TUTORIAL VIDEO 05

05 Mesh editing: nodes (move, morph, create, equivalence)

Edit a mesh node by node: move with or without morphing, merge on release, create nodes, and close a gap with node equivalence.

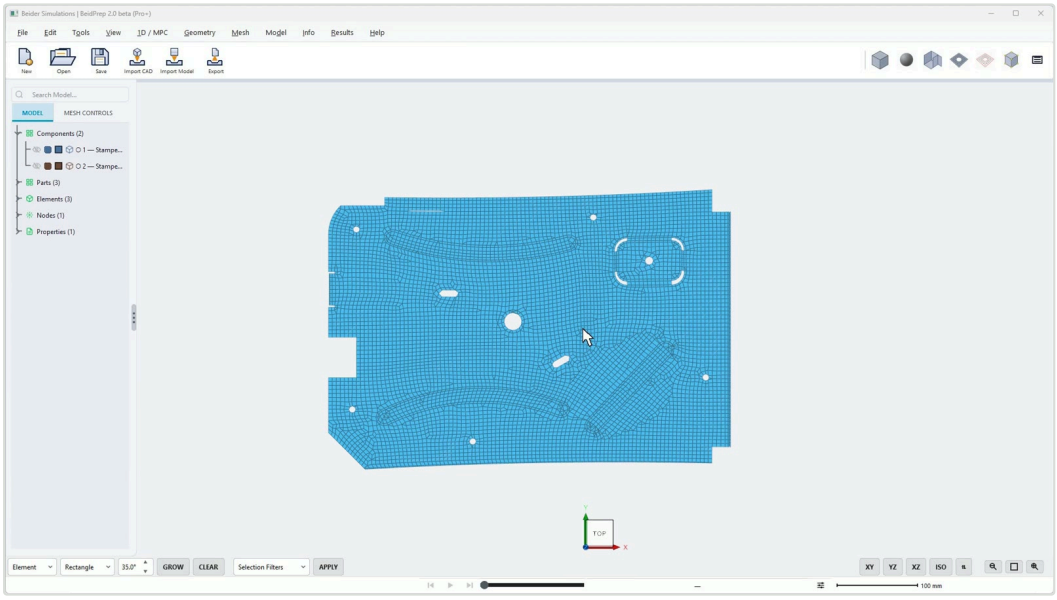
Tutorial files	folder `05_Mesh_editing_nodes` — open `sheet_gap.beid` first
Video	Watch video 05 on YouTube
Download files	Download the tutorial files (97 MB)

1 Opening

video 0:00

This video edits nodes on a real mesh: a stamped sheet-metal bracket, meshed from its midsurface.

The first mesh is good almost everywhere, but a few elements fail the quality limits, and a seam is not connected.



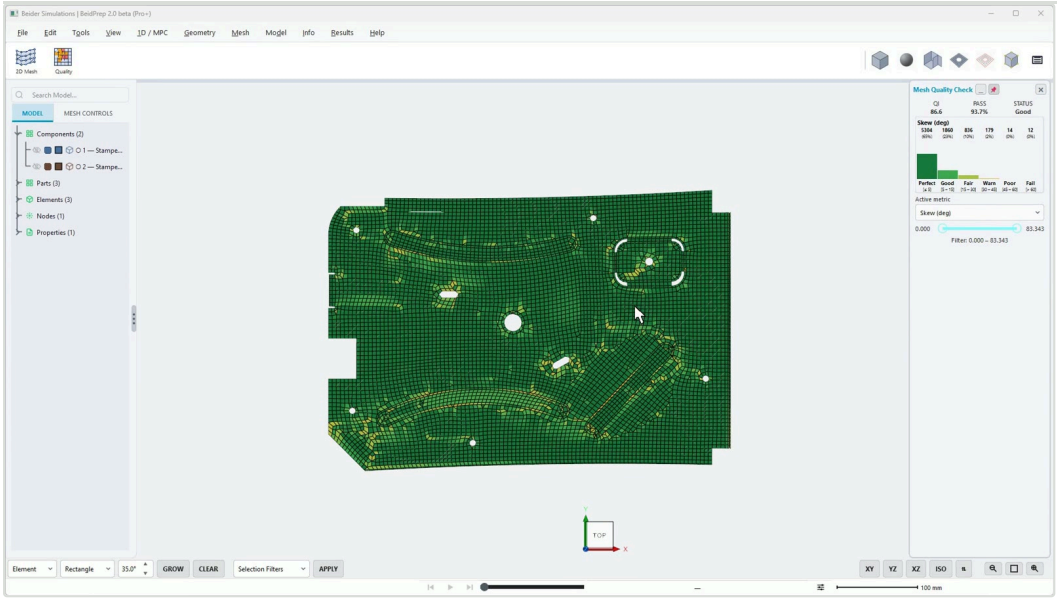
The screen at 0:13 in the video.

2 Quality colours

video 0:13

On the Mesh tab, Quality colours every element by a quality measure; here, skew.

Green is good. Yellow and red elements are the ones to fix.



The screen at 0:23 in the video.

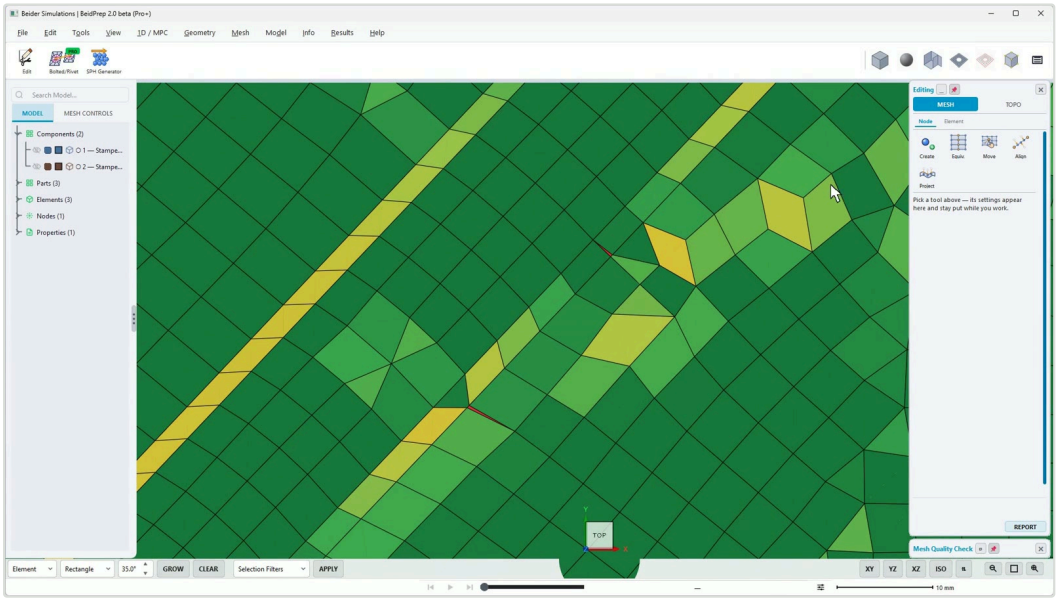
3 Editing toolbar, Area B

video 0:24

1. Open the Model menu, and click Edit.

   The node tools are Create, Equivalence, Move, Align and Project.

   Here, on the rib wall, is the worst element of the mesh: a sliver triangle with a corner of only three degrees.



The screen at 0:40 in the video.

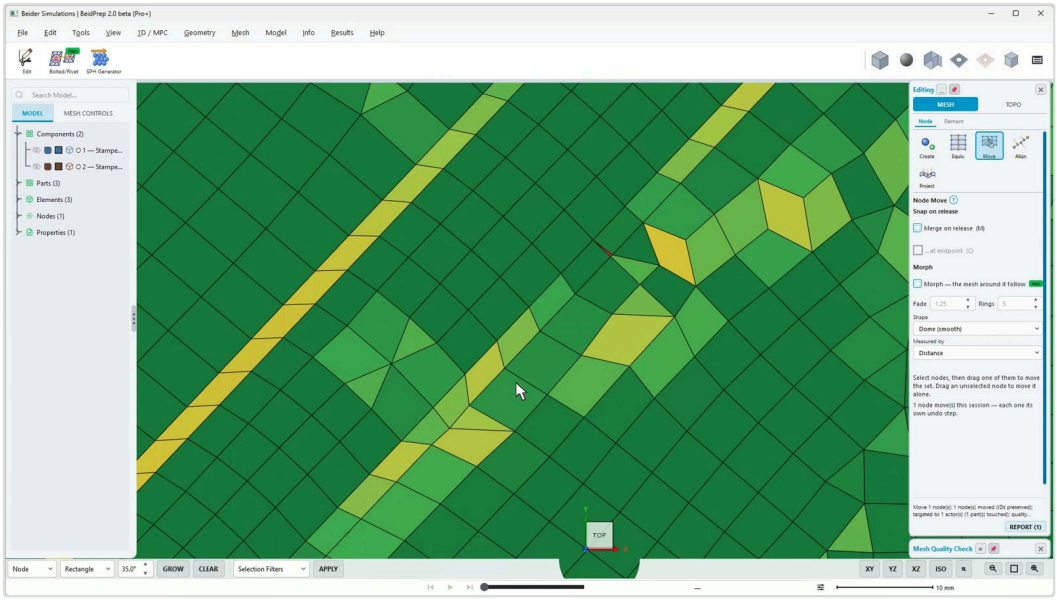
4 Move

video 0:40

1. Click Move, and drag one of its nodes along the surface.

The node slides in the plane of its elements, so it stays on the sheet.

The triangle opens up: its smallest corner goes from three degrees to about twenty eight, and it leaves the red.



The screen at 0:56 in the video.

5 Merge on release, Morph

video 0:56

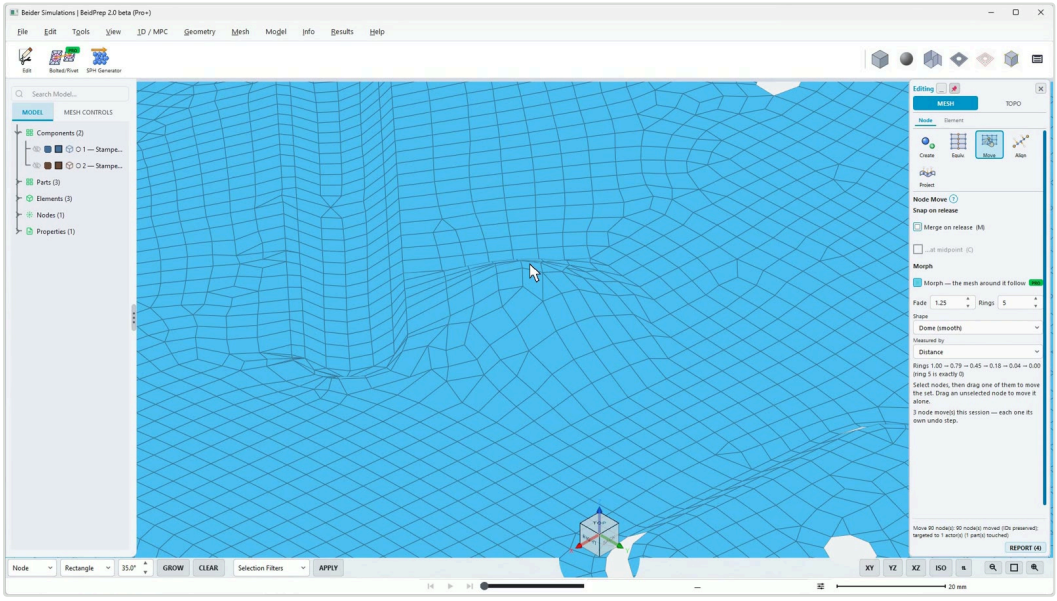
With Merge on release ticked, a node dropped on another node merges into it.

Control Z takes it back.

Morph moves the nodes around the one you drag as well, fading out over a number of rings.

1. Hold N and drag up, out of the sheet: the nodes around it follow, ring by ring, into a dome.

Control Z takes it back.



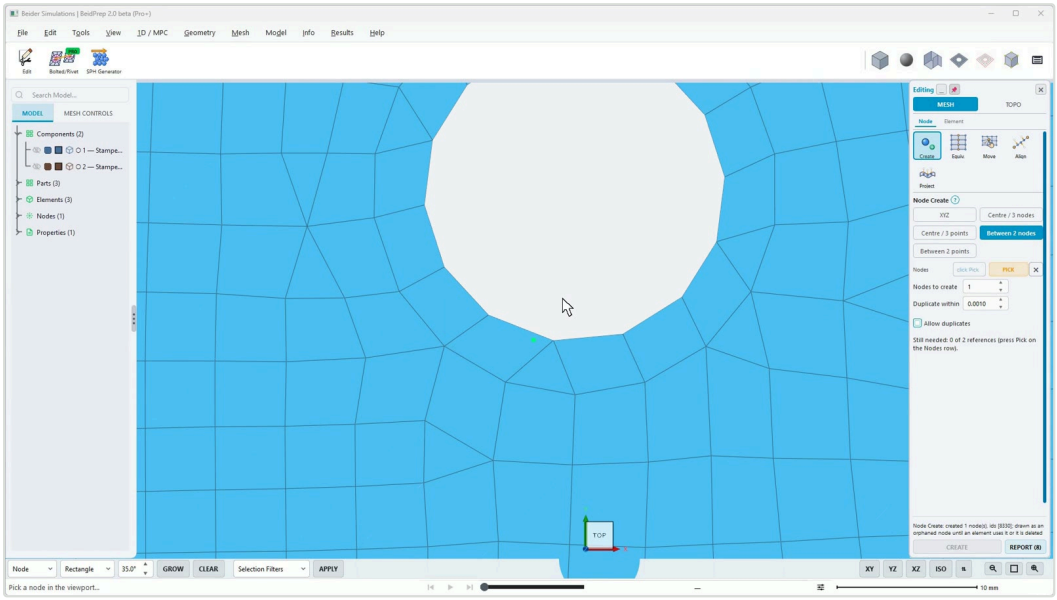
The screen at 1:22 in the video.

6 Create

video 1:25

Create adds a node: here, exactly halfway between two nodes you pick.

Control Z removes it again.



The screen at 1:39 in the video.

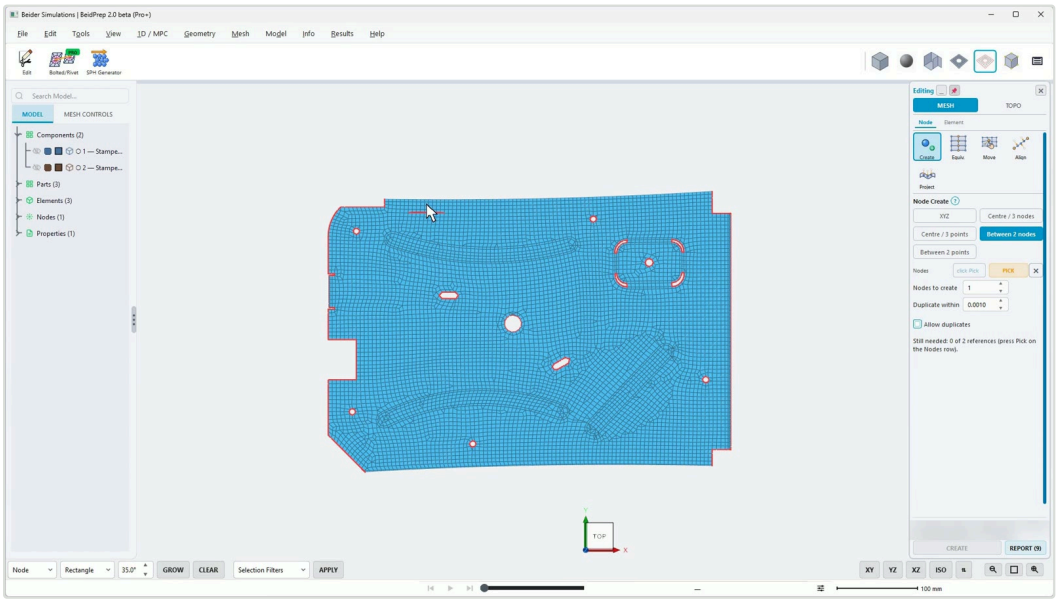
7 The seam

video 1:42

Now the seam. The Mesh Edges view draws, in red, every element edge used by only one element.

On a connected sheet that is only its outline and its holes.

This red line runs across the sheet: the elements on its two sides are not joined.



The screen at 1:58 in the video.

8 Zoom on the gap, Equivalence

video 1:58

Seen close up, the two rows of nodes are almost a millimetre apart.

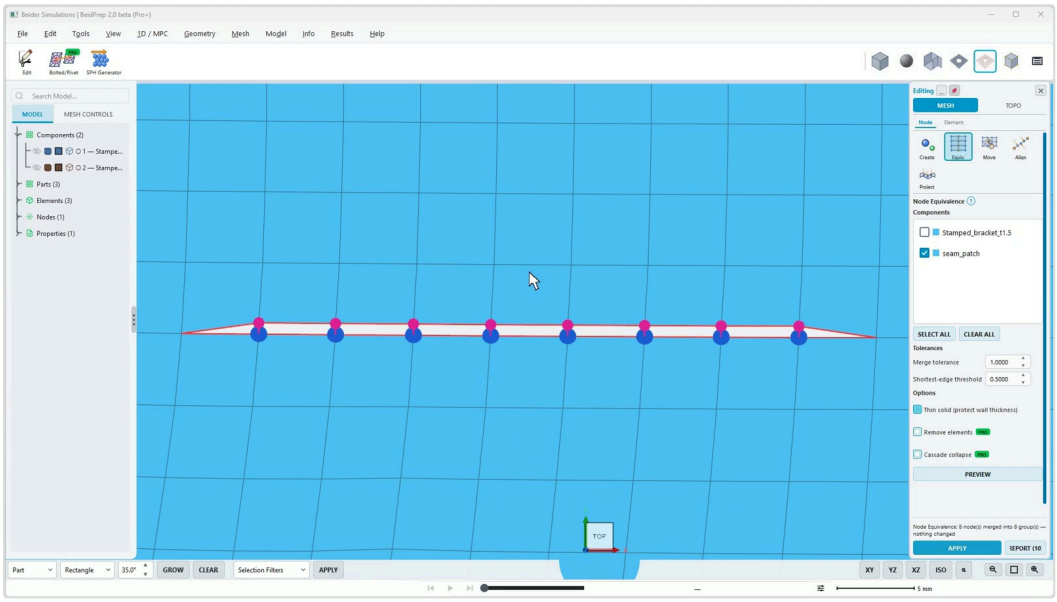
The solver would treat the two sides as separate pieces.

1. Click Equiv., tick only the part beside the seam, and set the merge tolerance to one millimetre.

Elsewhere on this sheet some nodes are meant to be closer than that, so the merge is kept to where it belongs.

Preview marks every pair of nodes that would merge, before anything changes.

In the video: **1** in Merge tolerance.



The screen at 2:23 in the video.

9 Apply, Align and Project, Close

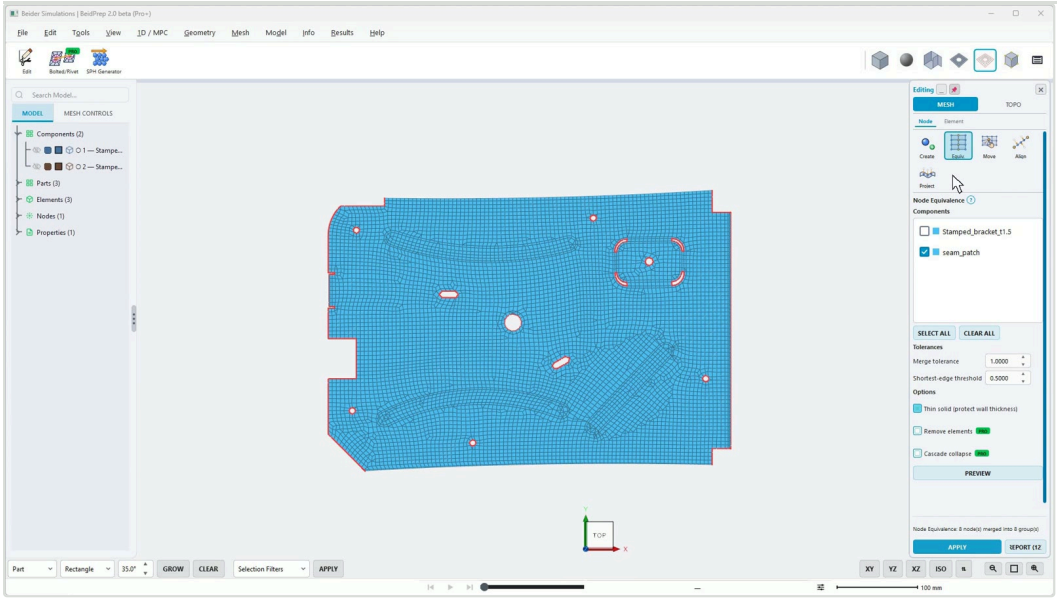
video 2:24

Apply merges them: the two rows become one.

The red edges are gone. The sheet is connected again.

Align lines nodes up between two end nodes, and Project moves nodes onto a surface, a plane or a line.

Every node edit is one step on the undo list, so you can try, look, and take it back.



The screen at 2:37 in the video.

Steps and pictures are taken from tutorial video 05. Every picture is a frame of the video.