

Create/Remove Hole in Mesh



Create/Remove hole in mesh panel

- “Create hole” allows you to make a hole in an existing mesh. There are various options to control the mesh and hole created.
- The “Remove hole” function allows the user to either remove a single hole or multiple holes in selected parts or shells.
- The “Remesh area” function allows the user to remesh the area around where a hole has been created or where one has been removed.

The screenshot shows a software panel titled "Create hole in mesh". At the top, there are three tabs: "Create hole" (highlighted in blue), "Remove hole", and "Remesh area". Below the tabs is a title bar with a question mark and a close button. The panel contains several controls:

- A "Restart" button (red) and an "Apply" button (grey).
- An "Options" button (grey).
- Two main sections: "Add shells" and "Remove shells", both with grey headers.
- Input fields for:
 - Element size: 5.0
 - Hole centre: not set (with a "Pick" button)
 - Hole diameter: 10.0
 - No. elem round hole: 4 (with a dropdown arrow)
 - Hole rotation: 0.0 (with minus and plus buttons)
 - Washer diameter: 20.0 (with a checkmark button)
 - No. washer elem: 1 (with a "Set PID" button)
 - Feature line limit: 20.0 (with an empty checkbox)

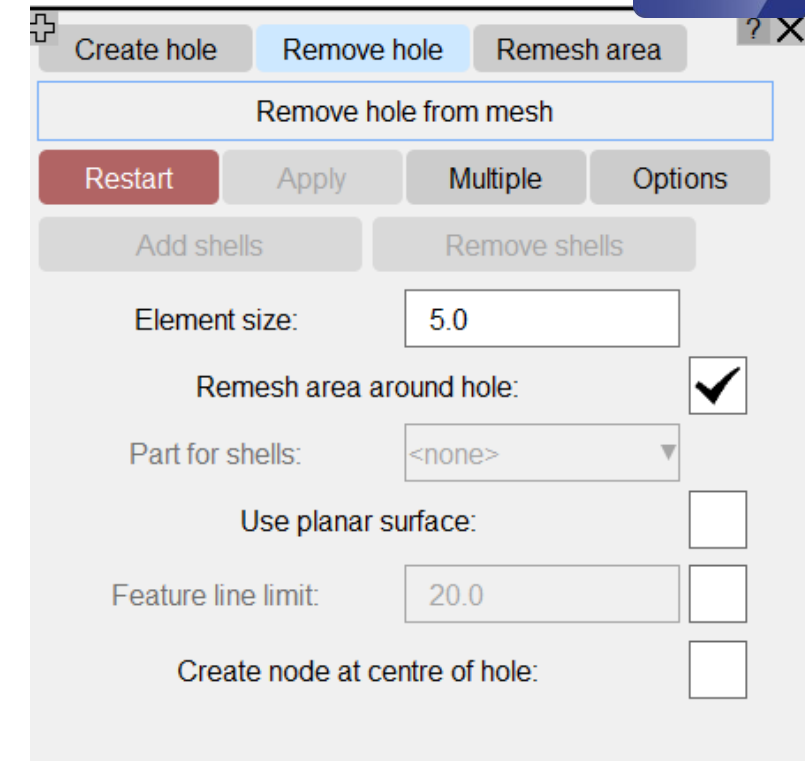
Create Hole in Mesh

- **Element Size** – allows you to change the size of elements that will be created in the area that is remeshed.
- **Hole Centre** – allows you to specify the hole centre (the “Pick” button allows you to pick an element on the hole edge).
- **Hole Diameter** – changes the diameter of the hole created.
- **No. of Elem round hole** – the number of elements that will be created will either be specified by this field or the size of the elements can be given instead by using the pop up and changing to “Elem size round hole”.
- **Hole rotation** – this can be used to change the orientation of the elements for the hole.
- **Washer diameter** – create a ring or rings of elements around the hole of a specified diameter.
- **No. washer elem** – this controls how many washer elements/rings will be used to create the washer.
- **Feature line limit** – this can be used to stop automatic selection of shells which are beyond a certain angle.

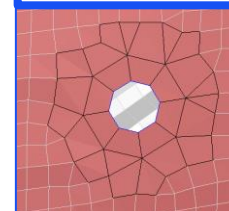
The screenshot shows the 'Create hole in mesh' dialog box. It has three tabs: 'Create hole' (selected), 'Remove hole', and 'Remesh area'. Below the tabs are buttons for 'Restart', 'Apply', and 'Options'. There are two main sections: 'Add shells' and 'Remove shells'. The 'Add shells' section contains the following fields: 'Element size' (5.0), 'Hole centre' (not set), 'Hole diameter' (10.0), 'No. elem round hole' (4), 'No. elem round hole' (0.0), 'Elem size round hole' (20.0), 'Washer diameter' (20.0), 'No. washer elem' (1), and 'Feature line limit' (20.0). The 'Remove shells' section is empty. A red box highlights the 'No. elem round hole' and 'Elem size round hole' options. There is a 'Pick' button next to the 'Hole centre' field and a 'Set PID' button next to the 'No. washer elem' field.

Remove Singular Hole in Mesh

- To remove a hole from a mesh, pick a shell element next to the hole.
- PRIMER will then automatically select shells around the hole to remesh. “Add shells” and “Remove shells” can be used to alter the selection of shells.
- **Use Planar Surface** – Will force PRIMER to try to use a planar surface when creating shells. The planar surface will be the best fit that can be created from the nodes on the edge of the hole.
- When removing a hole PRIMER can optionally make a node at the centre of the hole; this can be useful for making a beam or connection at the hole position.
- There are two ways PRIMER can remove a hole:
 - **Method 1** - Fill the hole completely with new elements.
 - **Method 2** - Completely remesh the area around the hole to remove the hole mesh completely, this is controlled by the remesh around hole checkbox.
- The results of these two methods can be seen below:



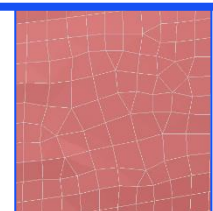
Original hole



Method 1: Remesh area around hole selected

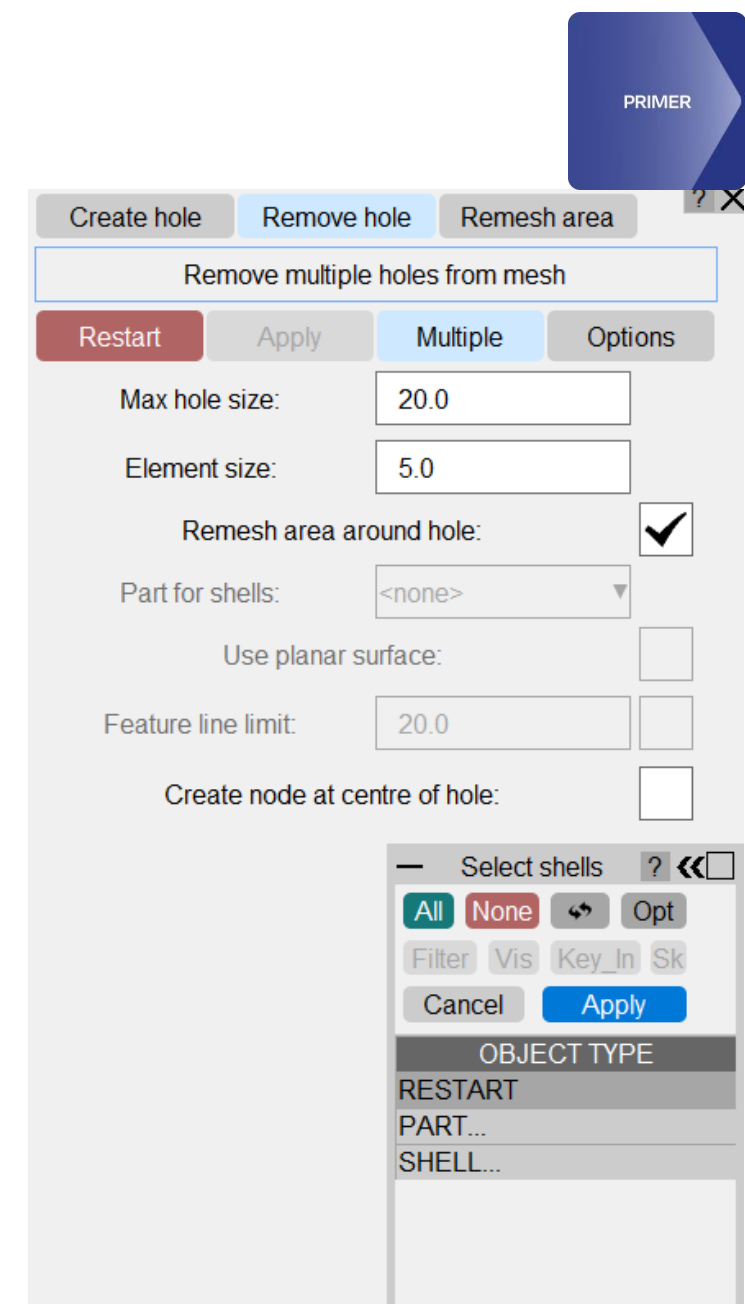


Method 2: Remesh area around hole not selected



Remove Multiple Holes in Mesh

- To remove multiple holes first the “Multiple” button needs to be toggled on (green when on).
- PRIMER then asks to specify the maximum hole size to remove, it will not remove any holes with a diameter bigger than this value.
- As when removing singular holes there are two ways that PRIMER can remove the hole. It can either fill the hole with new elements or completely remesh the area around the hole, this is controlled by the “Remesh area around hole” checkbox.
- Once the above is complete PRIMER will request to select the parts or shells that contain the holes you want to remove.
- Once “Apply” has been pressed PRIMER will search for the holes and will highlight the holes to be removed with a blue outline, by pressing “Apply” again the hole will be removed and either filled with elements or remeshed.



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