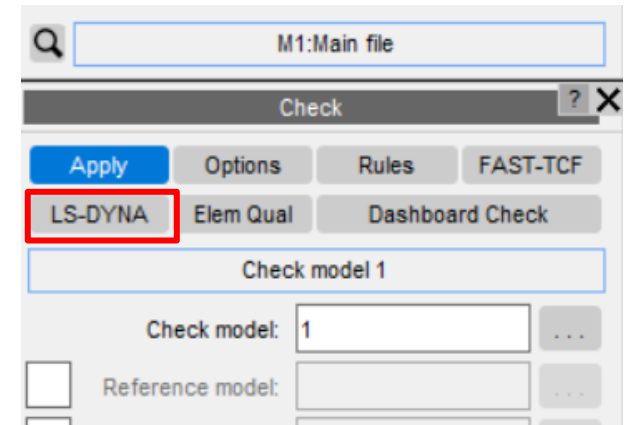
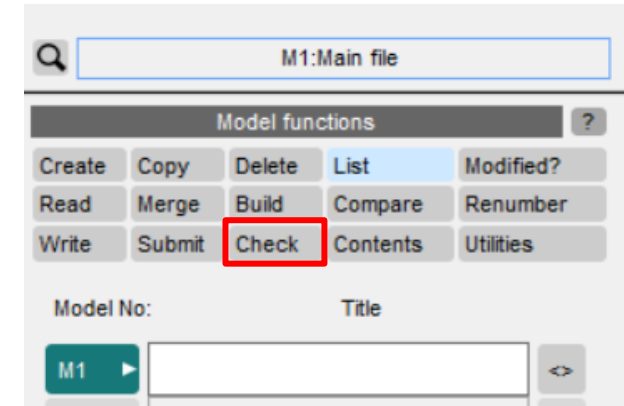


LS-DYNA Output File Reader



What is the LS-DYNA Output File Reader?

- This functionality can be accessed by clicking the “**LS-DYNA**” button, under **Model->Check** which displays the following window
- Using this tool it is possible to interrogate the standard output text files from LS-DYNA for the following :
 - Errors and warnings
 - Load/Contact/Message Profiles
 - Decomposition on CPUs
- The entities associated to the above can be displayed with the associated entities within PRIMER
- Reading LS-DYNA output error files is most useful when the corresponding model is loaded so the entities associated with the errors/warnings can be located and modified
- You can either “**initialise**” the model in LS-DYNA and interrogate the LS-DYNA results directly or load the “**existing**” LS-DYNA results



Initialise in LS-DYNA

- You can choose to “**initialise**” the PRIMER model in session via the “**Initialise in LS-DYNA**” option for “**LS-DYNA Results**”
- The model initialisation in LS-DYNA happens via the “**LS-DYNA Submission**” tool in PRIMER by pressing the “**Submit**” button.
- The “**LS-DYNA Directory**” is taken from the “**Submit Directory**” path from the “LS-DYNA Submission” panel
- After the model is submitted to LS-DYNA, PRIMER monitors the LS-DYNA job progress:
 - After the LS-DYNA run is terminated, PRIMER automatically updates this panel with a list of the LS-DYNA output files.
- You can choose the types of files to read and check from the options in the “**Output Categories**” section.
- After the **LS-DYNA directory** is populated these LS-DYNA output files will be listed and automatically selected for viewing in the tree view.
 - **Log files:** filenames of the format *.otf, d3hsp or mes****
 - **Contact, Load profile files:** filenames with extensions *.csv, *.xy
 - **Decomposition files:** filenames with extensions *.ses
- Once the “**Apply**” button has been pressed PRIMER will open the “**Dyna output tree viewer**” and this will display all the errors/warnings and profiles/decomposition information – prepared from the LS-DYNA output files associated with the input model

Read Dyna

Apply Help

Read LS-DYNA output

Apply to model: 1

LS-DYNA Results: Initialise in LS-DYNA Submit

LS-DYNA directory: C:\Test-Models

Additional search:

Compressed search

Initialisation Options

Decomposition NUMPROC: 4

Initialise with: NCYCLE NCYCLE: 10

Output Categories

Error/Warnings Load Profile

Contact Profile Mes Profile

Decomposition

Output files found:

Select/Deselect all

cont_profile.csv

decomp_parts.ses

load_profile.csv

mes0000

mes0001

mes0002

mes0003

Vehicle.otf

Initialise in LS-DYNA (Initialisation Options)

- The LS-DYNA submission can be modified using the “**Initialisation Options**” on this panel:
 - Initialising the model with the “**Decomposition**” option will do the following upon the LS-DYNA submission:
 - “Temporarily” add these keywords to the PRIMER Model
 - CONTROL_MPP_DECOMPOSITION_FILE**
 - CONTROL_MPP_DECOMPOSITION_NUMPROC**
 - CONTROL_MPP_DECOMPOSITION_OUTDECOMP**
 - Re-write the model file in the “Submit Directory” specified on the LS-DYNA Submission panel
 - Submit the re-written model file for LS-DYNA initialisation
 - The “**number of processors**” for decomposition can be specified using the “**NUMPROC**” input
 - You can choose to initialise in LS-DYNA using the “**MCHECK**” or “**NCYCLE**” option
 - Initialising with MCHECK does not consume an LS-DYNA server license but a special license option of “**LS-DYNAMC**” is required in the LS-DYNA server license file
 - You can perform initialisation using “**NCYCLE=1**”, which is similar to performing “**MCHECK**” initialisation. This does consume a license and is perhaps appropriate for local submissions using node-locked licenses

Read Dyna

Apply Help

Read LS-DYNA output

Apply to model: 1

LS-DYNA Results: Initialise in LS-DYNA Submit

LS-DYNA directory: C:\Test-Models

Additional search:

Compressed search

Initialisation Options

Decomposition ☒ NUMPROC: 4

Initialise with: NCYCLE NCYCLE: 10

Output Categories ☒ ☒

Error/Warnings ☒ Load Profile ☒

Contact Profile ☒ Mes Profile ☒

Decomposition ☒

Output files found:

☒ Select/Deselect all

☒ cont_profile.csv

☒ decomp_parts.ses

☒ load_profile.csv

☒ mes0000

☒ mes0001

☒ mes0002

☒ mes0003

☒ Vehicle.otf

LS-DYNA Submission Tool

- The LS-DYNA initialisation can only be done using the LS-DYNA installation on the same (LOCAL) machine from where PRIMER is launched.
- LS-DYNA initialisation requires an LS-DYNA license on the local machine
- The LS-DYNA model submission can be modified via the options in the “**LS-DYNA Submission**” panel
- Advanced LS-DYNA options can be changed via the sub-panel launched by pressing “**More Options**” button
- Input/Output file options for LS-DYNA submission can be changed via the sub-panel launched by pressing “**Optional Files**” buttons.
 - The **NCYCLE** and **MCHECK** options on this panel are overridden by the related “**Initialisation options**” in the “Read DYNA” tool (see previous slide).

LS-DYNA Submission

Submit Cancel Help New Settings: HOME Save Settings

LS-DYNA Jobs Monitor

Machine and Model Options

Machine Type: Local

Remote Machine:

Enter Password:

Model Number: 1 (Vehicle)

Submit Directory: C:\Test-Models

Add/Edit Remote Machines

Connect Remote Machine

Write Model File

>>> LS-DYNA output options

Submission Options

Submission Bookmark: MPP-SINGLE

Precision Type: SINGLE

Code Type: MPP

MPI Type: IMPI

LS-DYNA Executable: LS 64 SP MPP (PLATFORM IMPI)

LS-DYNA Path: C:\Program Files\LSTC\LS-DYNA\R11...p_s_R101_winx64_ifort131_mpi.exe

MPI Executable Path: C:\Program Files (x86)\Intel\MPI-RTV4.0.3.010\bin\mpiexec.exe

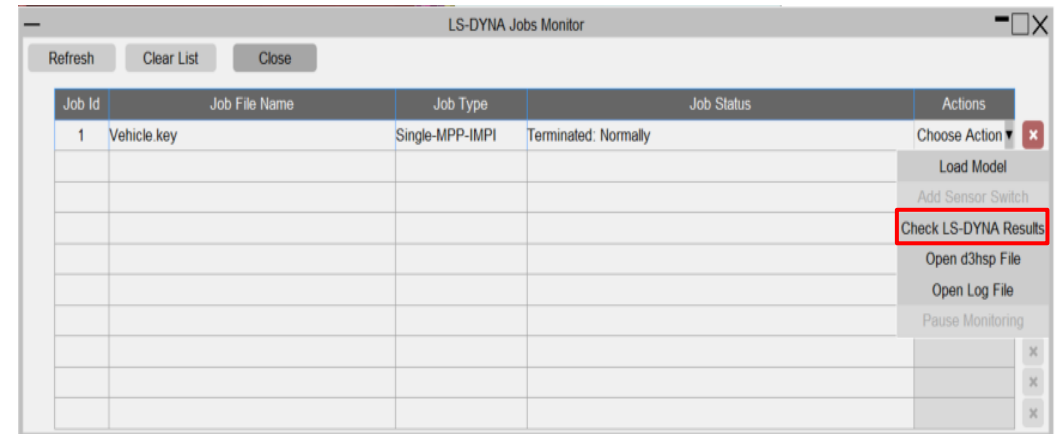
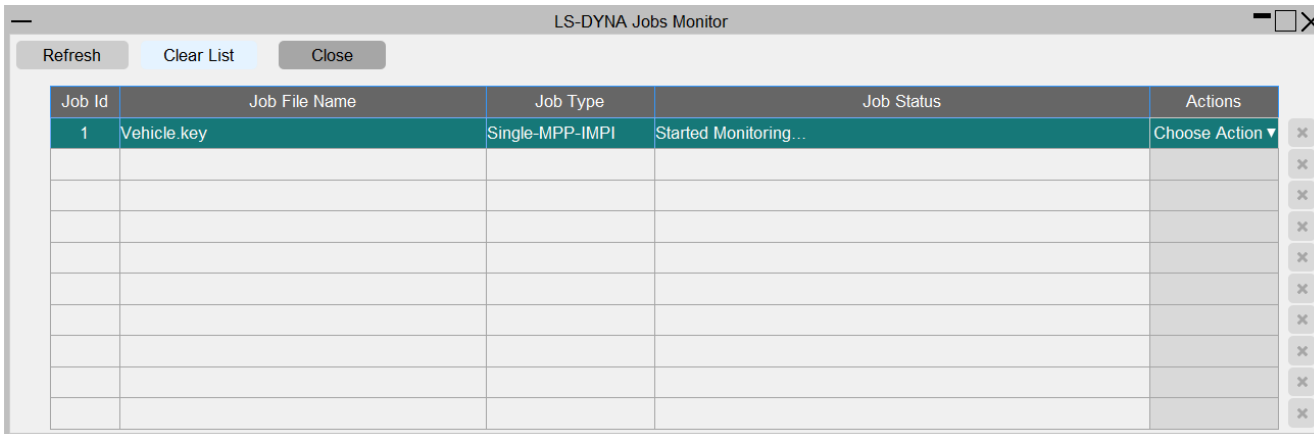
Submission Type: ONLINE

NCPU: 4

More Options Optional Files

LS-DYNA Jobs Monitor

- After the PRIMER model is submitted to LS-DYNA, PRIMER monitors the LS-DYNA run progress and updates the “**LS-DYNA Job Monitor**” panel
- After the LS-DYNA run has terminated, PRIMER automatically updates the “**Read DYNA**” panel with the output files.
- The “Read DYNA” panel with output files, also be mapped from the job monitor panel after the LS-DYNA job is terminated using the **Chose Actions->Check LS-DYNA Results** menu button.



Read existing LS-DYNA results

- You can load “**existing**” LS-DYNA results using the “**LS-DYNA Results**” drop down menu.
- By default the “**LS-DYNA directory**” field is populated with the directory containing the model that is currently read into PRIMER.
- Different filename formats can be found via the “**Additional search**”, which can include wildcards ('?' represents one character, '*' represents any number of characters). This additional search can be set via the text box and turned on or off via the adjacent tick box on the panel; or with the preferences 'additional_dyna_output' and 'additional_dyna_output_search', respectively.
- LS-DYNA output files that have been compressed as .zip or .gz files can also be found and read. Compressed files are only found when the Compressed search tick box is on (also set via the preference 'compressed_dyna_output_search'), which searches for filenames of the format *.zip and *.gz.
- You can choose the types of files to read and check from the options in the “**Output Categories**” section.
- After the **LS-DYNA directory** is populated, these LS-DYNA output files will be listed and automatically selected for viewing in the tree view:
 - Log files:** filenames of the format *.otf, d3hsp or mes****
 - Contact, Load profile files:** filenames with extensions *.csv, *.xy
 - Decomposition files:** filenames with extensions *.ses
- Once the “**Apply**” button has been pressed PRIMER will open the “**Dyna output tree viewer**” in error mode and this will display all the errors/warnings from the output file associated with that model.

Read Dyna

Apply Help

Read LS-DYNA output

Apply to model: 1

LS-DYNA Results: Existing Results Submit

LS-DYNA directory: C:\Test-Models\

Additional search:

Compressed search

Initialisation Options

Decomposition ☒ NUMPROC:

Initialise with: NCYCLE NCYCLE:

Output Categories ☒ ☐

Error/Warnings ☒ Load Profile ☒

Contact Profile ☒ Mes Profile ☒

Decomposition ☒

Output files found:

☒ Select/Deselect all

☒ cont_profile.csv

☒ decomp_parts.ses

☒ load_profile.csv

☒ mes0000

☒ mes0001

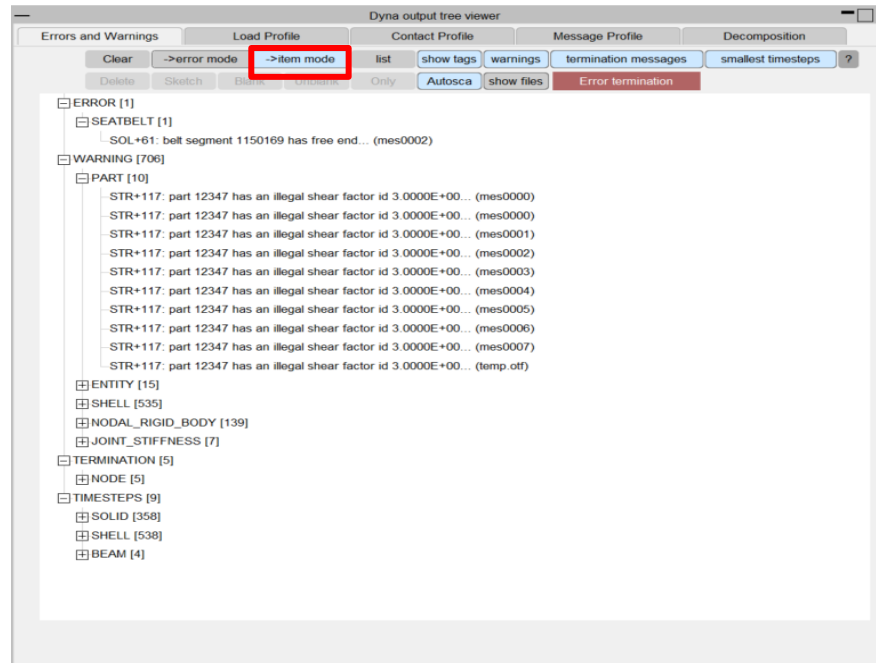
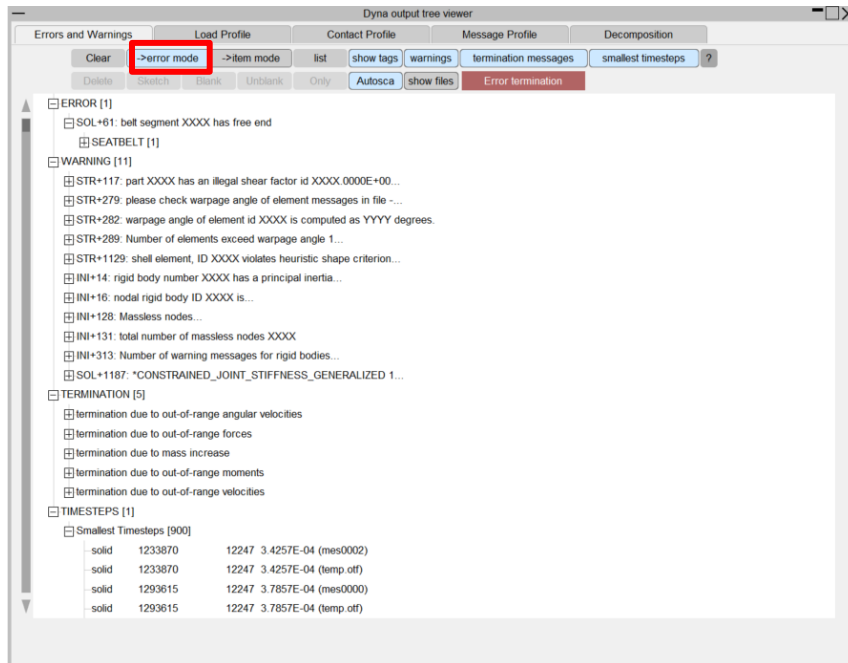
☒ mes0002

☒ mes0003

☒ Vehicle.otf

Dyna Output Tree Viewer (Errors and Warnings)

- “-> error mode”:
 - In this mode the tree branches can be expanded to view at the first level, a generalised version of the error/warning message.
 - At the second level the entity type(s) to which the error/warning pertain.
 - At the third level a list of entity labels referred to by the error/warning or a shortened form of each specific error/warning message.
- “->item mode”:
 - The tree branches can be expanded to view at the first level the entity type(s) that have errors/warnings associated with them.
 - At the second level a list of entity labels that are referred to by one or more errors/warnings.
 - At the third level a shortened form of each specific error/warning pertaining to that particular entity.
- Hovering over any shortened messages will display the full message text.



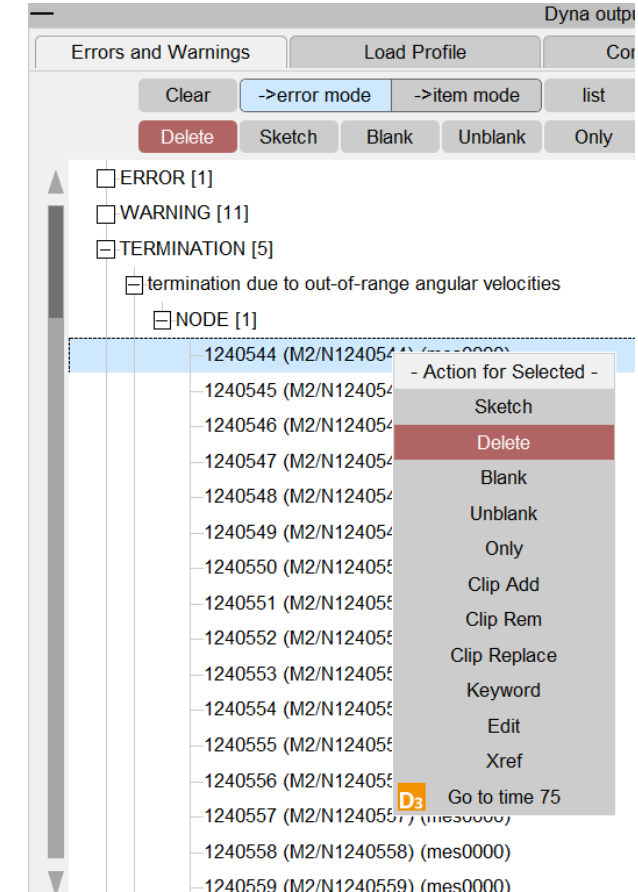
Dyna Output Tree Viewer (Errors and Warnings)

- **“List”** – Gives a concise summary of the errors and warnings in a text box.
- **“Show tags”** – Toggles on and off the LS-DYNA error/warning tags, e.g. STR+2899.
- **“Warnings”** – Toggles the warnings branch on or off, can be useful as warnings will not stop the model running in LS-DYNA where as errors will stop the model running.
- **“termination messages”** – Toggles the termination errors
- **“smallest timesteps”** – shows the list of element ids (along with part ids) with smallest timesteps
- **“Autoscale”** – Autoscales the model display after an “Only” operation
- **“show files”** – Adds an extra layer to the tree display so the errors/warnings are displayed by the output file



Dyna Output Tree Viewer (Right Click Options)

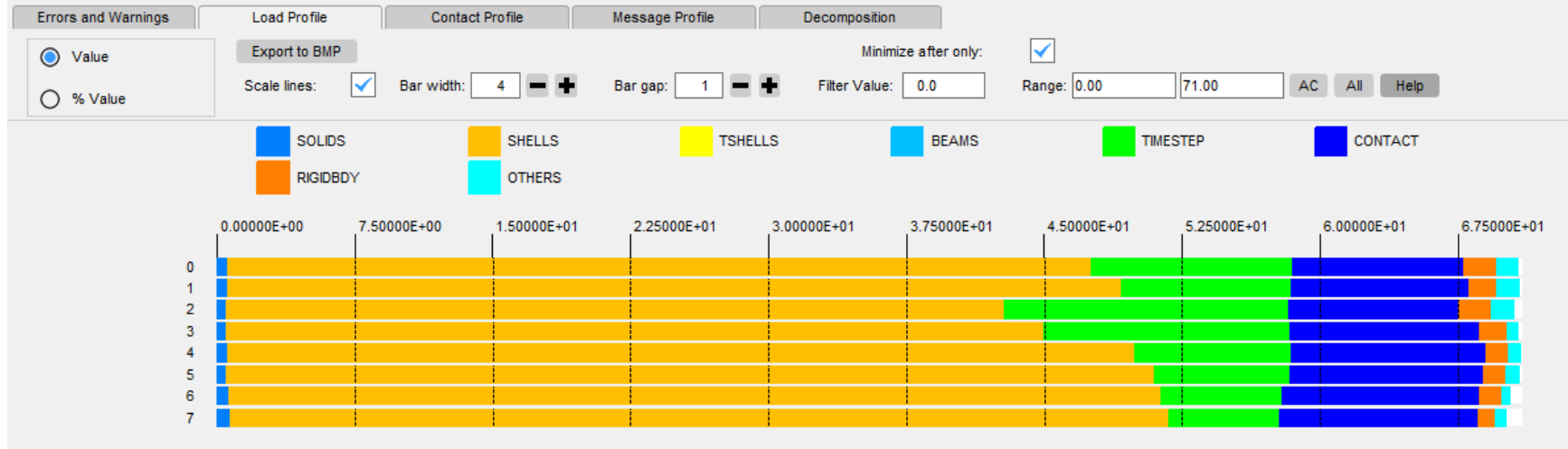
- **Sketch** – Sketches the selected items.
- **Delete** – Deletes the selected items.
- **Blank** – Blanks the selected items.
- **Unblank** – Unblanks the selected items.
- **Only** - Display only the items selected in the tree.
- **Clip Add** – Adds the selected items to the clipboard.
- **Clip Rem** – Removes the selected items from the clipboard.
- **Clip Replace** – Replaces the items on the clipboard with the selected entity.
- **Keyword** – Displays the keyword editor for the selected item.
- **Edit** – Opens the standard editor for the selected items.
- **Xref** – Displays the cross references for the selected items.
- **Go to time**: Opens up the integrated D3PLOT session, loads the ptf file results and moves the animation to the selected time.



Dyna Output Tree Viewer (Load/Contact/Message Profiles)

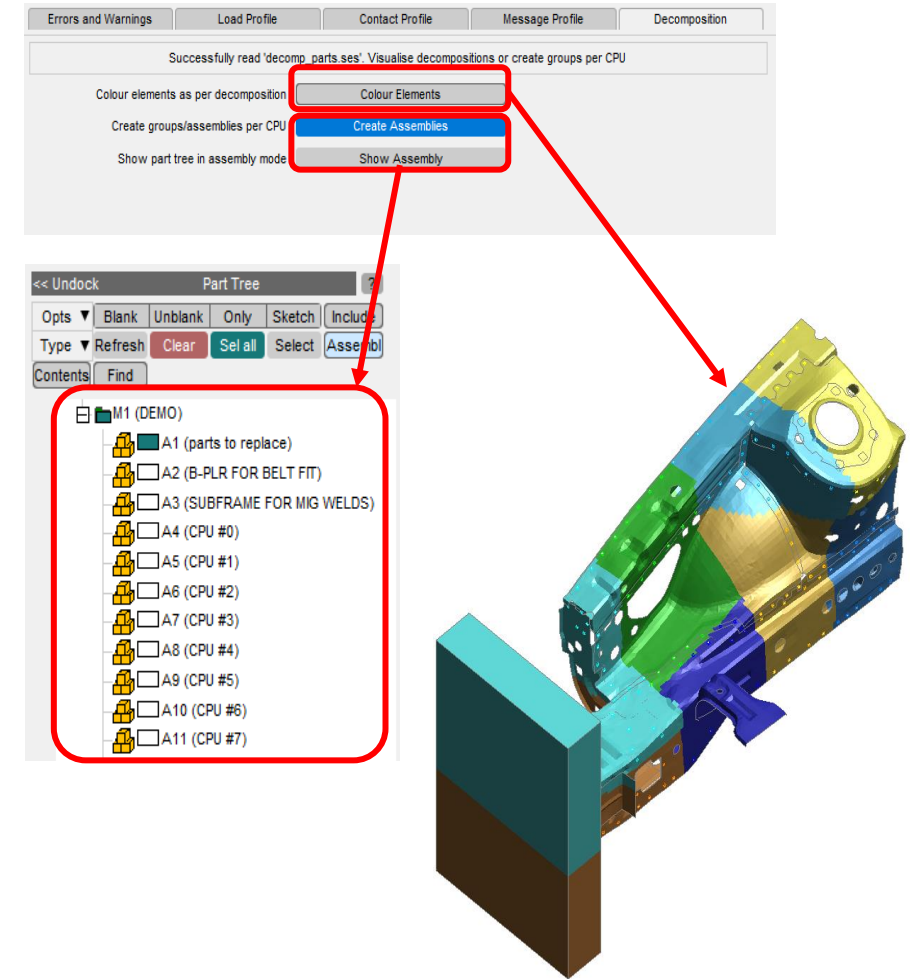


- Dyna Output Viewer can also read “load profile” “contact profile” and “message profile”. This is useful to:
 - Easily investigate the entities, processes and calculations leading to your analysis runtime.
 - Understand how these processes are spread across CPU in MPP runs.
 - In particular investigate the effect of contacts in your analysis.



Decomposition Visualisation

- Visualise how your model is decomposed across the CPU's
 - “Colour elements”** will change the colour of the elements in the model according to how the model was decomposed by LS-DYNA.
 - “Create assemblies”** will create an assembly for each CPU containing all the elements that are processed by that CPU after decomposition.
 - “Show Assembly”** will show the part tree in assembly mode so you can easily visualise the new assemblies.



Contact us

Global / UK

T: +44 121 213 3399

E: dyna.support@arup.com

India

T: +91 40 69019723 / 98

E: india.support@arup.com

China

T: +86 21 3118 8875

E: china.support@arup.com

USA

T: +1 415 940 0959

E: us.support@arup.com

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