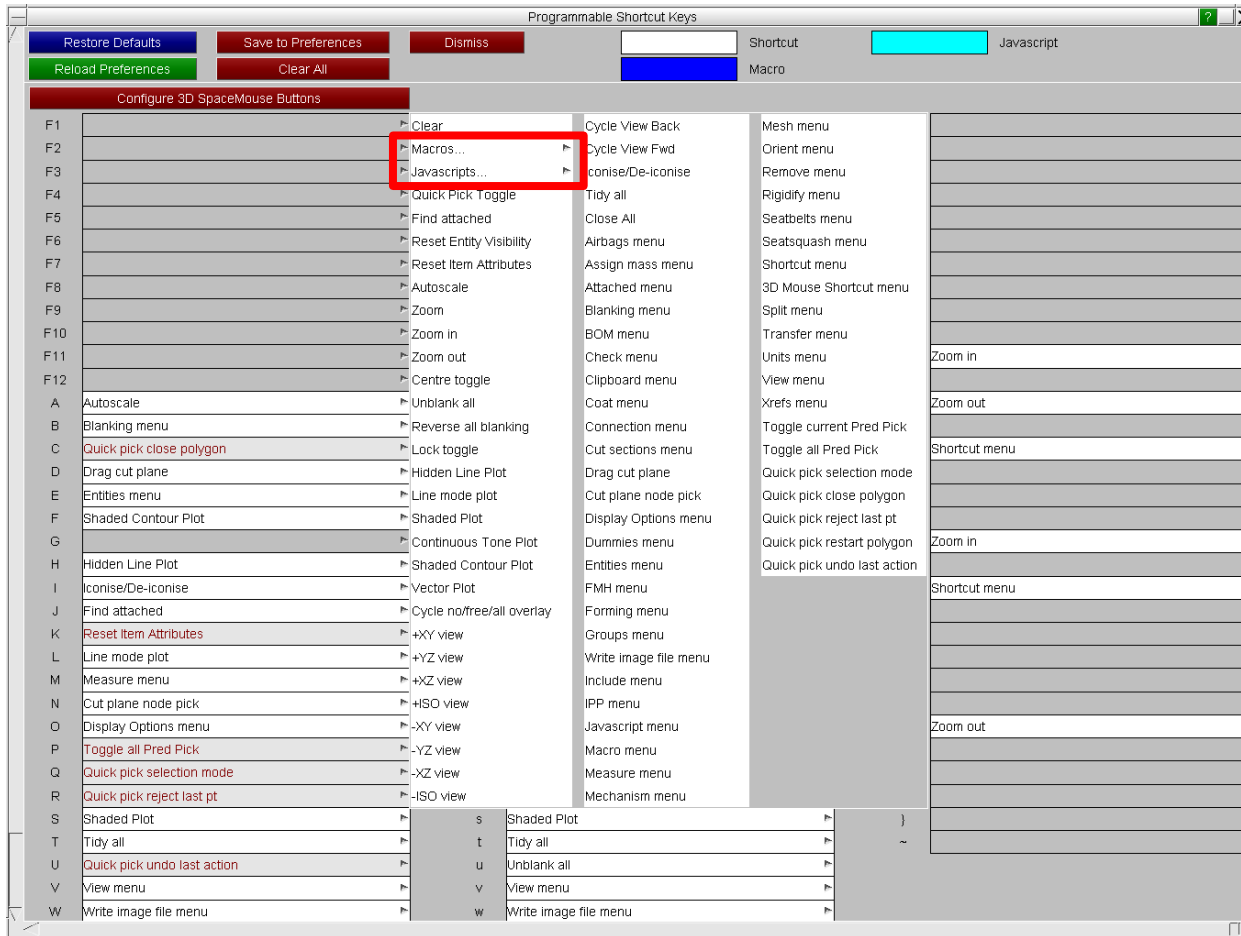
# PRIMER Top Tips



- [Primer Shortcuts](#)
- [Panel Configuration](#)
- [Quick Pick](#)
- [Find Tool](#)
- [Mass Properties Calculator](#)
- [Saving Views](#)
- [Part Tree Assemblies & Contents](#)
- [Object Menus](#)
- [Model Building from CSV](#)
- [Dummies and Seats](#)
- [Assembly Replace](#)
- [Compare Models](#)
- [Cross Sections](#)
- [Connections](#)
- [Mesh Quality & Modifying](#)
- [SPC Colour Plotting](#)
- [Scripts Released with Primer](#)
- [Preference Files](#)
- [What's New PPT](#)



- Press “?” to bring up the programmable Shortcuts menu.



- By right-clicking on any of the keys it is possible to view and change the action **as well as** assign macros or JavaScript's to an empty key.

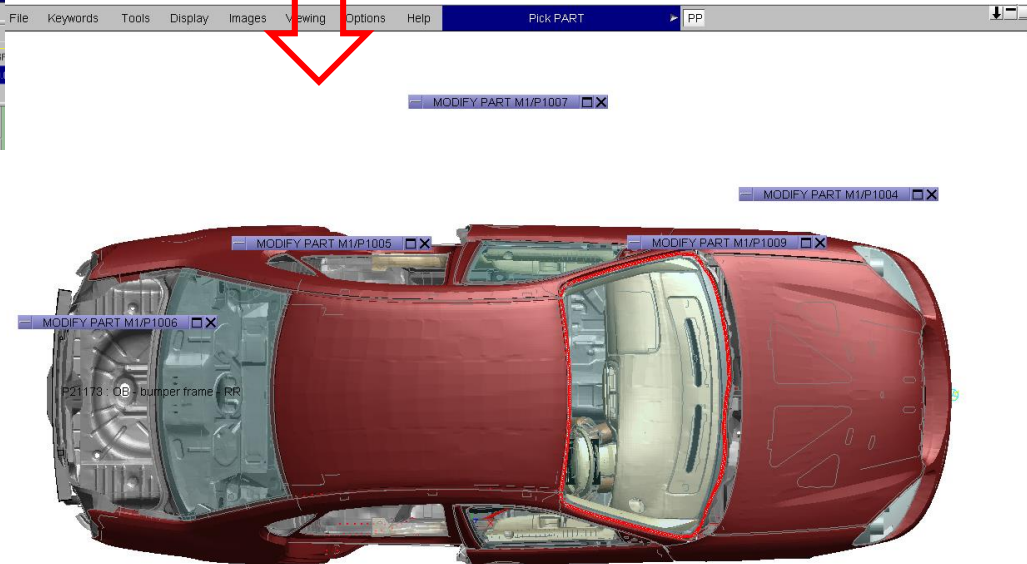
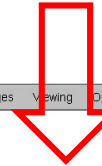
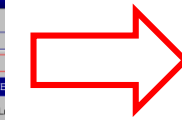




# PRIMER Shortcuts - Iconise

PRIMER

- Press “i” to iconize all open panels.



[Back to Contents](#)

Slide 5

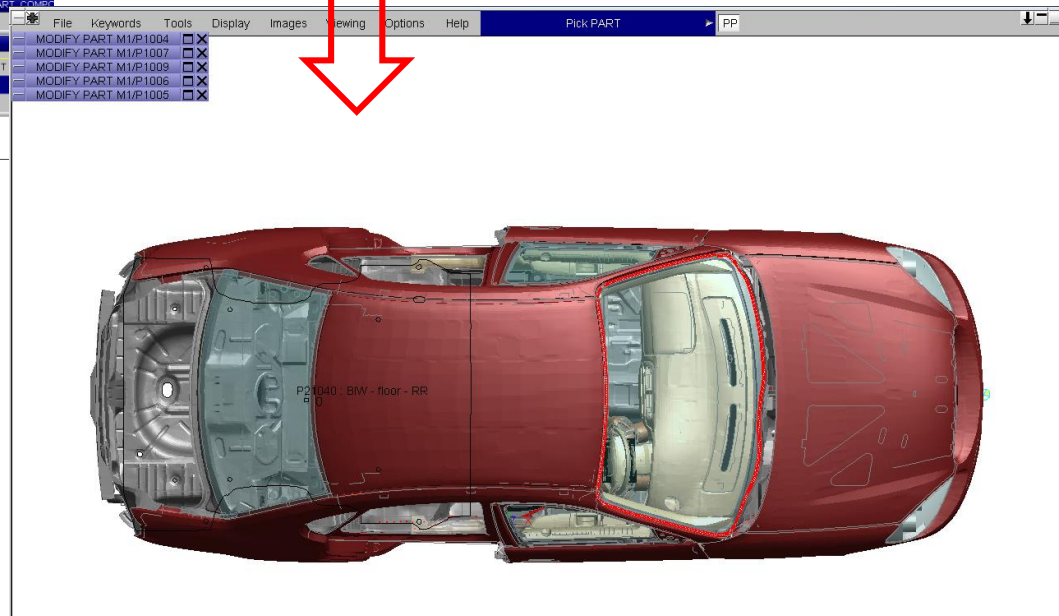
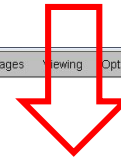
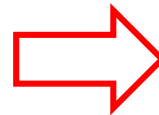
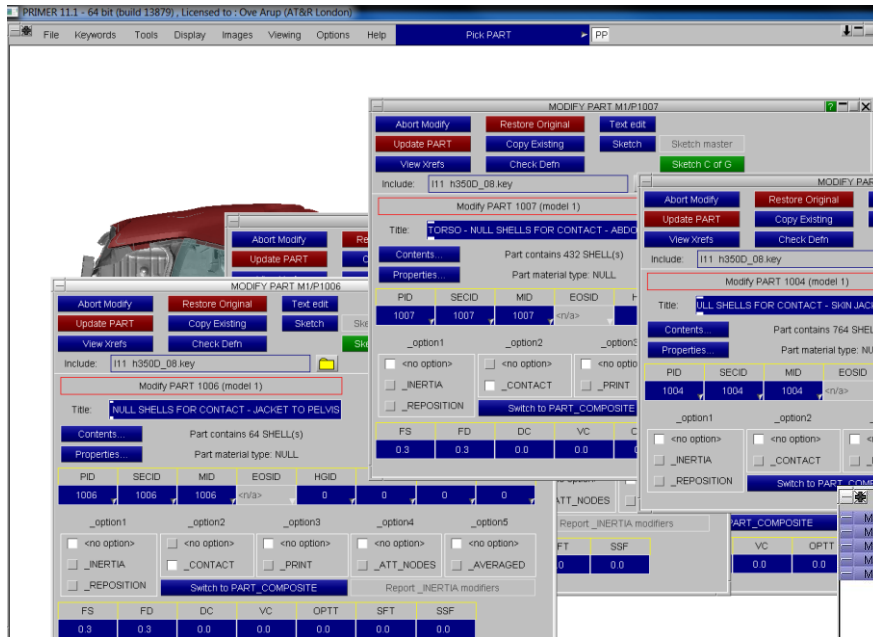
ARUP



# PRIMER Shortcuts - Tidy

PRIMER

- Press “t” to tidy and iconize all open panels at the top left hand corner of the display window.



[Back to Contents](#)

Slide 6

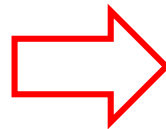
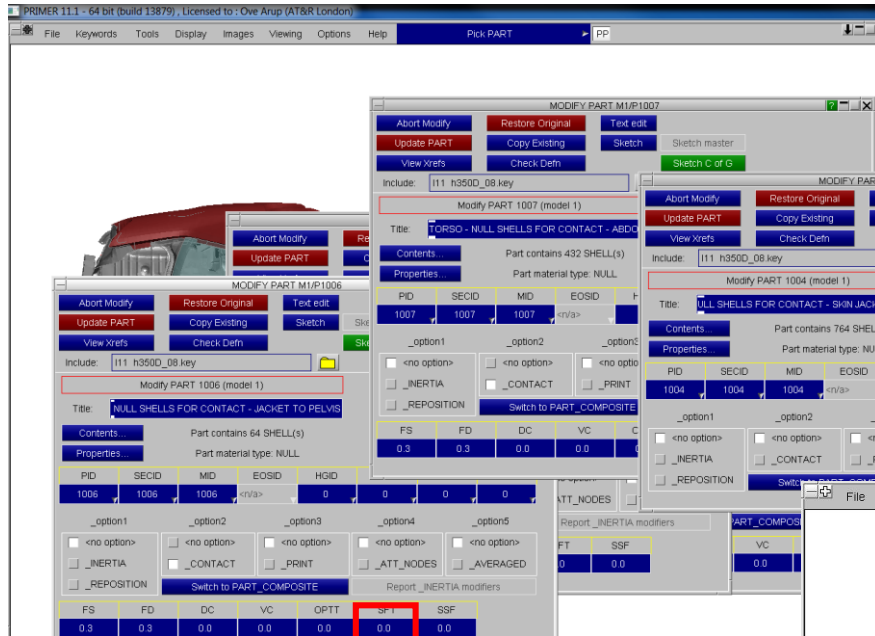
ARUP



# PRIMER Shortcuts – Close Panels

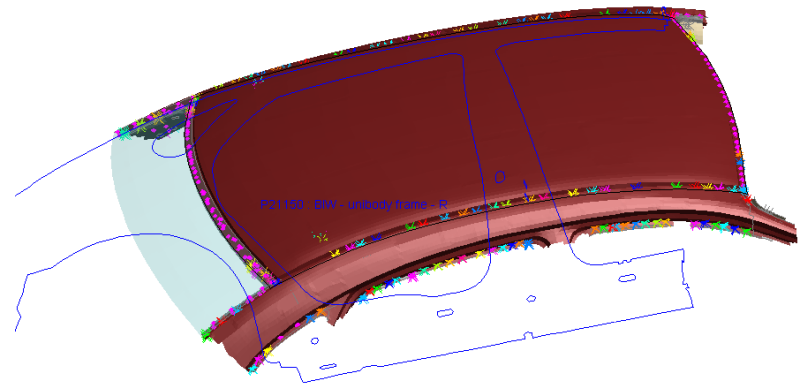
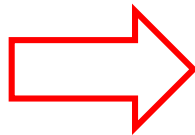
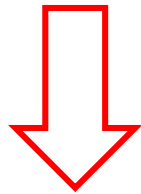
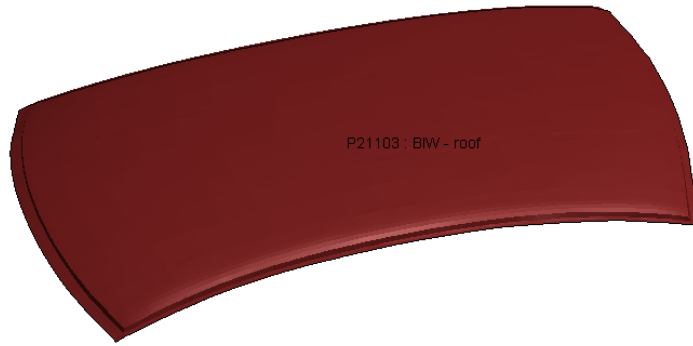
PRIMER

- Press “**c**” to close all panels, or press “**Esc**” to close each panel one at a time.

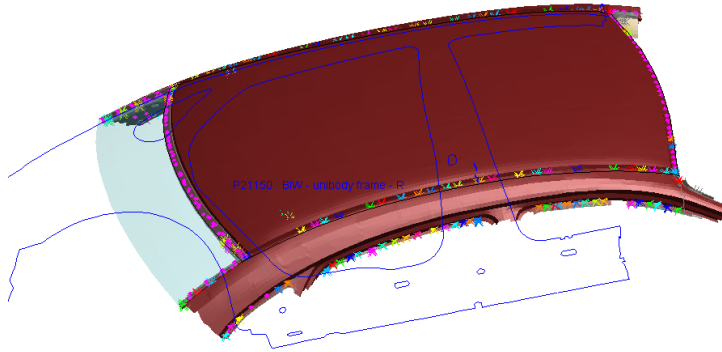




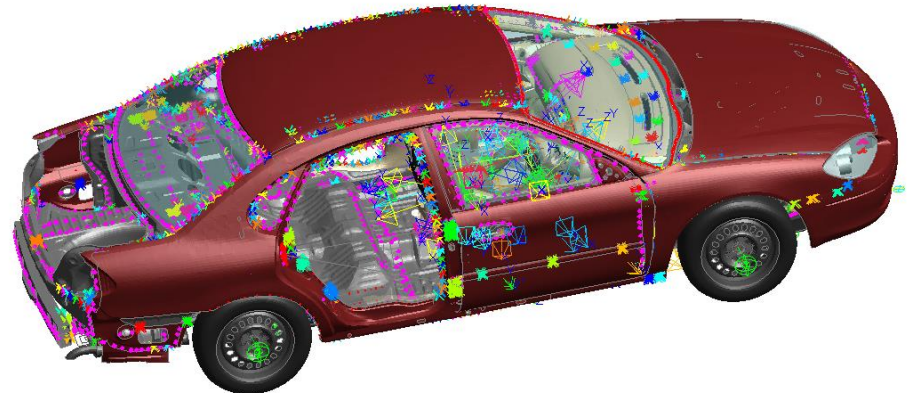
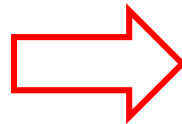
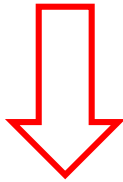
- Press “J” to find and display entities which are attached to the displayed entities.





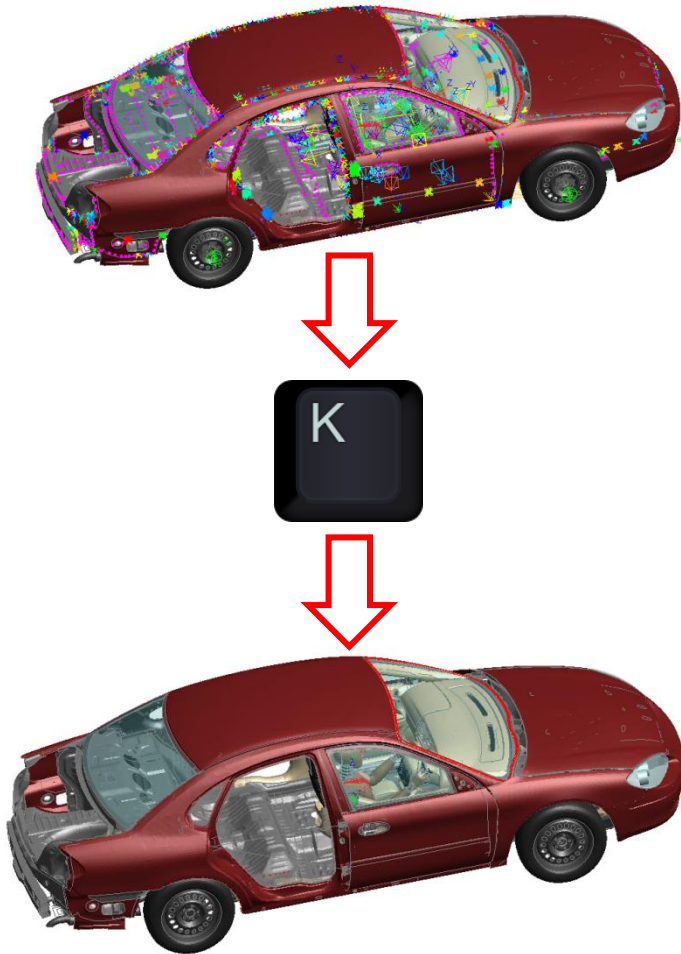


- Press “u” to un-blank all parts.





- Press “k” to view the default entities.



- Press “e” to bring up the entities menu.

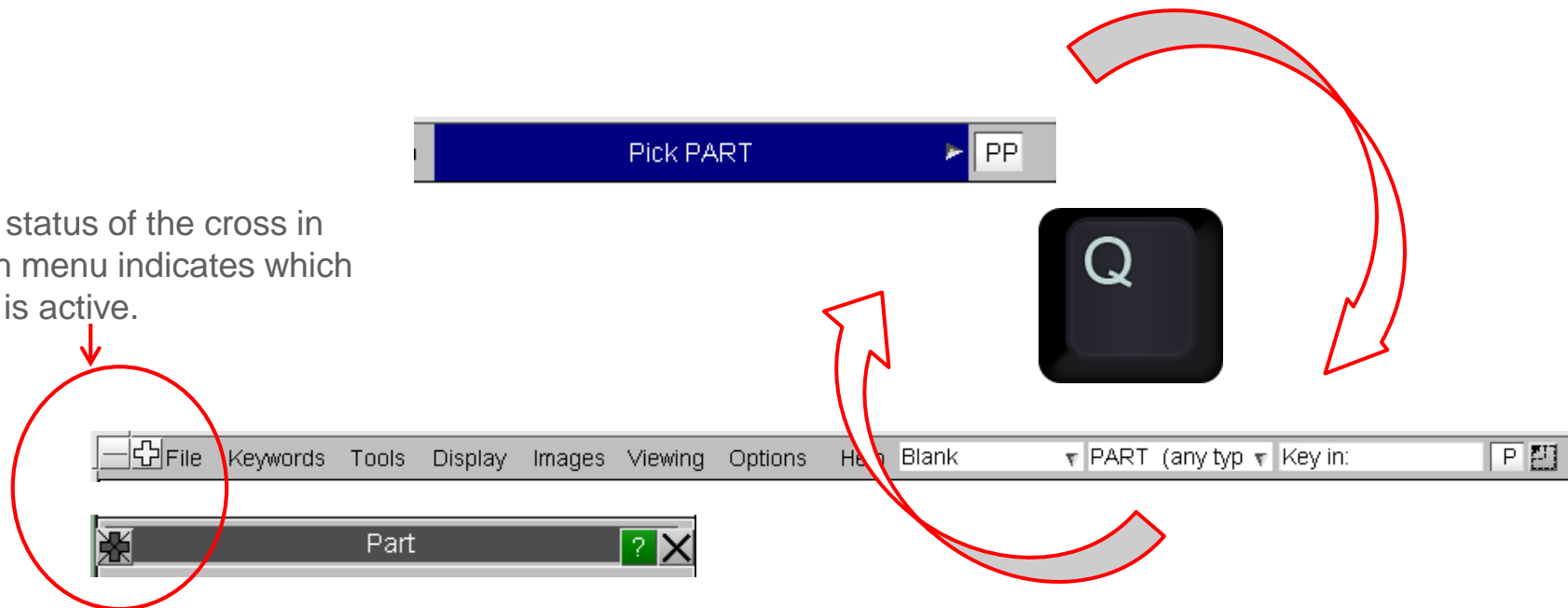




- Most functions in Primer allow the user to pick parts or other entities to perform an action. In these cases the “**Quick Pick**” bar only allows the user to pick an entity of that type.

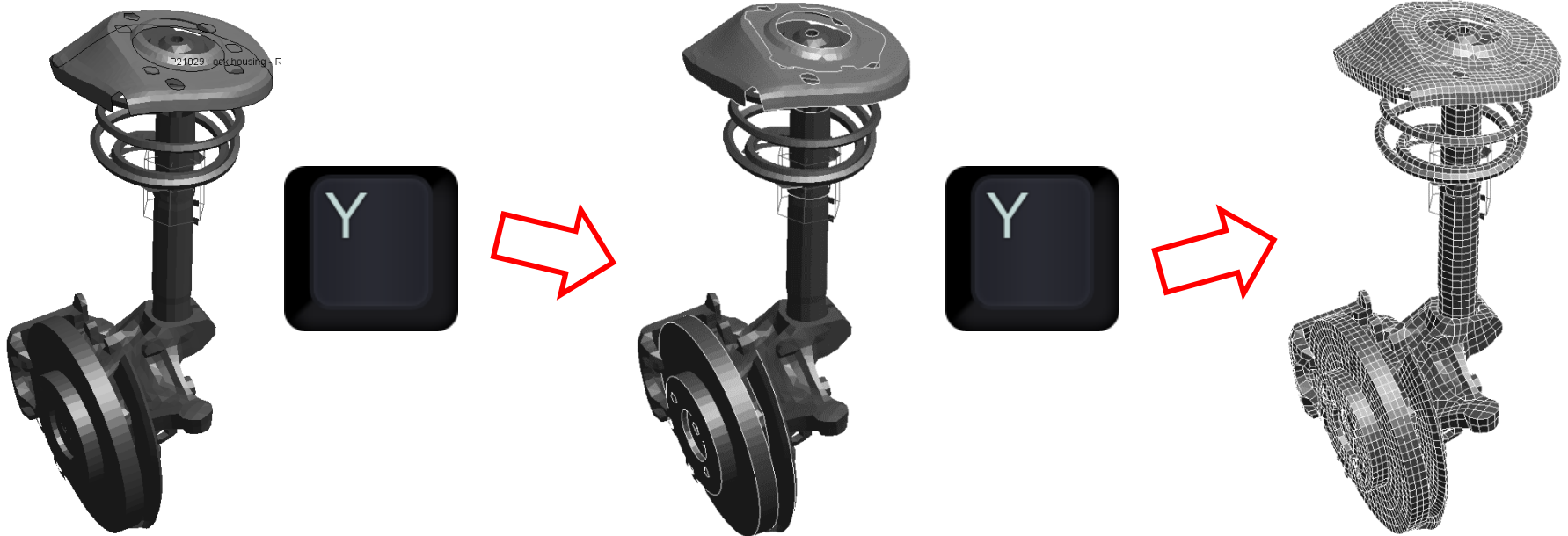
- Press “**q**” to toggle between the standard “Quick Pick” bar and the one driven by the Primer function.

- The status of the cross in each menu indicates which one is active.





- Press “y” to cycle through the different overlays (None, Boundaries Only, All edges).

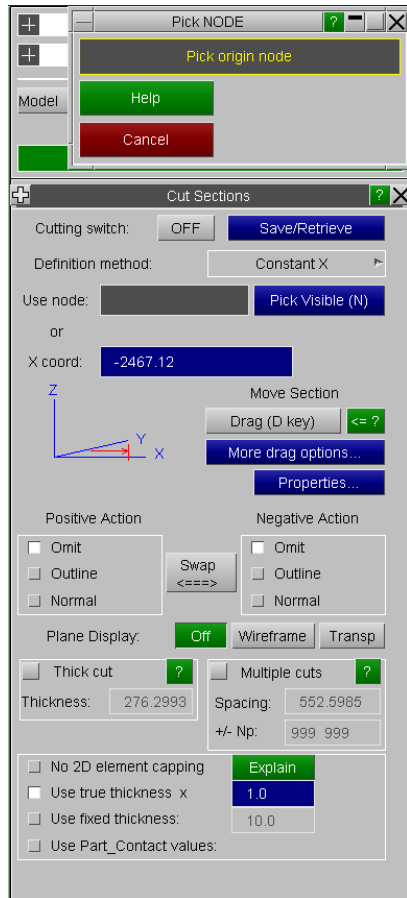




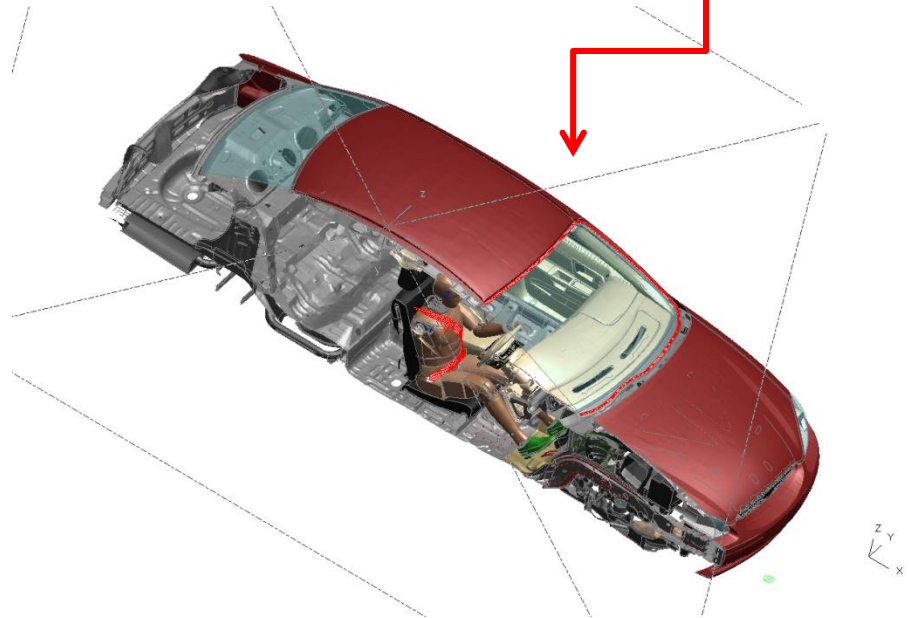
# PRIMER Shortcuts – Cut Sections

PRIMER

1. Press “n” to bring up the Cut Sections menu. By default it is ready to pick a node to cut through (in constant X).

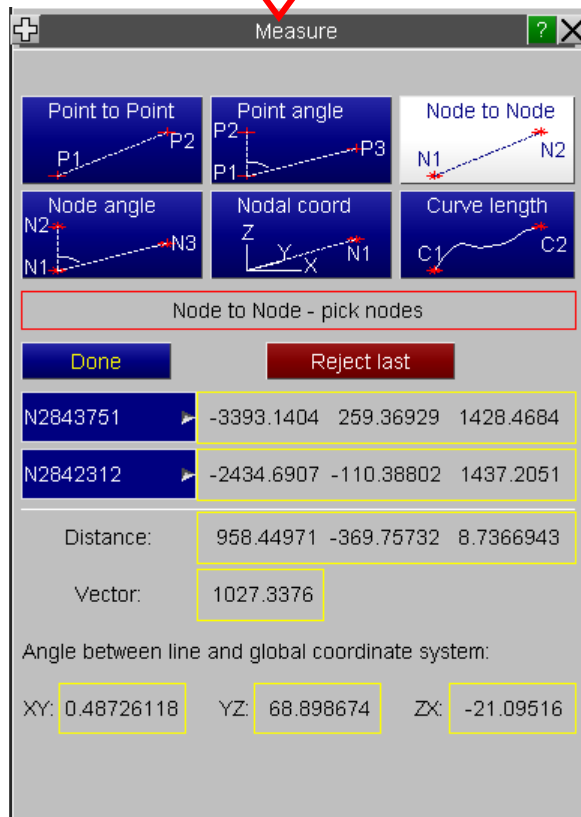
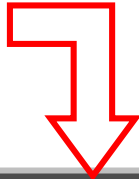


2. Press “d” to activate the drag option (use mouse to drag).





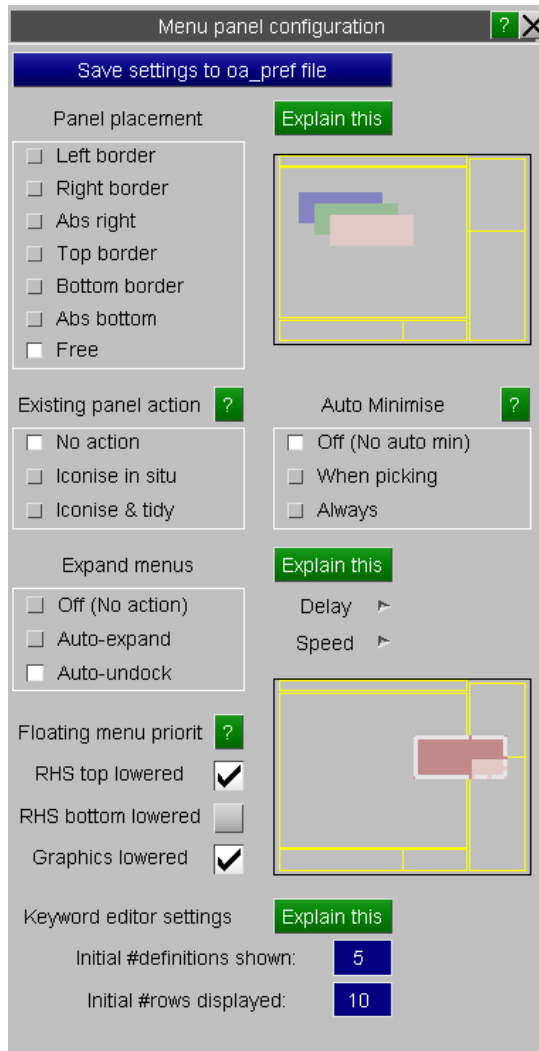
- Press “m” to bring up the Measure menu.



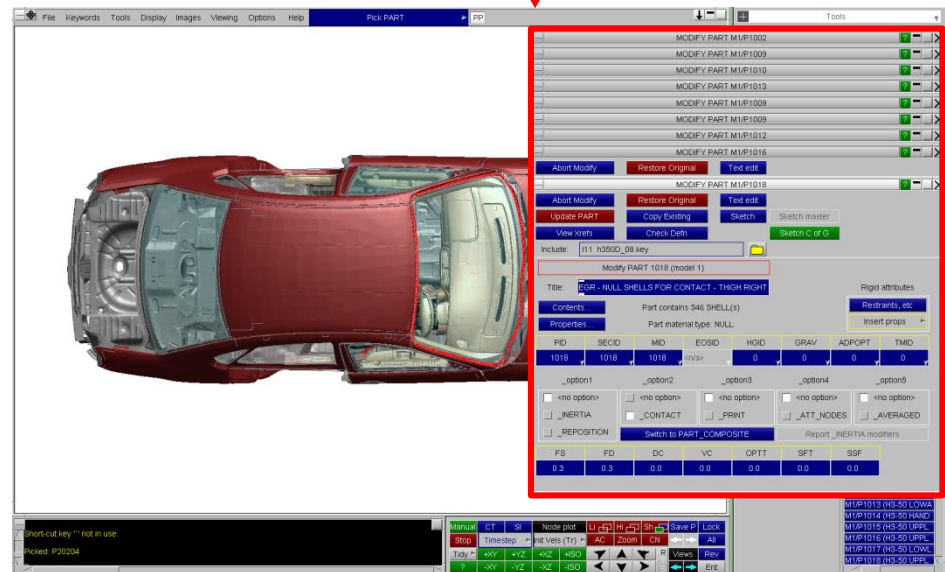
- By default it will be ready to pick two nodes.





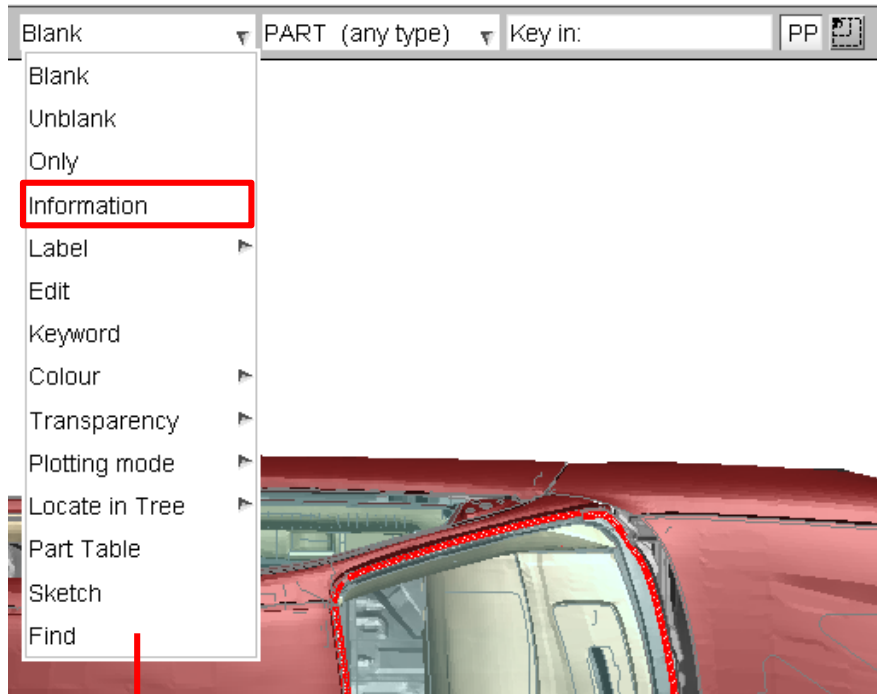


- The Panel Configuration Menu found under “Options”->”Panel behaviour” allows the user to set the location and behaviour of the pop-up panels in Primer.
- For example, selecting “**Abs right**” forces all panels to open at the top right hand corner of the Primer window.



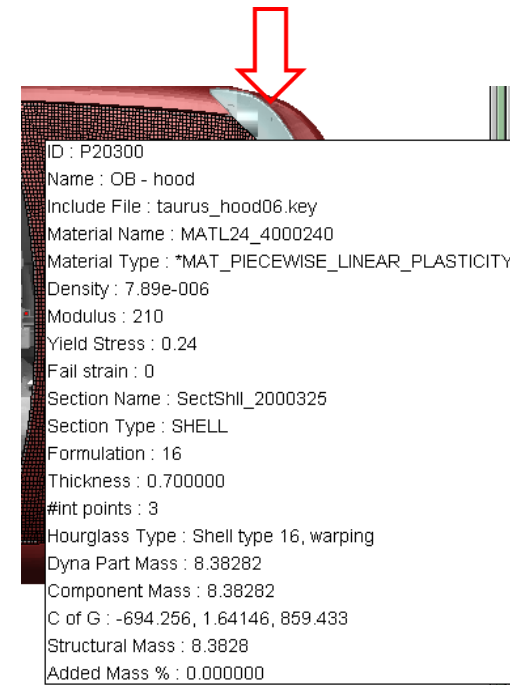


- By default the “**quick pick**” menu is set to “**Blank**”. A lot of users forget how many other actions can be performed by changing the action in the drop down menu.

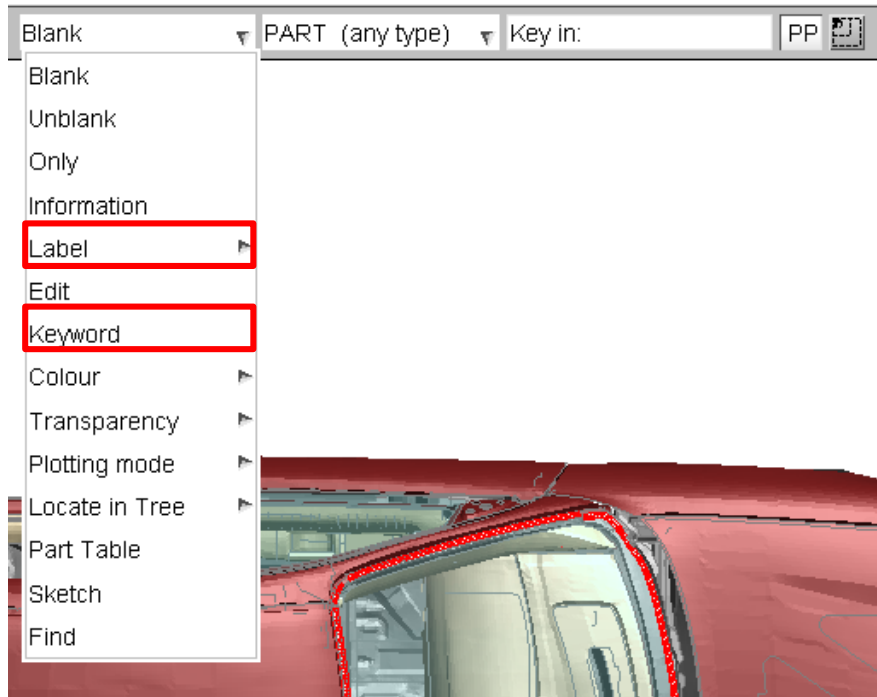


- This menu also appears when right-clicking on a part.

- Select “**Information**” and then click on a part to get the a summary of its properties:



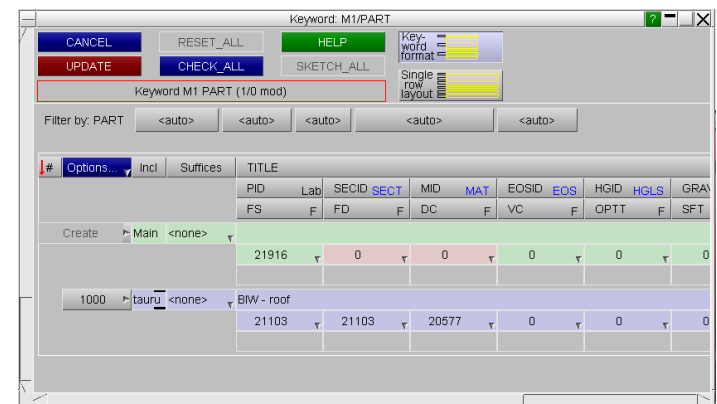




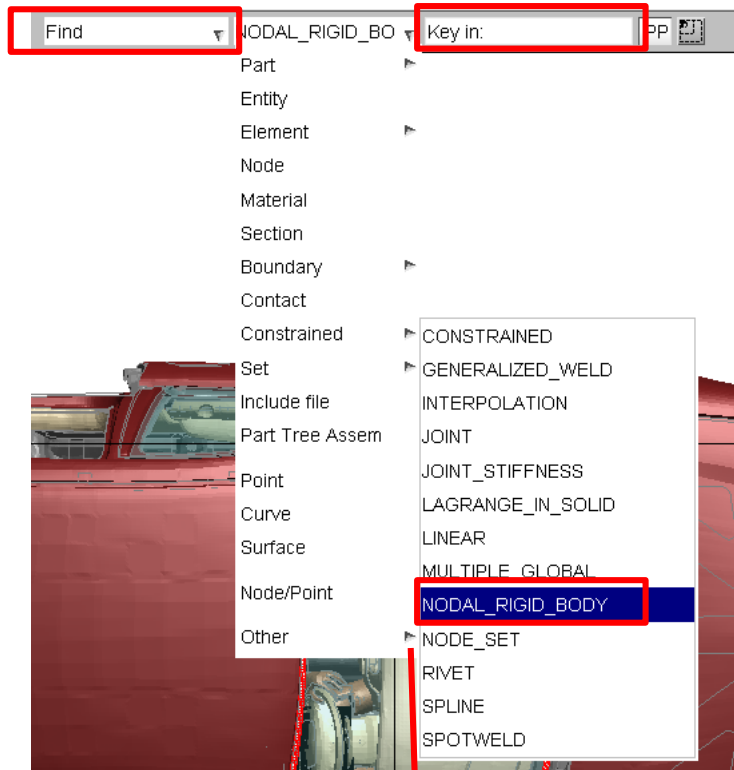
- Select “**Label**” and click on a part to display the part ID:



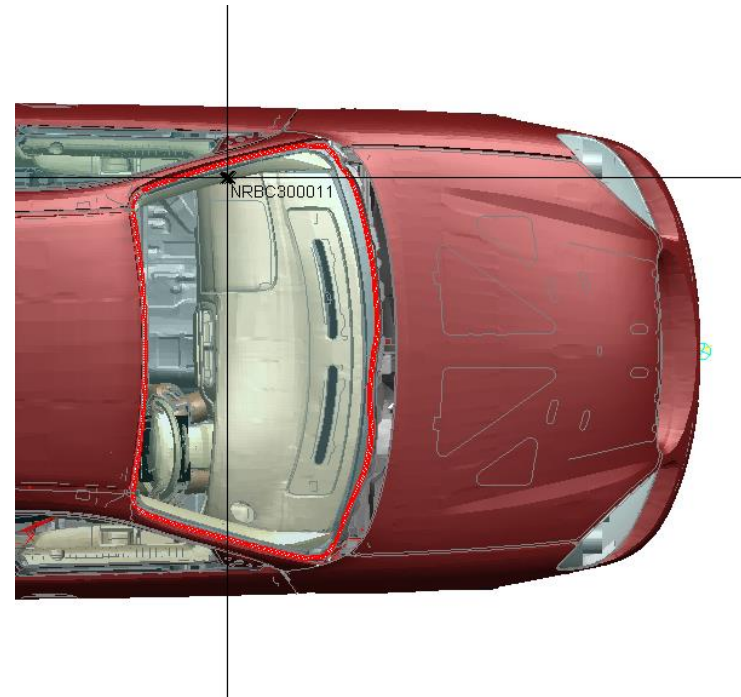
- Select “**Keyword**” and click on a part to open the part’s keyword editor:





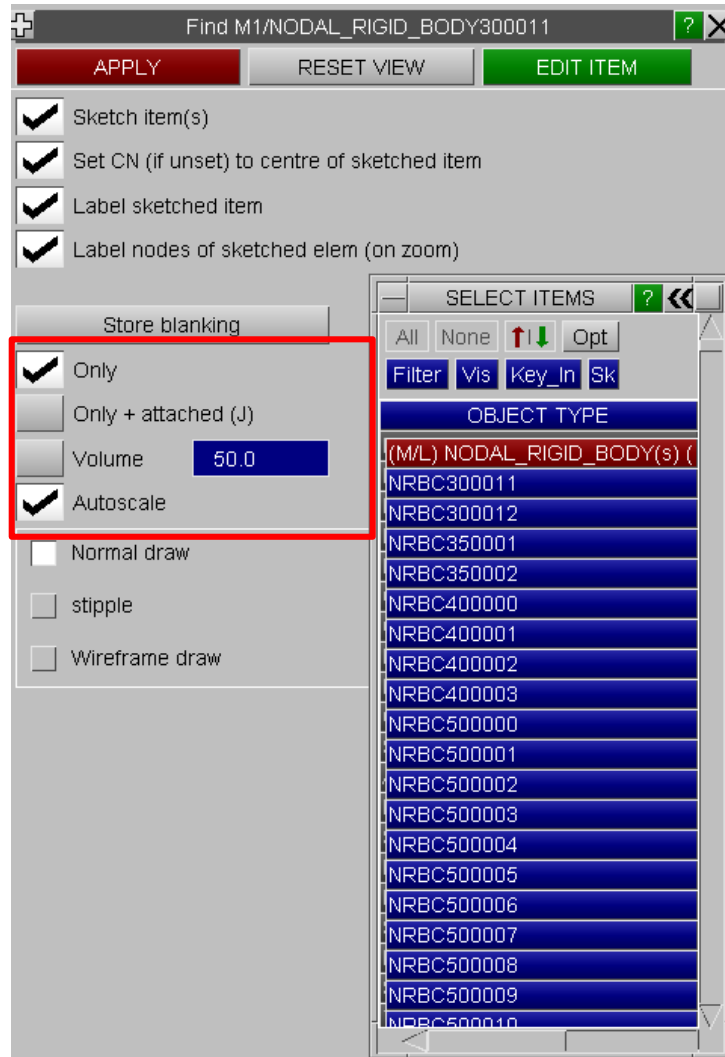


- Select “**Find**” and change from “**Part**” to “**Nodal Rigid Body**”.
- Key in a NRB ID number to get a crosshair at the location of the object.

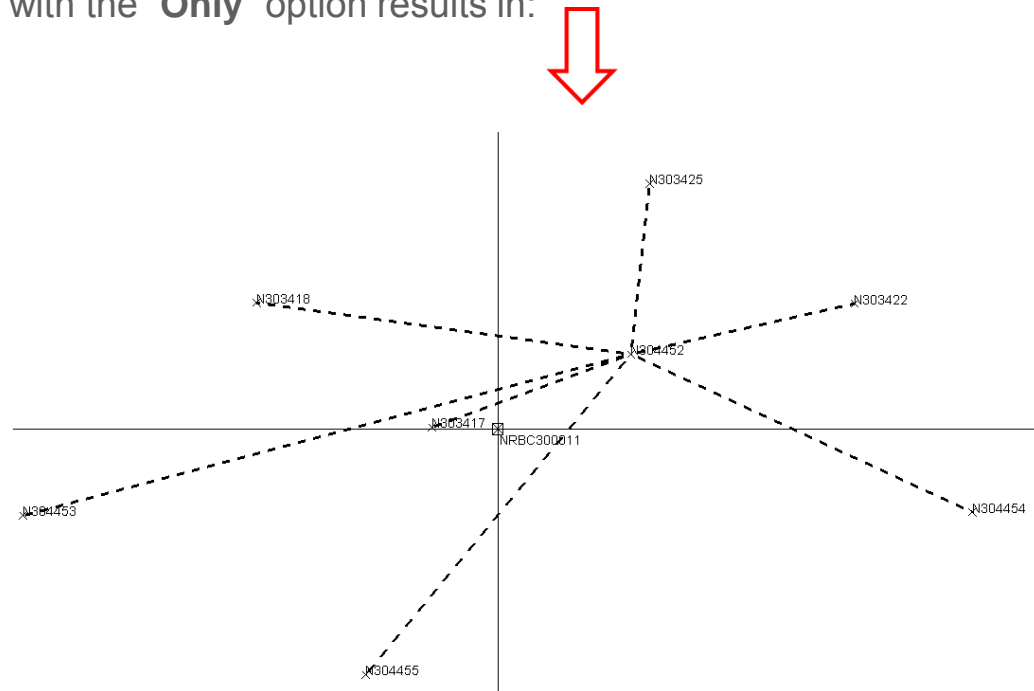


- By default the entity type is “**Part**” but this can also be changed.

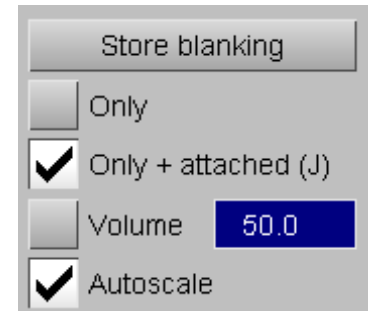
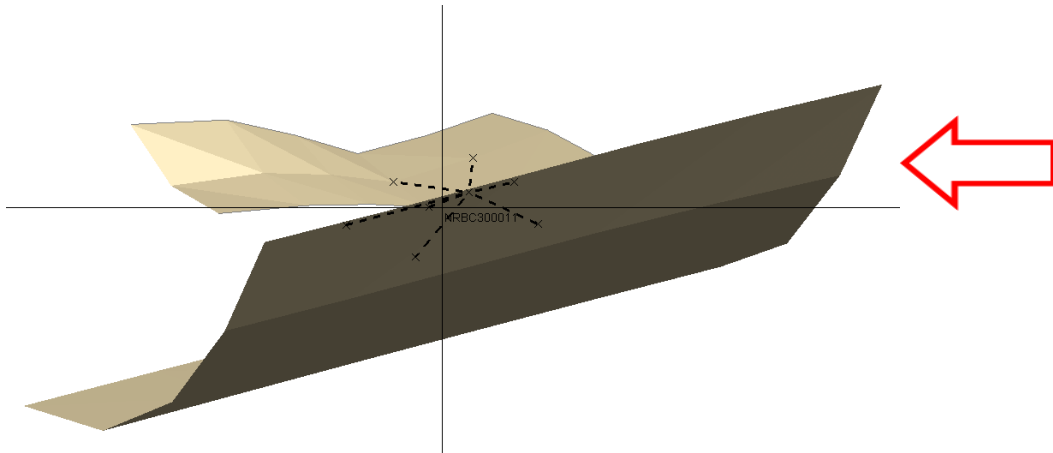




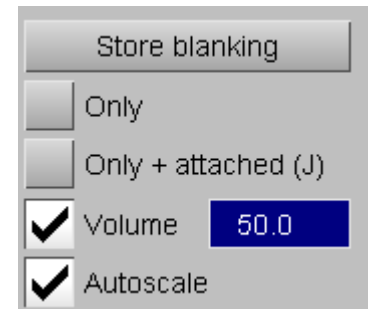
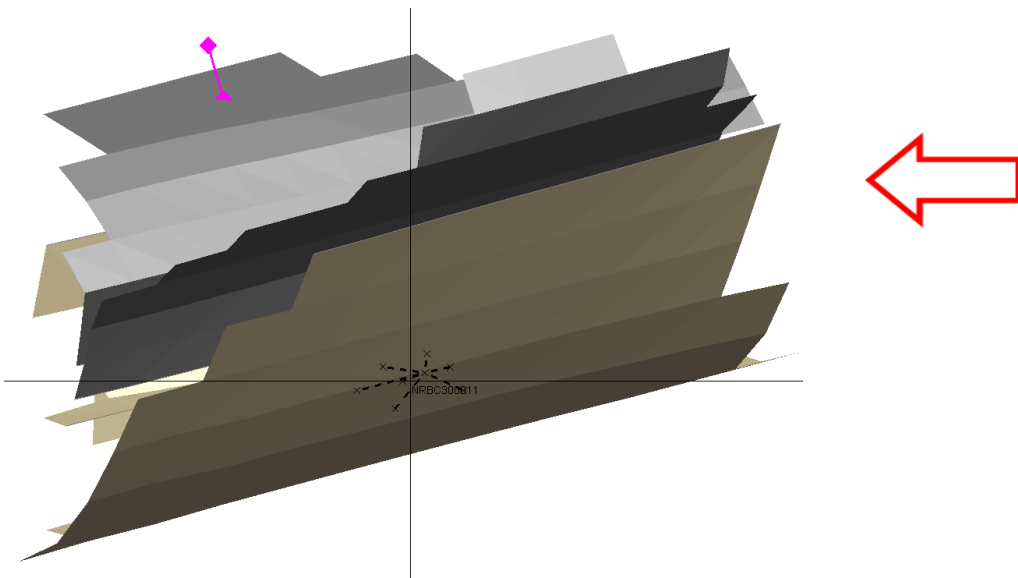
- Under the Tools menu is the function “**Find**”. This opens a menu that allows the user to find any object in the model and sketch it.
- The option to display “**Only**” the entity in question can be very useful as is the “**Only + attached**” option.
- In our demo, selecting the Nodal\_RIGID\_BODY 300011 with the “**Only**” option results in:





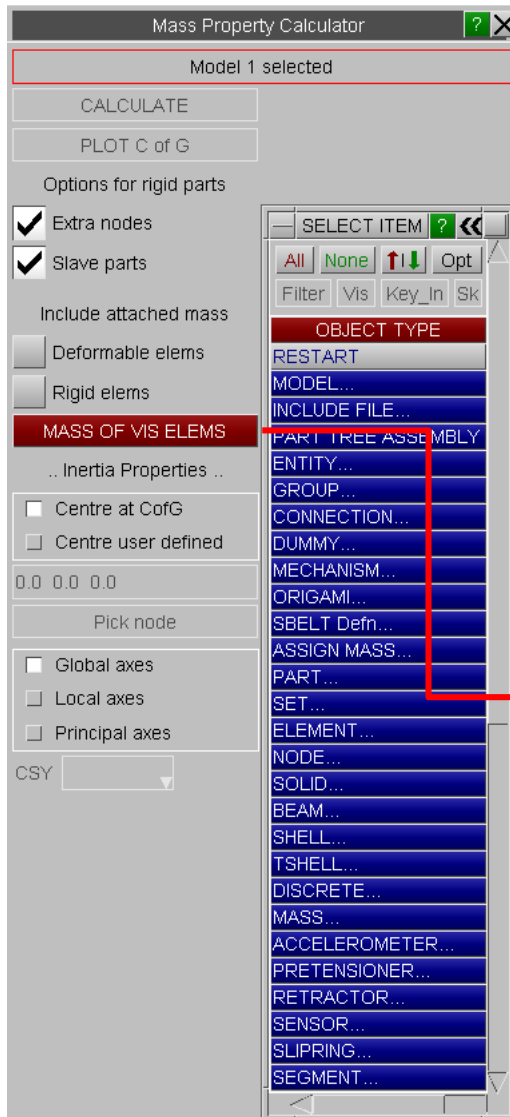


- Selecting “**Only + attached**” displays the NRB and the entities attached to it.

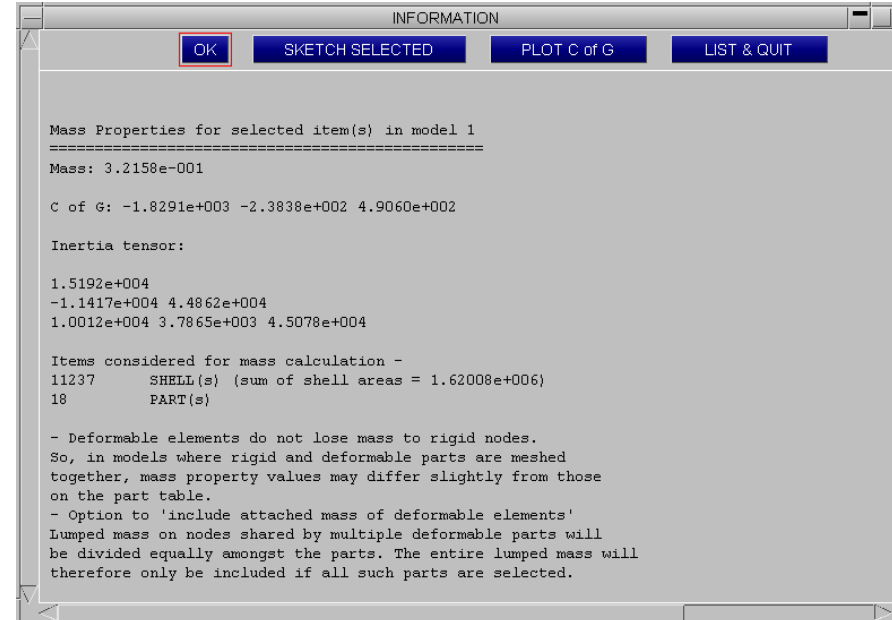
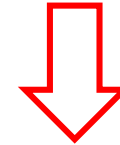


- Selecting a “**Volume**” of 50 displays the entities inside a cube with sides 50, centred at the NRB.





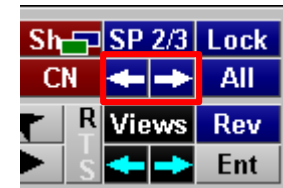
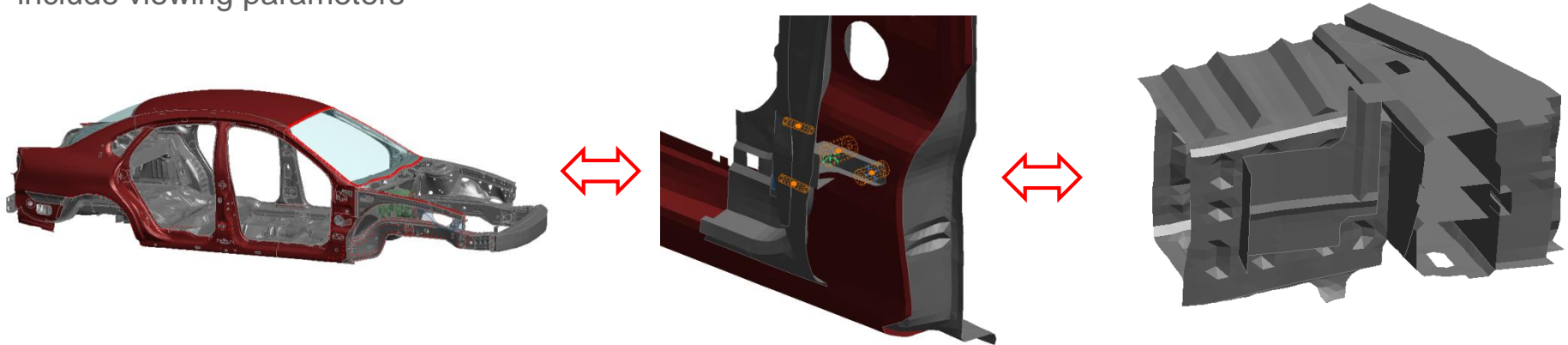
- The Mass Property Calculator found as “**Mass Prop**” in the Tools section allows the user to select elements and obtain a report with the mass, centre of gravity and inertia of the selection.



- It is also possible to blank any parts that are not of interest and obtain the report for just the Visible Elements.



After blanking certain parts or elements, the blanking property status may be saved. The same blanking can be recovered later. **“Property”** includes blanking, colour, transparency, entity visibility status; optionally, it can also include viewing parameters



Save some blanking states, then toggle between them using the arrows.

“SP” means “Save Properties”



Save Props (@ 2 of 3)

Options Explain

Manu CT SI Node plot Li Hi Sh SP 2/3 Lock

Stop Timestep nit Vels (Tr AC Zoom CN All

Tidy +XY +YZ +XZ +ISO R Views Rev

? -XY -YZ -XZ -ISO S Ent

Saved Properties ? X

Local Stored Properties Explain

Currently at state: 2 of 3 states

Sh SP 2/3 Lock

CN All

R Views Rev

S Ent

Blanking

☒ Transparency ☒ Colour

☒ Entity & label switches ☒ Plotting mode

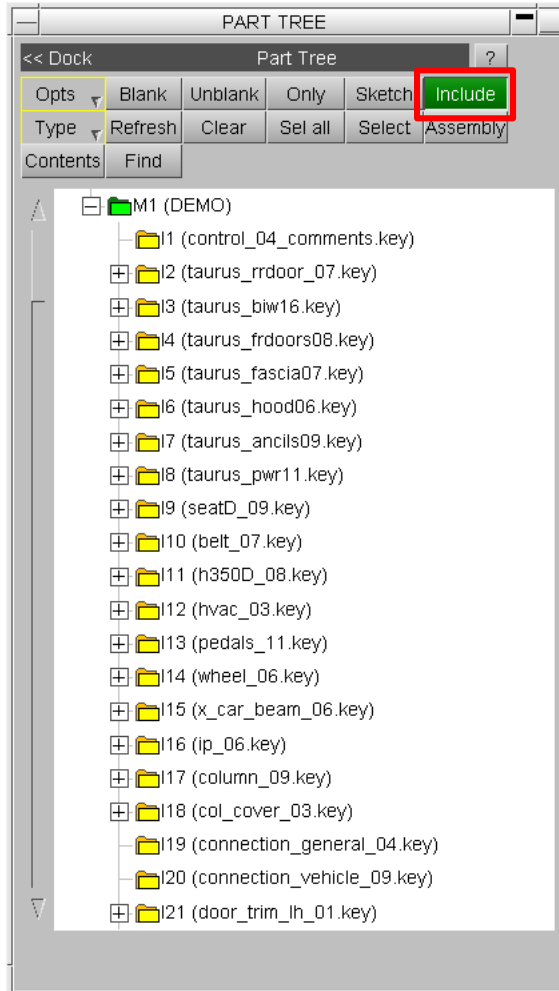
☐ Viewing parameters Explain

Export to file ...

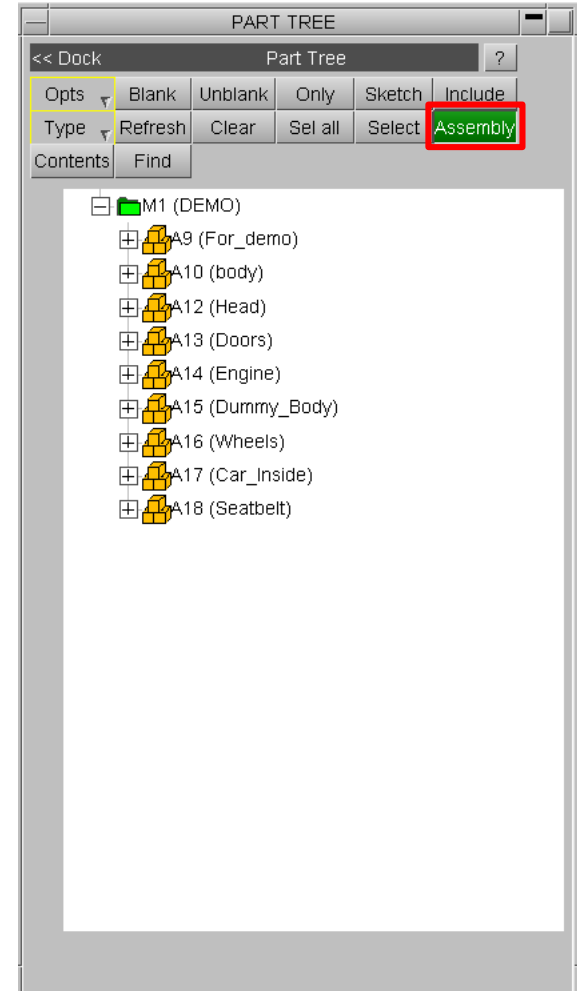
Import from file ...

- Hover the mouse over this button, then click “Options”
- A menu appears, giving control of which properties should be recovered when the arrow button is pressed
- By default, the viewing angle and zoom are not recovered. Switch on recovery of view here
- The current blanking, colours, etc can be written to a file \*.prp for use in future sessions of PRIMER. The same file is also compatible with D3PLOT

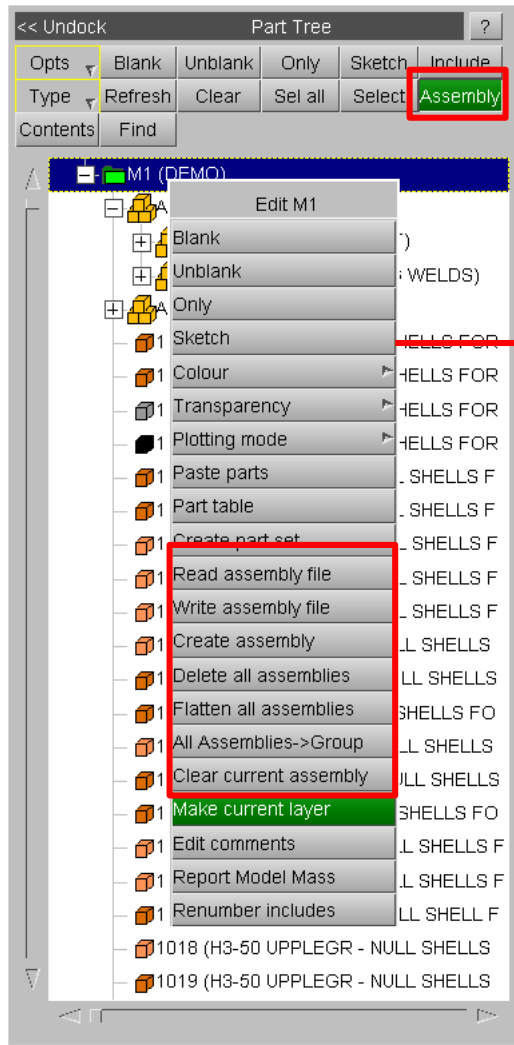




- The “**Part Tree**” can be arranged in different ways to help users find parts as quickly as possible.
- Two of the most useful are the “**Include**” option, which sorts the parts by the include file in which they are defined; and the “**Assembly**” option, which sorts the parts by user defined assemblies created in Primer.

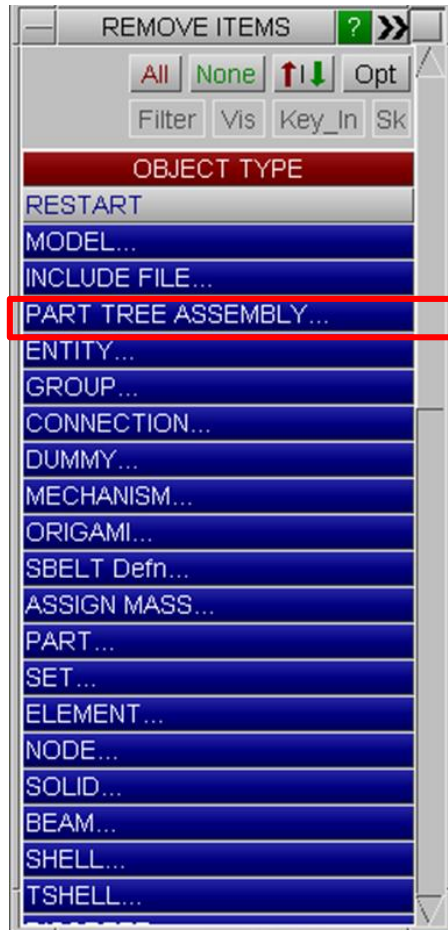






- To view, edit or create new assemblies go to the “**Part Tree**” menu and click on “**Assembly**”.
- Right-clicking on the model to bring up the “**Edit**” menu.
- To add a new assembly, click on “**Create Assembly**”, give your assembly a name in the pop-up window. Then drag and drop, or cut and paste the parts you wish to add into the assembly.

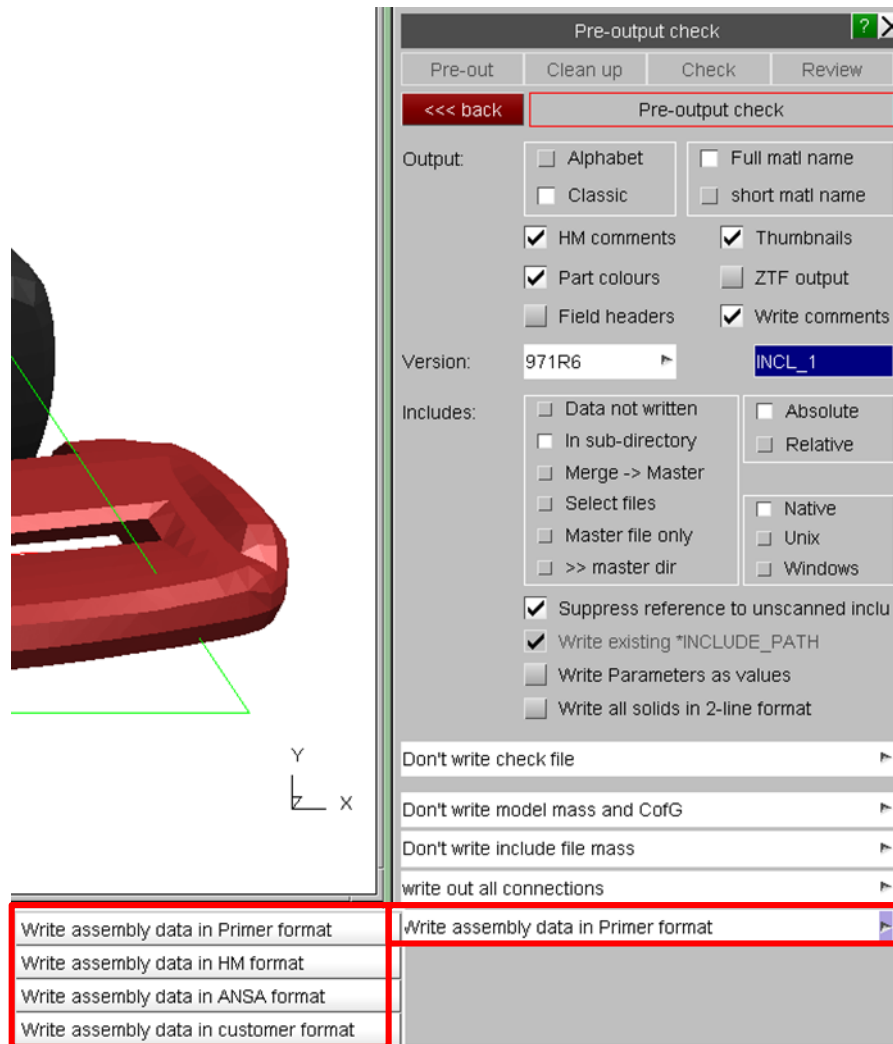




- Most Tools in Primer use the object menu to pick which elements the action will be performed on.
- Part Tree Assemblies created by the user are one of the categories available to users in the object menu.
- Actions can be performed on all the parts belonging to the Part Tree Assembly.

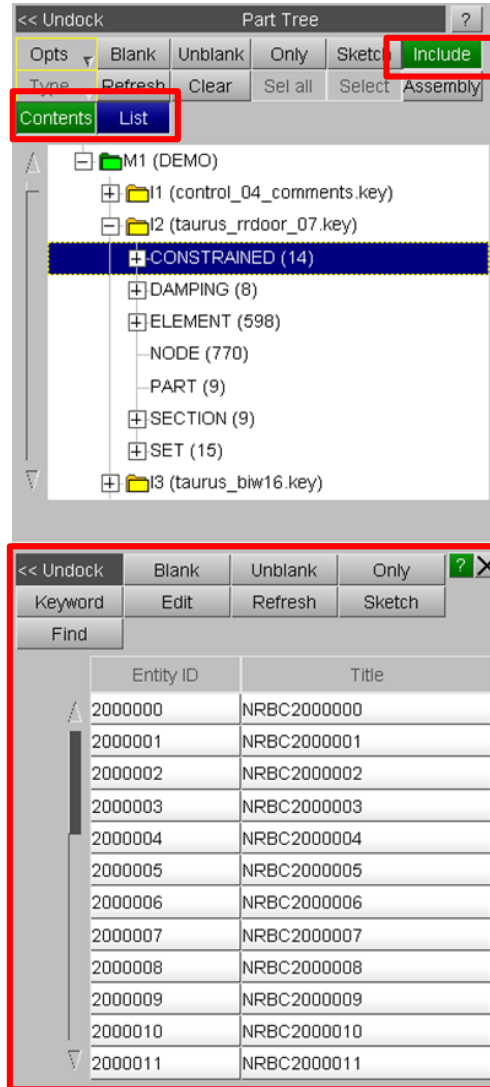






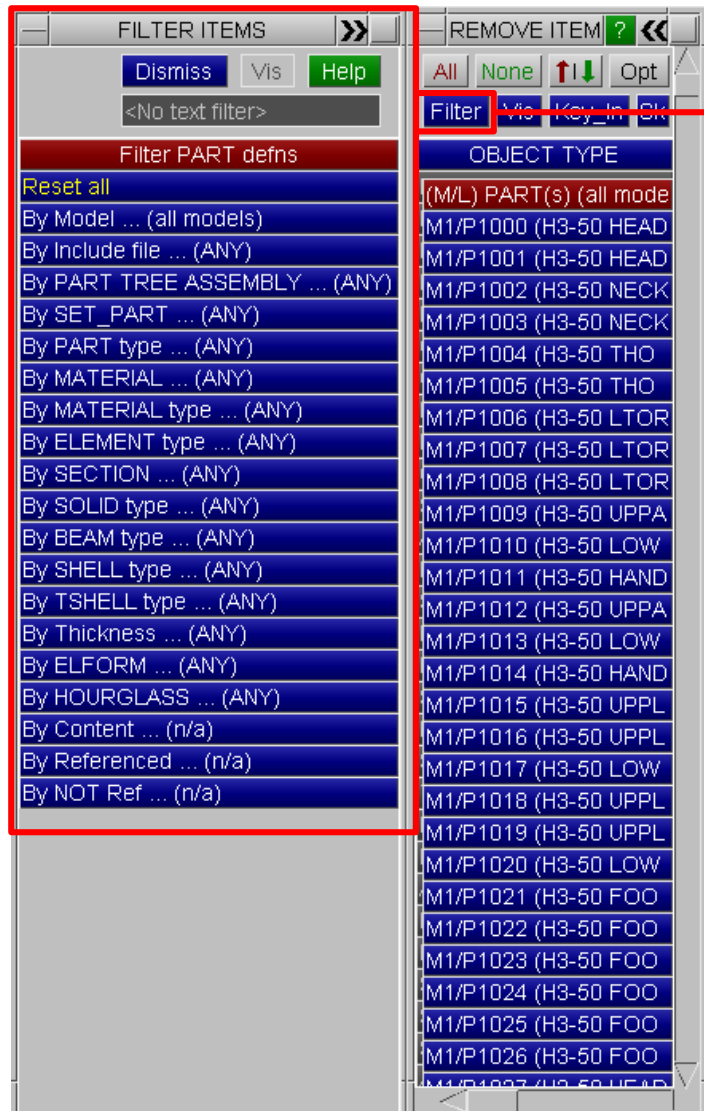
- Information for the assemblies created in Primer can be saved as comments in the keyword deck or in HM/ANSA format.
- This is done by going to “**Model -> Write -> LS-Dyna output options**”.
- Use the last drop down menu to choose the format in which the Part Tree Assemblies are written.



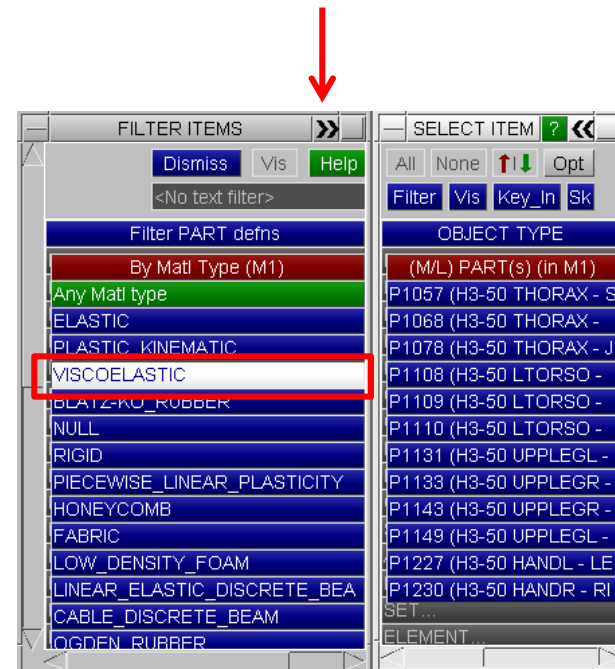


- Another useful function within the “**Part Tree**” menu is the “**Contents**” tree.
- This organizes all the different objects by entity type, and can be grouped by which include file they are in by toggling on/off the “**Include**” button.
- Furthermore, by turning on the “**List**” button the bottom half of the menu will list all the objects found in the selection. Including options to Blank, Unblank, Only, Edit and Sketch.



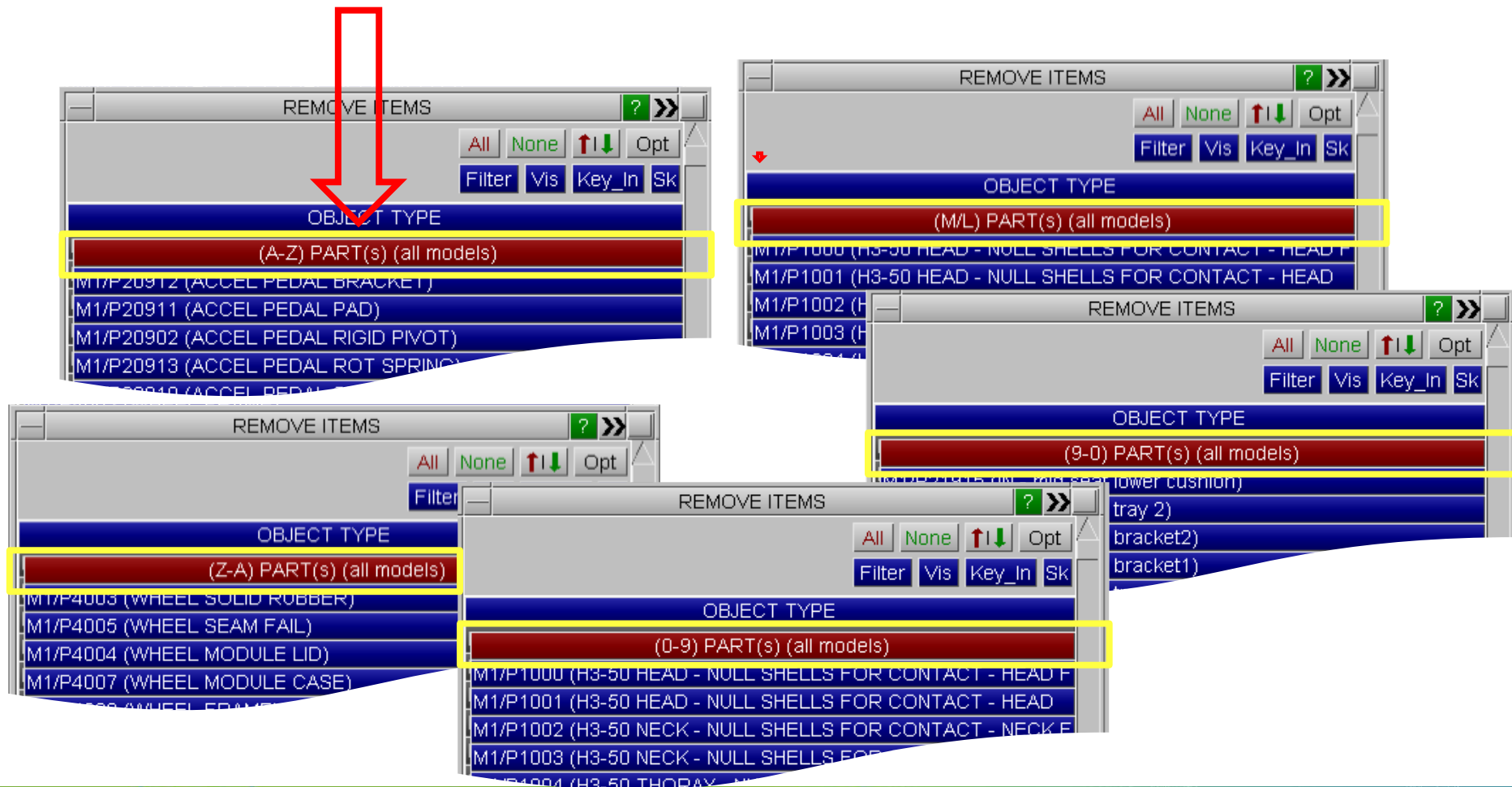


- Most actions in Primer involve using the Object menu to pick which entities the action will be performed on.
- The “**Filter**” option in the Object menu allows the user to find parts faster, especially in bigger models.
- In the demo, selecting “**Filter by MATERIAL type-> VISCOELASTIC**” results in just 12 parts to pick from

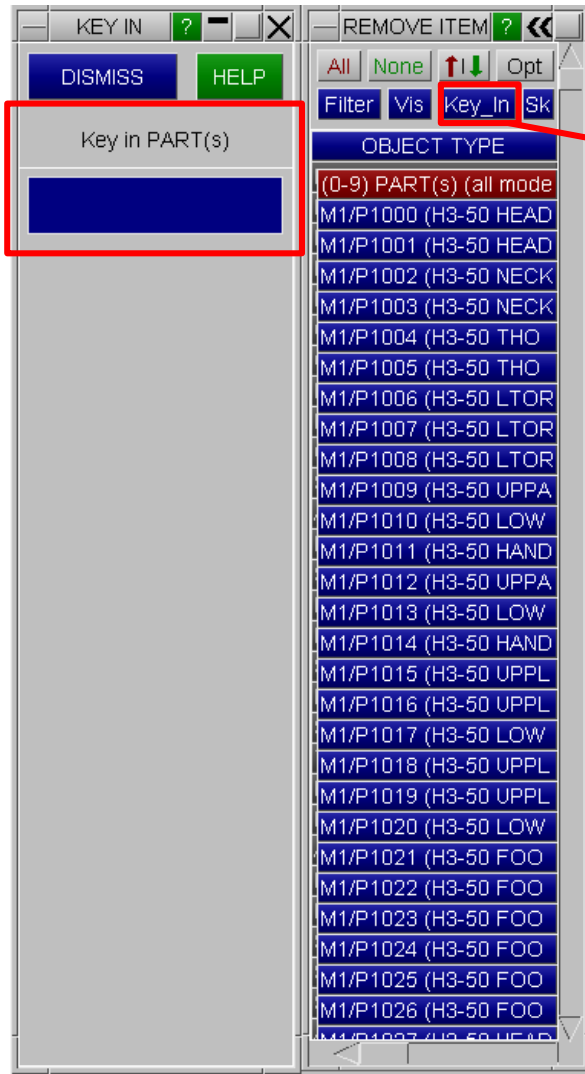




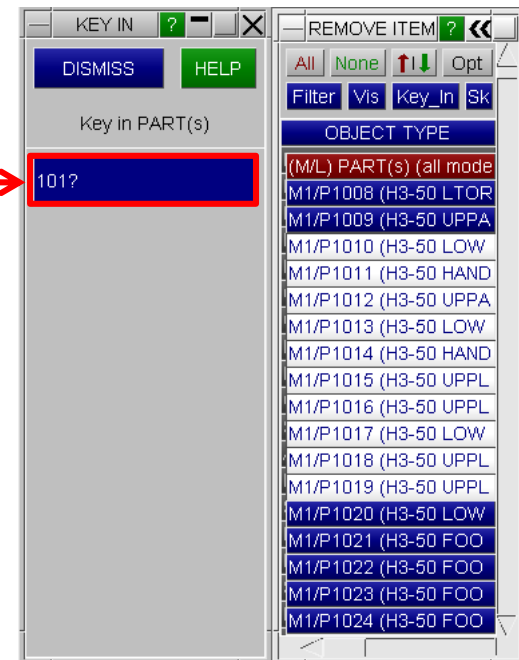
- Clicking on the red bar labelled **“PART(s) (all models)”** sorts the parts in the object menu by different quantities.



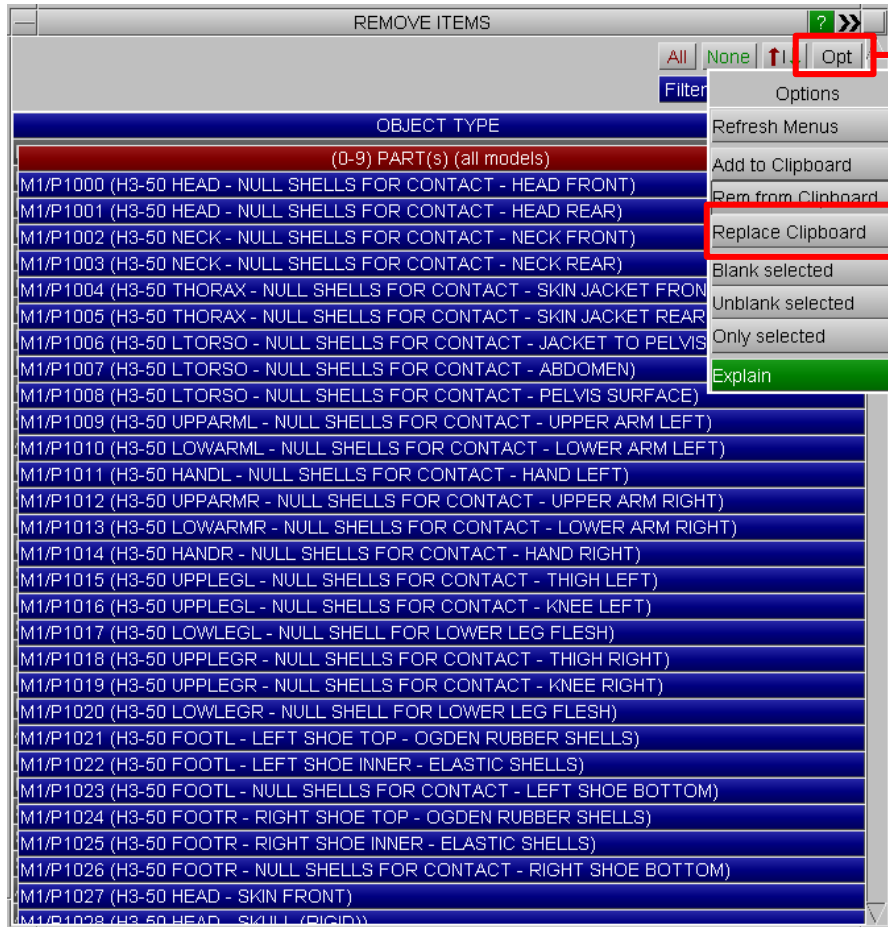




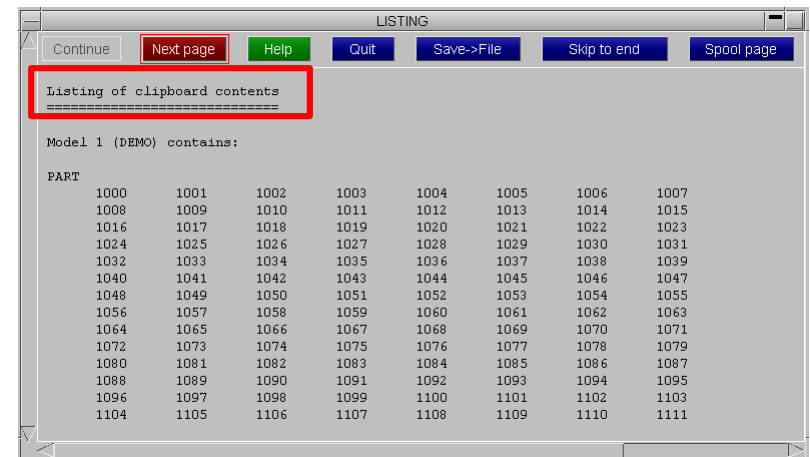
- The “**Key\_In**” command opens a text box for the user to input a particular part number.
- However, it is also possible to include a range, for example: 1000-2000.
- Or key in “101?” to select all part IDs consisting of four numbers beginning with 101.
- Or key in “1\*” to select all parts beginning with 1.



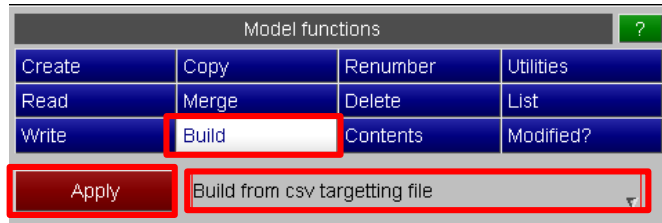




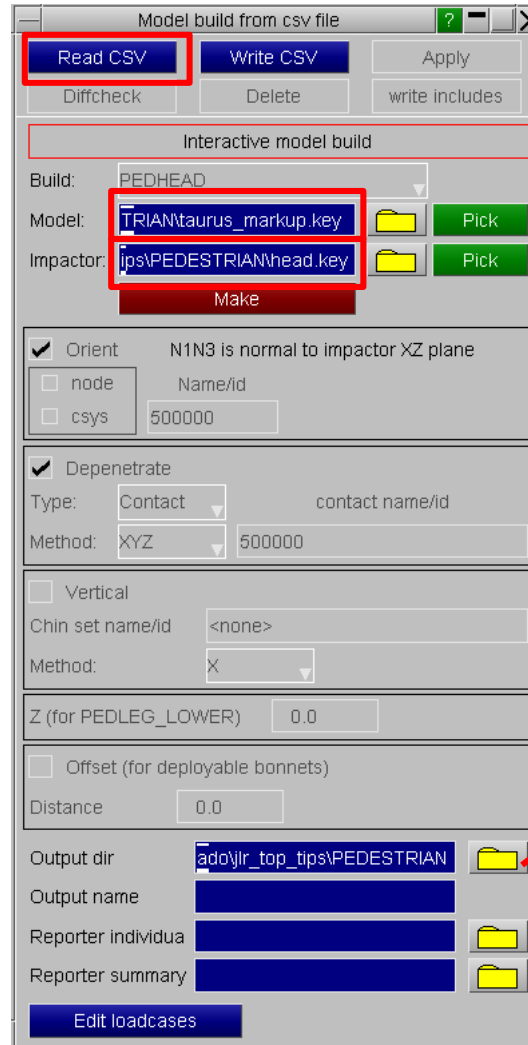
- The options menu “**Opt**” can be useful for blanking and un-blanking selected parts.
- Also, adding or replacing on the clipboard the selected parts or removing the selected parts from the clipboard.





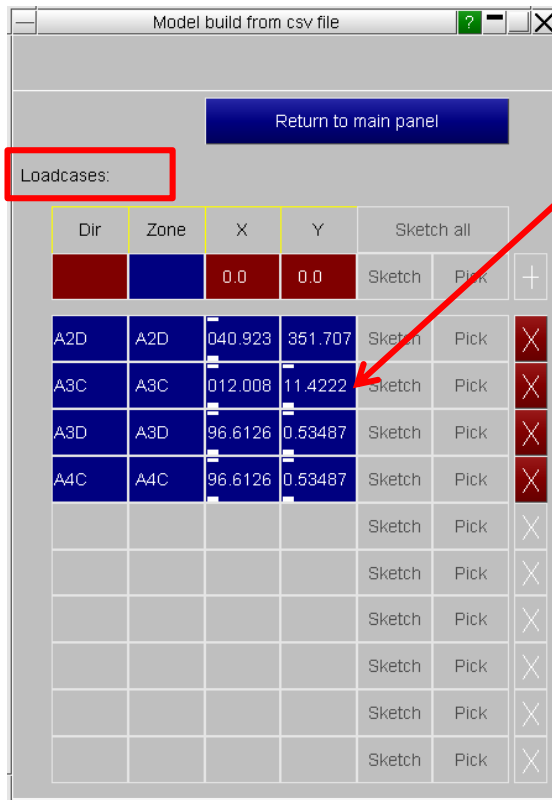


- In the Model menu, select “**Build**” and then “**Build from csv targetting file**” from the drop down menu. Press Apply.
- It’s possible to “**Read CSV**” file if one has already been made.

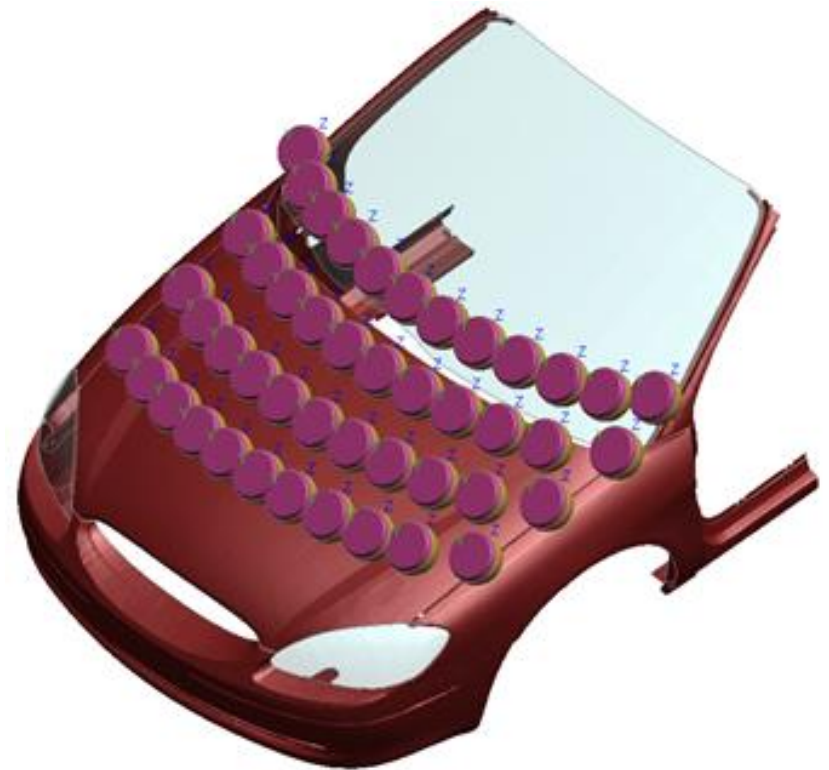


- This function is used for impactor positioning in multiple locations on a model.
- Select the “**Model**” that is to be tested, and the “**Impactor**” file.
- This will create a certain number of cases with the impactor set up at different locations.
- Select the output directory for all the new models.



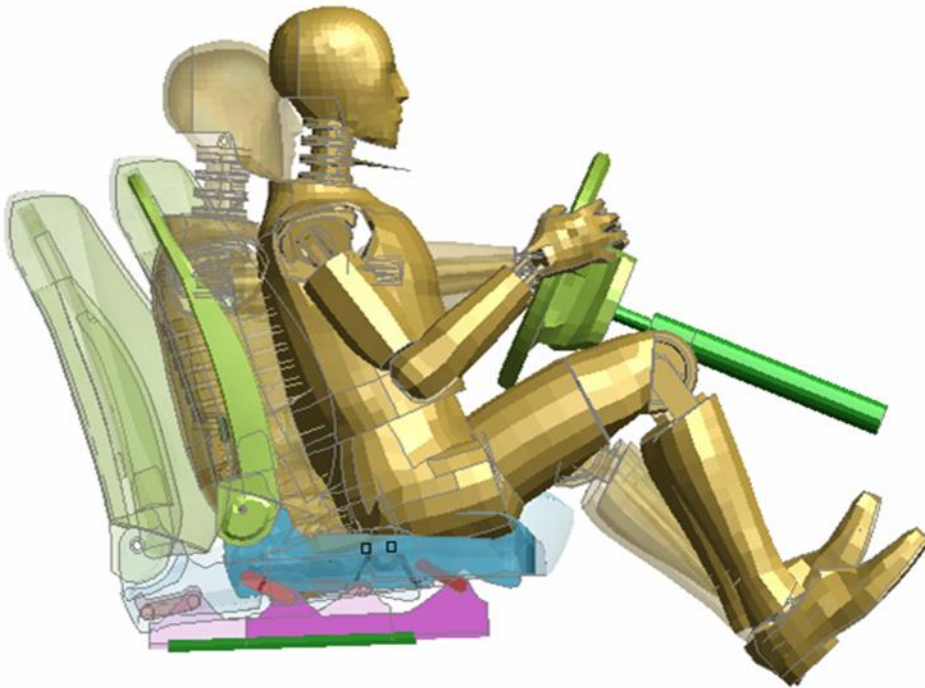


- Insert the locations of the impactor and the name of the directory to be created.
- Go back to the previous menu and **“Write a CSV”** file for future use.



- Open this menu in order to **“Edit the Loadcases”**, from the previous menu **“Model Building from CSV”**.

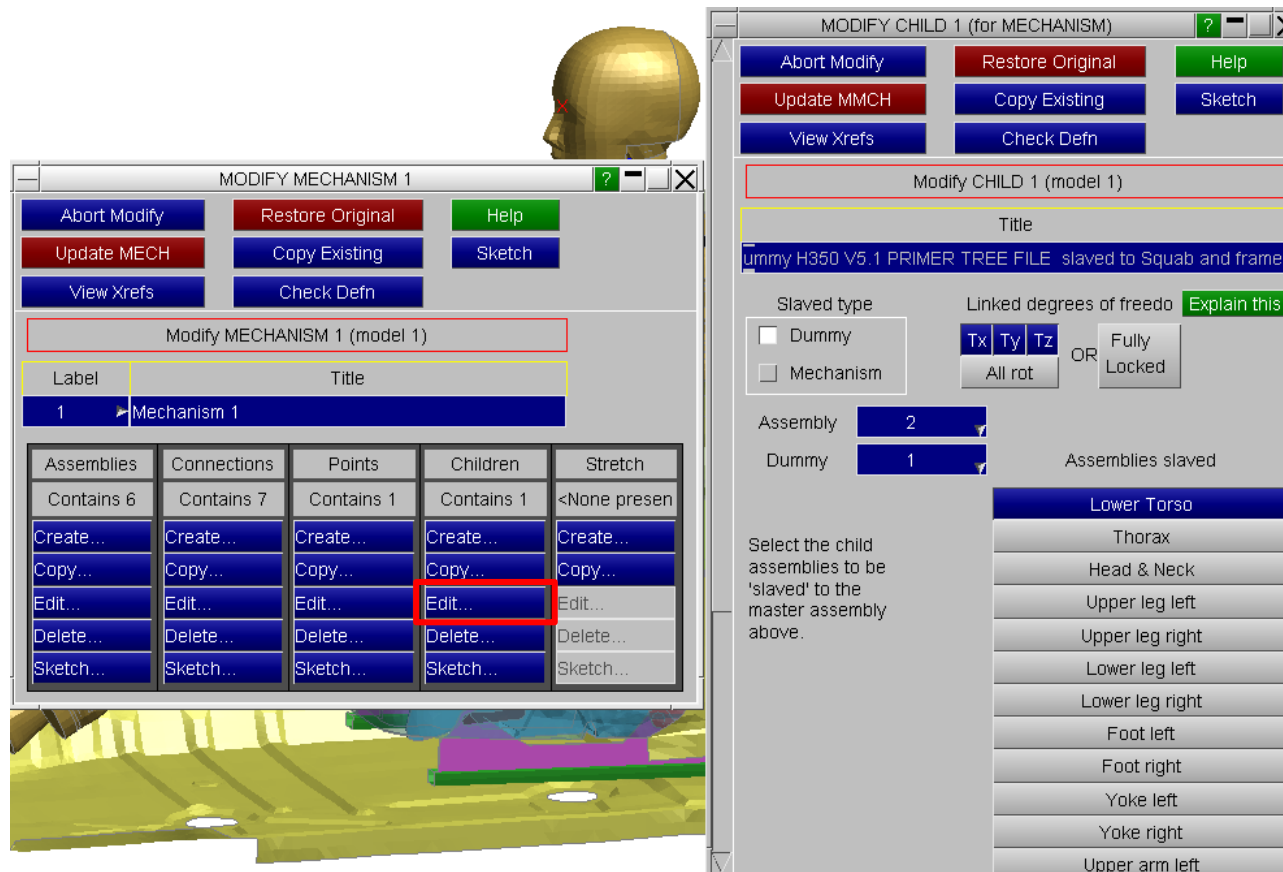




- One mechanism may be linked to another, e.g. seat squab to dummy pelvis. Then the dummy and seat can be dragged together in a single action.
- Go into “**Mechanism -> Position**” and drag the seat to the desired location. If the dummy is “**slaved**” to the seat it will move with it.

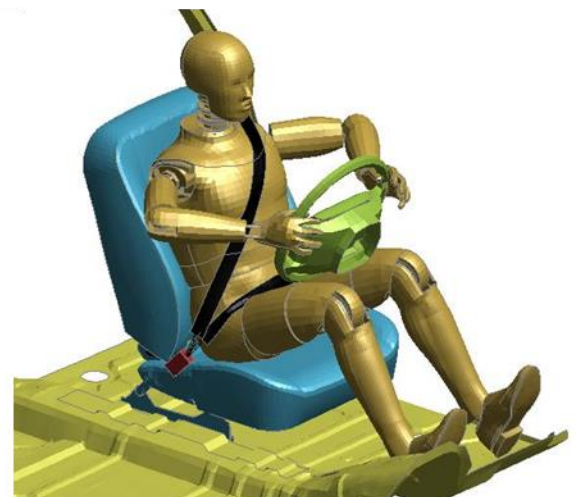
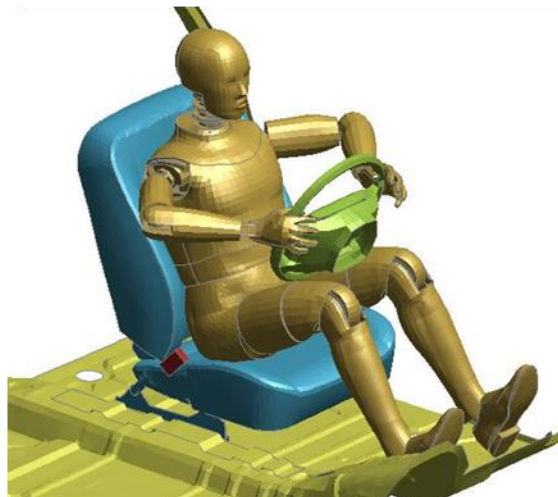


- The Dummy can be “**slaved**” to the Seat assembly by going into “**Mechanism->Modify->Edit Children**”.
- This brings up the menu where the “**Master**” and “**Slave**” assemblies can be selected. It is possible to select which parts of the dummy are slaved to the seat assembly.



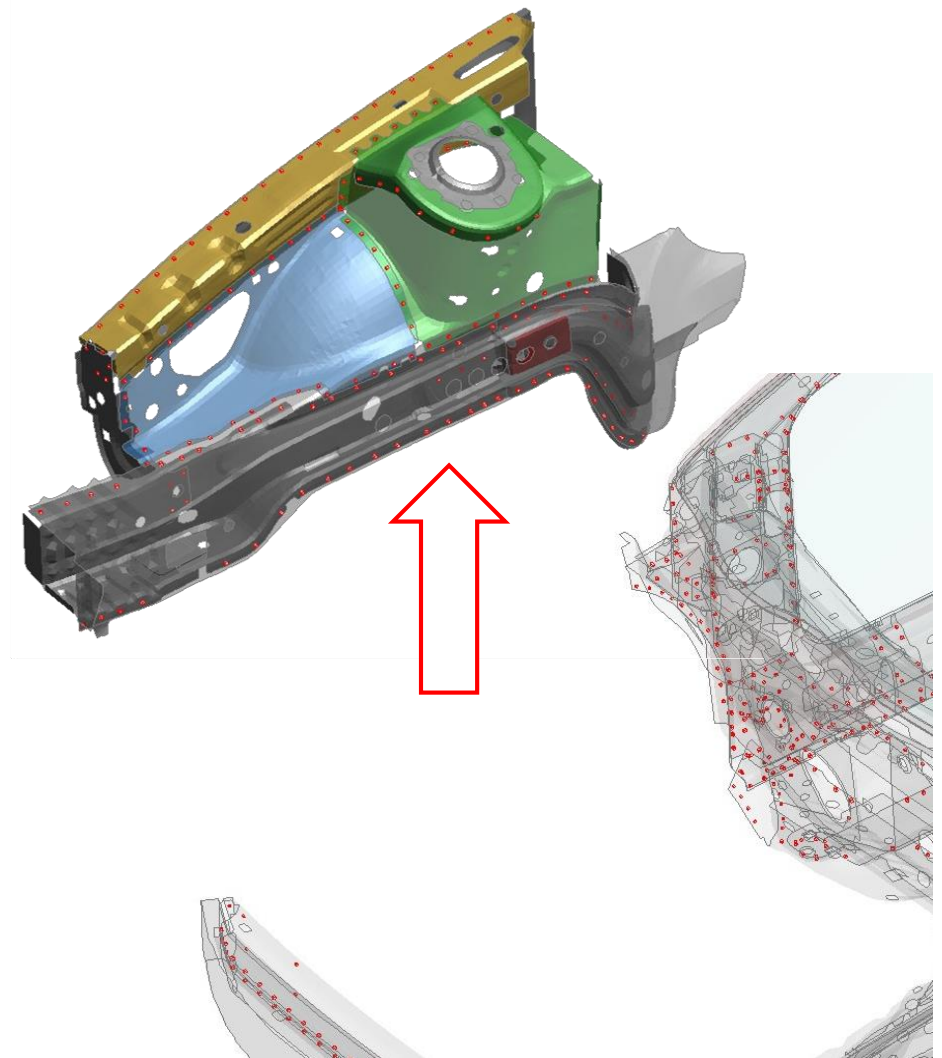
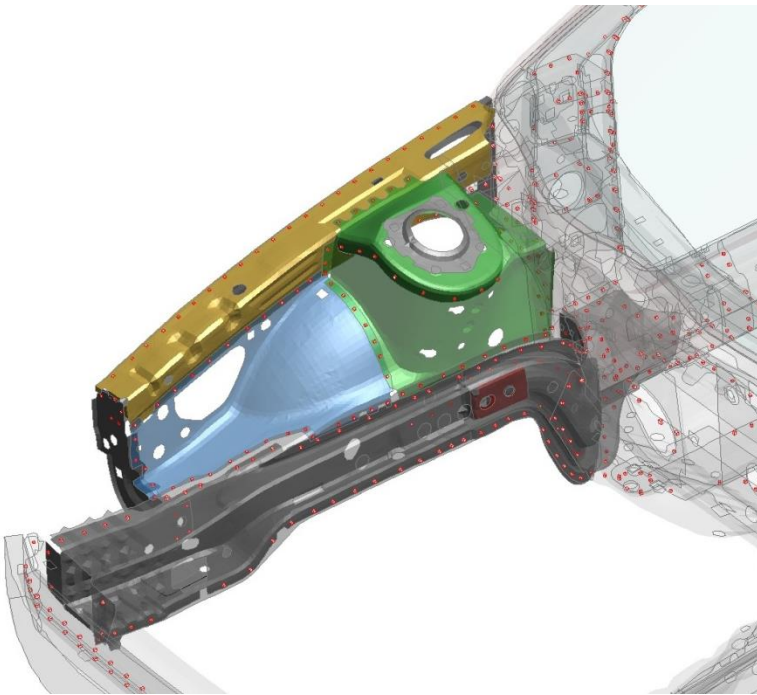


- In most cases after repositioning the seat and dummy it is necessary to re-fit the seatbelt.
- PRIMER remembers the belt information at the end of the keyword files so the belt can be re-fitted in one operation if the dummy is moved
- This can be done by going into “**Occupant -> Seatbelts -> Auto-Refit**” and selecting **Apply** if no further changes are to be made.

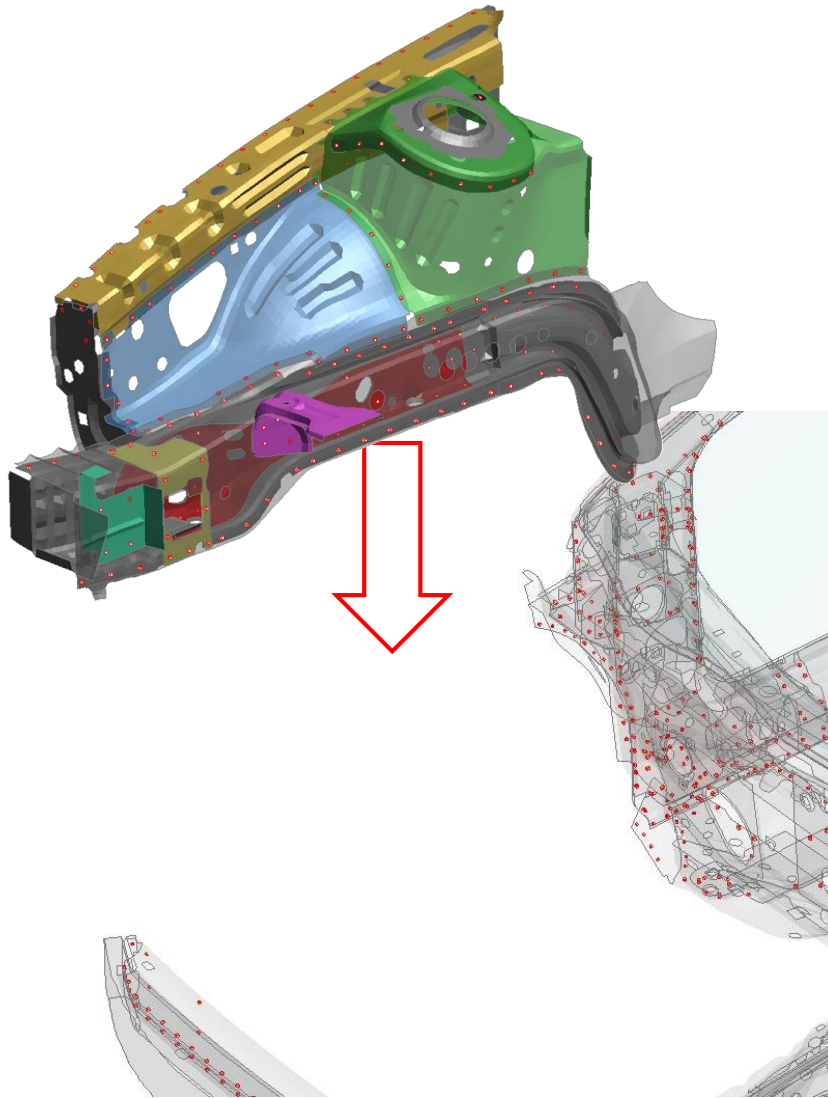




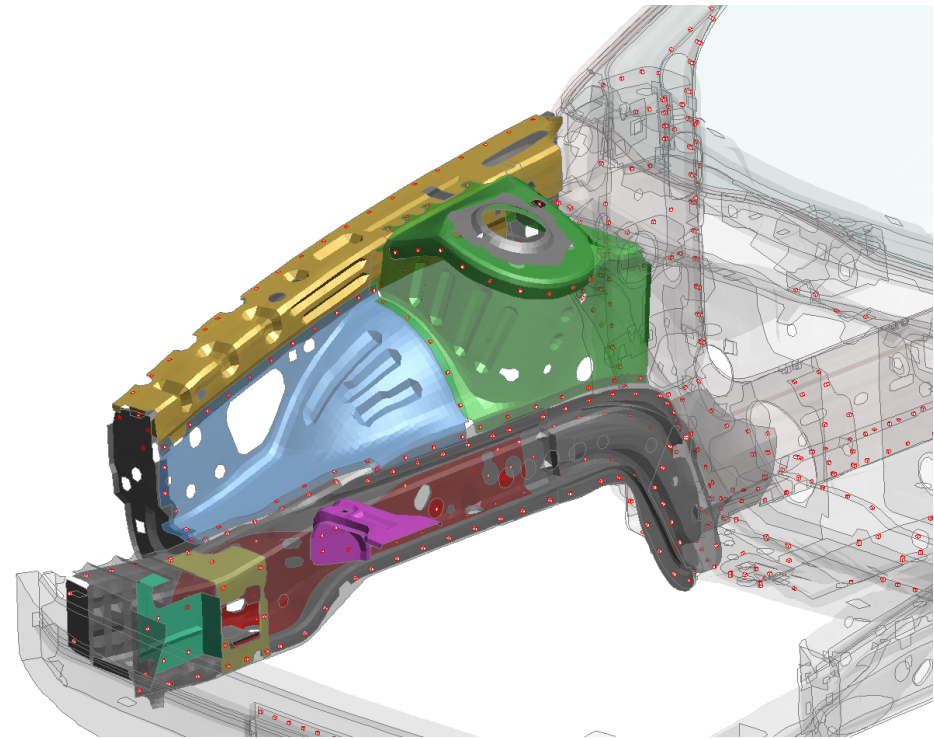
- Old meshes are removed, including any spotwelds and other connected items that are “internal” to the selected parts



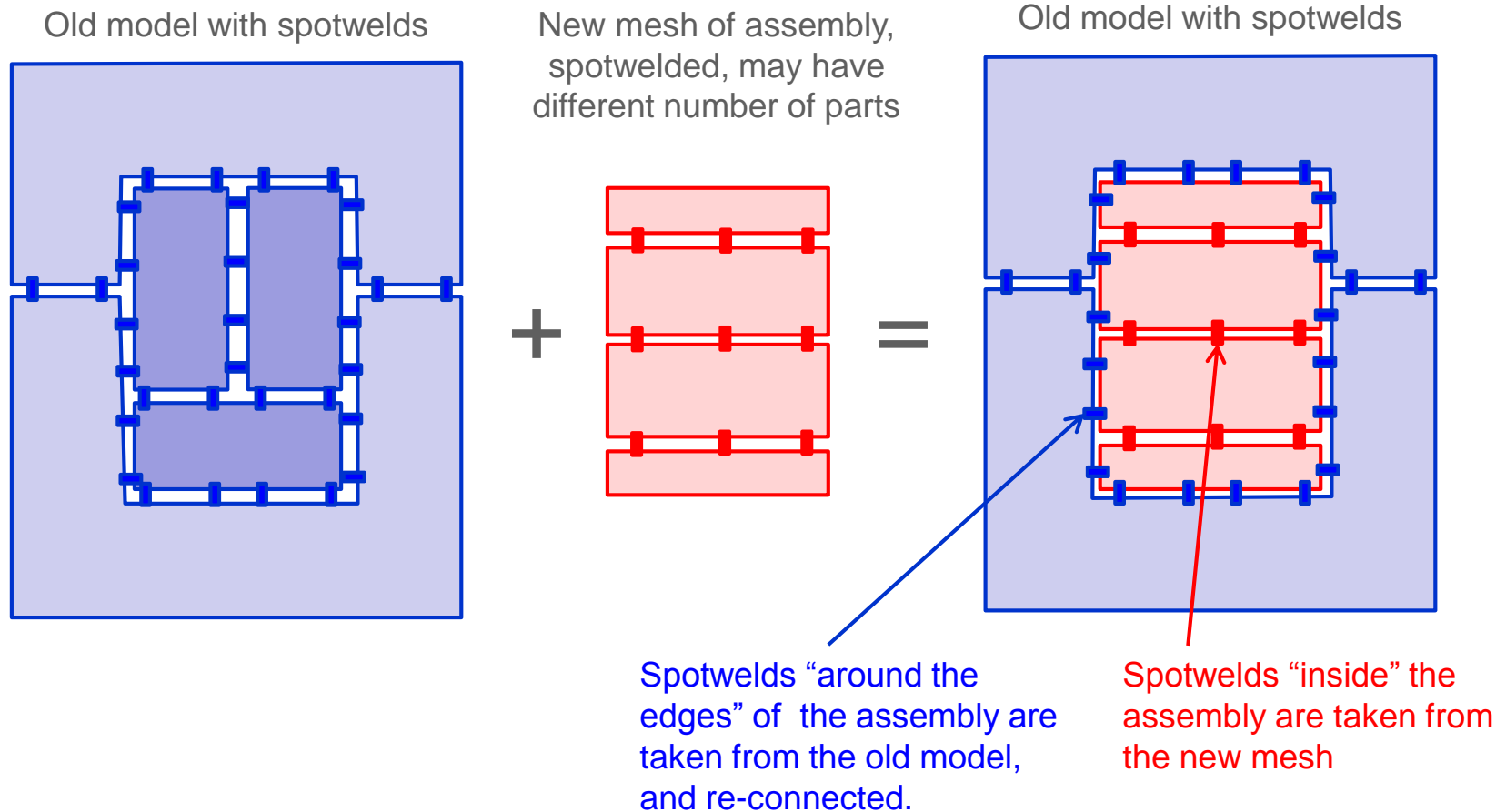




- New assembly, which can include its own spotwelds and other connected items, new parts, etc. The new assembly is connected to the rest of the structure using existing spotwelds









Part

Create	Replace	Sketch	Renumber
Copy	Delete	Table	Compare
Modify	Keyword	Check	Pen check

Apply SELECT TARGET PARTs (nothing select)

☐ replace single target part  
☐ replace multiple parts matched by ID  
☐ replace part assembly

Action for Connections

☐ Keep none  
☐ Keep external  
☐ Keep all

Action for \*PART data

☐ Retain target data  
☒ Set data from source

☒ import source matl  
☒ import source sect  
☒ import source hgls  
☒ import source eqos

Assign Mass on Assembly

☐ <no action>  
☐ re-make assign mass  
☐ batch deletion  
☐ interactive deletion  
☐ batch merge  
☐ interactive merge  
☐ no report  
☐ report summary  
☐ all details  
☐ <no action>  
☐ pre-emptive save

PART ASSEMBL ? <<

All Non ↑↓ Opt  
 Filte Vis Key\_I S  
 Cancel Apply

OBJECT TYPE

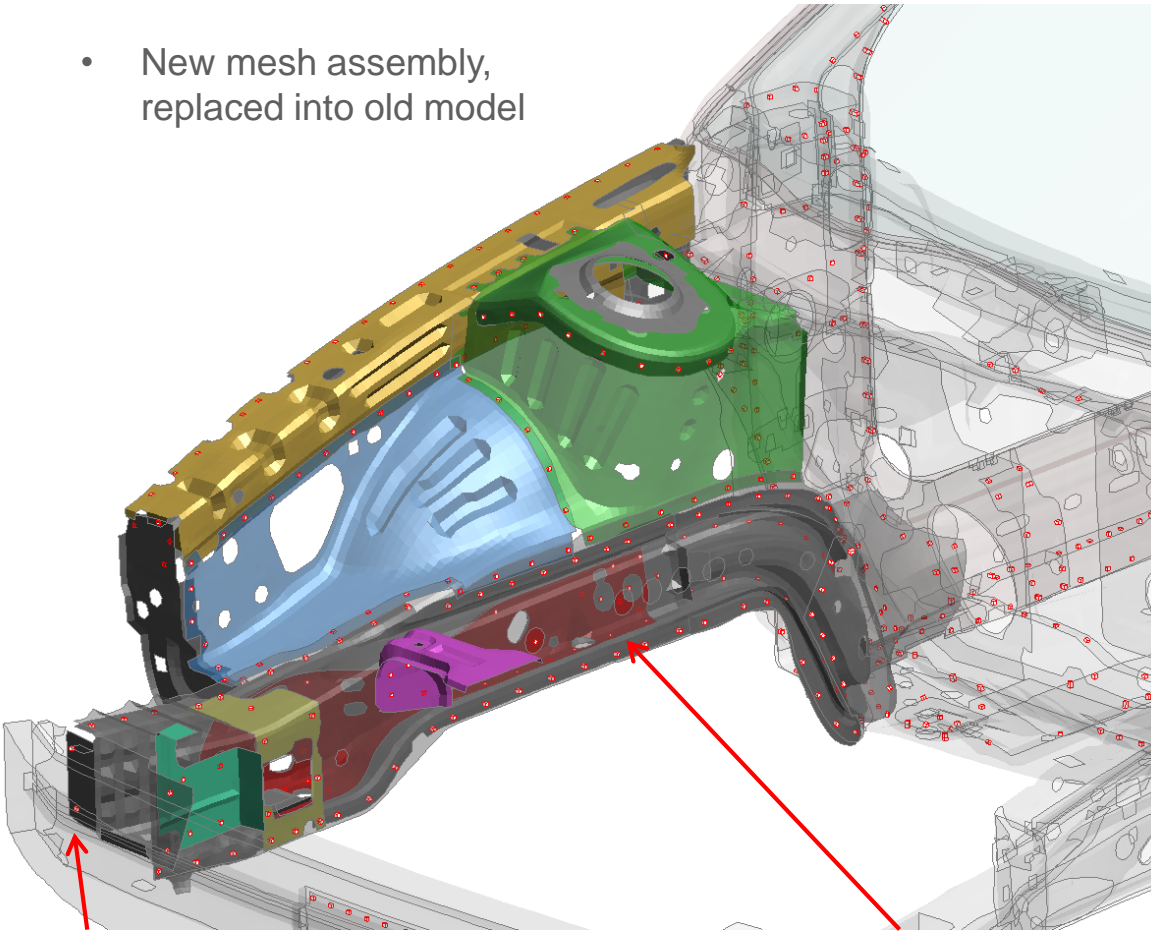
(M/L) PART TREE ASSEMB  
 SASS1 (parts to replace)  
 SASS2 (front end)  
 SASS3 (rear floor)  
 SASS4 (centre floor)  
 SASS5 (upper structure)  
 SASS6 (glazing)  
 SASS7 (SUBFRAME FOR  
 SASS8 (B-PLR FOR BELT  
 SASS9 (For\_demo)  
 SASS10 (body)  
 SASS11 (underframe)

## Action for \*PART data

- When replacing an assembly, if a part in the source model has the same label as a part in the assembly you are replacing in the target model, there are two options available for data on the \*PART card:
  - Retain target data** – part will reference the section, material etc. that it references in the target model
  - Set data from source** – part will reference the section, material etc. that it references in the source model. With this option you can also choose to import the referenced section, material, section, hourglass and equation of state cards from the source model to the target model
- Note that if a part in the source model does not match the label of a part in the assembly you are replacing in the target model, all referenced data (section material etc.) will be copied across

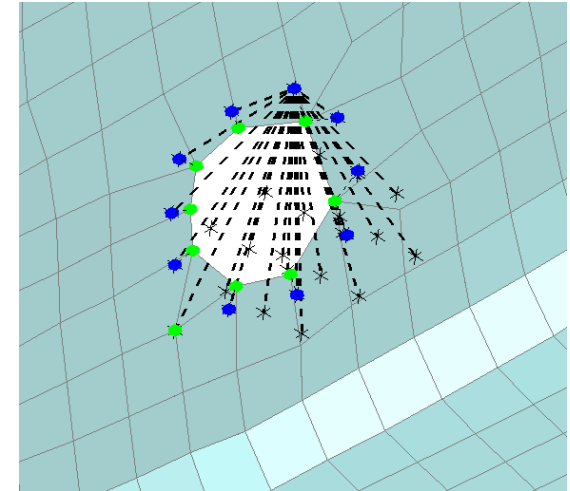


- New mesh assembly, replaced into old model



Spotwelds “around the edges” of the assembly are taken from the old model, and re-connected

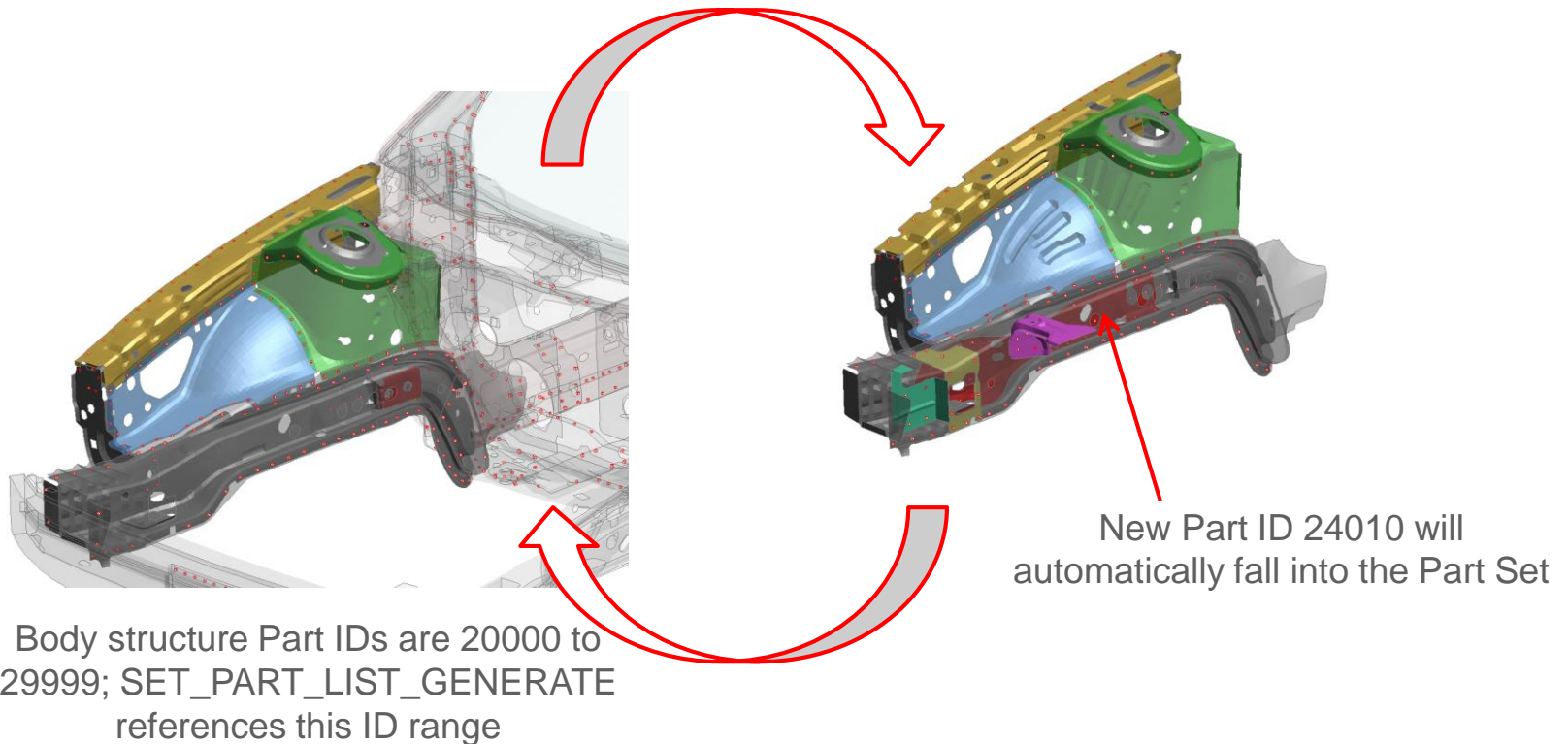
Spotwelds “inside” the assembly are taken from the new model



Same capabilities as existing Part Replace: re-creating bolt connections, re-attaching entities to the new mesh, etc

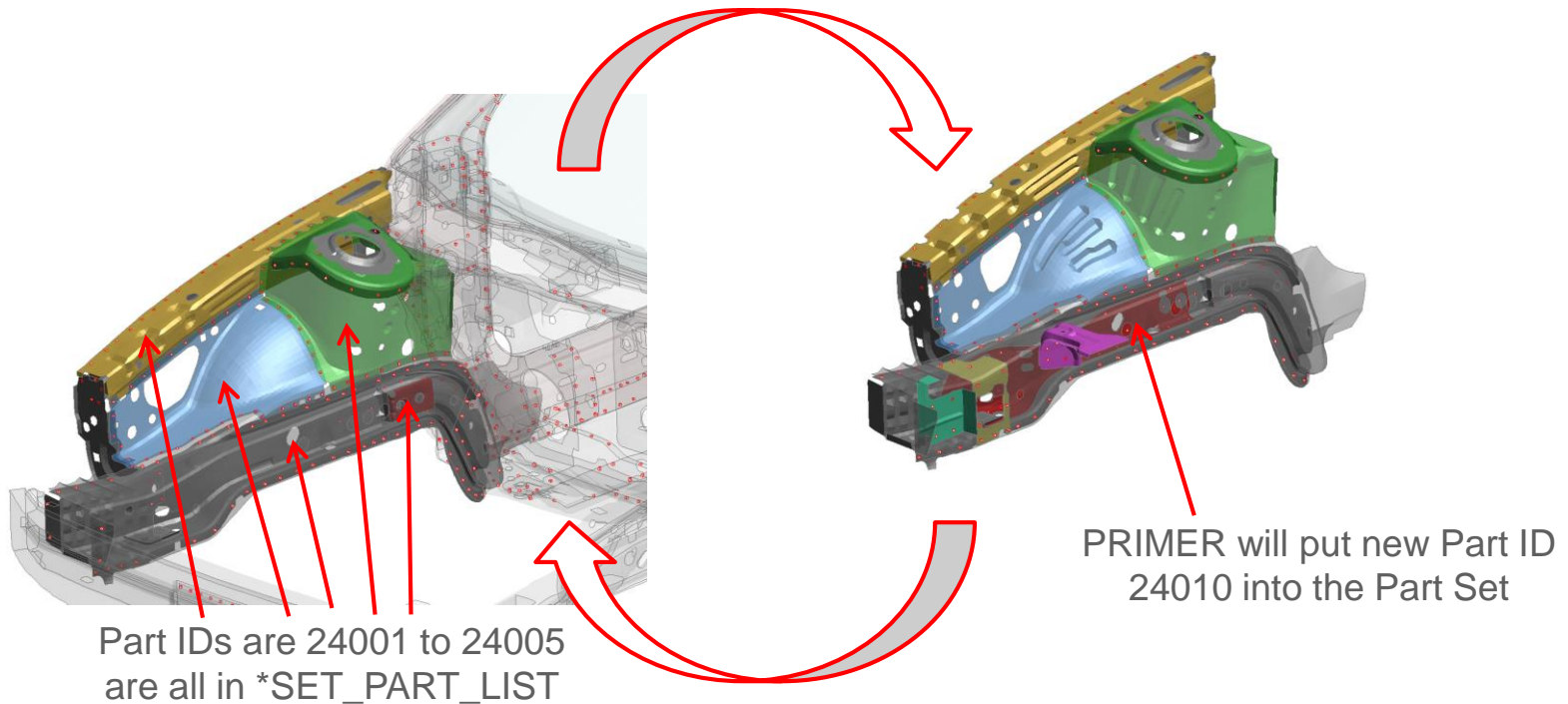


- How to ensure that new parts are in the correct Part Sets for contact, initial velocity, etc?
- Method 1 - \*SET\_PART\_LIST\_GENERATE.
  - Incoming new parts are correctly numbered to fall within the ID range





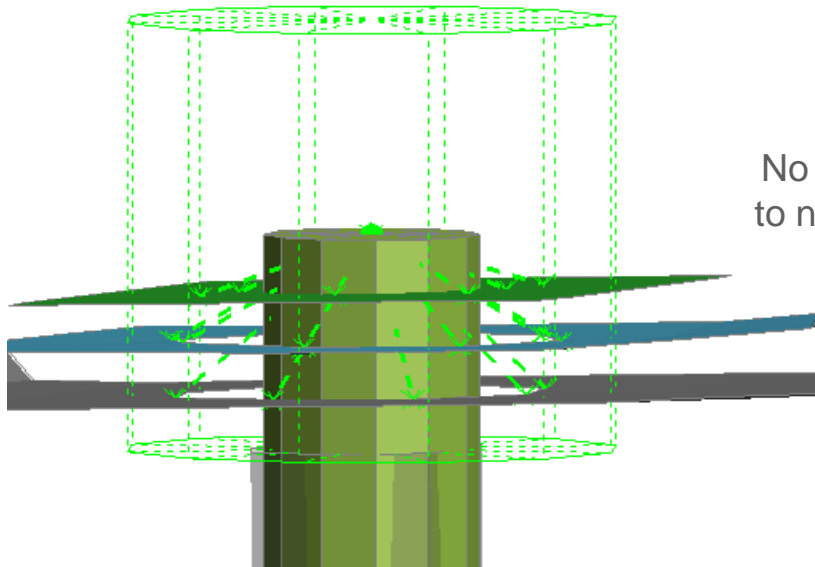
- How to ensure that new parts are in the correct Part Sets for contact, initial velocity, etc?
- Method 2 - \*SET\_PART\_LIST.
  - If ALL the outgoing parts are in the set, then the incoming parts will all be placed into the set automatically



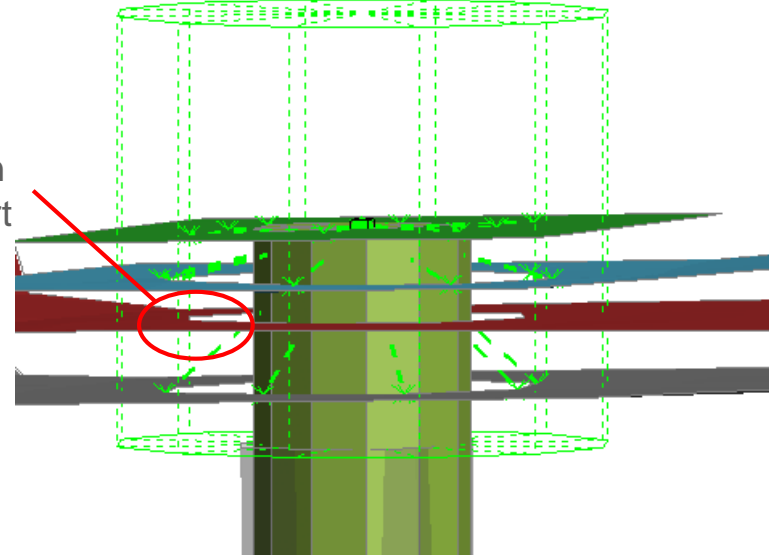


- Re-connection of bolt connections at the boundary of the new mesh depends on the definition method. If the layer definition consists of Part IDs, the bolt will re-connect only to those Part IDs, not to the new parts

CONNECTION TABLE							
Dismiss	View...	Options...	Refresh	Action: update & remake	Show all	Spotweld	Adhesive
Apply:	Undo	All	Selected	Changed	Autoscale	Clear	Sel all
↓ID	Type	Subtype	Diam	Layer 1	Layer 2	Write...	?
M1/CNX978	RIGID	2pt NRB Beam	35	P21009P21017P21016	P35112	Set colu	



No connection  
to new red Part





- If Part Set ID or Part Tree Assembly name is used in the bolt definition, and if the new parts are included in that set or assembly, then the bolt will re-connect to the new parts too

CONNECTION TABLE

Dismiss View... Options... Refresh Action: update & remake Show all Spotweld Ac

Apply: Undo All Selected Changed Autoscale Clear Sel all Select Show sel Bolts/Join Sp

ID	Type	Subtype	Diam	Layer 1	Layer 2
M1/CNX978	RIGID	2pt NRB Beam	35	A:FRT Sidemember RHS	P35112

<< Undo Part Tree ?

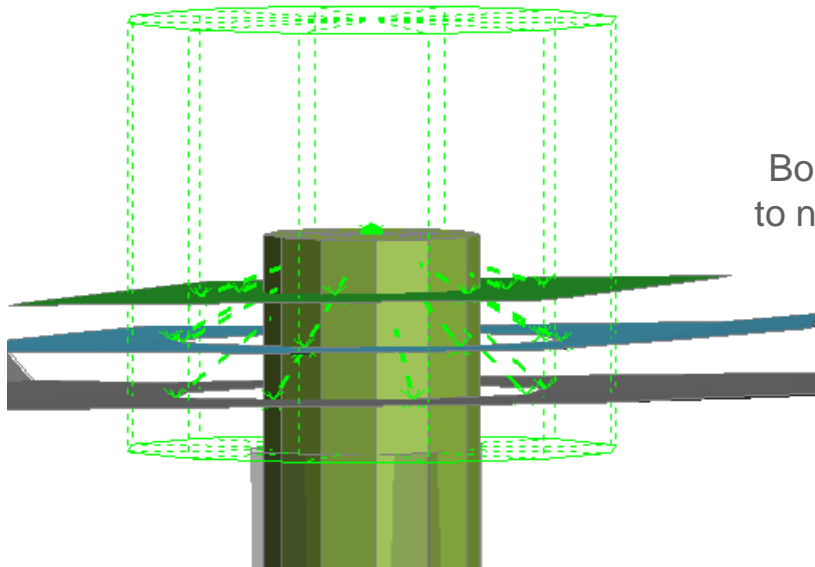
Opts Blank Unblank Only Sketch Include

Type Refresh Clear Sel all Select Assembl

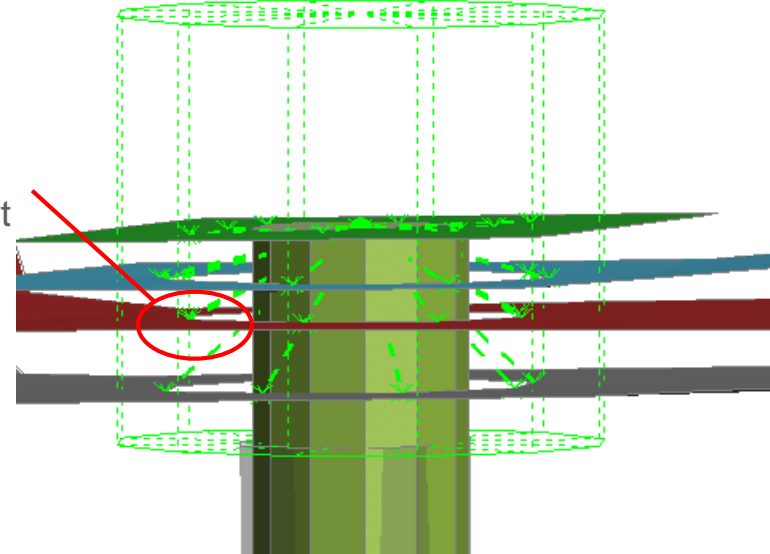
Content Find

M1 (USER DIAM)

- A3 (Body + powertrain)
  - A1 (POWERTRAIN)
  - A2 (VEHICLE BODY)
  - A4 (Bolts joining body to powertrain)



Bolt connects  
to new red Part





Model functions ?

Create	Copy	Renumber	Utilities
Read	Merge	Delete	List
Write	Build	Contents	Modified?

Apply Model modified?

Modified Mod 2 (DEMO) ...

Compare to:

Original	Model	File
Options	1 (DEMO)	...

Output to:

Screen	Clipboard	Tree View
File	primer.mod	

☒ Use names when comparing paramet

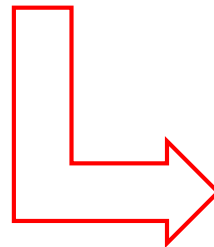
Further options for Part vs Part compare

Properties ☒ Calculate part masses

Geometries MIN/MAX: 0.0 10.0

☒ Auto filter Parts for geometry compari

- With two versions of a model open in the same Primer window, it is possible to compare the keyword files and find any differences between the two models.
- Go to Model ->Modified? and select one model as the Modified version and one as the comparing version. This can be a model already open, the original version of the current model, or another file which can be read in.
- Turn on the Geometries button if any changes in geometry are to be recorded. Then click on Apply.
- Primer will output a tree viewer listing all the differences.



"What's modified?" tree viewer

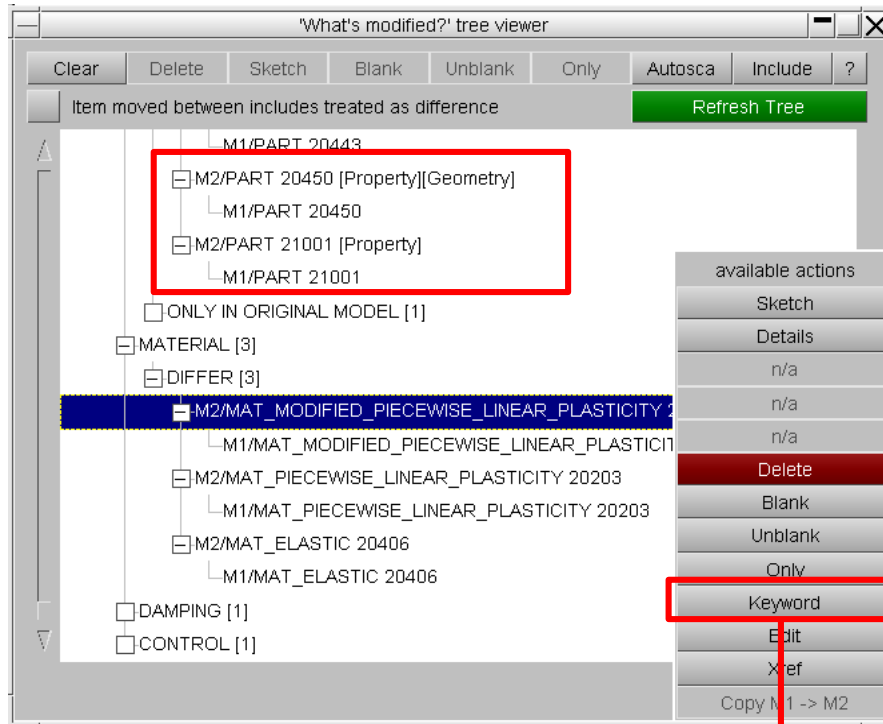
Clear Delete Sketch Blank Unblank Only Autosca Include ?

Item moved between includes treated as difference Refresh Tree

DIFFERENCES: Modified model M2 vs Original model M1

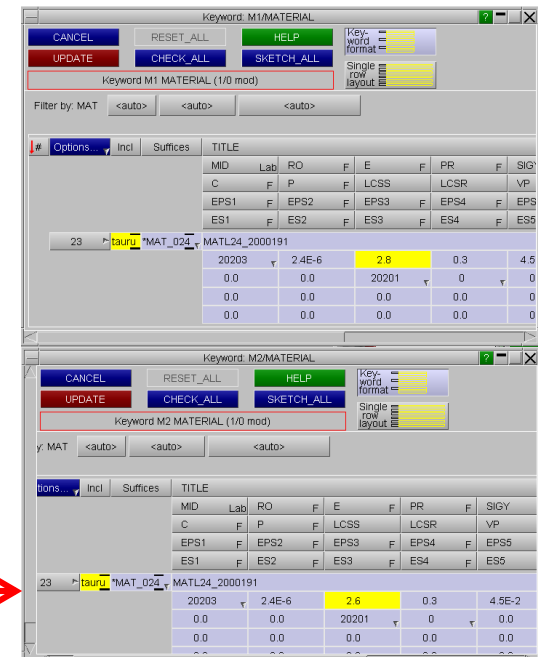
- ☐ NODE [723]
- ☐ SHELL [595]
- ☐ MASS [1]
- ☐ SET\_NODE [2]
- ☐ SET\_PART [1]
- ☐ PART [11]
- ☐ MATERIAL [3]
- ☐ DAMPING [1]
- ☐ CONTROL [1]





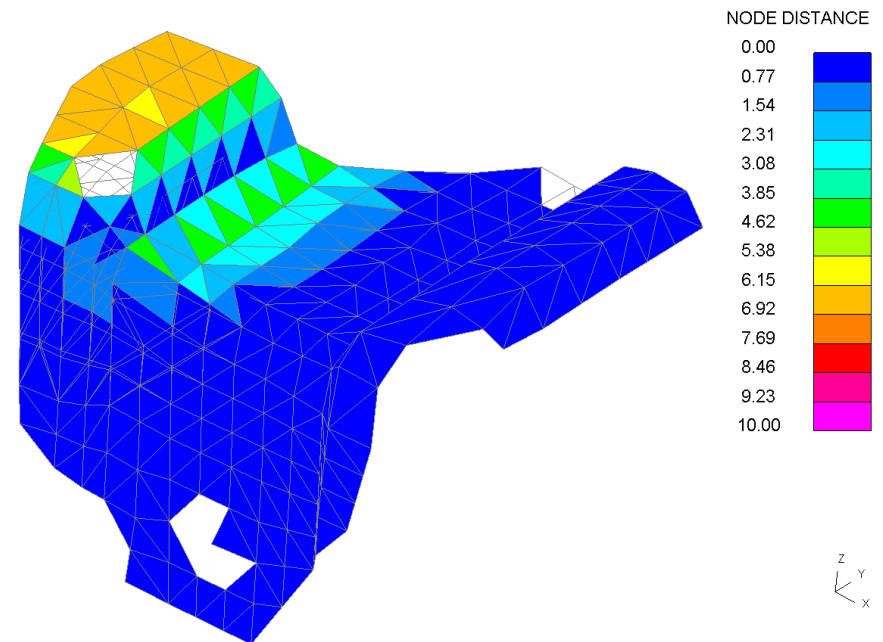
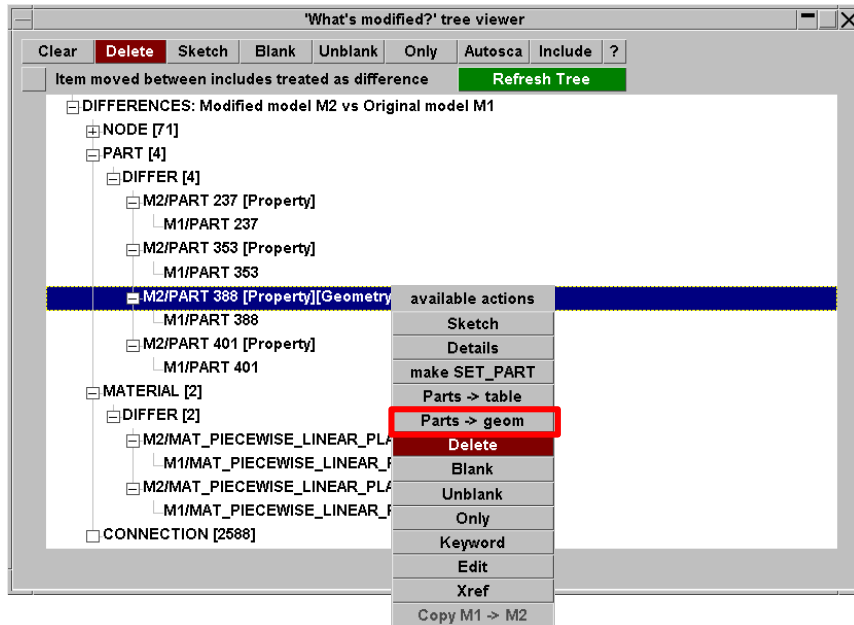
- Right clicking on any of the entity differences opens a menu with the option of opening the Keyword.
- This opens a keyword for each model with the differences **HIGHLIGHTED!**

- In the Part category of the tree viewer, Primer differentiates between differences in the properties or geometry of parts.
- It also list any entities that are only present in one of the models.
- When entities are present in the original model only, it is possible to copy them to the second model.

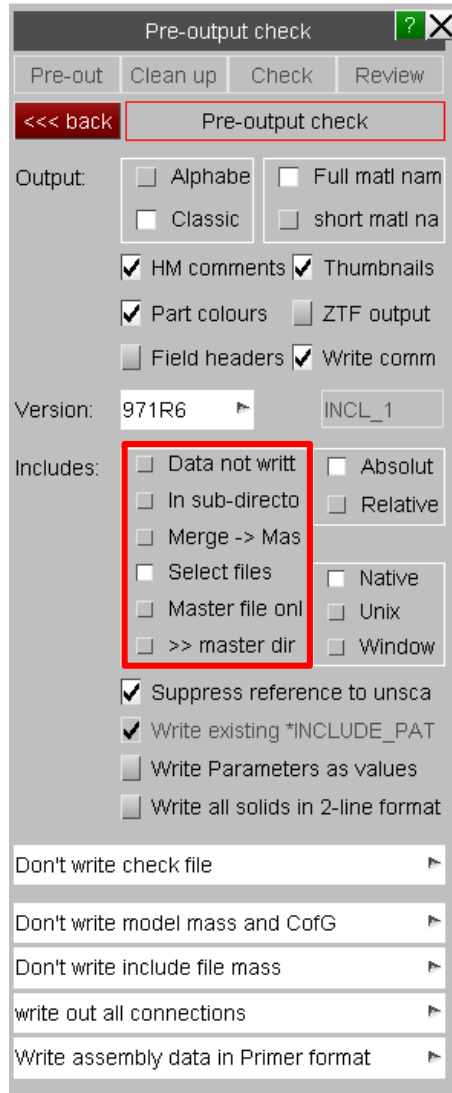




- Another option available when right mouse clicking on one of the differences is:
  - Checking and contouring geometric differences between parts.







Pre-output check

Pre-out Clean up Check Review

<<< back Pre-output check

Output:

☐ Alphabe ☐ Full matl nam  
☐ Classic ☐ short matl na

☒ HM comments ☒ Thumbnails  
☒ Part colours ☐ ZTF output  
☐ Field headers ☒ Write comm

Version: 971R6 INCL\_1

Includes:

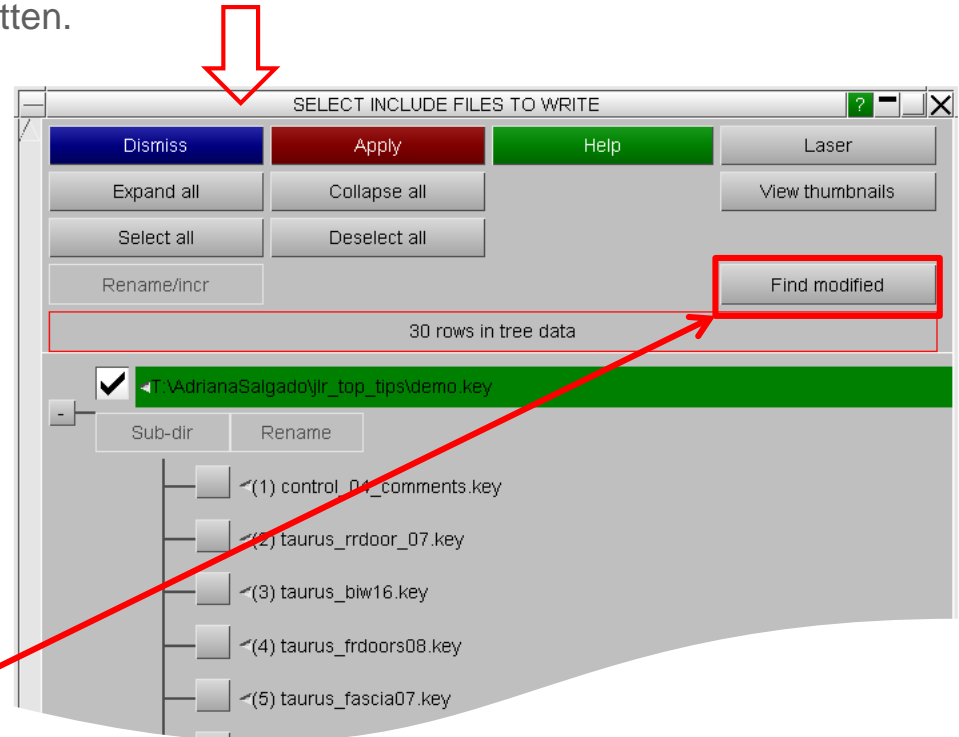
☐ Data not writt ☐ Absolut  
☐ In sub-directo ☐ Relative  
☐ Merge -> Mas  
☐ Select files ☐ Native  
☐ Master file onl ☐ Unix  
☐ >> master dir ☐ Window

☒ Suppress reference to unsca  
☒ Write existing \*INCLUDE\_PAT  
☐ Write Parameters as values  
☐ Write all solids in 2-line format

Don't write check file  
Don't write model mass and CofG  
Don't write include file mass  
write out all connections  
Write assembly data in Primer format

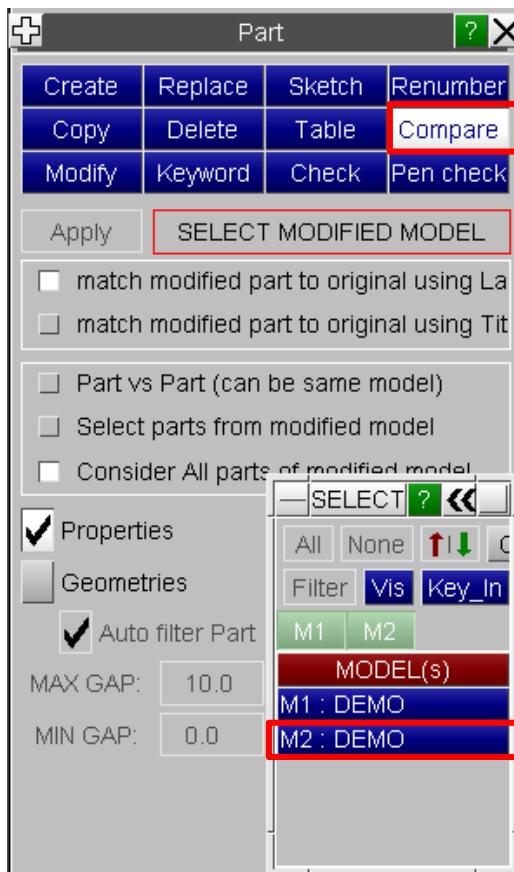
- In order to save only the include files with differences in them got to: Write -> LS-Dyna output options, then tick “Select files”.
- When saving the file a new window will appear for the user to select the includes to be written.

Select “Find Modified” for a list of the include files which have changed.





- Another way to compare differences is to go into Part -> Compare and select the modified model.



PART COMPARE

Dismiss View... Refresh Clear Set all show M2 value difference signed diff  
show M1 value difference diff as %age

Table Changes: Undo Apply Remove selected

Part ID	Density	Modulus	Struct Ma	Dyna Part	Compon	C of G	Inertia (XX)	Inertia (YY)	Lumped M	Dyna Ad	%Added	Include	Numel	Smallest	Smallest
M1/P202	1.2e-006	2	0.119723	0.116039	0.119723	[-1.832e+]	[5.440e+0]	[1.204e+0]	0	0.000282	0.243814	taurus_fa	11543	2.247e-0	3.379e-0
M2/P202	1.2e-006	1.8	0.119723	0.116039	0.119723	[-1.832e+]	[5.440e+0]	[1.204e+0]	0	0.000243	0.209992	taurus_fa	11543	2.369e-0	3.379e-0
M1/P202	1.2e-006	2.8	4.43261	4.41317	4.43261	[-2.349e+]	[1.548e+0]	[-1.244e+]	0	0	0	taurus_fa	9414	2.540e-0	4.520e+0
M2/P202	1.2e-006	2.8	4.43261	4.41317	4.43261	[-2.349e+]	[1.548e+0]	[-1.244e+]	0	0	0	taurus_fa	9414	2.540e-0	4.520e+0
M1/P202	7.89e-00	210	3.48065	3.43193	3.48065	[-1.061e+]	[9.542e+0]	[-3.686e+]	0	0.001977	0.057607	taurus_fa	3219	7.915e-0	4.756e+0
M2/P202	7.89e-00	210	3.48065	3.43193	3.48065	[-1.061e+]	[9.542e+0]	[-3.686e+]	0	0.001977	0.057607	taurus_fa	3219	7.915e-0	4.756e+0
M1/P202	1.2e-006	2	0.032601	0.031446	0.032601	[-1.563e+]	[6.871e+0]	[1.583e+0]	0	3.84273e	0.000122	taurus_fa	3228	9.979e-0	1.501e+0
M2/P202	1.2e-006	1.8	0.032601	0.031446	0.032601	[-1.563e+]	[6.871e+0]	[1.583e+0]	0	0	0	taurus_fa	3228	1.052e-0	1.501e+0
M1/P202	7.89e-00	210	3.47608	3.42502	3.47608	[-1.065e+]	[9.503e+0]	[3.650e+0]	0	0.001980	0.057832	taurus_fa	3219	7.915e-0	4.756e+0
M2/P202	7.89e-00	210	3.47608	3.42502	3.47608	[-1.065e+]	[9.503e+0]	[3.650e+0]	0	0.001980	0.057832	taurus_fa	3219	7.915e-0	4.756e+0
M1/P202	1.2e-006	2	0.378131	0.378131	0.378131	[-3.186e+]	[4.859e+0]	[3.270e+0]	0	0	0	taurus_fa	1845	2.167e-0	3.258e+0

- This brings up a table of all the model parts and their differences with the original model.
- The table can be sorted by column and more properties can be added by clicking on “View”.



- Cross sections can be created normal to a feature line by selecting this option in the “Local System Type” drop down menu.
- This allows the user to select a point on the feature line (XCT,YCT,ZCT) and the size of the plane (LENL & LENM).
- It is also possible to select the part set that the cross section is applied to (PSID).

CREATE DATABASE\_CROSS\_SECTION

Abort Create Reset All Text edit

Create XSECTION Copy Existing Sketch

Undo Create Check Defn

Include: M1 <Master file>

Pick point P1

Label: 6 Give label \_PLANE \_SET Properties

Title: <No Xsection name given>

PSID	XCT	YCT	ZCT	XCH	YCH	ZCH	RADIUS
0	-2467.1204	-1499.3699	-266.29285	-2466.1204	-1499.3699	-266.29285	0.0

XHEV	YHEV	ZHEV	LENL	LENM	ID	ITYPE
-2467.1204	-1498.3699	-266.29285	3000.0	2000.0	0	0

Drag translate Drag rotate Auto create Move by half element

Local system type: Point 1 position:

Feature line Infinite plane P1 at centre

Local system type

Origin + vectors

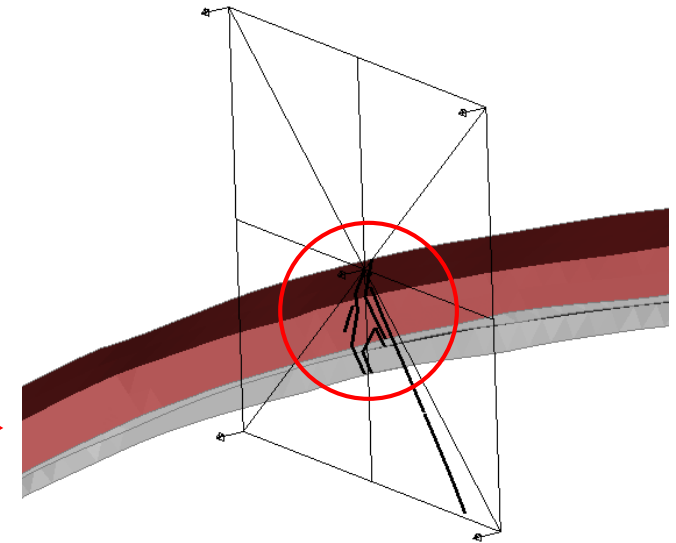
3 nodes

Constant X

Constant Y

Constant Z

Normal to feature line





- Turn on the Auto Create option and set the Offset to 50 (or desired amount).
- Press “+” to create multiple cross sections along the feature line at a constant distance.

CREATE DATABASE\_CROSS\_SECTION

Abort Create Reset All Text edit

Create XSECTION Copy Existing Sketch

Undo Create Check Defn

Include: M1 <Master file>

Pick point P1

Label: 12 Give label \_PLANE \_SET Properties

Title: <No Xsection name given>

PSID	XCT	YCT	ZCT	XCH	YCH	ZCH	RADIUS
20100	<unset>	<unset>	<unset>	<unset>	<unset>	<unset>	0.0

XHEV	YHEV	ZHEV	LENL	LENM	ID	ITYPE
<unset>	<unset>	<unset>	200.0	200.0	0	0

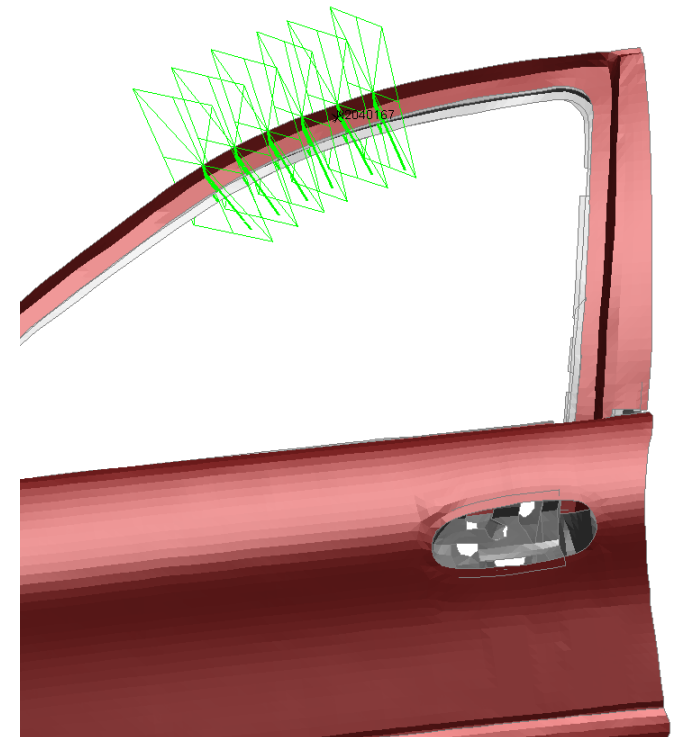
Drag translate Drag rotate Auto create Move by half element

Local system type: Feature line Infinite plane P1 at centre

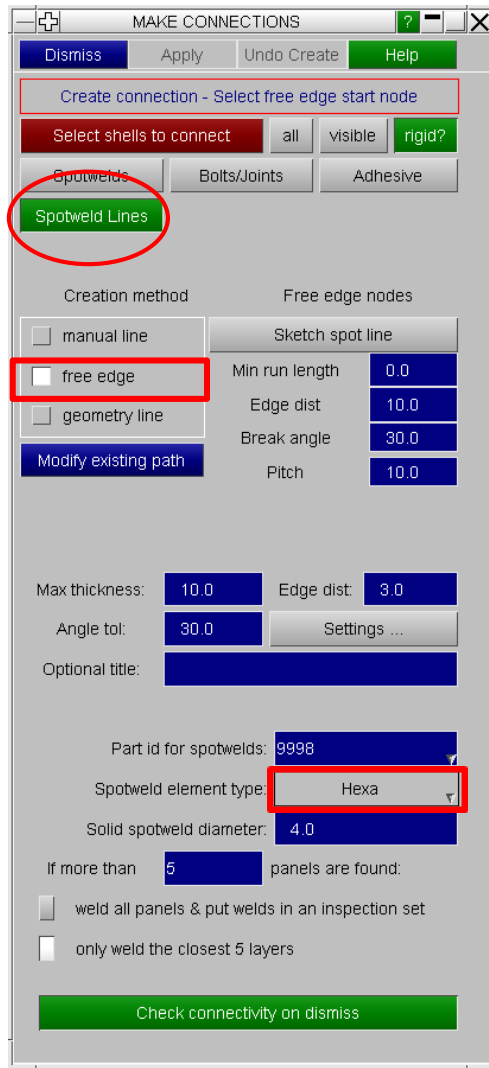
Offset 50.0 + - Auto CSYS 11001

Auto create PSID

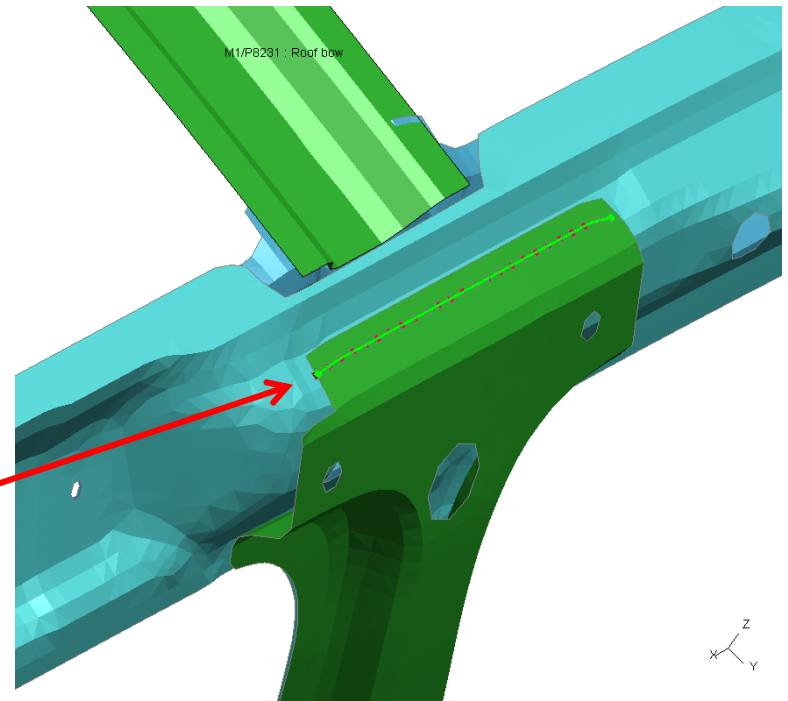
Show only PSID





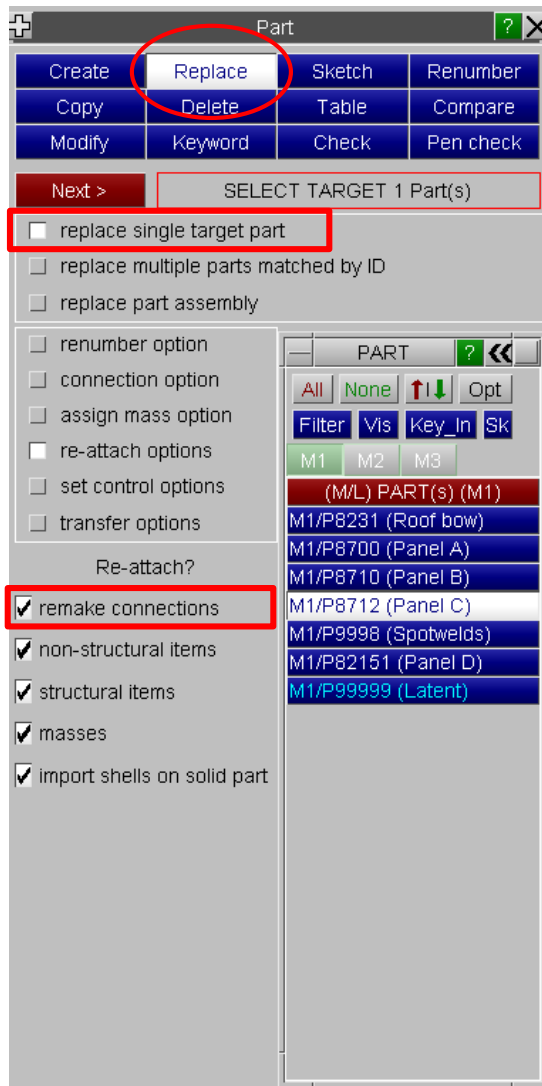


- A useful feature of Primer connections is that a line of Spotwelds can be created along a free edge.
- Set the distance from the edge and the size and type of the Spotweld element.
- Pick the parts to be joined and two nodes defining the free edge. Then click Apply.

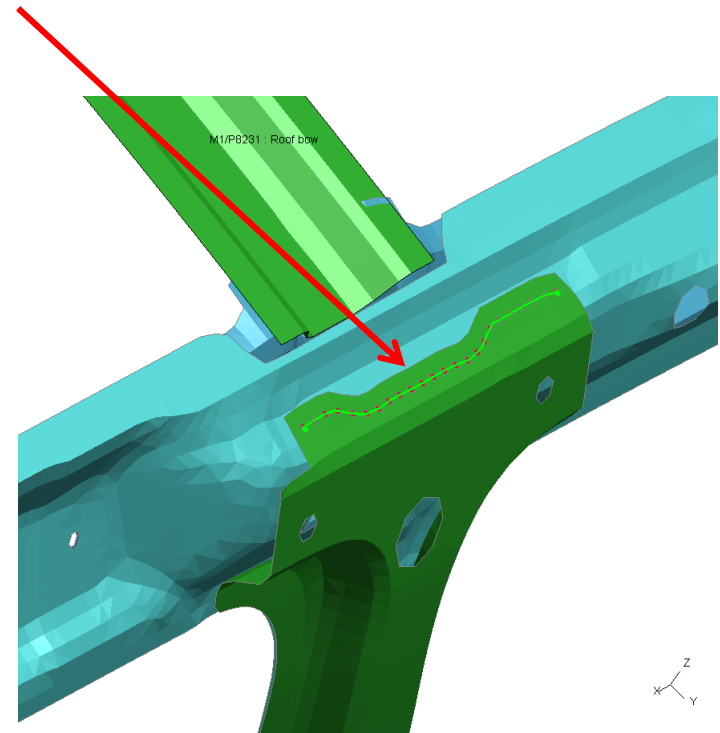


- The result is a line of Spotwelds such as in this example.

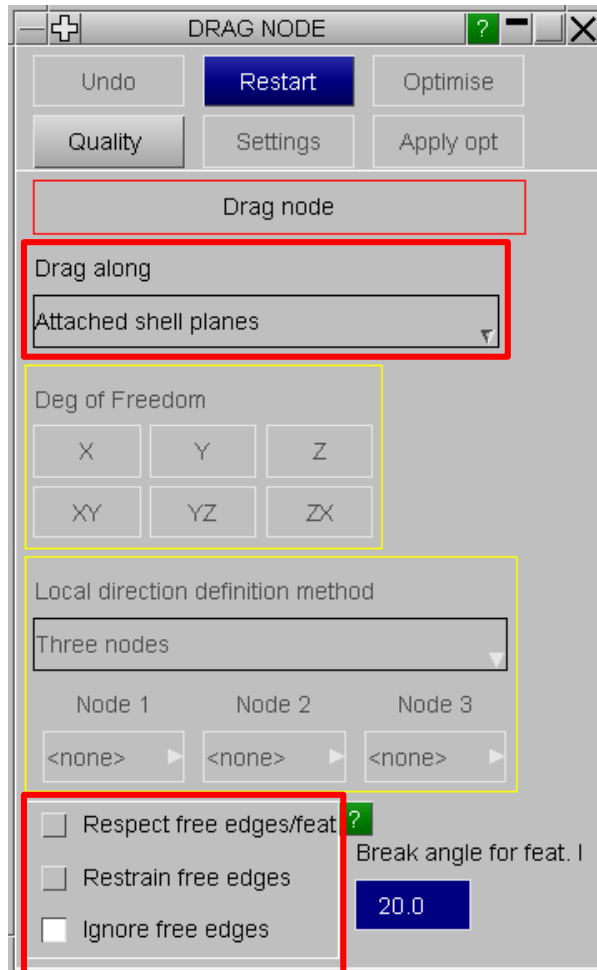




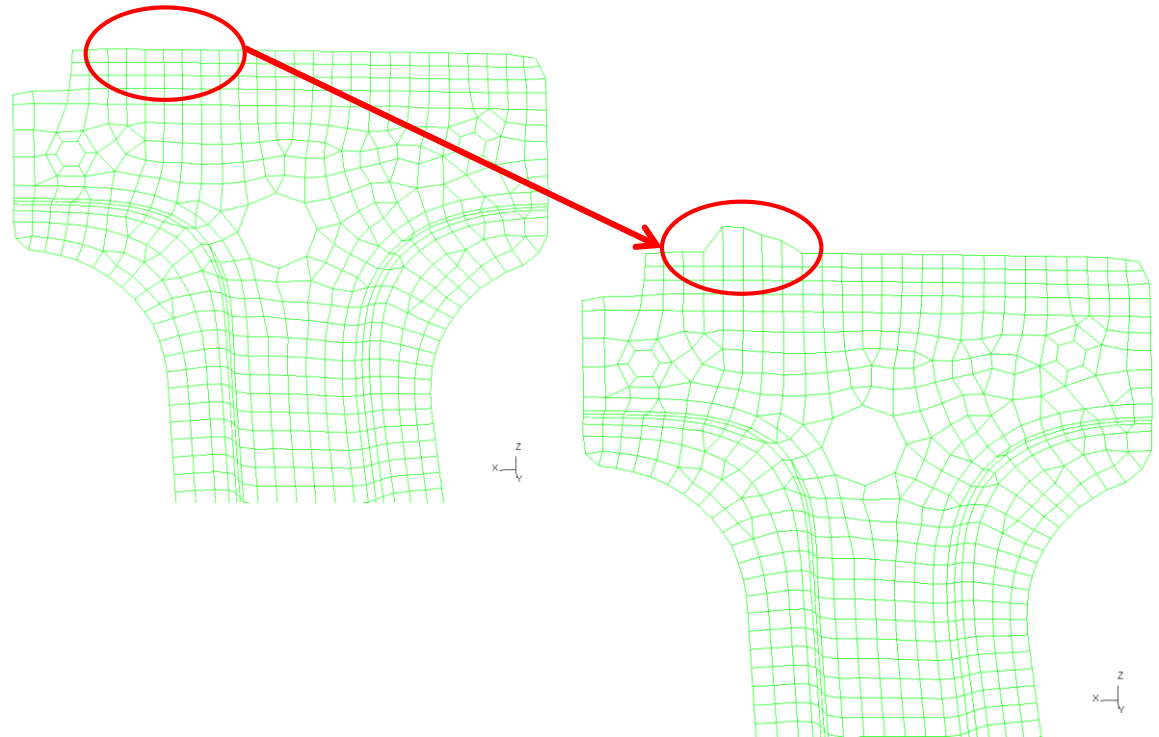
- If one of the parts that were welded together needs to be replaced, first load the new version of the part.
- Go to Part -> Replace, select the old and new parts and make sure the “re-attach options” include “remake connections”.
- The Spotwelds are re-made by Primer so that they still follow the free edge defined earlier.



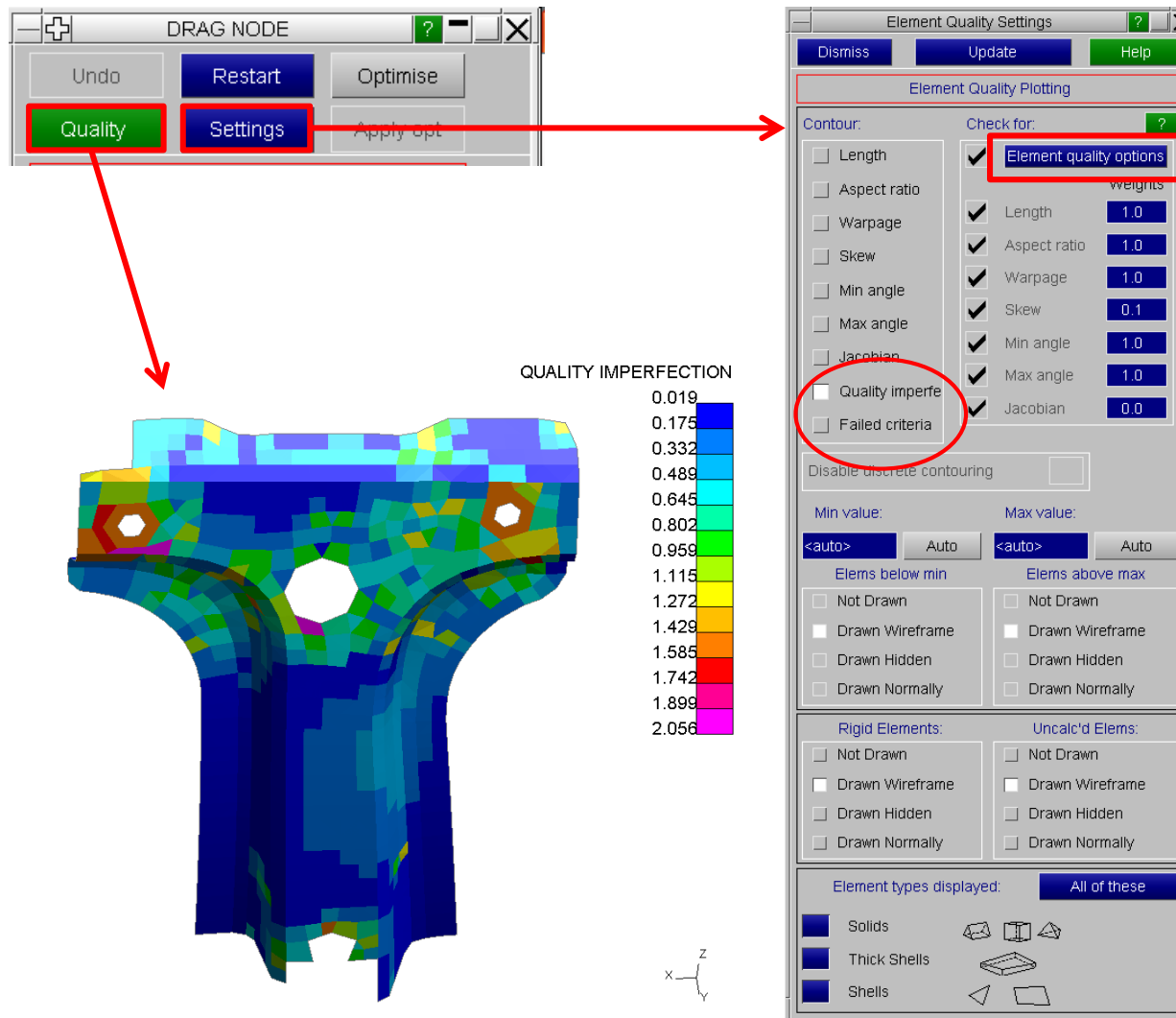




- A useful tool in Primer to make small changes to the mesh is “Drag Node”.
- This allows the user to move nodes along different directions, with the added feature of respecting or not any free edges.

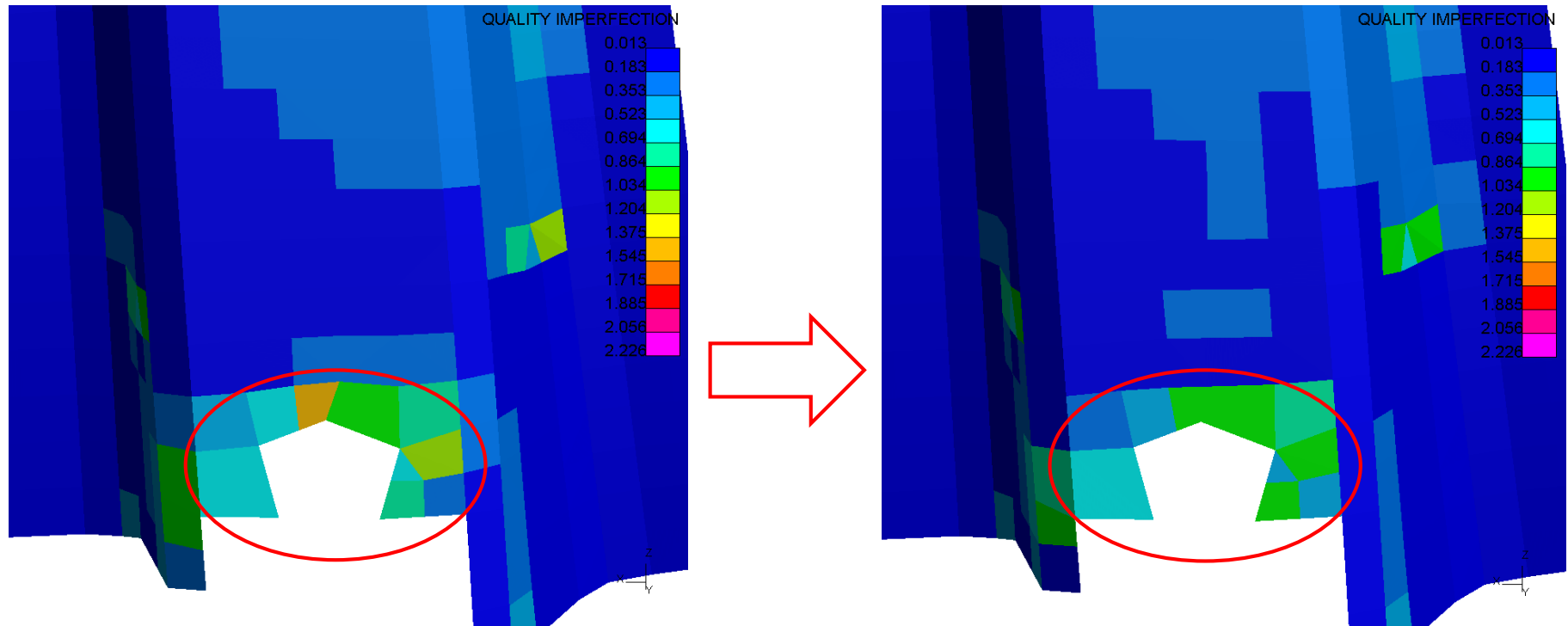






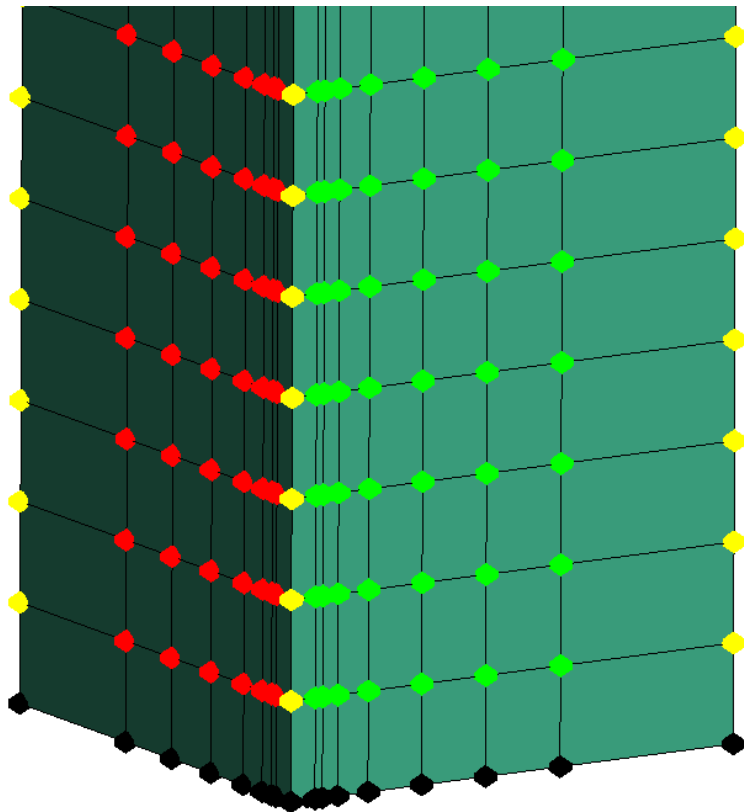
- To visualize the quality of the elements turn on the “Quality” button.
- This plots the quality imperfection of each element by default.
- In order to change the plot click on “Settings”. This brings up the “Element Quality Settings” menu where the user can select what is visualized.
- Selecting the Failed Criteria box allows the user to only colour the elements which are failing given a user defined criteria.
- Click on “Element quality options” to specify the criteria.





- It's useful to have the quality setting on when dragging nodes in order to visualize any improvements, given that the contour updates in real time.



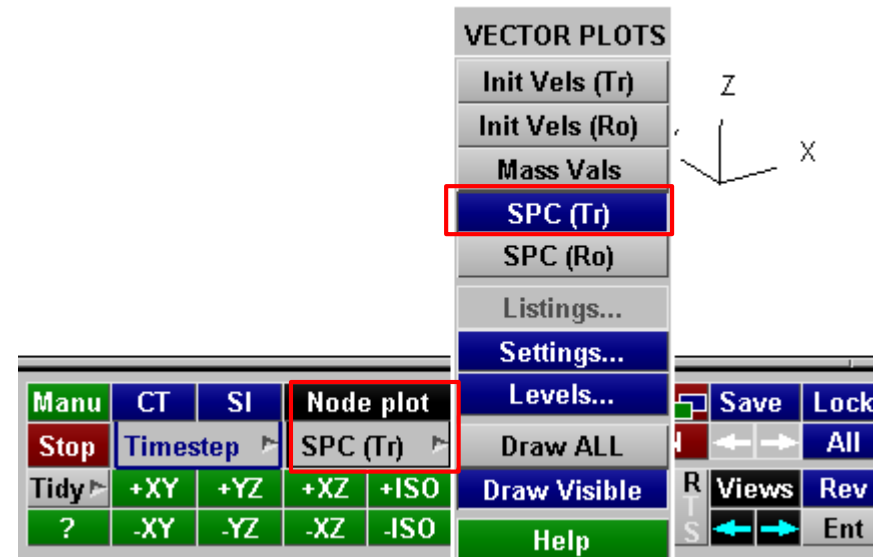


Translational Constraint (Global)

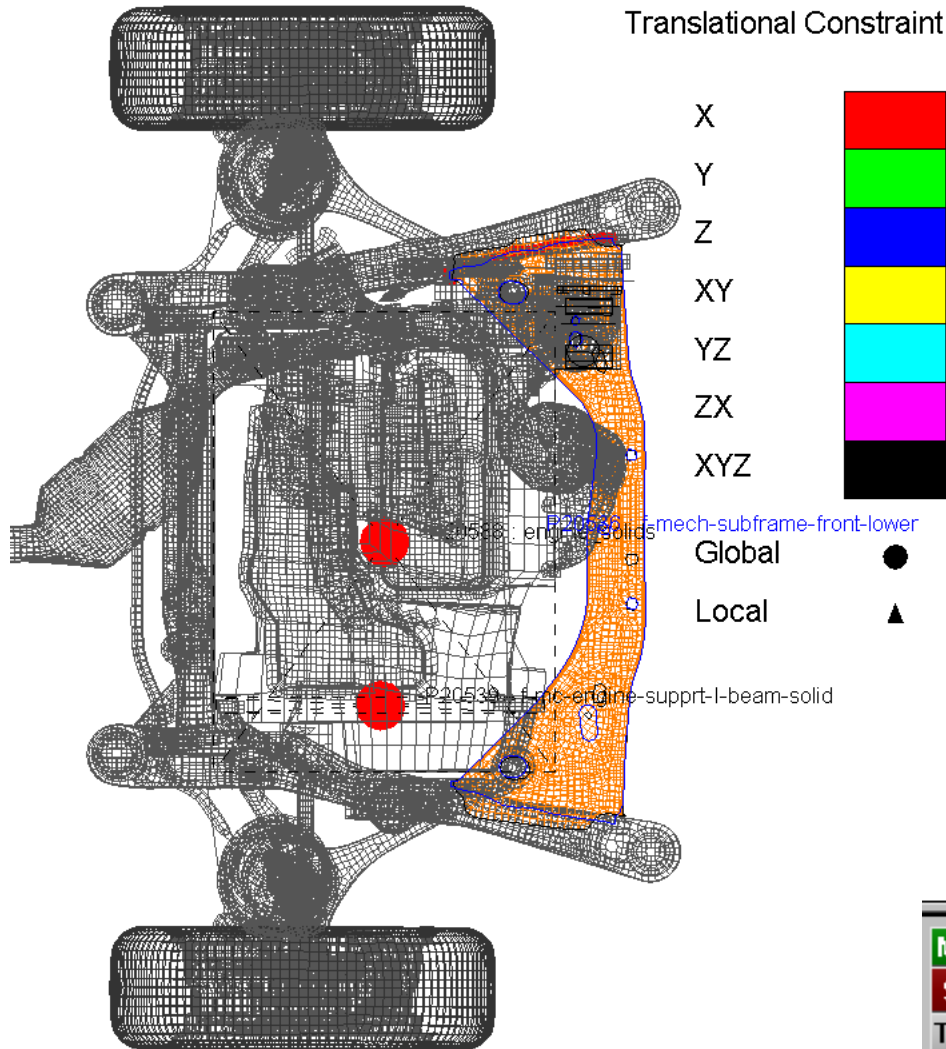
X  
Y  
Z  
XY  
YZ  
ZX  
XYZ



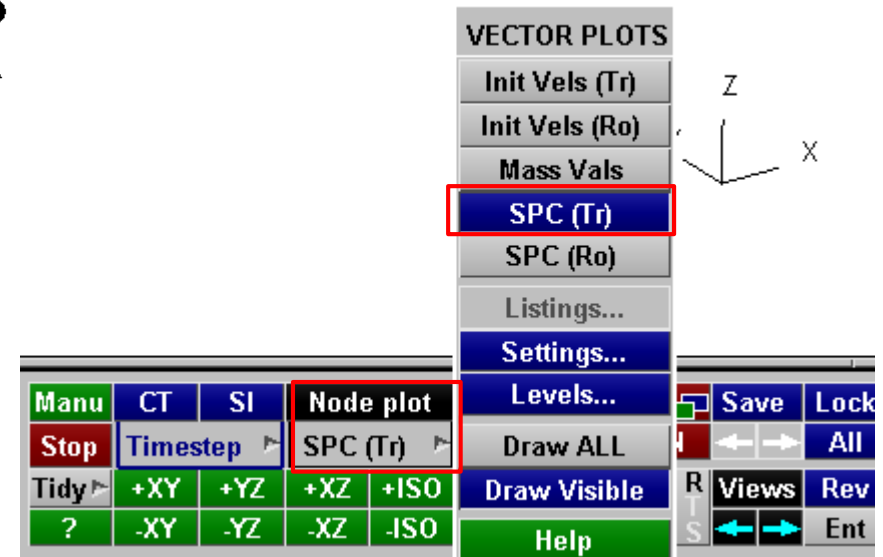
Translational or rotational restraints applied by either \*BOUNDARY\_SPC or MAT\_RIGID can be plotted in PRIMER. The colour indicates the degrees of freedom of the SPC.







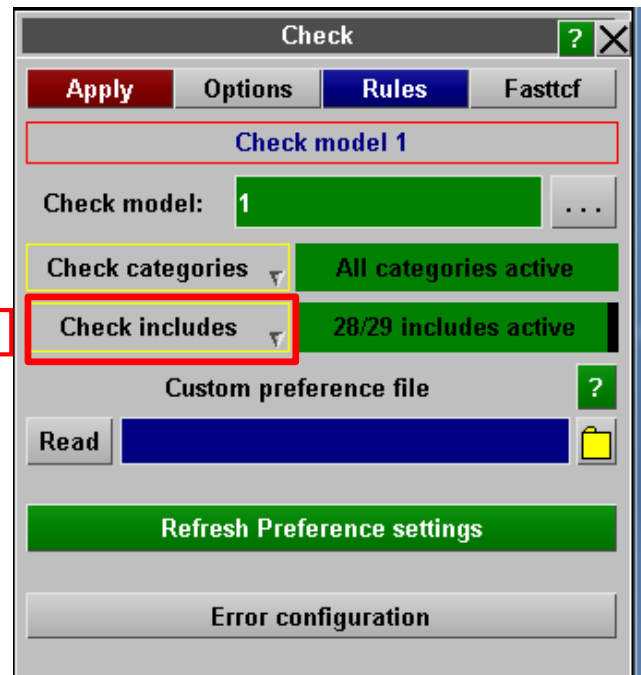
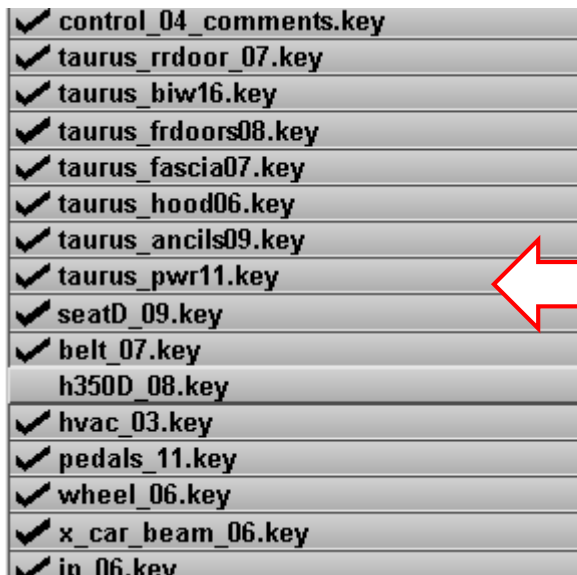
For \*MAT\_RIGID, a larger circle is drawn at the Centre of Mass. This may be hidden inside the part; we recommend to draw in Line mode.





When I perform a Model Check, how can I stop Primer reporting errors in standard dummy models?

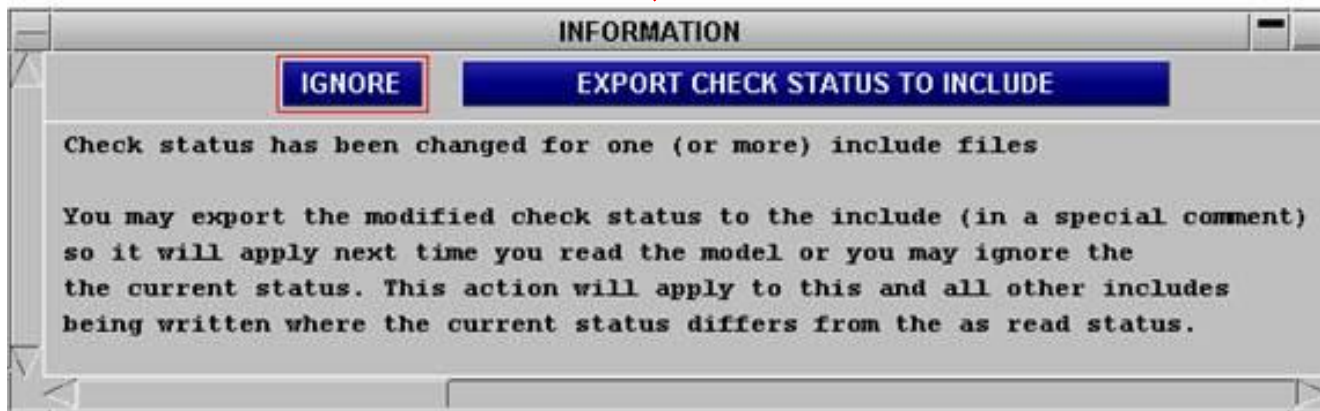
How can I find errors in the Include file for which I am responsible?



Switching off the checking for an Include File means “do not check the entities in this Include File”. Entities in other Include files might still have errors caused by entities in the switched-off Include Files, and these errors would still be reported.



Write out model



Comment at top of Include File

(same comment could be added by text-edit)

`$PR_SUPPRESS_INCLUDE_CHECK`



Error tree viewer

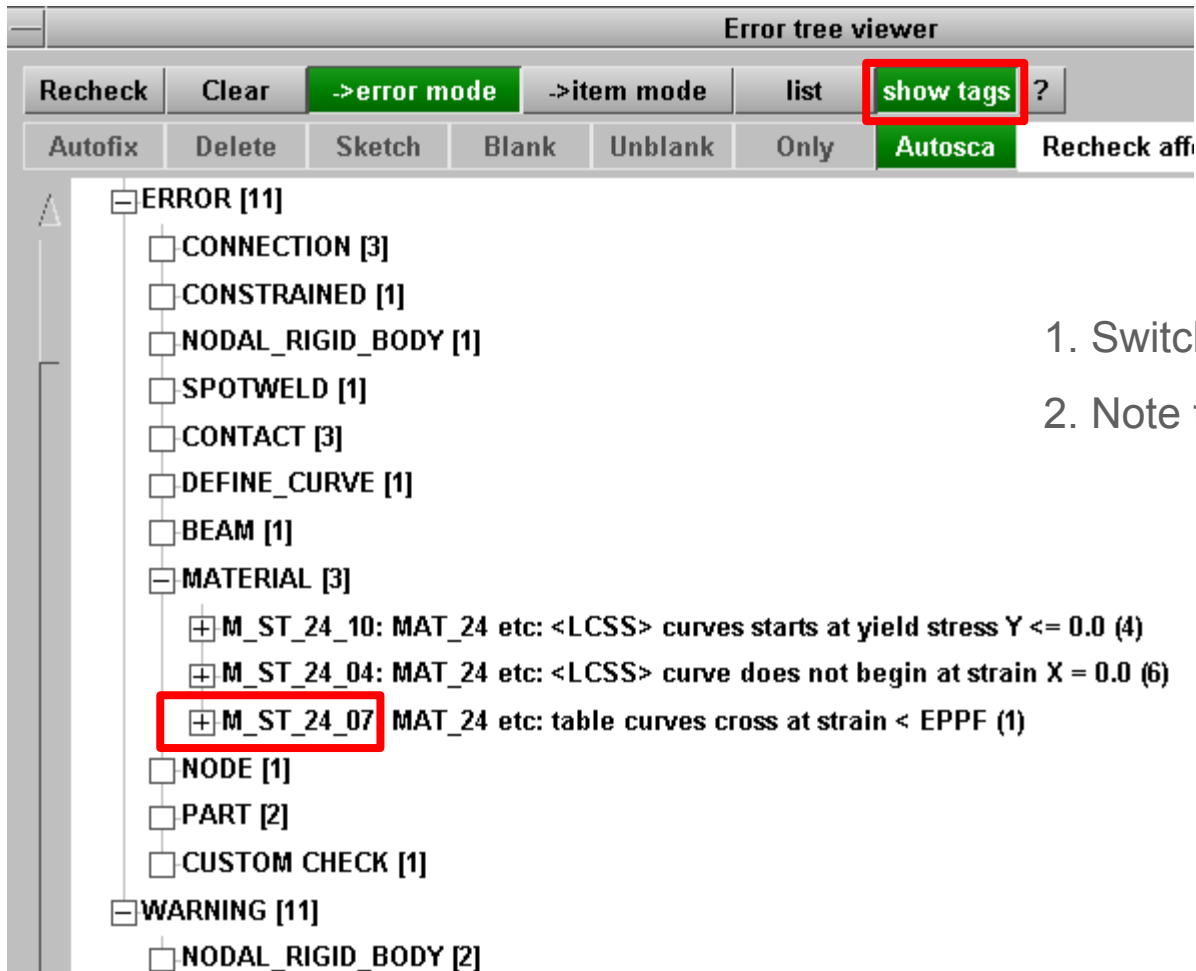
Recheck Clear **->error mode** ->item mode list show tags ?

Autofix Delete Sketch Blank Unblank Only **Autosca** Recheck

- ☐ ERROR [11]
  - ☐ CONNECTION [3]
  - ☐ CONSTRAINED [1]
  - ☐ NODAL\_RIGID\_BODY [1]
  - ☐ SPOTWELD [1]
  - ☐ CONTACT [3]
  - ☐ DEFINE\_CURVE [1]
  - ☐ BEAM [1]
  - ☐ MATERIAL [3]
    - ☐ MAT\_24 etc: <LCSS> curves starts at yield stress  $Y \leq 0.0$  (4)
    - ☐ MAT\_24 etc: <LCSS> curve does not begin at strain  $X = 0.0$  (6)
    - ☐ MAT\_24 etc: table curves cross at strain < EPPF (1)
  - ☐ NODE [1]
  - ☐ PART [2]
  - ☐ CUSTOM CHECK [1]
- ☐ WARNING [11]
  - ☐ NODAL\_RIGID\_BODY [2]

How can I stop Primer reporting a certain type of error?





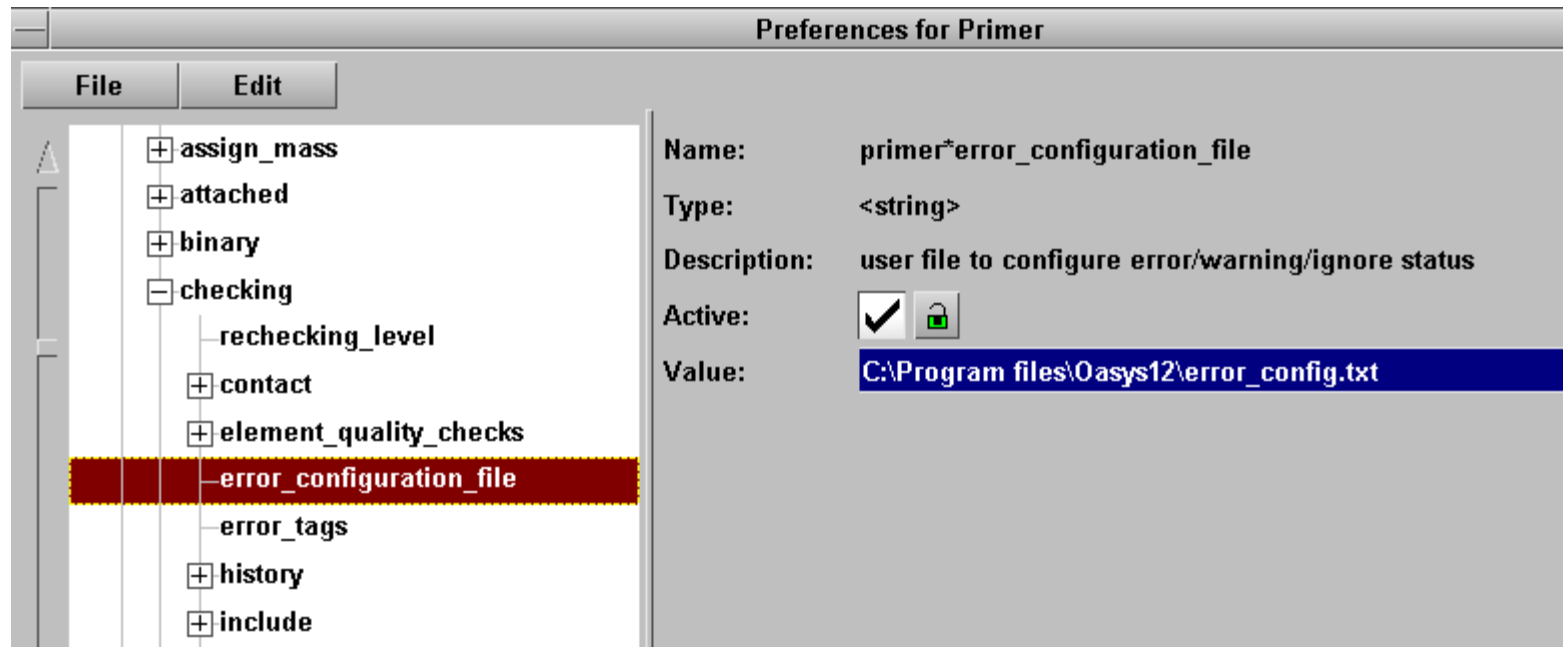
1. Switch on “Tags”

2. Note the Tag for this type of error...



M_ST_24_07	WARNING
M_ST_24_10	IGNORE
PART_122	ERROR

3. Create “error configuration file”
4. Set preference to refer to this file



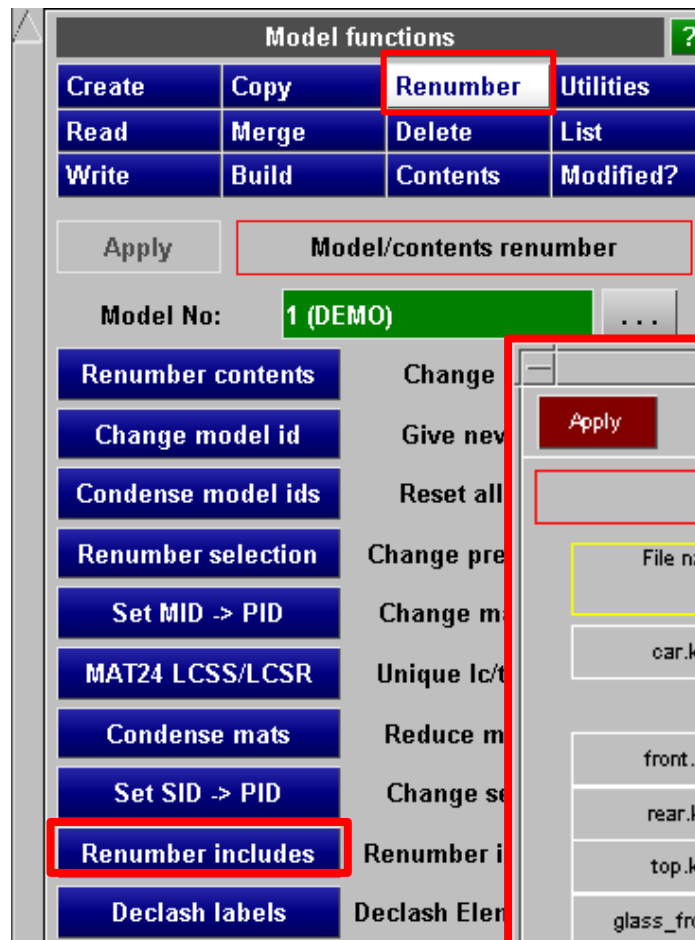


My company has a numbering scheme defining the IDs for each Include File.  
What is the easiest way to implement that in Primer?

- Example:

- Barrier: 1-999999
- Dummy (driver): 1000000-1999999
- Dummy (passenger): 2000000-2999999
- Engine: 5000000-5999999
- Suspension: 6000000-6999999
- Body: 10000000-19999999



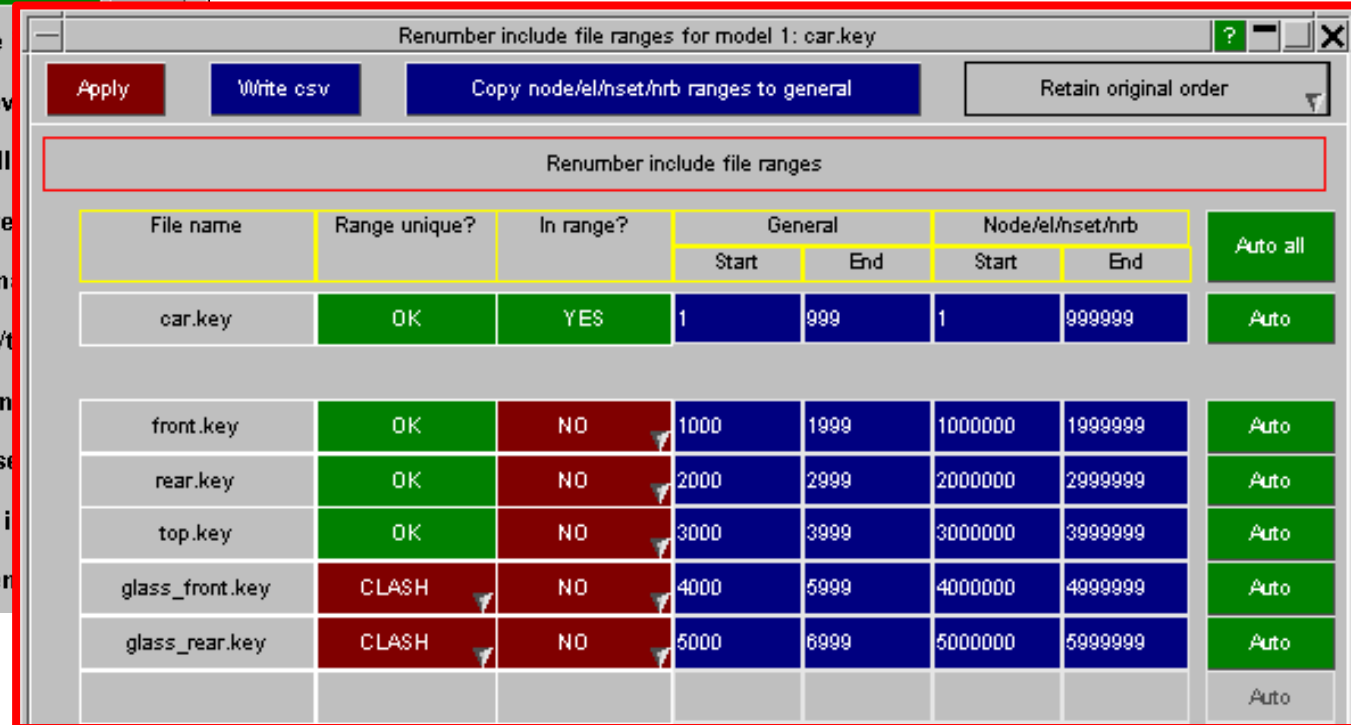


\$PR\_MIN\_LABEL: 1000000

\$PR\_MAX\_LABEL: 1999999

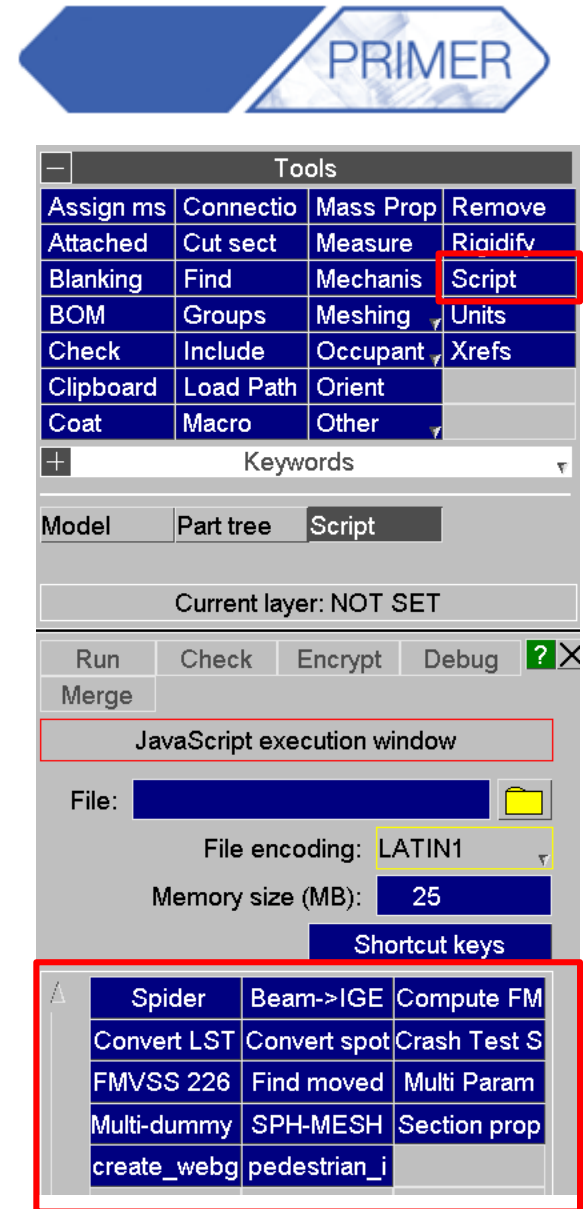
\$PR\_N\_EL\_MIN\_LABEL: 1000000

\$PR\_N\_EL\_MAX\_LABEL: 1999999

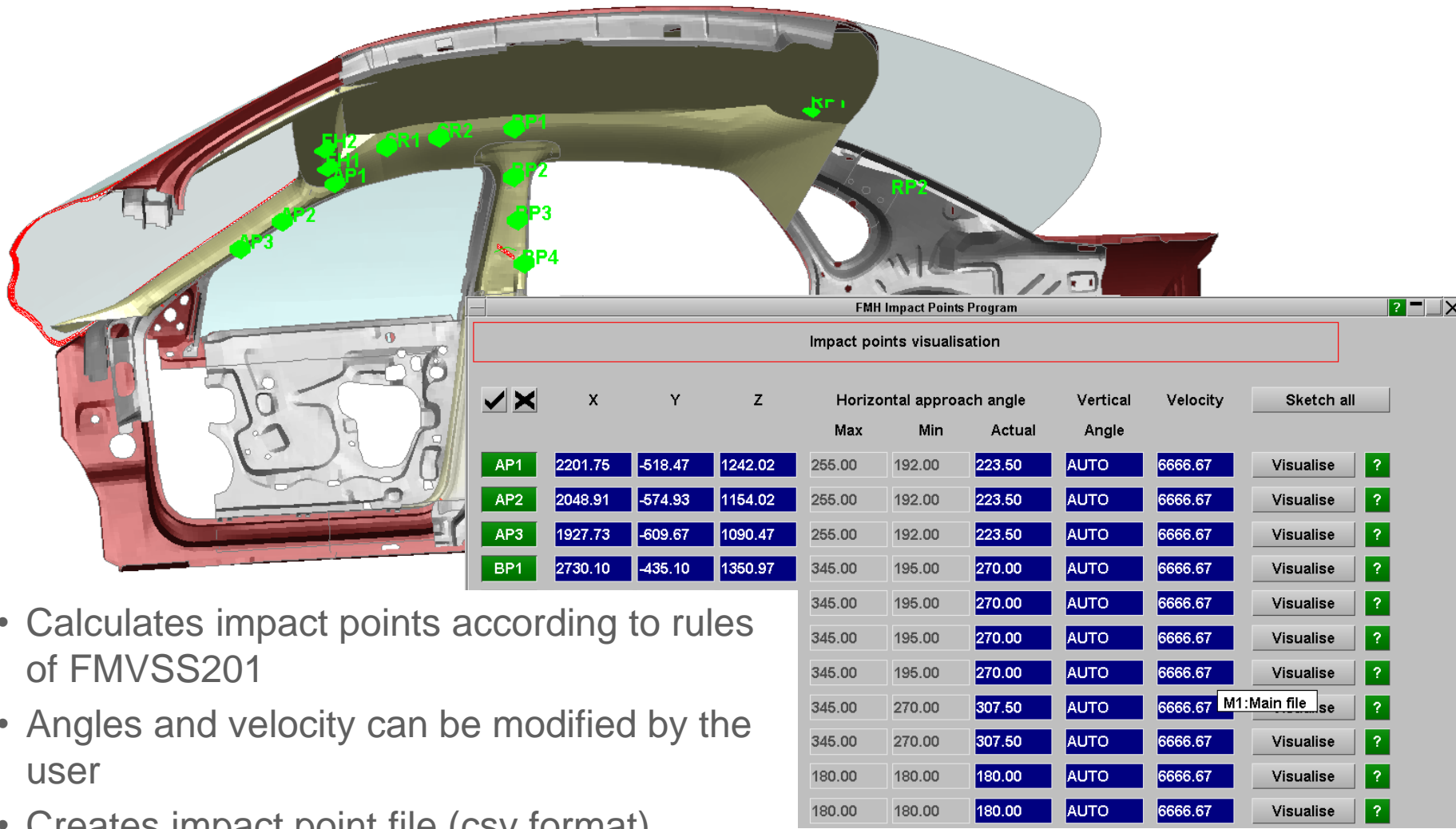




- Some PRIMER capabilities are issued in the form of scripts.
- See Tools=>Scripts







- Calculates impact points according to rules of FMVSS201
- Angles and velocity can be modified by the user
- Creates impact point file (csv format)



Crash Test Setup

1. CRASH TEST

2. VEHICLE

3. BARRIER

NEXT

Preferences...

Cancel

Help

SEARCH:

Search

FILTER BY: Reg.Bodies (all) Test Types (all) Custom Groups (all)

REG. BODY	REQ. CODE	TEST TYPE	CUSTOM GROUP
EuroNCAP	Side Impact	Side Impact (R-point)	My Job 027
EuroNCAP	Pole Side Impact	Side Impact (Pole)	<default>
EuroNCAP	Frontal Impact	Frontal Impact (ODB)	Tutorial,Oasys Favourites
FMVSS	216A	Roof Crush	My Job 027,Oasys Favouri
FMVSS	214P	Side Oblique Impact (Pol	<default>
FMVSS	214D	Angled Side Impact	AT+R,Tutorial,My Job 027
FMVSS	208	Frontal Impact (ODB)	Tutorial
FMVSS	208	Frontal Impact (Rigid)	AT+R,Tutorial,My Job 027
IIHS	Side Impact	Side Impact (IRD)	My Job 027,Oasys Favouri
IIHS	Frontal Offset	Frontal Impact (ODB)	My Job 027
UN-ECE	ECE-R95	Side Impact (R-point)	Oasys Favourites
UN-ECE	ECE-R94	Frontal Impact (ODB)	Tutorial,Oasys Favourites,
UN-ECE	ECE-R12	Frontal Impact (Rigid)	Oasys Favourites,Tutorial
UN-ECE	96/79/EC	Frontal Impact (ODB)	AT+R,Tutorial,Oasys Favo

PREVIEW: Side Impact (Side Impact (R-point))

TEST OPTIONS

Left Impact

Right Impact ☒

Create Initial Velocity Card ☒

Magnitude: 13888.89

Height above ground: 300

EuronCAP Side Impact (MDB) regulation details:

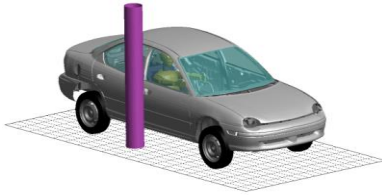
- Impact: mobile deformable barrier propelled into side of vehicle
- Alignment: with R-point
- Initial Velocity: 50 km/h
- Height above ground: 300mm
- Barrier: European mobile deformable barrier

- Step 1 – select crash protocol

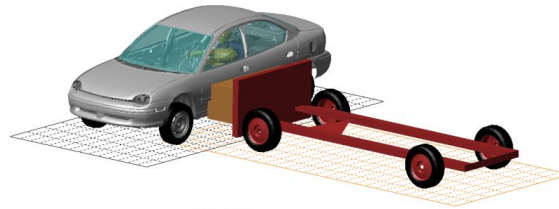


The supported crash test protocols are listed here. Small changes to these crash types (e.g. impact velocity) can be made by the user and saved easily:

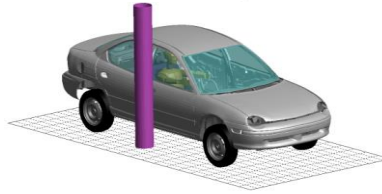
**EuroNCAP:**  
Side Impact (Pole)



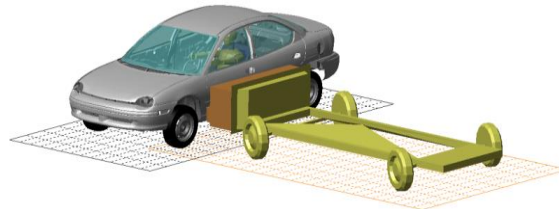
**EuroNCAP, UN-ECE:**  
Side Impact (R-Point)



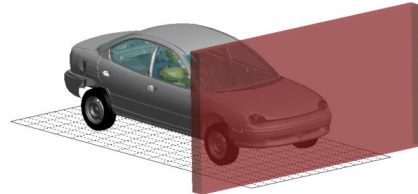
**FMVSS 214P:** Side  
Oblique Impact (Pole)



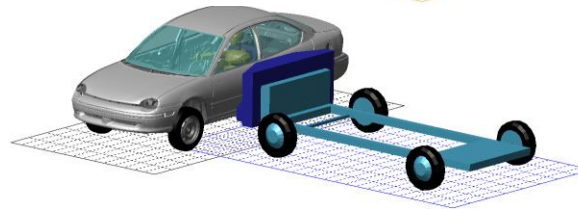
**FMVSS 214D:**  
Angled Side Impact



**FMVSS, UN-ECE:**  
Frontal Impact (Rigid)



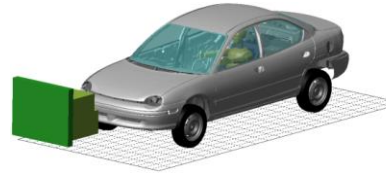
**IIHS:**  
Side Impact (IRD)



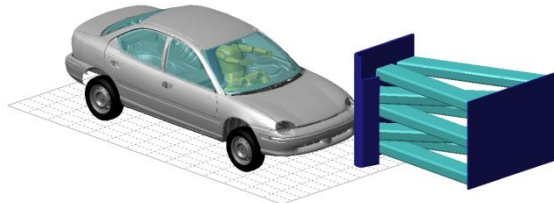
**FMVSS 216A:**  
Roof Crush



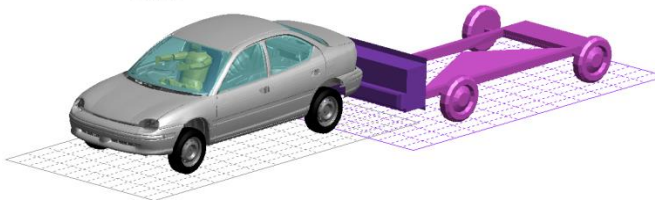
**EuroNCAP, FMVSS, IIHS,  
UN-ECE:** Frontal Impact (ODB)



**IIHS:** Frontal  
Small Overlap



**FMVSS 301R:**  
Rear Impact  
(MDB)





The screenshot shows the PRIMER software interface. The main window displays a 3D model of a vehicle interior with four target points (A1, A2, A3, A4) circled in blue. The 'Ejection Mitigation' dialog box is open, showing a table of target point data and build model options.

	X	Y	Z	Y-angle	Velocity	Visualise	
A1	-2015.2	750.6	1020.6	90.0	4444.4	Visualise	?
A2	-2321.6	750.6	1026.8	90.0	4444.4	Visualise	?
A3	-2168.4	750.6	1103.0	90.0	4444.4	Visualise	?
A4	-2474.8	750.6	1192.4	90.0	4444.4	Visualise	?

Build model options:

- Target point: ?
- Target point+offset: ?
- Target y-coord: ?

Buttons: Read/Write csv, Build, Quit

- Calculates impact points according to rules of FMVSS 226.
- Multiple models can be built automatically.



- Script for creation of SPH elements within an enclosed volume.

SPH MESH GENERATION

ELEMENT PROPERTIES:

PID

Mass

GRID OPTIONS:

Pitch in X

Pitch in Y

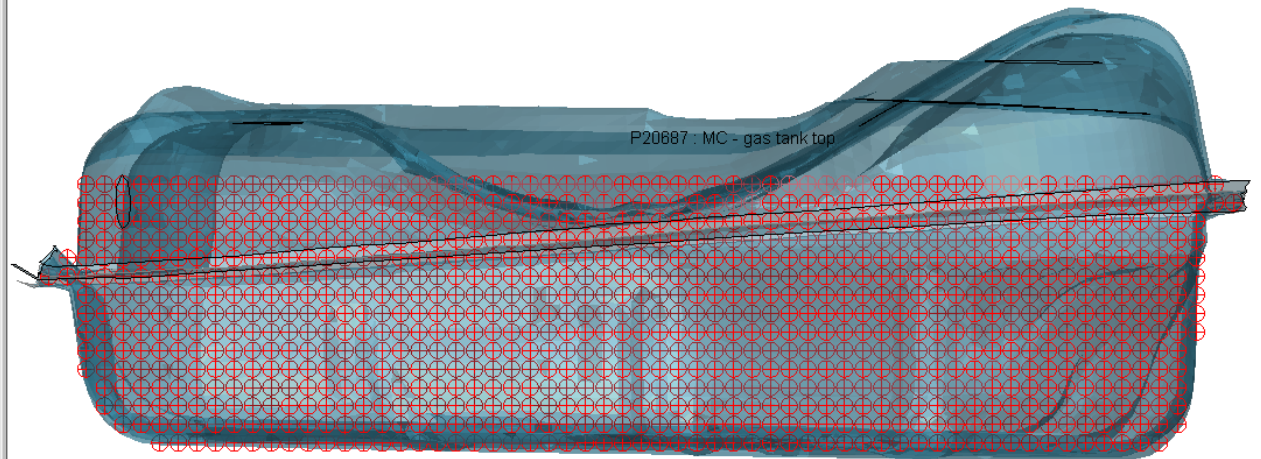
Pitch in Z

FILL OPTIONS:

Vol. to fill (%)

SHELL VOLUME:

Pick Parts..



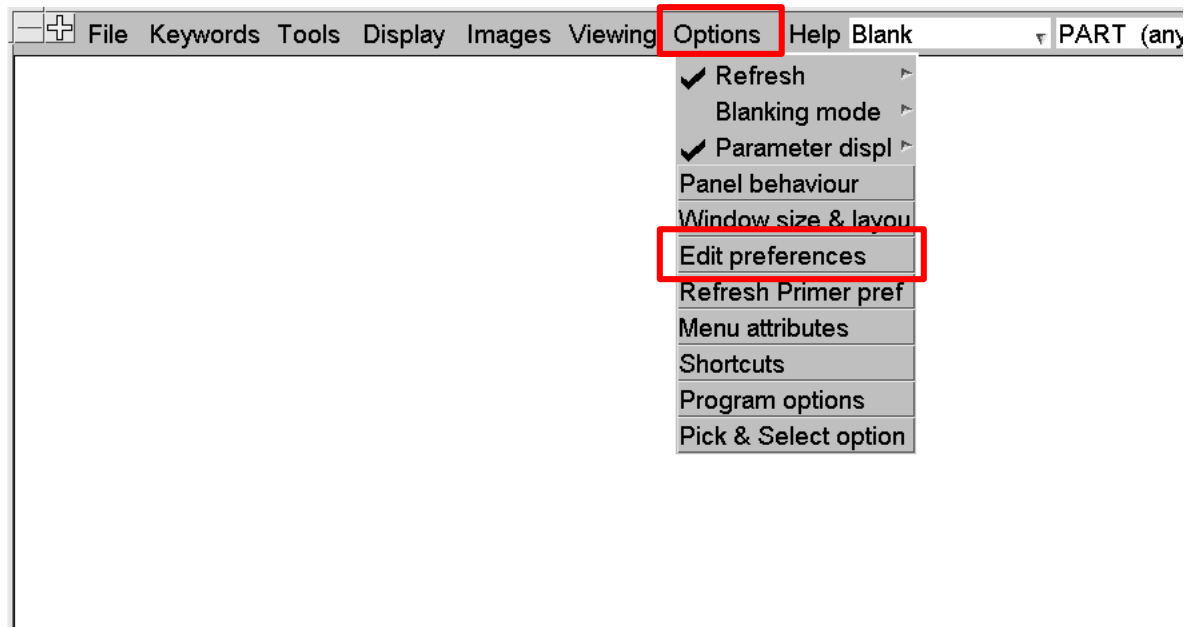


- oa\_pref files are text files saved on your system that contain preferences used by Oasys software.
- These are useful so you don't have to change settings every time you open PRIMER/D3PLOT etc.
- The file will contain lines that look like this:

```
primer*display_factor:          1.40
primer*display_brightness:      1.00
primer*display_saturation:      1.00
primer*button_gradation:        0.00
primer*font_size:               default
primer*font_type:               helvetica
primer*background_colour:       WHITE
```

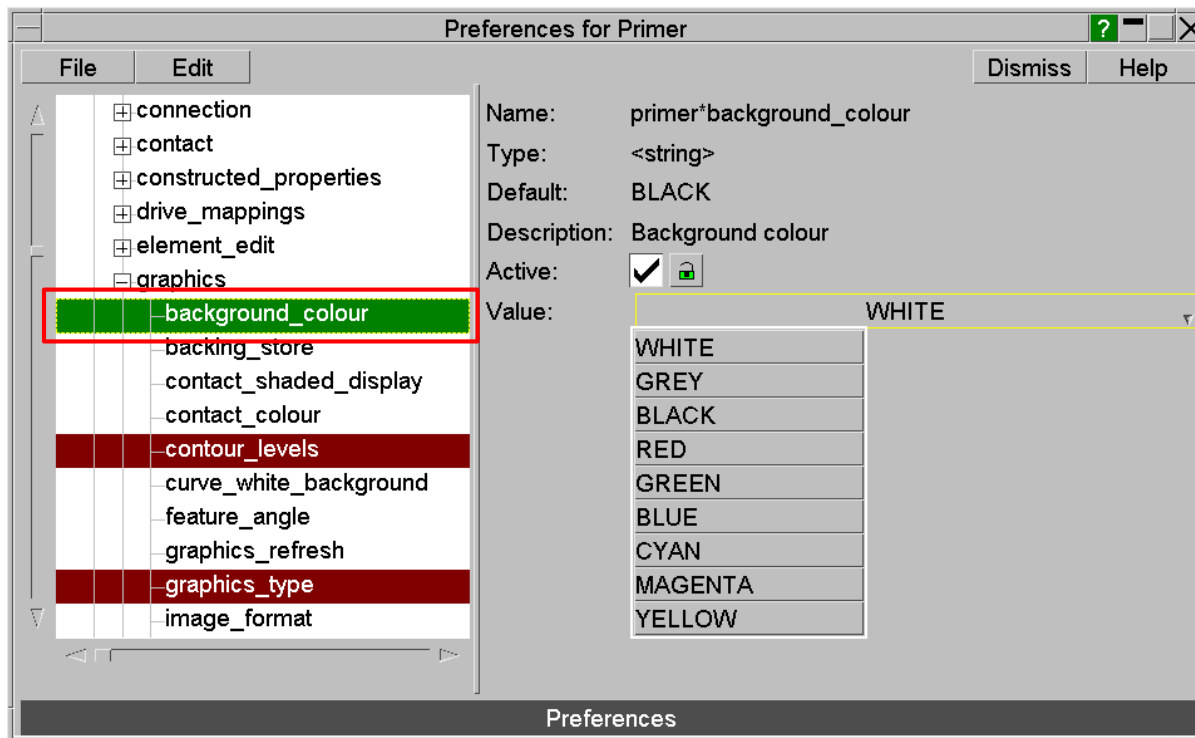


- Preferences can be set in PRIMER through the “Options” menu:



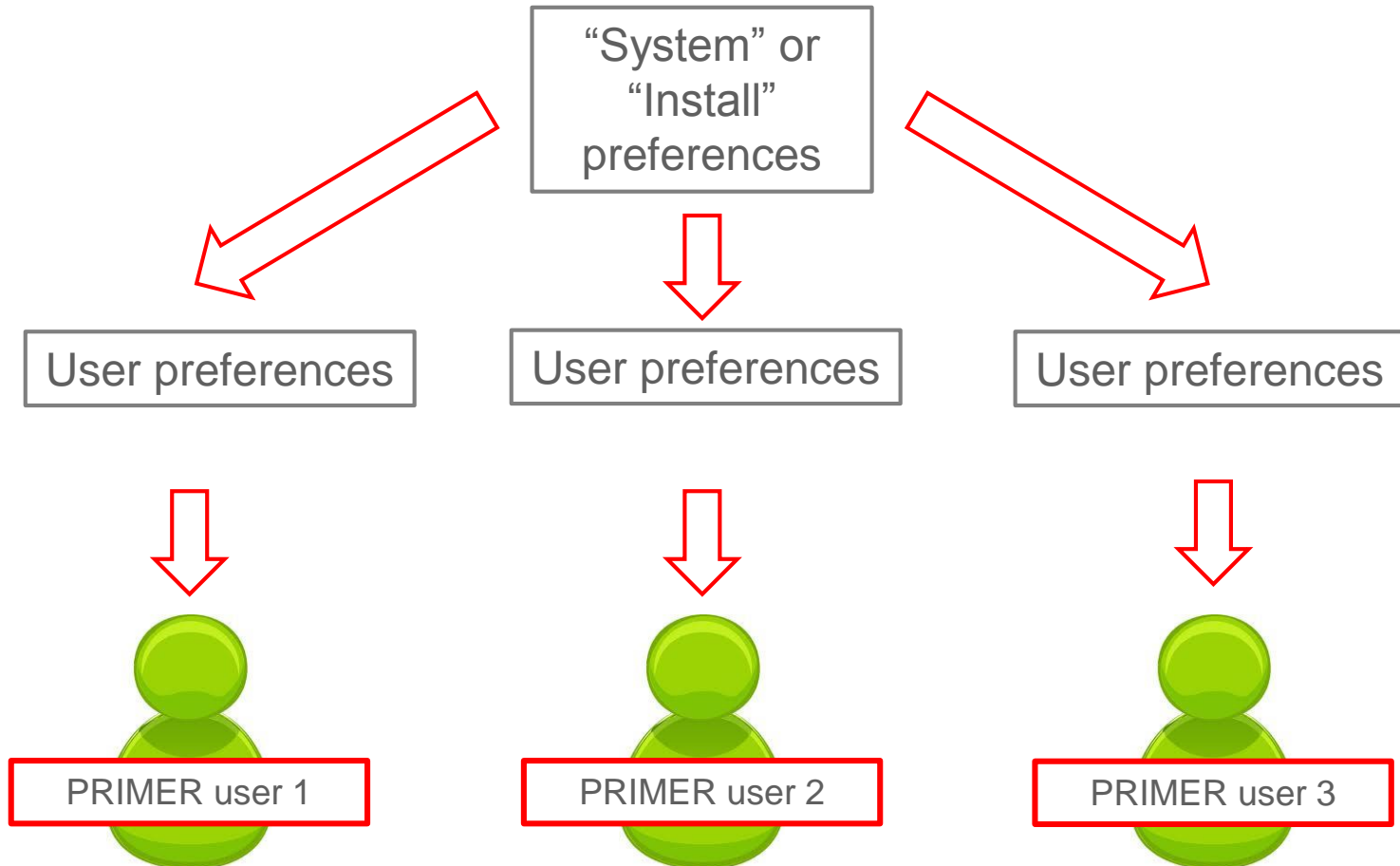


- Preferences can be changed in the preference panel which opens. The example below shows how to change the background colour of the graphics window.



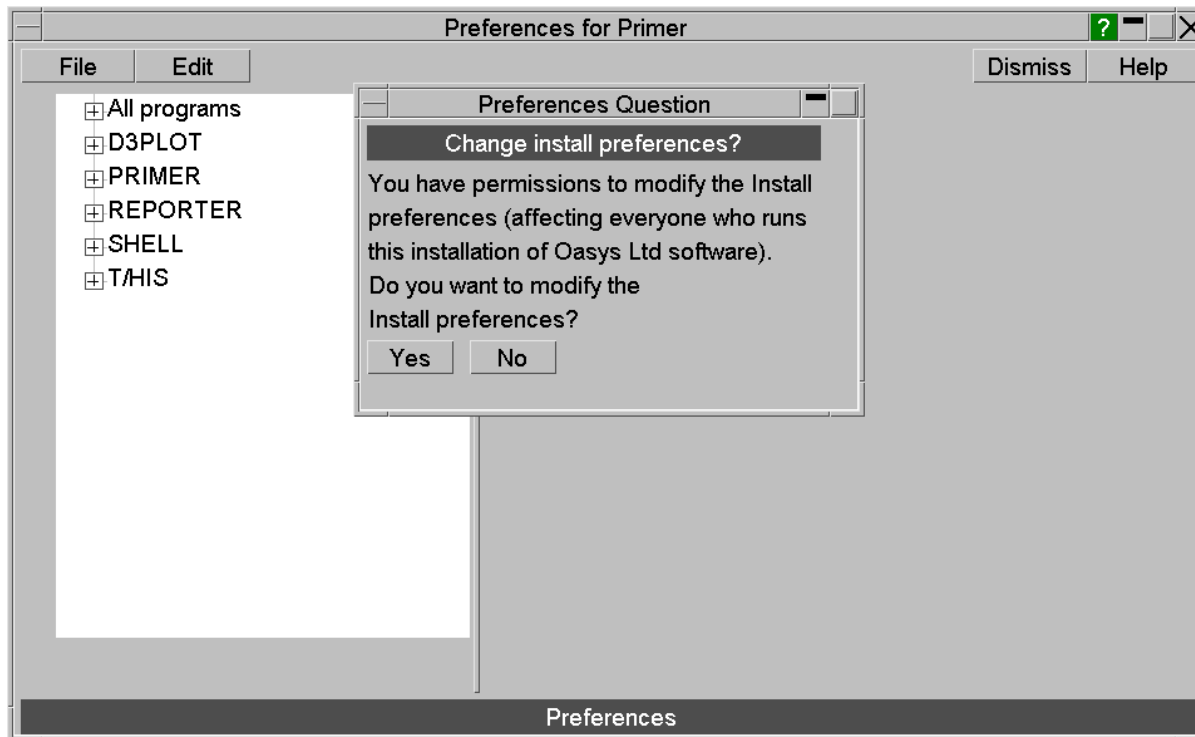


- oa\_pref files can be read from a number of locations





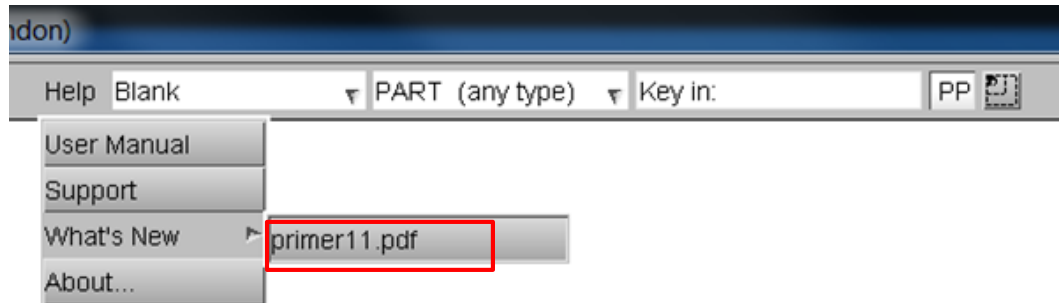
- When opening the preference panel, you may get a message about modifying the install preferences – this is because preferences can be saved in a number of places:





- oa\_pref files can be stored in 4 locations:
  - OA\_ADMIN – top level configuration – often the same as OA\_INSTALL
  - OA\_INSTALL – Installation level (location of executables)
  - HOME – users personal home area
  - Current working directory (rarely used)
- Oasys software will read the oa\_pref files in the order above. When modifying preferences from within the software, if you get the option shown on the previous slide, it is because you have permission to change the preferences stored in the installation area. If you do have permission and choose not to modify the installation preferences, any preference modifications will be saved in the HOME area.
- If you do not have permission to change installation preferences, any preference modifications will be saved in the HOME area.





- Don't forget that every version of Primer comes with a PDF detailing all the new functions added in that version.



# PRIMER Top Tips

