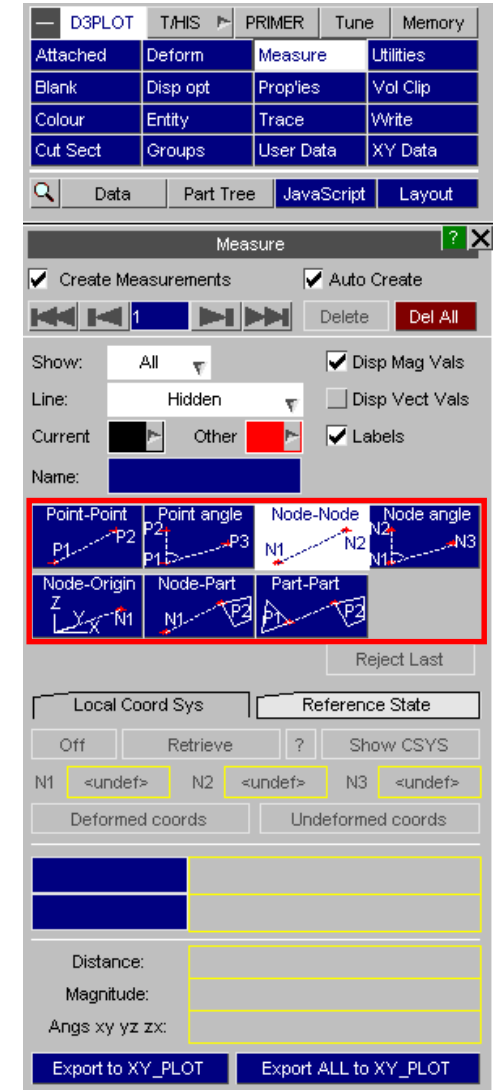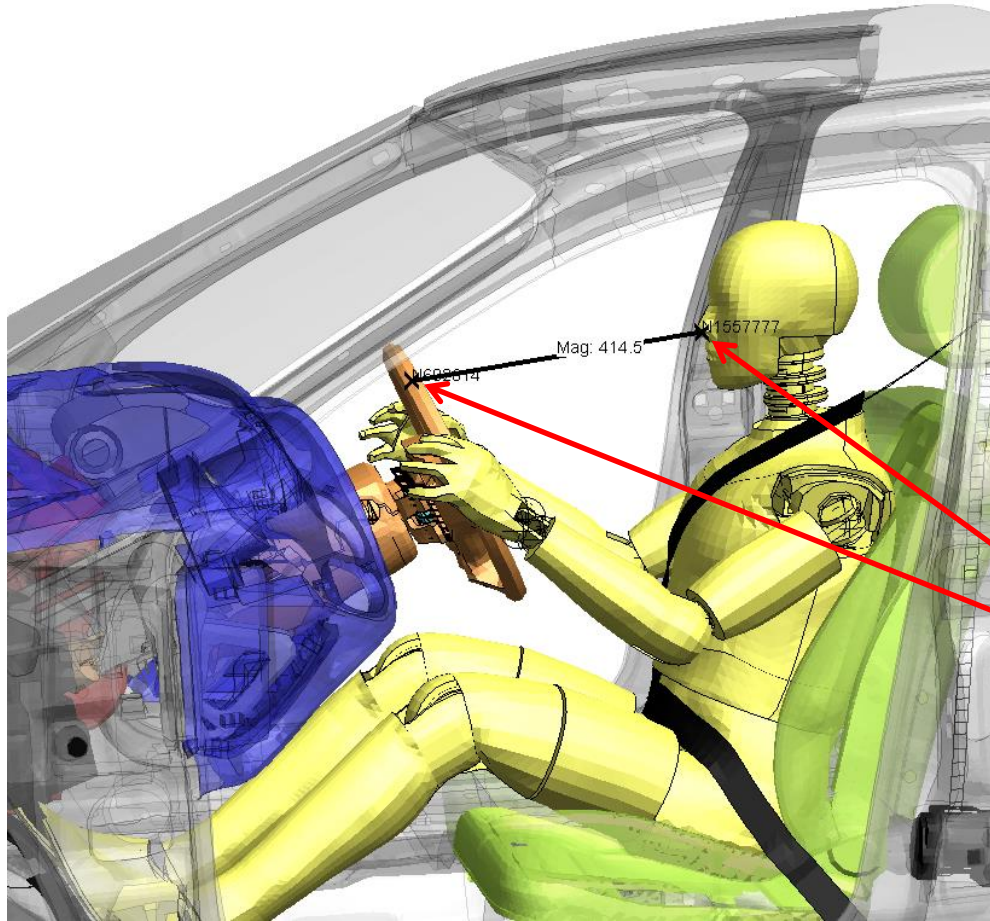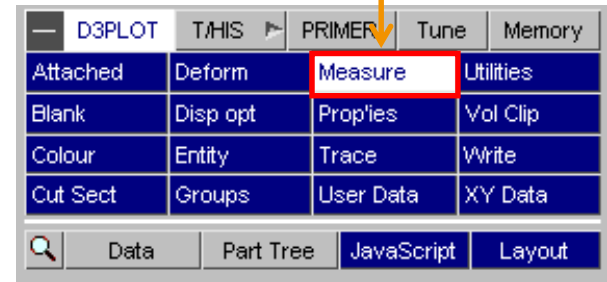# Measure

Measure Functions

- **Point-Point** – Measure the distance between two points.

- **Point angle** – Measure the angle between 3 points.

- **Node-Node** – Measure the distance between 2 nodes.

- **Node angle** – Measure the angle between 3 nodes.

- **Node-Origin** – Retrieve nodal position and distance from [0,0,0].

- **Node-Part** – Retrieve the shortest distance between a node and a part.

- **Part-Part** – Retrieve the shortest distance between two parts.

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Worked Example - Node-Node

(1) The distance between nodes can be measured by either accessing the 'Measure' panel or by pressing the 'M' button on a keyboard.

(2) Pick 2 nodes.

Mag: 414.5

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Modifying a Measurement

The nodes selected for the current measurement can be modified by right-clicking the text boxes, and clicking the 'PICK' button.

Or the measurement can be deleted by pressing the 'Delete' button.

Formatting Options

- **Show** – choose which measurements are displayed.
- **Line** – select if the measurement lines are on top of the model (Wireframe) or Hidden.
- **Current** – specify the colour of the current measurement.
- **Other** – specify the colour of measurements, excluding the current measurement.
- **Name** – define the measure with a name.
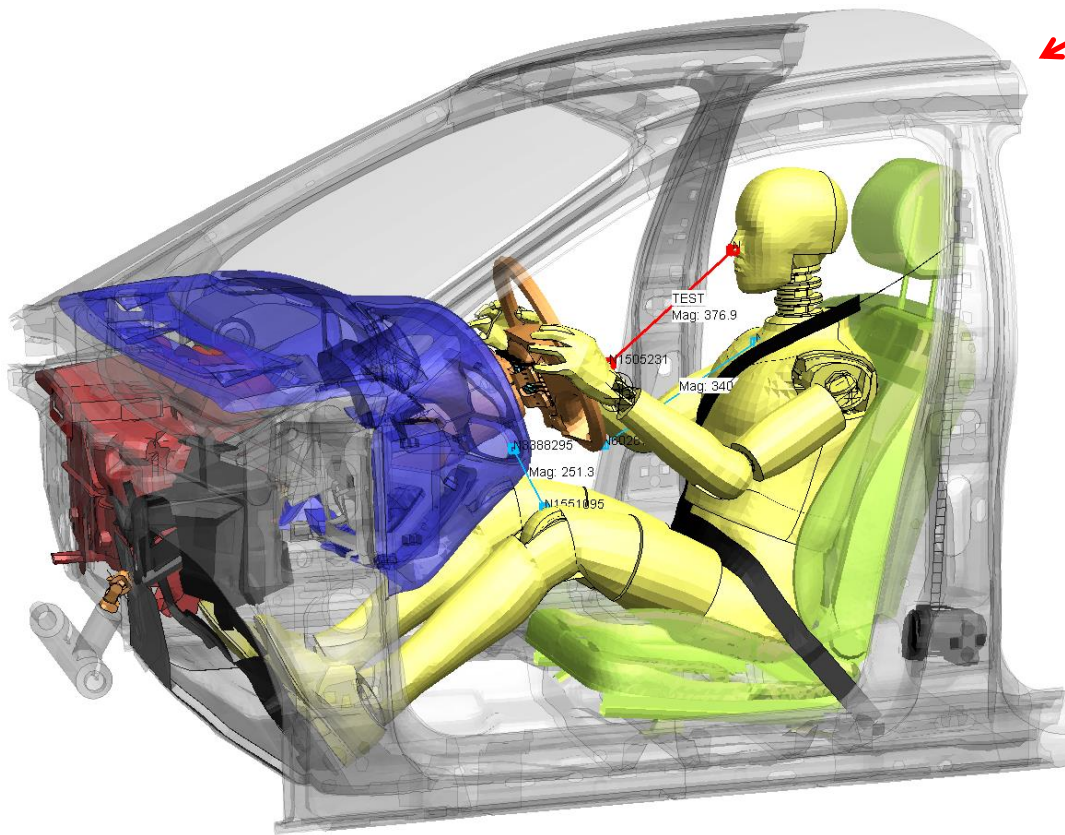
Measurement Display

The value of the current measurement can be seen in the 'Magnitude' box within the 'Measure' menu. Also the magnitude of the measurements can be displayed on the model by selecting the 'Disp mag Vals' option.

The vector between both points chosen for "measure" is displayed in the 'Distance' box within the 'Measure' menu.

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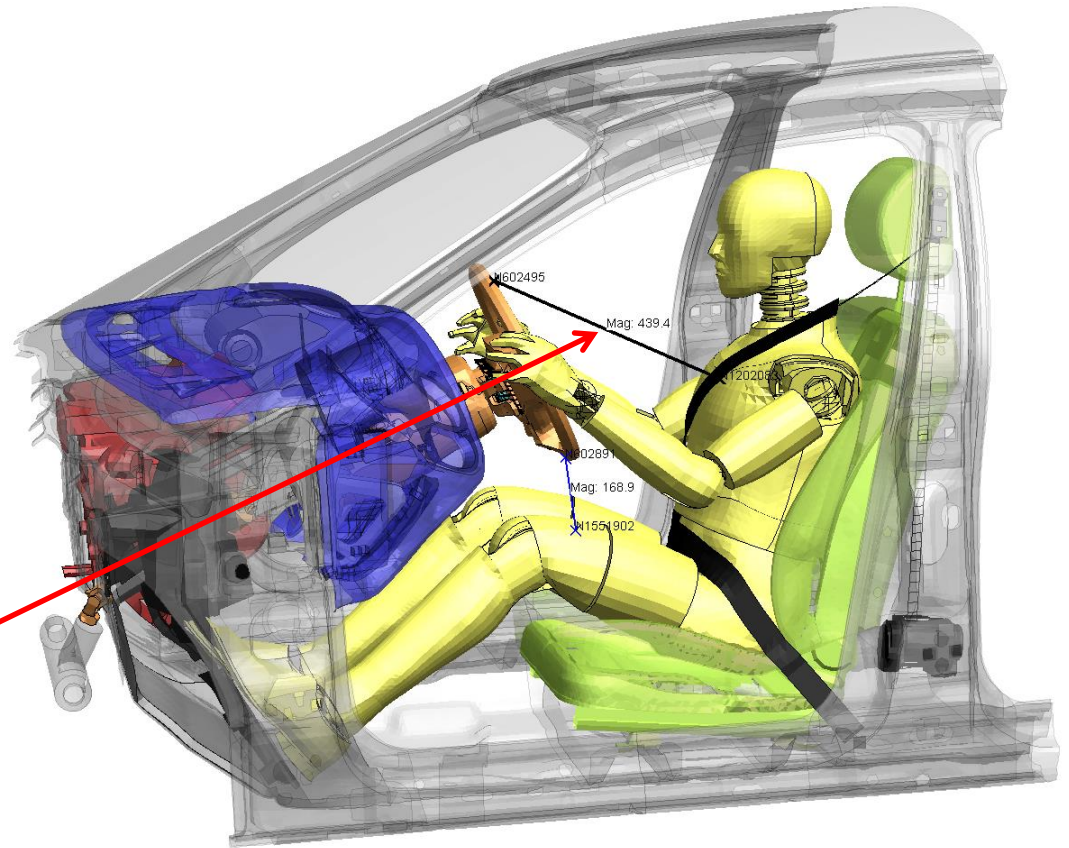
Multiple Measurements

Up to 100 "measures" may be defined. With the 'Auto Create' option selected, each time the user clicks on another pair of nodes, a new "measure" is created. If the 'Auto Create' option is not selected, creating a new "measure" requires navigating to the next undefined measurement using the '>>I' button and then creating the measurement (e.g. picking 2 nodes).

The measure which is 'current' can be selected.

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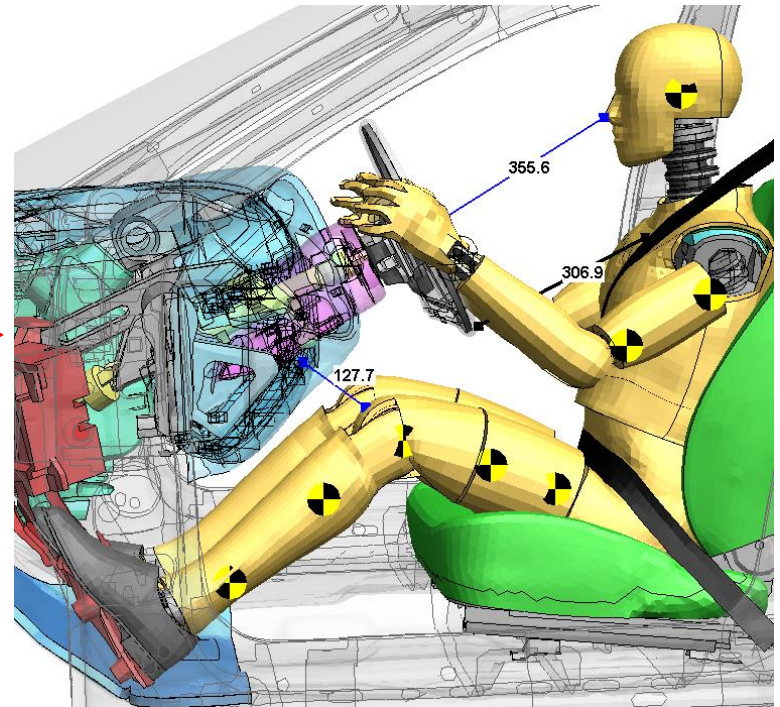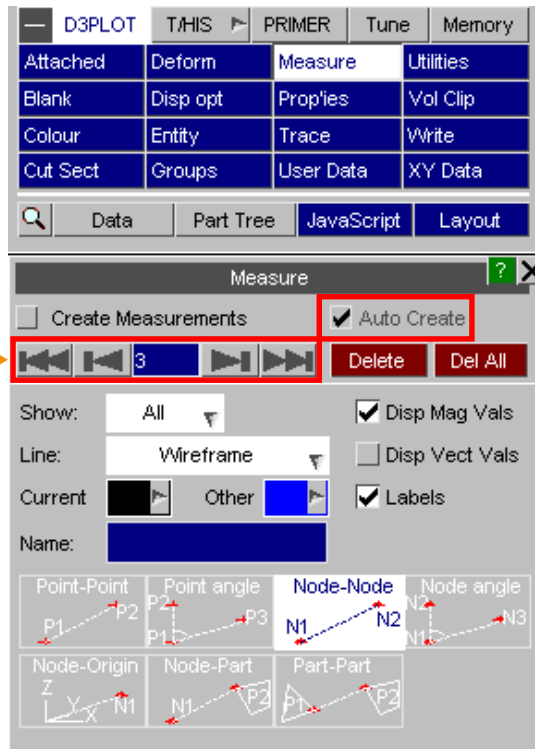
Measurement Data

The measurement data (distance) is updated automatically when a different time-state is loaded.
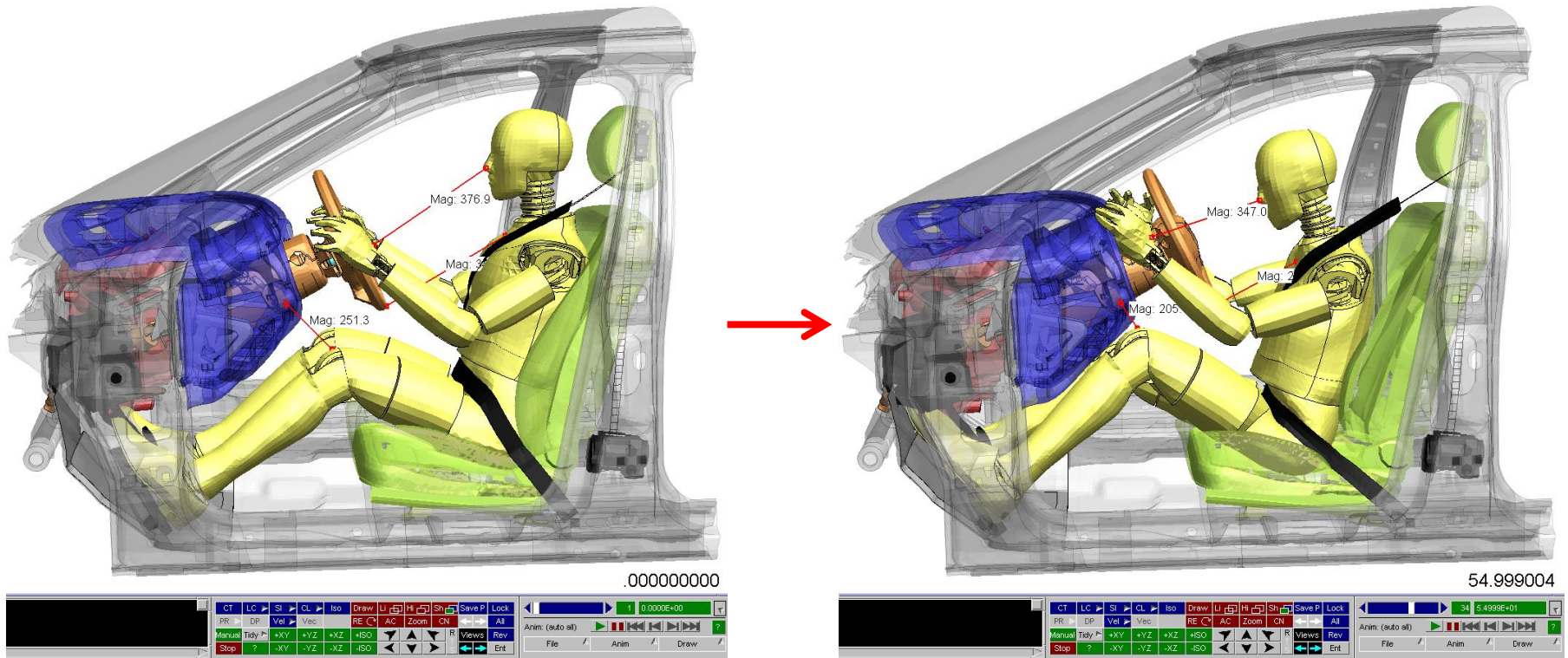
Deleting Measures

The "measures" remain visible until deleted. To remove all the "measures", click the 'Delete All' button in the Measure panel or press the 'Delete' button on a keyboard.

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Local Coordinate System

Measurements can be transformed to a local coordinate system using the 'Local Coord Sys' function within the 'Measure' Panel.

Coordinate systems can be retrieved from "csys.loc" files or coordinates defined in a ZTF file, using the 'Retrieve' button. Alternatively, if no coordinate system can be retrieved. A coordinate system can be created and stored in the Deform -> Shift Def menu.

The user has a choice of whether the local coordinate system is defined by the undeformed coordinates of the nodes, or changes with each state to followingthe deformed coordinates.

Different coordinate systems can be used for different measures.

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Reference State

The 'Reference State' menu within the 'Measure' panel allows for a reference value to be applied to the measurement.

The measurement displayed when the reference state is on is the difference in distance at the current time from the distance at the reference time.

The reference state can be turned on and off for each measurement. The same reference state is used for all measurements.

Exporting Measurements

The measurements can be graphed over time in the XY-Data tool by clicking the 'Export ALL to XY_PLOT' button.

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Exporting Measurements

Four separate curves are generated for each measurement: Distance in X,Y and Z and Vector distance.

Tip: Click the '=> T/HIS' button to further process the curves within T/HIS.

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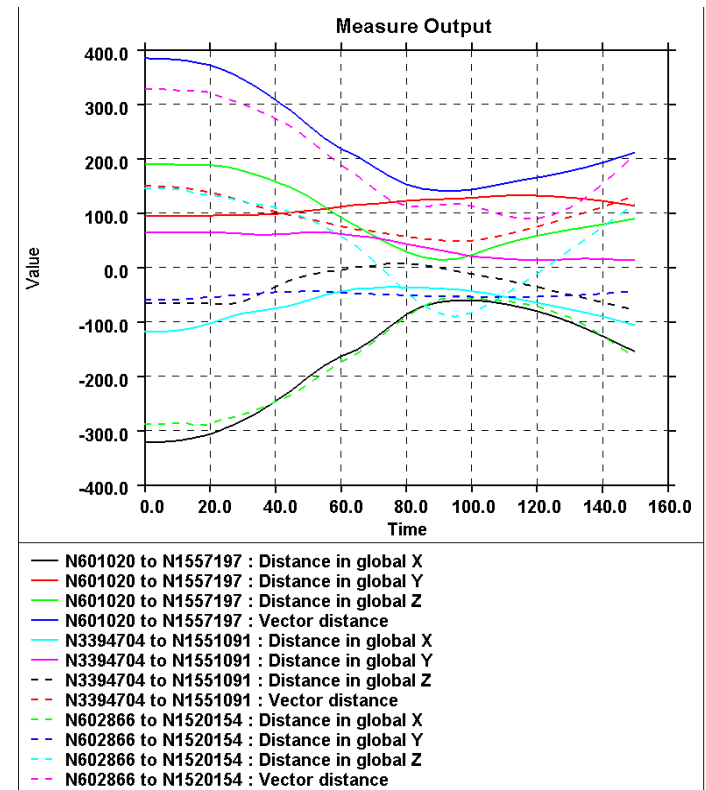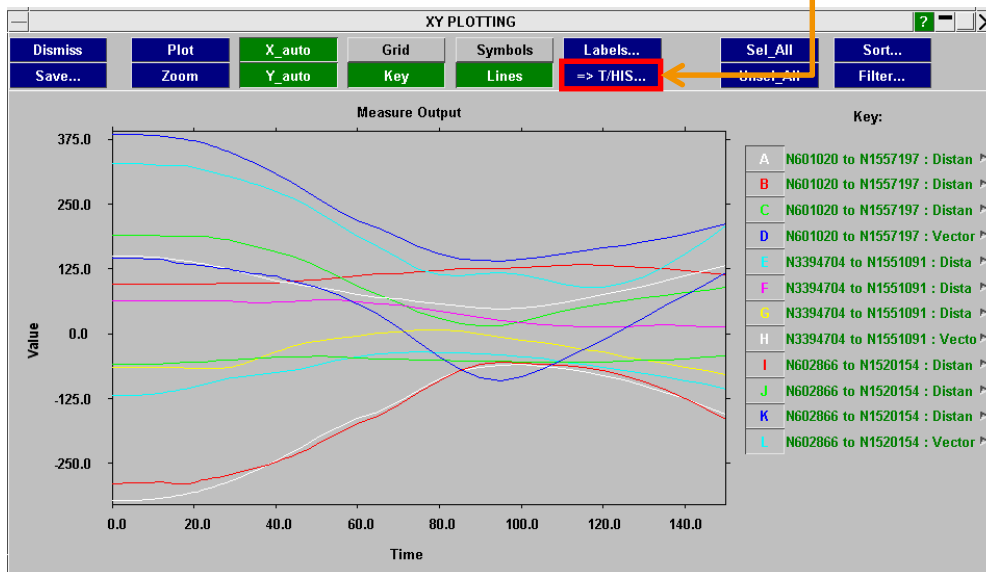
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