Altair HyperMesh 2019 Tutorials

HM-3420: Creating Bolt Connectors

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In this tutorial, you will learn how to apply a bolted connection to two rear trusses.

Model Files

This exercise uses the `frame_assembly_2.hm` file, which can be found in the `hm.zip` file. Copy the file(s) from this directory to your working directory.

Exercise

The **Bolt** panel creates connectors based on holes within the connected components, using spiders or washers at each end of an RBE connector. When the **Bolt** panel is active, only bolt-type connectors display in the graphics area; graphics for other connector types are suppressed until you exit the panel. The **Bolt** panel contains three subpanels:

- **bolt**   Create and realize bolt connectors in a single process.

- **create**   Create, but not realize, bolt connectors.

- **realize**   Create FE representations of previously-created bolt connectors.

Step 1: Retrieve and view the model file.

1.   Start HyperMesh Desktop.

2.   In the **User Profile** dialog, select **OptiStruct**.

3.   Click *OK*.

4.   Open a model file by clicking *File* > *Open* > *Model* from the menu bar, or clicking 🗂️ on the **Standard** toolbar.

5.   In the **Open Model** dialog, open the `frame_assembly_2.hm` file. A model appears in the graphics area.

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6. Observe the model using various visualization options available in HyperMesh (rotation, zooming, and so on).
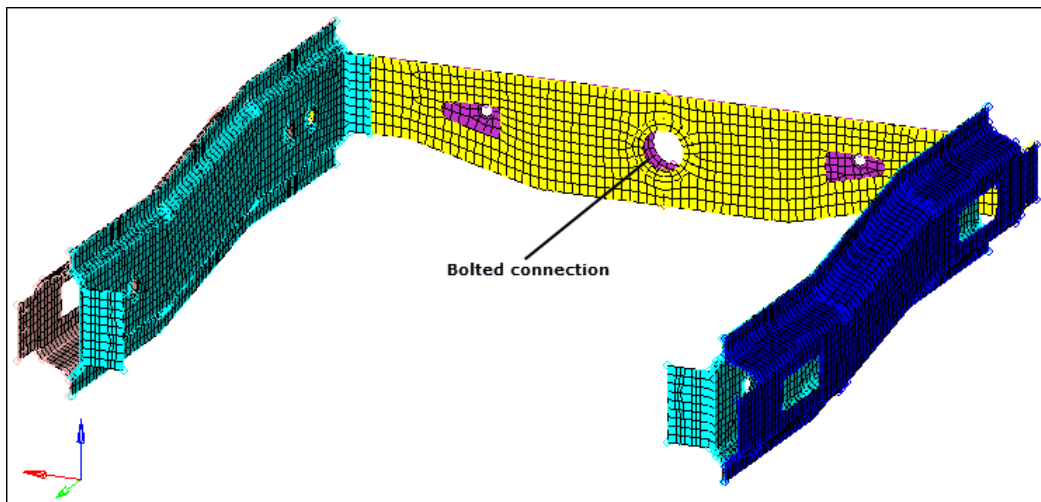
Create a bolted connection between the two rear truss parts.

## Step 2: Display only the assembly *assem_5* for elements and geometry.

1. In the **Model** browser, click (**Model View**).

2. Expand the **Assembly Hierarchy** folder and sub-folders.

3. Set the entity selection to (**Elements and Geometry**).

    Note: This options turns on/off both elements and geometry when you perform right-click operations in the **Model** browser.

4. Right-click on *assem_5* and select *Isolate* from the context menu. HyperMesh only displays the components that are in the **assem_5** assembly.

5. Right-click on the *Con_Rear_Truss* component and select *Make Current* from the context menu.

Step 3: Load the Connector Browser.

1. Open the **Connectors** browser by clicking *View* > *Browsers* > *HyperMesh* > *Connector* from the menu bar.

2. Review the layout of the **Connector** browser. Currently there are no components or connectors listed because there are no connectors in the model.

    Note: You can use the **Connector** browser to view and manage the connectors in your model. The top portion of the browser is referred to as the **Link Entity** browser, and it displays information about the linked entities in your model. The middle portion is referred to as the **Connector Entity** browser, and it contains a list of the connectors in your model. The bottom portion of the browser is referred to as the **Connector Entity Editor**, and it displays

attributes assigned to the connector(s) selected in the Connector Entity browser. HyperMesh groups the connectors based on their connection type.
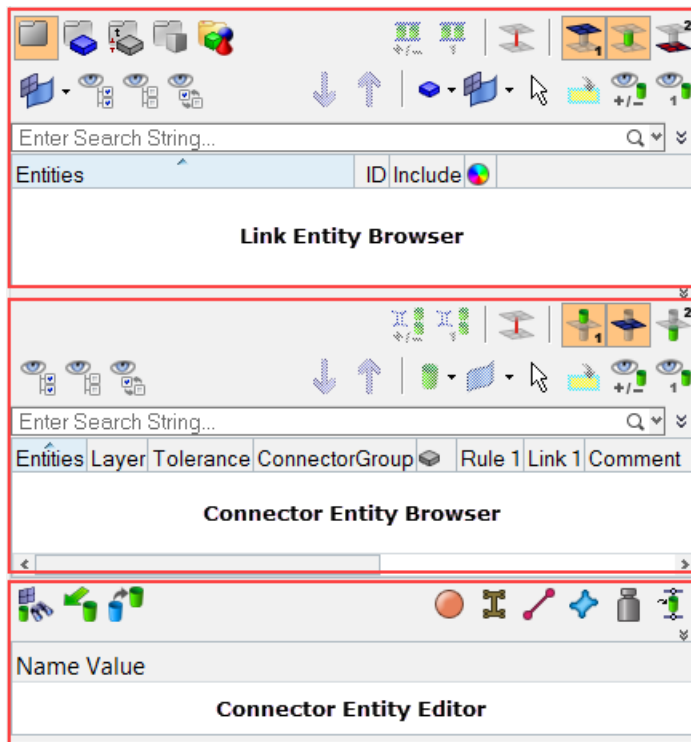

Step 4: Create a bolt connector.

1. Open the **Bolt** panel by right-clicking in the **Connector Entity** browser and selecting *Create* > *Bolt* from the context menu.

2. Set the **location** selector to *nodes*.

3. Select a node on the edge of the hole in the **Rear_Truss_1** component as indicated in the following image.

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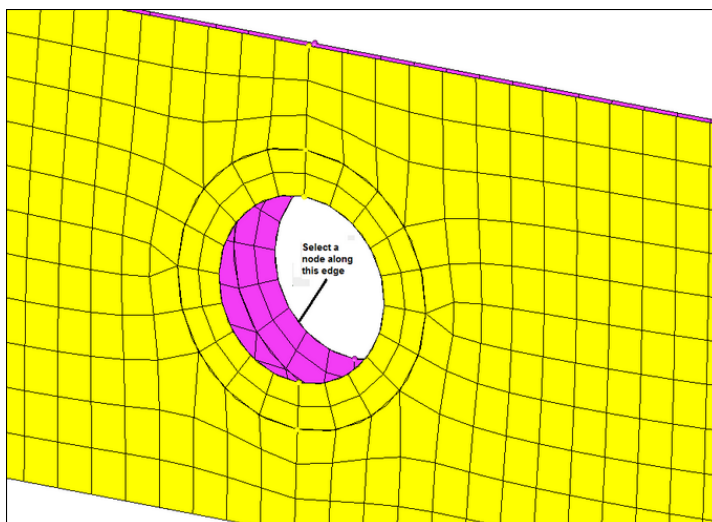
4. Set the **connect what** selector to *comps*.

5. Click *comps*.

6. Select the components, *Rear_Truss_1* and *Rear_Truss_2*.
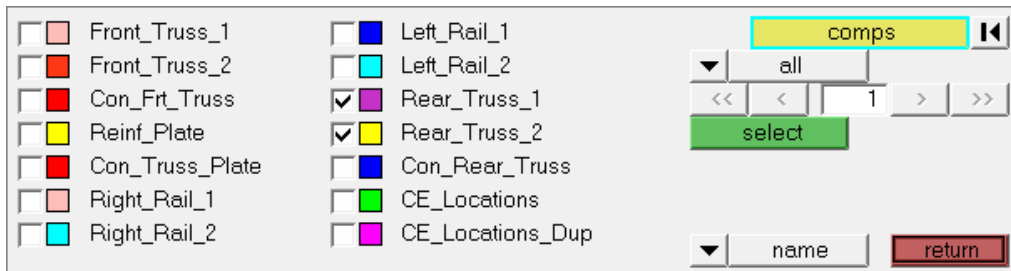
7. Click *select*.

8. In the **tolerance=** field, enter `50`.

    Note: The connector will connect any selected entities within this distance of itself.

9. Click **type=** and select *bolt (general)*.

    Note: Re-realizing the connector will allow you to see the different bolt types.

10. Click *realize & hole detect details*.

11. In the **max dimension =** field, enter `60` to ensure that the diameter of the picked hole will be captured.

12. Click *return*.
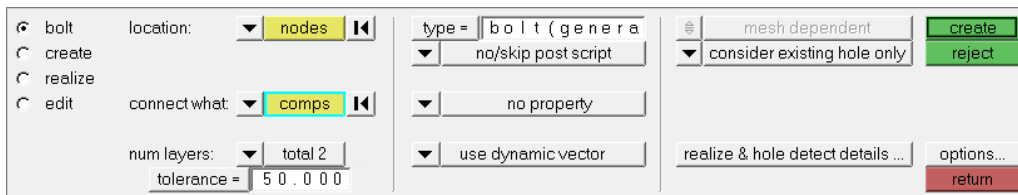
13. Click *create*.

    Note: Ensure the display of the current component is turned on.

Bolted connection

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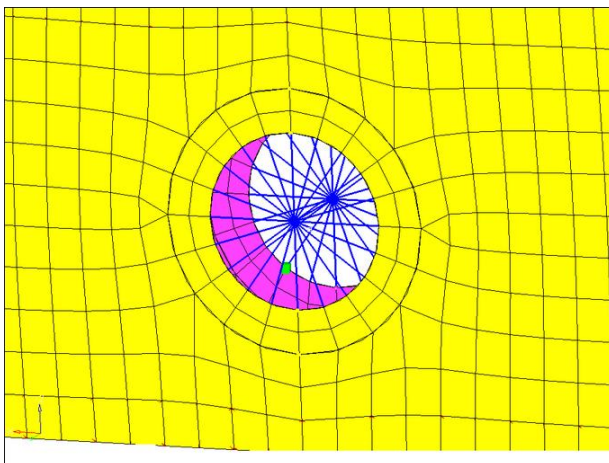
14. To access the main menu, click **return**.