

Altair® HyperWorks®

2022.2

Renumber Entities

Use the Renumber tool to review and organize the IDs of model entities.

Organizing entity IDs can facilitate easier post-processing and model management. This tool can renumber entities into a different range, offset the IDs of selected entities by a specified amount, and/or renumber entities in a particular order.

1. From the Assembly ribbon, click the **Renumber** tool.



Figure 1.

2. Choose either the **Renumber** or the **Offset** method from the drop-down on the guide bar.
3. Select the entities to be renumbered.
 - Use the Ordered checkbox to select nodes or elements in the explicit order they are to be renumbered. Use the Alt shortcut key to quickly make selections by path.
 - By default, IDs are shown on selected entities for review. This may be turned off in the options menu (≡) for large selections or when ID labels are otherwise undesirable.
4. Input the new starting ID and/or offset as appropriate.

By default, entities will be renumbered to the next available ID if the starting ID is already in use. The Overwrite existing IDs option will force renumbering into the specified range and automatically renumber any conflicting entities above the highest ID used in the model.
5. On the guide bar, click one of the following:
 - ► - Apply and stay in the tool
 - ✓ - Apply and close the tool
 - ✗ - Exit the tool without applying

Use the Maintain selection option to perform iterative renumbering actions on the same selection.


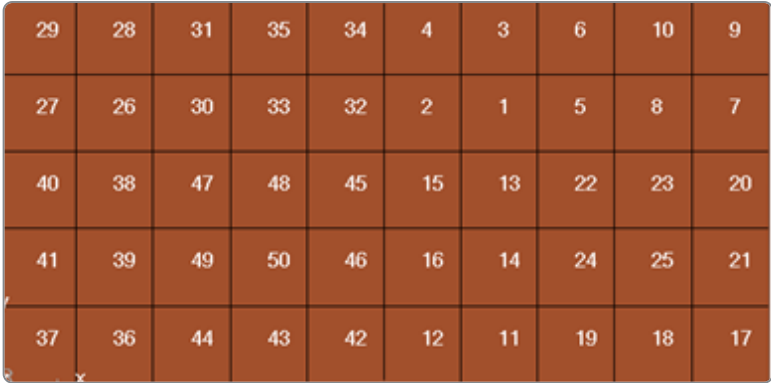
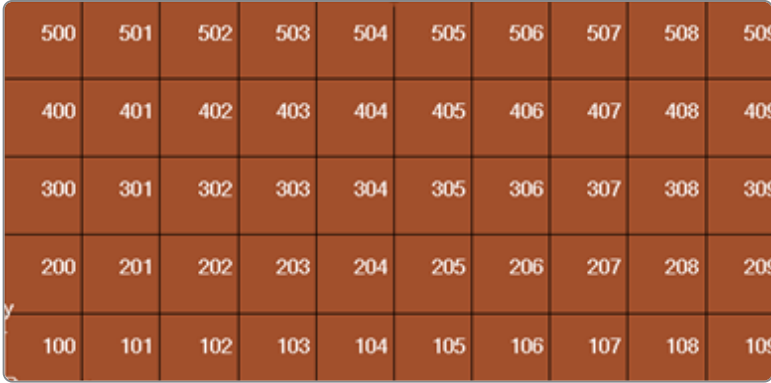
After renumbering, the new IDs are displayed on the renumbered entities for review until another selection is made.

Spatial Renumbering

Renumber elements and nodes based on spatial sorting.

1. From the Assembly ribbon, click the arrow next to the Renumber tool, then select **Spatial Renumber**.
2. Select a sorting schema from the drop-down on the guide bar.
3. Select a list of nodes or elements to renumber.

4. Use the microdialog to define relevant options.

Option	Description
Spatial	<p>a. Click  and select a system. The global system may be used.</p> <p>b. Define the ordered list of axes to consider to sort the selection (primary/secondary/tertiary axes). Arrows will show the starting location and directions for renumbering.</p> <p>c. Define the start ID.</p> <p>d. Define a tolerance and ID increment for each axis. The ID schema is continuous across directions.</p>
Rectangular grid	<p>Using this method, you can renumber a rectangular regular array of elements or quads in two perpendicular directions in a user-defined coordinate system (Cartesian or cylindrical).</p> <p>The steps are the same as the spatial method, but in this case a local coordinate system must be used to match the primary numbering directions and the mesh is expected to be a rectangular pattern of quads. You must define 3 different increments.</p>  <p><i>Figure 2. Before Element Renumber</i></p>  <p><i>Figure 3. After Element Renumber: X increment by 1, Y increment by 100</i></p>
Adjacent	<p>Using the adjacent method, renumbering is based on element/node connectivity directions instead of system directions.</p> <p>This method works only with quadrilateral elements (without any triangular elements) and</p>

5. On the guide bar, click one of the following:

- ▶ - Apply and stay in the tool
 - ✓ - Apply and close the tool
 - ✗ - Exit the tool without applying
- a. Enter the Start ID.
b. Click **Options** on the guide bar.
c. Select a starting node or element.
d. Select an element/node for the primary, secondary, and tertiary directions and define their

How the Tolerance Setting Affects the Renumber Result

The tolerance is used to group the nodes/elements in the correct order for renumbering.

For example, if you have a simple structured mesh with nodes distanced 5 mm on the local X direction and 2 mm on the local Y you want to renumber the nodes so that it starts with 101 for the starting ID. Then increment in local X direction by 1, for example 101, 101+1, 101+2, and in local Y direction by 10, for example 101, 101+10, 101+20.

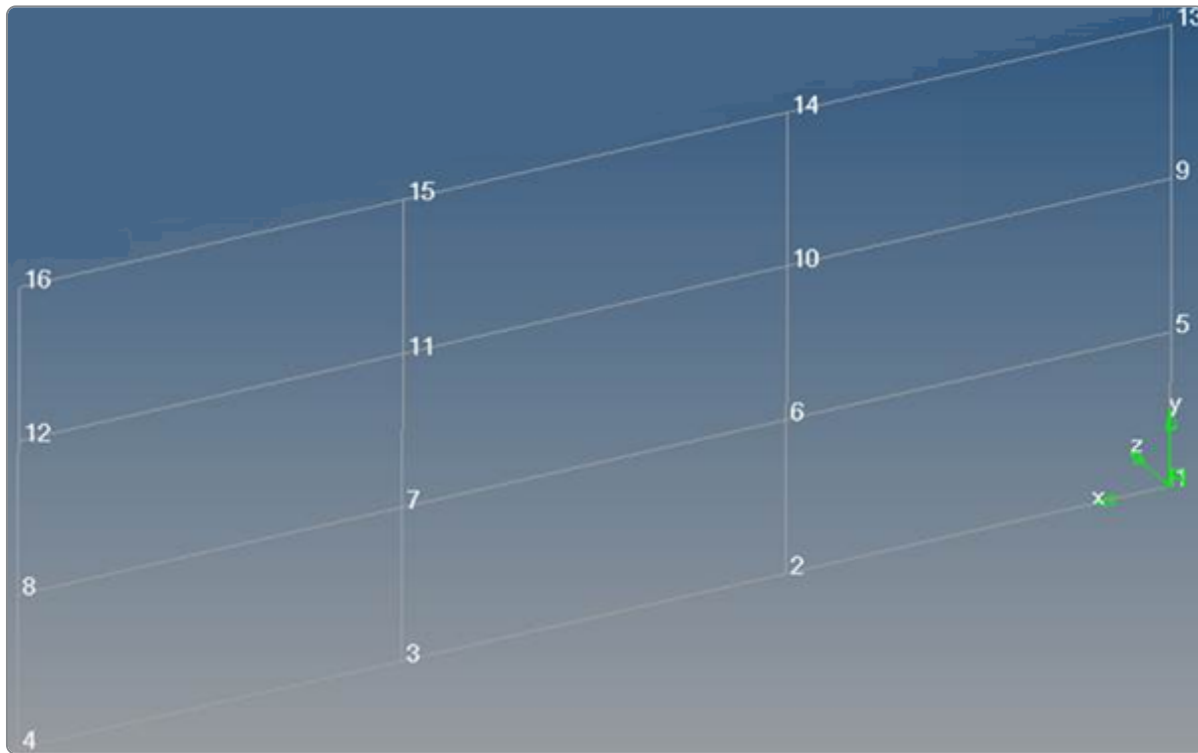


Figure 4.

If you use the correct tolerance of 1 mm (which is < 5 mm and < 2 mm nodal distances) here is the result:

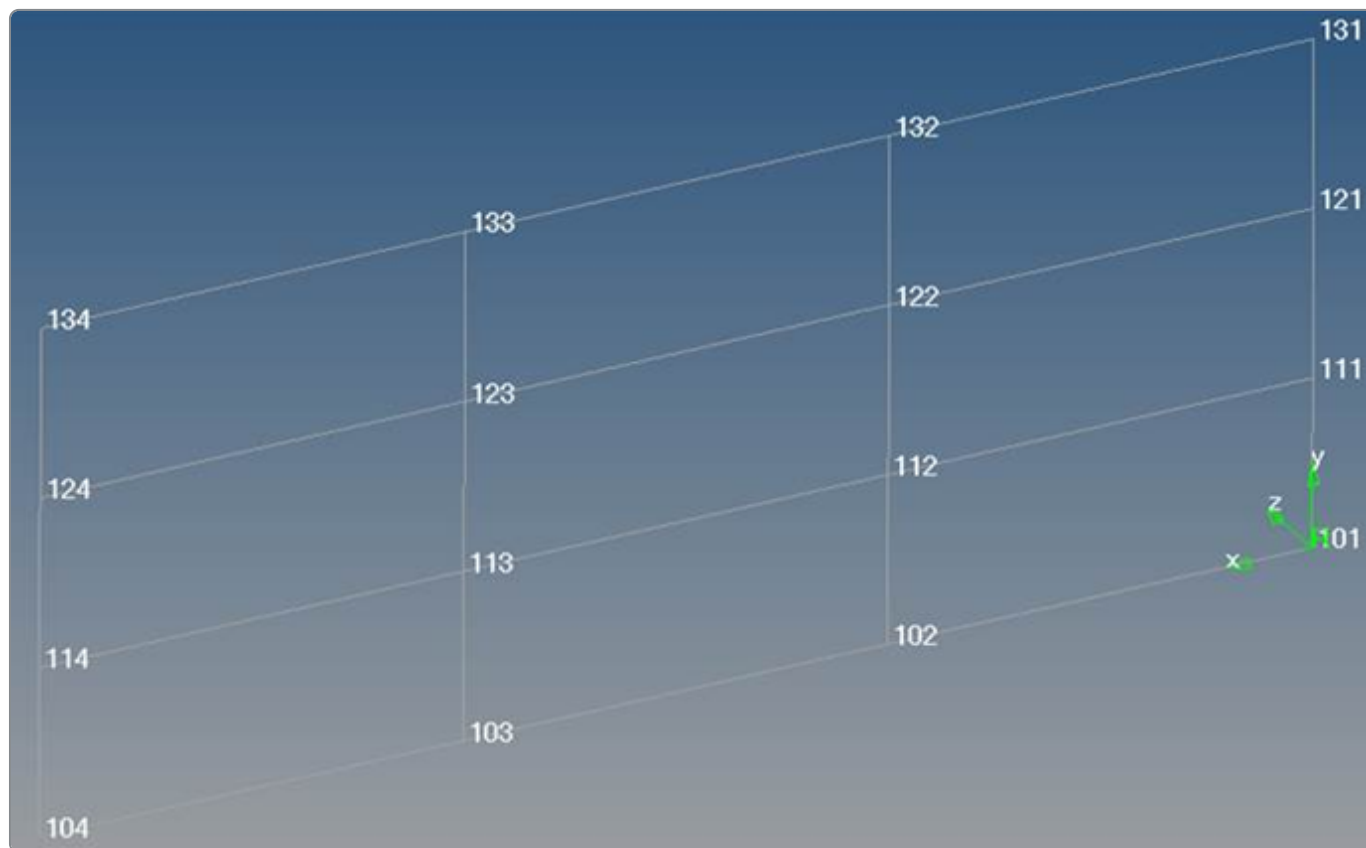


Figure 5.

In a real scenario you rarely get meshes like the example above, so the distances between nodes are variable like the image below. You want to renumber it with the same objective and tolerances (1mm).

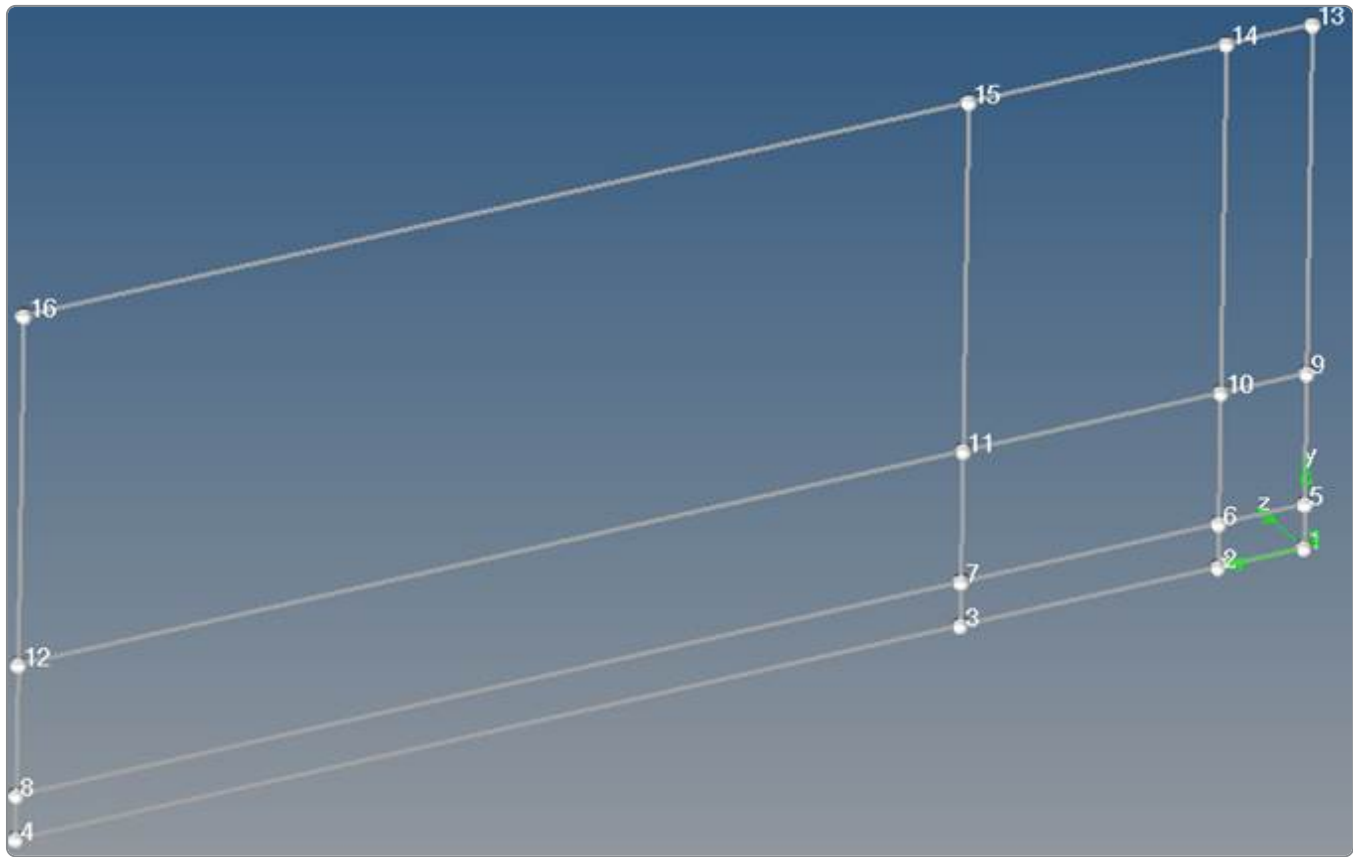


Figure 6.

The result is:

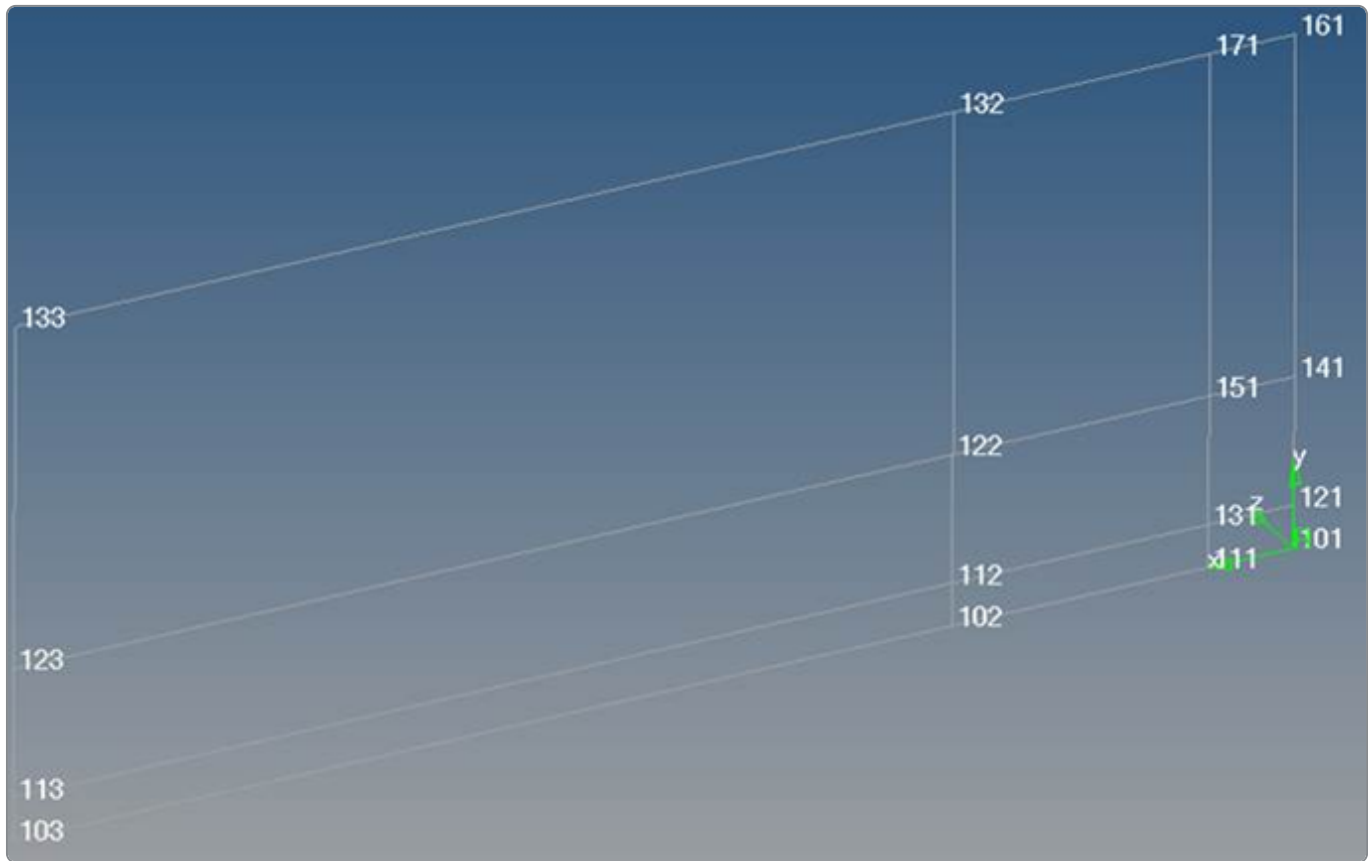


Figure 7.

As you can see in the image above, the renumbering is not done properly. This is because the smallest nodal distance is 0.5 mm which is smaller than 1 mm tolerance. If you reduce the tolerance to 0.1 mm you will get the correct result.

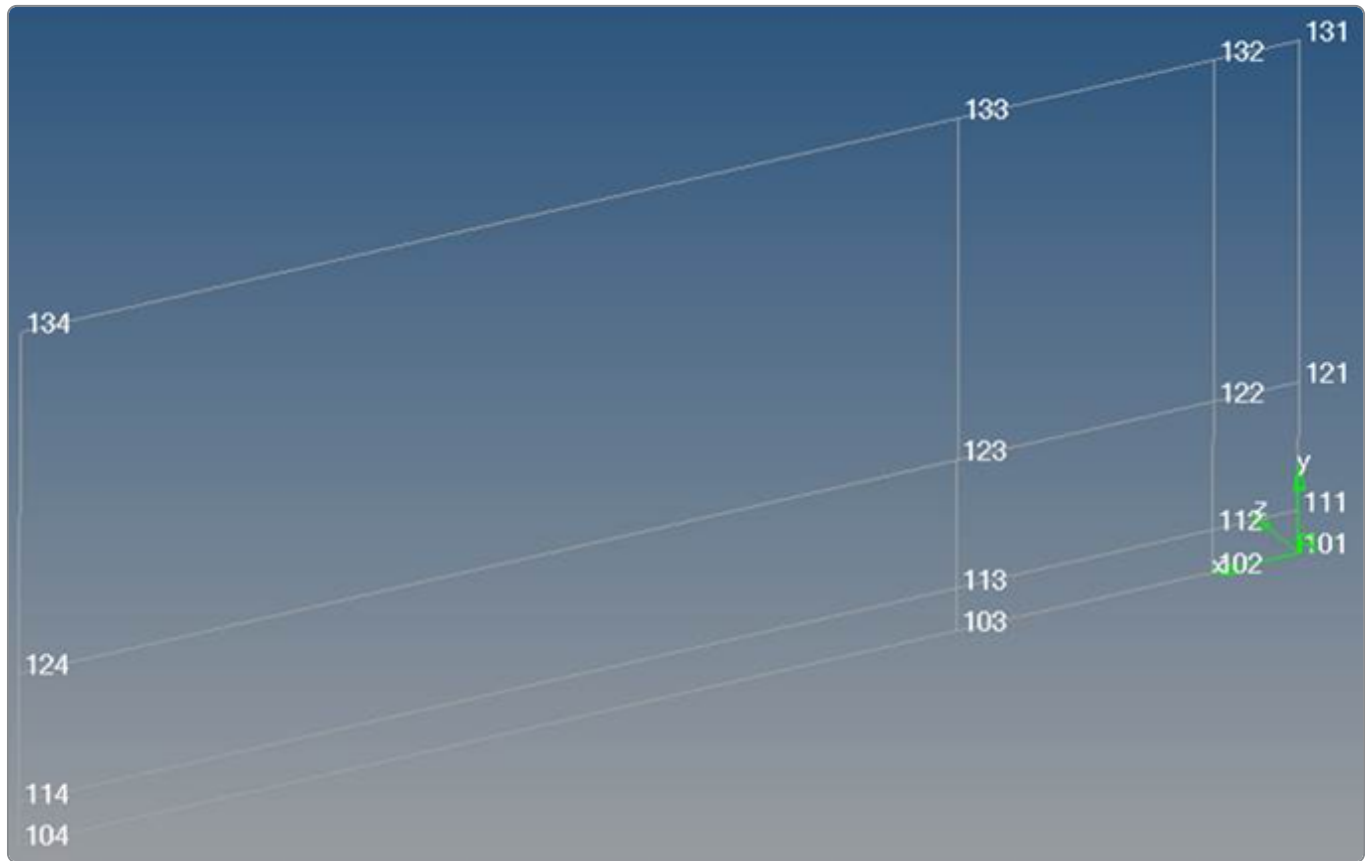


Figure 8.

See Also

[ID-Management](#)