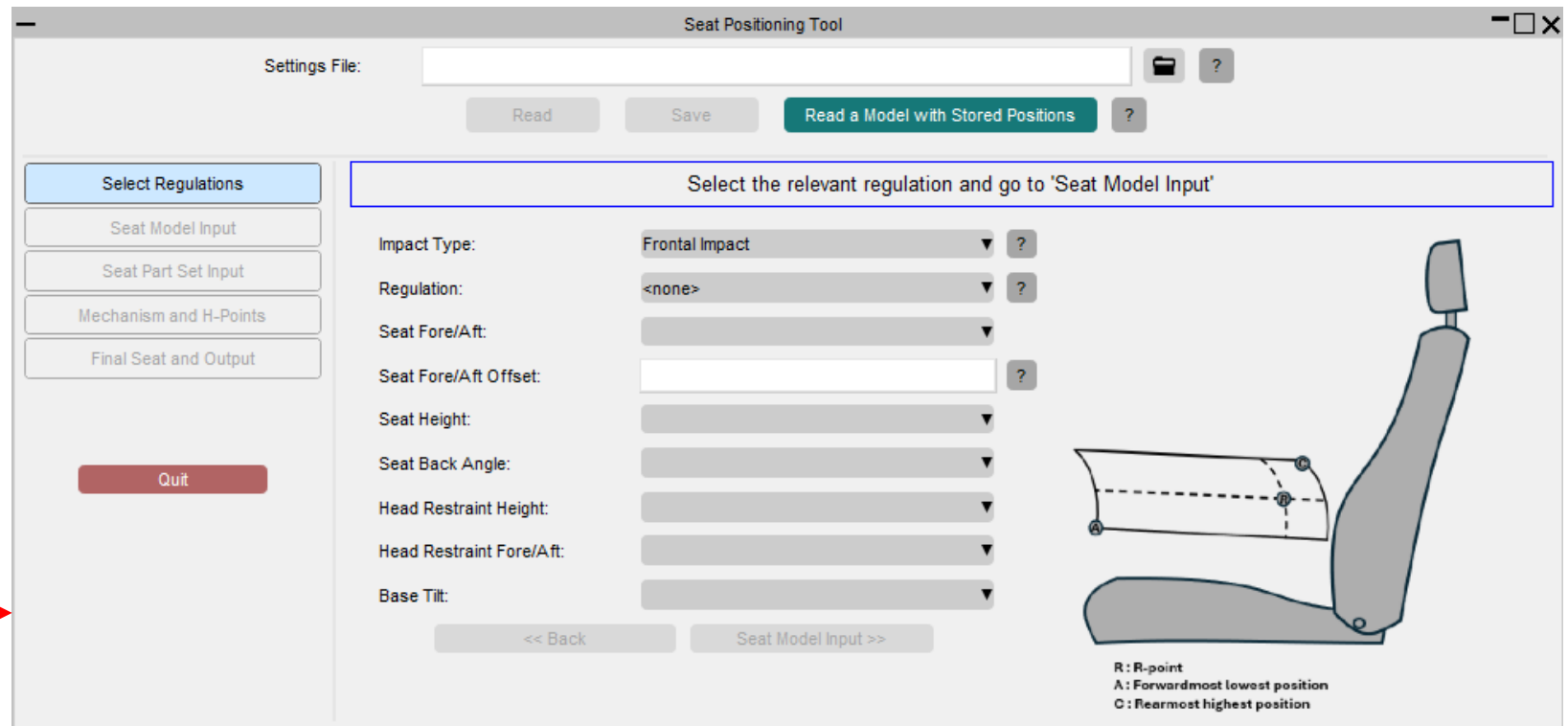
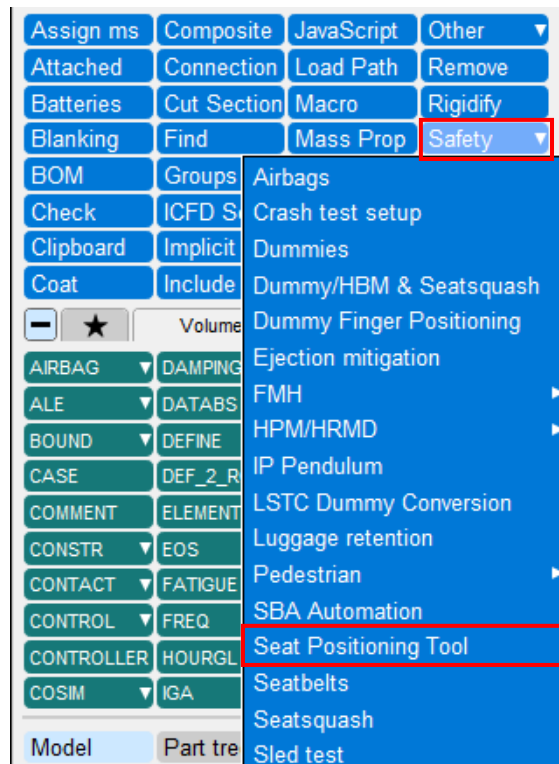


Seat Positioning Tool



Introduction

- The tool allows you to create seat mechanism definitions for a given seat model and position the seat according to the various testing protocols.
- You can define the seat track curve points by using a .iges file, a CSV file, or by selecting nodes within the model.



Step 1: Specify a regulation

- Select “Impact Type” and select relevant regulation to load the required seating position.
- Press “Seat Model Input >>” to go to Seat Model Input panel.

The screenshot shows the 'Seat Positioning Tool' window. On the left is a sidebar with buttons: 'Select Regulations' (highlighted in blue), 'Seat Model Input', 'Seat Part Set Input', 'Mechanism and H-Points', 'Final Seat and Output', and a red 'Quit' button at the bottom. The main area has a title bar 'Seat Positioning Tool' and a 'Settings File:' section with 'Read', 'Save', and 'Read a Model with Stored Positions' buttons. Below this is a blue-bordered box with the text 'Select the relevant regulation and go to 'Seat Model Input''. The main configuration area contains several settings, with 'Impact Type' and 'Regulation' highlighted by a red box. 'Impact Type' is set to 'Frontal Impact' and 'Regulation' is set to 'ASEAN NCAP'. Other settings include 'Seat Fore/Aft' (Mid Point), 'Seat Fore/Aft Offset' (0), 'Seat Height' (Lowest), 'Seat Back Angle' (Manufacturer's Design), 'Head Restraint Height' (Highest), 'Head Restraint Fore/Aft' (Manufacturer's Design), and 'Base Tilt' (Manufacturer's Design). At the bottom of the main area are '<< Back' and 'Seat Model Input >>' buttons, with the latter highlighted by a red box. On the right is a diagram of a car seat with points A, B, and C marked on the backrest. A legend below the diagram defines these points: 'R: R-point', 'A: Forwardmost lowest position', and 'C: Rearmost highest position'.

Settings File:

Select Regulations

Seat Model Input

Seat Part Set Input

Mechanism and H-Points

Final Seat and Output

Quit

Select the relevant regulation and go to 'Seat Model Input'

Impact Type: Frontal Impact

Regulation: ASEAN NCAP

Seat Fore/Aft: Mid Point

Seat Fore/Aft Offset: 0

Seat Height: Lowest

Seat Back Angle: Manufacturer's Design

Head Restraint Height: Highest

Head Restraint Fore/Aft: Manufacturer's Design

Base Tilt: Manufacturer's Design

<< Back

R: R-point
A: Forwardmost lowest position
C: Rearmost highest position

Step 2: Seat Model Input

- Please specify the "Seat Model," "Seat Type," "SGRP-Point (R-point)," and the default seating positions. Then, select "Read Model" and navigate to "Seat Part Set Input."
- The tool assumes that the seat will be positioned at default SGRP-point when it is read.
- Next, select the manufacturer's design position for the various assemblies required by the regulation.
- Select the default initial position for seat back angle, seat base tilt angle, head restraint angle, and head restraint height when the model is read.

The screenshot shows the 'Seat Positioning Tool' window. The 'Settings File' is 'C:\SOURCE\scripts_dir\PRIMER\SEAT_POSITIONING\test_inp_h_pt1.stg'. The 'Seat Model Input' tab is selected in the left sidebar. A red box highlights the 'Seat Model Input' section, which includes a file path, a 'Read Model' button, and a 'Seat Type' dropdown set to 'FRONT_RIGHT'. Another red box highlights the 'Manufacturer's' section, which includes dropdowns for 'Seat Fore/Aft' (Mid Point), 'Seat Fore/Aft Offset' (20), 'Seat Height' (Lowest), 'Seat Back Angle' (25), 'Head Restraint Height' (Highest), 'Head Restraint Fore/Aft' (Full Forward), and 'Base Tilt' (Mid Point). A third red box highlights the 'Default' section, which includes input fields for 'Default Seat Back Angle' (23), 'Default Seat Base Tilt Angle' (0), 'Default Head Restraint Angle' (15), and 'Default Head Restraint Height' (0). Red arrows point from the text in the first three list items to these respective sections.

Settings File: C:\SOURCE\scripts_dir\PRIMER\SEAT_POSITIONING\test_inp_h_pt1.stg

Read Save

Select Regulations
Seat Model Input
Seat Part Set Input
Mechanism and H-Points
Final Seat and Output

Quit

Specify the seat model, seat R-Point(Default position), then select 'Read Model' to load a model.

Seat Model Input: SOURCE\scripts_dir\PRIMER\SEAT_POSITIONING\input_model1.key
Read Model

Seat Type: FRONT_RIGHT ?

Vehicle Direction: -X ?

Height Adjustable: YES ?

R-Point: 1300, -350, 390 Select Sketch

Manufacturer's Seat Fore/Aft: Mid Point ?

Manufacturer's Seat Fore/Aft Offset: 20 ?

Manufacturer's Seat Height: Lowest ?

Manufacturer's Seat Back Angle: 25 ?

Manufacturer's Head Restraint Height: Highest ?

Manufacturer's Head Restraint Fore/Aft: Full Forward ?

Manufacturer's Base Tilt: Mid Point ?

Default Seat Back Angle: 23 ?

Default Seat Base Tilt Angle: 0 ?

Default Head Restraint Angle: 15 ?

Default Head Restraint Height: 0 ?

<< Select Regulations Seat Part Set Input >>

Step 3: Seat Part/Node Set Input

- Please specify the seat part sets, node sets for creating the mechanisms for Seat Translation/Height Adjustment, Seat Base Tilt, and Headrest Height and Tilt.
- Click the "?" help button to learn more about the part sets that need to be selected.
- Once all the parts are selected, click "Create Mechanism" to define the mechanisms in the seat. This will redirect you to the "Mechanism and H-Points" section.

The screenshot shows the 'Seat Positioning Tool' interface. On the left is a sidebar with buttons: 'Select Regulations', 'Seat Model Input', 'Seat Part Set Input' (highlighted in blue), 'Mechanism and H-Points', and 'Final Seat and Output'. At the bottom of the sidebar is a red 'Quit' button. The main area has a 'Settings File' field with a file path, 'READ' and 'SAVE' buttons, and a blue instruction bar: 'Select 'Create Mechanism' after specifying the relevant seat part set ID(s) for creating mechanisms that allows for seat and headrest adjustment.' Below this are three tabs: 'Seat Slide & Height', 'Seat Base Tilt', and 'Head Rest Height & Tilt'. The 'Seat Slide & Height' tab is active, showing sections for 'Seat Back & Bottom', 'Seat Mount & Slider', and 'Seat Height Adjustment'. Each section contains input fields for part sets and nodes, with 'Select', 'Visualise', and '?' buttons. Red boxes and arrows highlight specific elements: a box around the 'READ' and 'SAVE' buttons points to a text box stating 'Part sets required for seat slide and height adjustment'; a box around the 'Seat Base Tilt' tab points to a text box stating 'Part sets required for the seat base tilt'; a box around the 'Head Rest Height & Tilt' tab points to a text box stating 'Part sets required for the head restraint height and tilt adjustments'; and a box around the 'Create Mechanism' button at the bottom points to the right.

Settings File: I:\PRIMER\SEAT_POSITIONING\Seat-Mech-Dummy-Belt\seat_pos_inputs_+x_latest.stg

READ SAVE

Select 'Create Mechanism' after specifying the relevant seat part set ID(s) for creating mechanisms that allows for seat and headrest adjustment.

Seat Slide & Height Seat Base Tilt Head Rest Height & Tilt

Seat Back & Bottom

Seat Back Part Set: 1000001 Select Visualise ?

Seat Cushion Part Set: 1000002 Select Visualise ?

Select Hinge Conn Node N1: 3000008 Select Sketch ? Select Hinge Conn Node N2: 3000007 Select Sketch ?

Seat Mount & Slider

Lower Fixed Rails Part Set: 1000003 Select Visualise ?

Upper Moveable Rails Part Set: 1000004 Select Visualise ?

Select Line Conn Node N1: 3000117 Select Sketch ? Select Line Conn Node N2: 3000116 Select Sketch ?

Seat Height Adjustment

Front Bar Linkages Part Set: 1000005 Select Visualise ? Rear Bar Linkages Part Set: 1000006 Select Visualise ?

Upper Linkages Cen Node S: 1000001 Select Sketch ? Lower Linkages Cen Node: 1000002 Select Sketch ?

Quit

<< Seat Model Input Create Mechanism Mechanism and H-Points >>

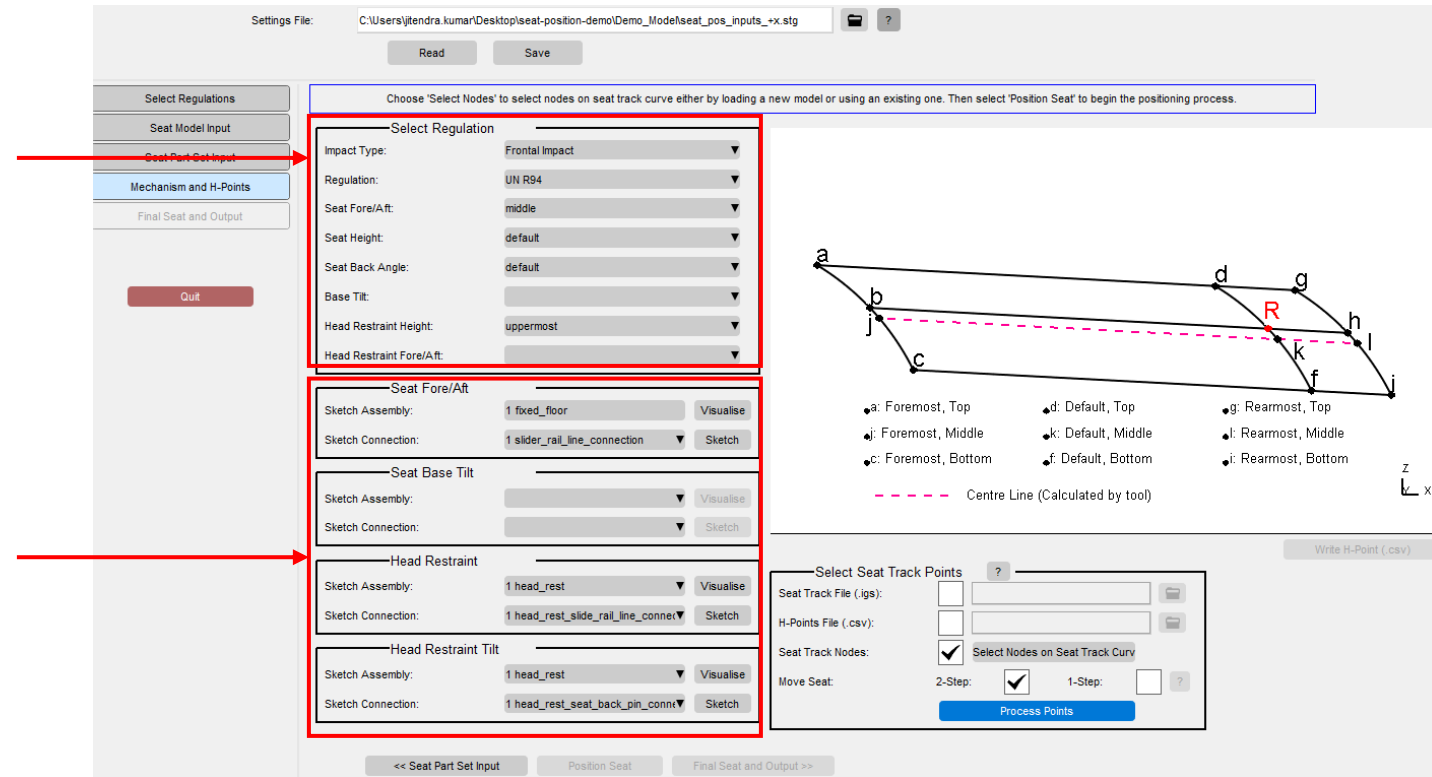
Part sets required for seat slide and height adjustment

Part sets required for the seat base tilt

Part sets required for the head restraint height and tilt adjustments

Step 4: Mechanism and H-Points

- You can also select a different regulation for performing multiple seat positioning.
- You can sketch assemblies and connections. Select the relevant assemblies/connections from the drop-down to Sketch/Visualise.



Step 5: Select Seat Track Points

- You can specify the seat track curve points by using an .iges file, a CSV file, or by selecting nodes directly within the model. After selecting the points, click "Process Points" to extract the seating positions and "Position Seat" will be activated.

Settings File: C:\Users\jendra.kumar\Desktop\seat-position-demo\Demo_Model\seat_pos_inputs_+x.stg

Read Save

Choose 'Select Nodes' to select nodes on seat track curve either by loading a new model or using an existing one. Then select 'Position Seat' to begin the positioning process.

Select Regulations

Impact Type: Frontal Impact
Regulation: UN R94
Seat Fore/Aft: middle
Seat Height: default
Seat Back Angle: default
Base Tilt:
Head Restraint Height: uppermost
Head Restraint Fore/Aft:

Seat Fore/Aft

Sketch Assembly: 1 fixed_floor Visualise
Sketch Connection: 1 slider_rail_line_connection Sketch

Seat Base Tilt

Sketch Assembly: Visualise
Sketch Connection: Sketch

Head Restraint

Sketch Assembly: 1 head_rest Visualise
Sketch Connection: 1 head_rest_slide_rail_line_conn Sketch

Head Restraint Tilt

Sketch Assembly: 1 head_rest Visualise
Sketch Connection: 1 head_rest_seat_back_pin_conn Sketch

Select Seat Track Points

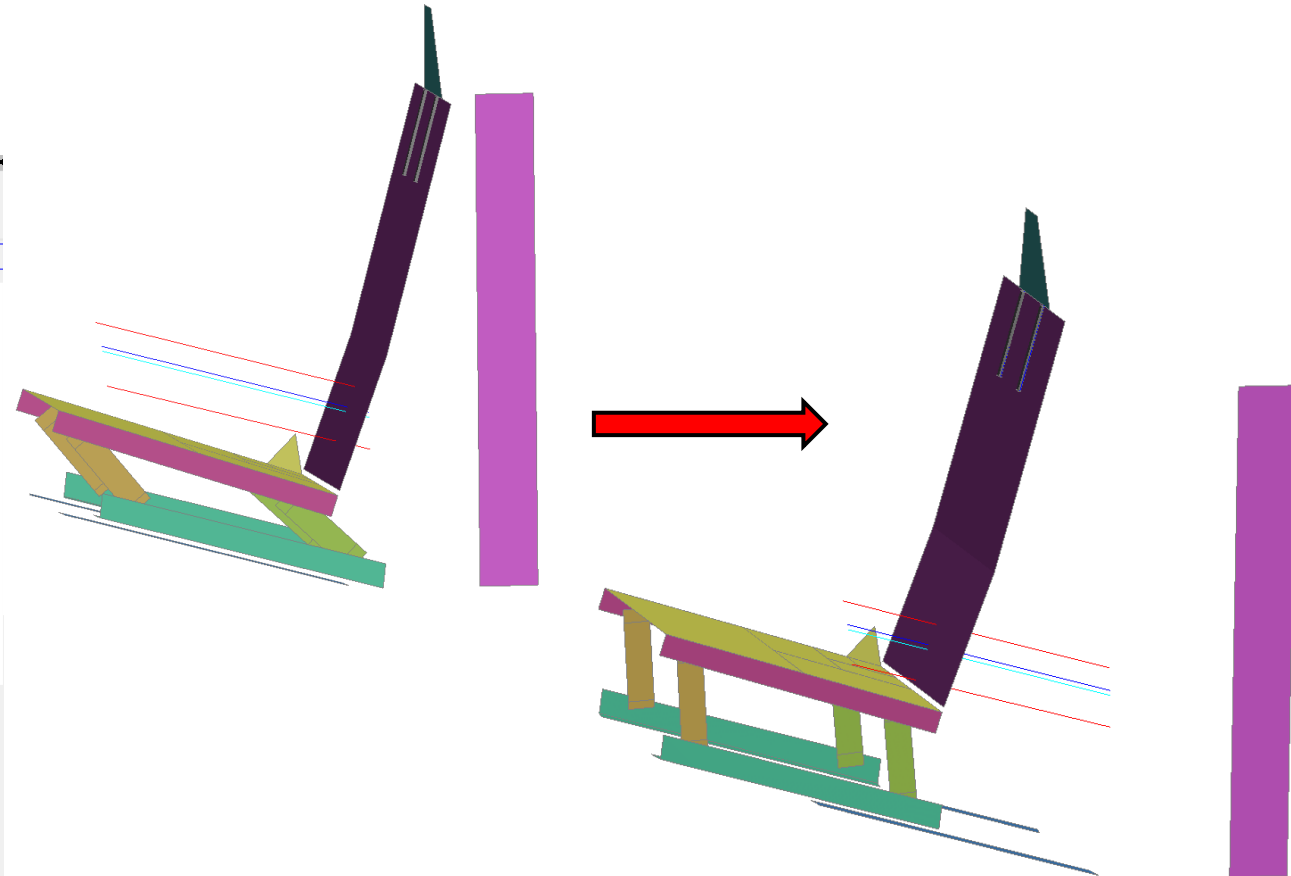
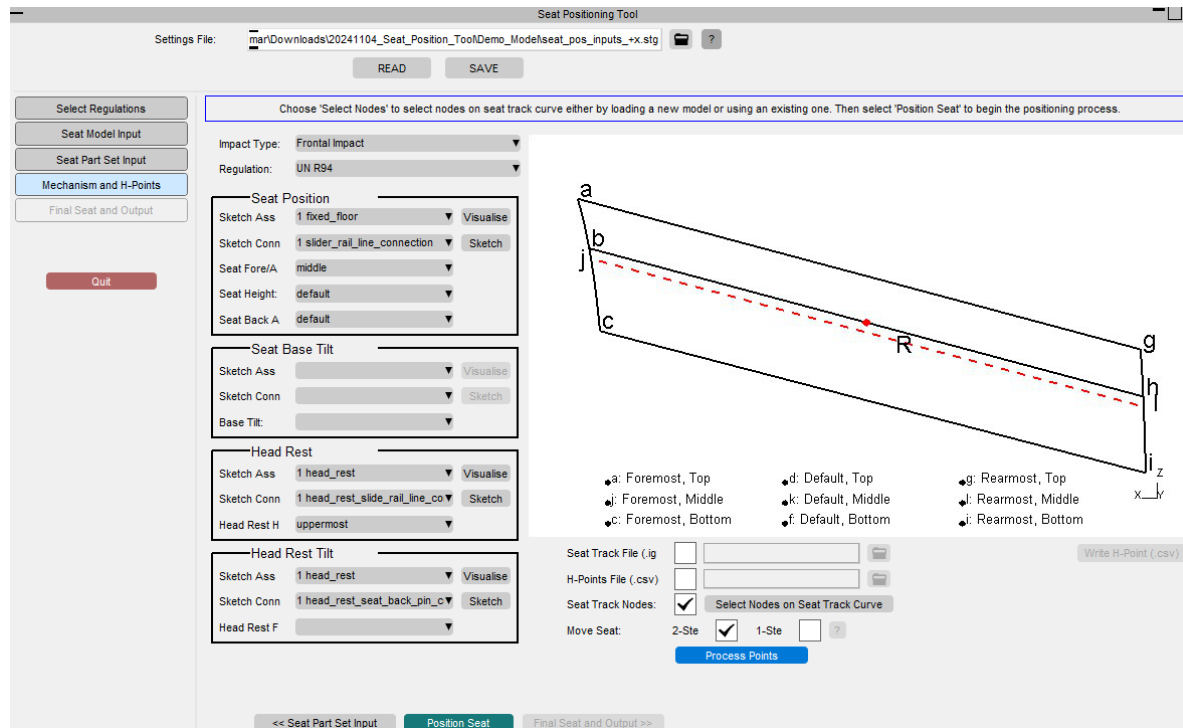
Seat Track File (.iges):
H-Points File (.csv):
Seat Track Nodes: ☒ Select Nodes on Seat Track Curve
Move Seat: 2-Step: ☒ 1-Step: ☐ ?
Process Points

Write H-Point (.csv)

Diagram illustrating the seat track curve points (a-i) and the Centre Line (Calculated by tool). The diagram shows a 3D coordinate system with Z and X axes. Points are labeled: a: Foremost, Top; b: Foremost, Middle; c: Foremost, Bottom; d: Default, Top; e: Default, Middle; f: Default, Bottom; g: Rearmost, Top; h: Rearmost, Middle; i: Rearmost, Bottom. A dashed pink line represents the Centre Line.

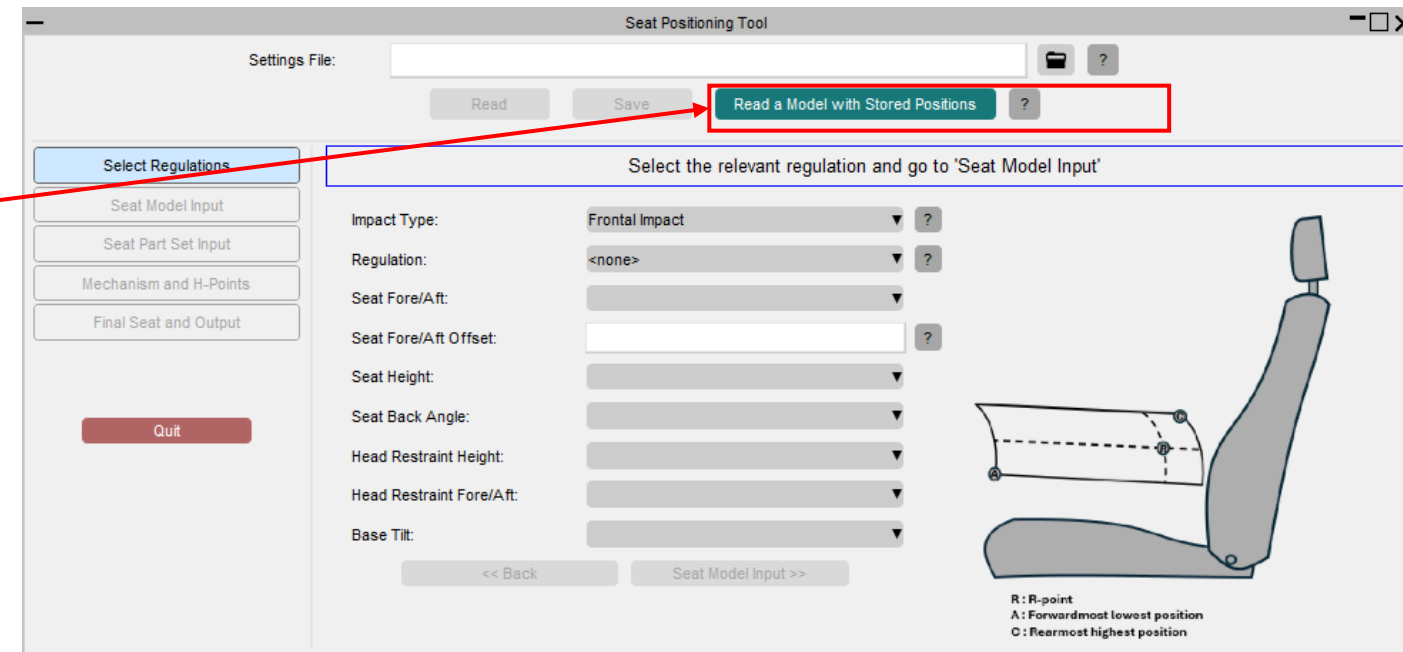
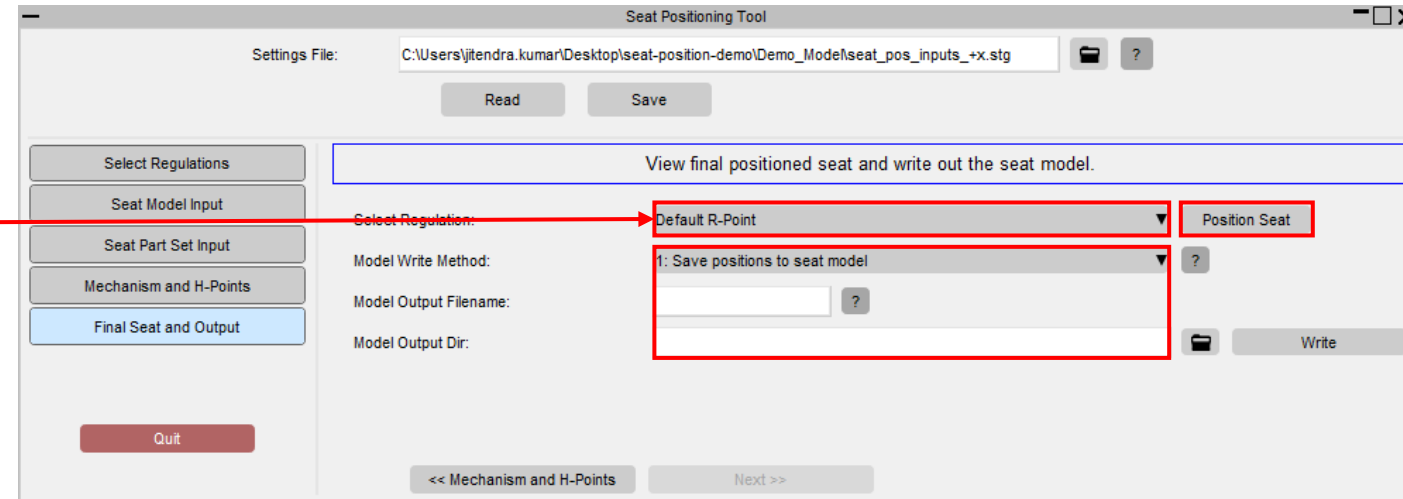
Step 6: Position Seat

- Click "Position Seat" to begin positioning the seat. To select a new position, choose a different regulation within the "Mechanism and H-Points" section.



Step 7: Final Seat and Output

- After performing multiple seat positionings, you can visualize them by selecting the regulation next to “Select Regulation” and choosing the relevant position from the dropdown. Click **Position Seat** to view the positioned seat.
- Select the appropriate model write method “**1: Save positions to seat model**” or “**2: Write separate models for each position**”,
- Select method -1 to store all positions in the seat model and use “**Read a Model with Stored Positions**” available on the main input panel to visualize the positioned seat
- Select method-2 to write out individual models for each seat position.



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