# Altair HyperMesh 2019 Tutorials

HM-3450: Multi-Component Replacement

### HM-3450: Multi-Component Replacement

In this tutorial, you will learn how to simultaneously replace multiple components in your current model using the Part Replacement tool. You will be replacing six related components (bumper, front frame, and radiator frame) in the Pr_Inc.k Include file with components that contain a finer mesh.

## Model Files

This exercise uses the files located in the `hm-3450` folder, which can be found in the `hm.zip` file. Copy the file(s) from this directory to your working directory.

## Exercise

### Step 1:  Start HyperMesh Desktop and Load the LS-DYNA User Profile

1.   Start HyperMesh Desktop.

2.   In the **User Profile** dialog, select *LS-DYNA*.

3.   Click *OK*.
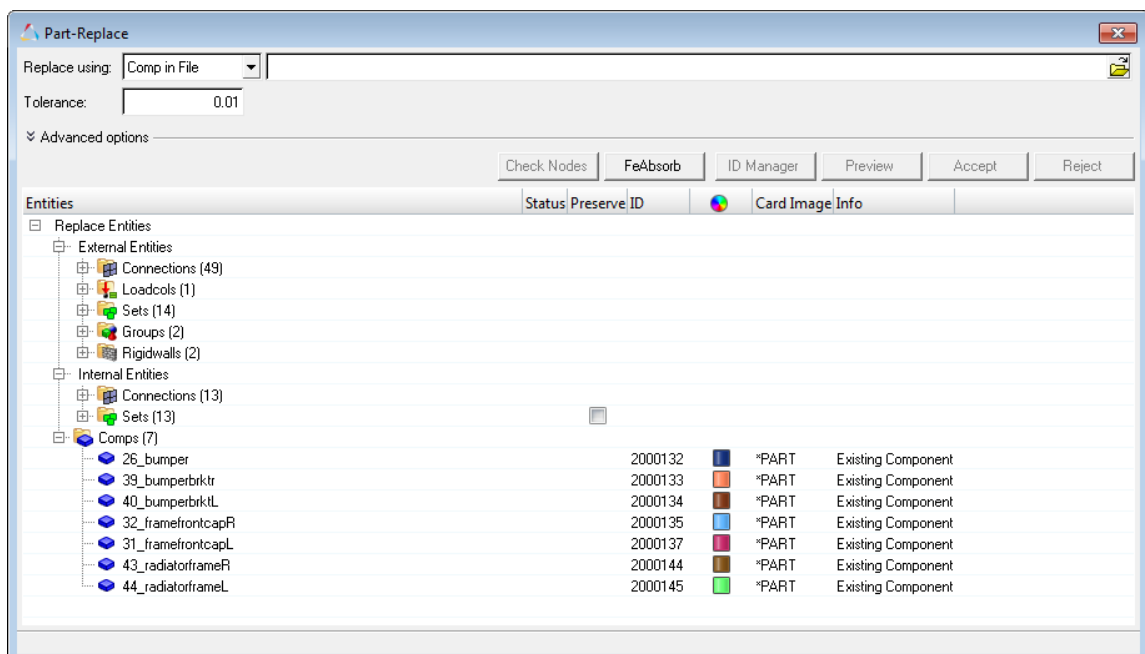
### Step 2:  Import the Solver Deck File

1.   Open the **Import - Solver Deck** tab by clicking *File* > *Import* > *Solver Deck* from the menu bar.

2.   In the **File** field, open the `Master.k` file.

3.   Click *Import*.

### Step 3: Replace Parts in the Pr_Inc.k Include File

1.  In the **Model** browser, right-click on the **Pr_Inc.k** Include file and select **Replace** > **Manual** from the context menu.
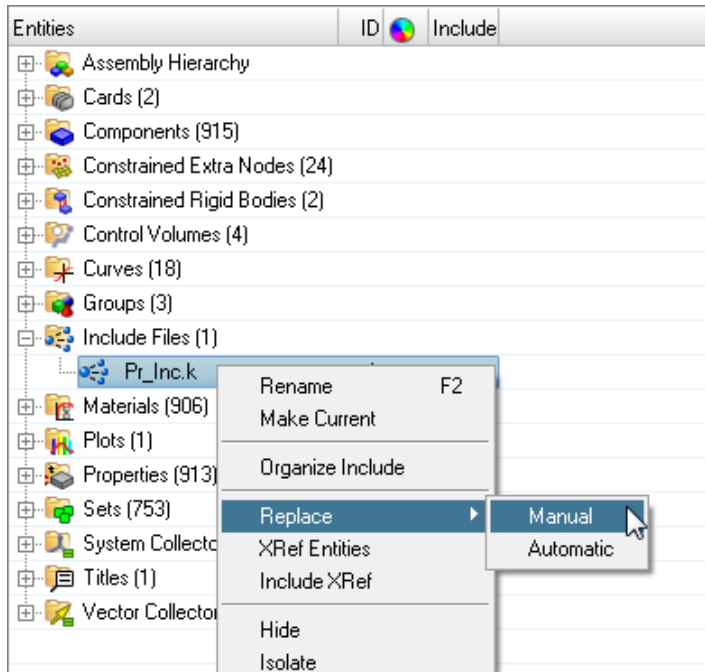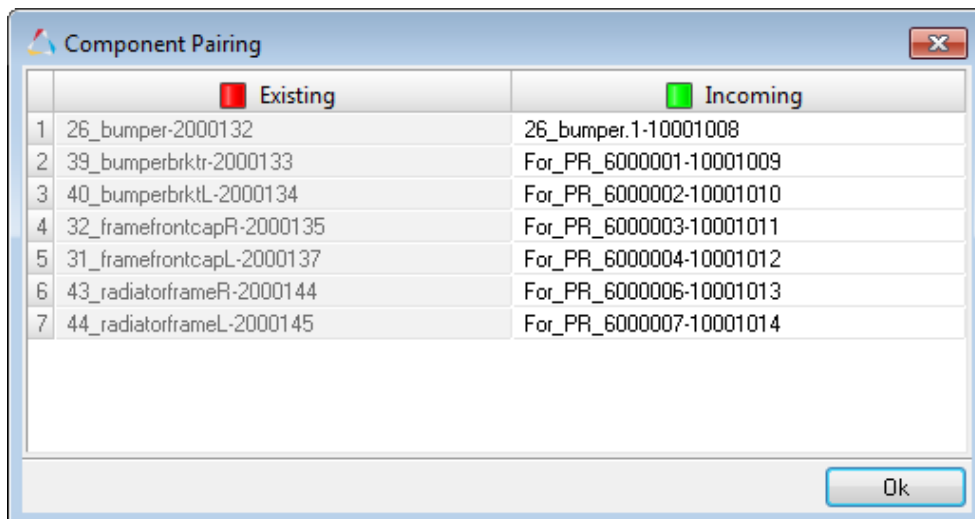


The **Part-Replace** dialog opens.

2.  Set the **Replace using** field to ***Comp in File***, then open the `Incoming_idclash.k` file, which contains the target, replacement parts.

    | Replace using: | Comp in File | ▼ | C:/hm_3450/Incoming_idclash.k |
    | --- | --- | --- | --- |
    | Tolerance: | | 0.01 | |
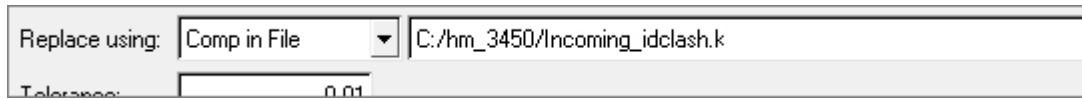
3.  In the **Tolerance** field, field, enter a tolerance to search for closest nodes and elements to re-establish the connections and other references between the target part and the model. For this tutorial, you can leave the default tolerance of `0.01`.

5.  Click ***Preview***.

6.  In the **Component Pairing** dialog, check the component pairing.

    a.  In the second row, note that there is one –two mapping. If it does not come up display, click on the second row to add the new pairing.

    b.  Click ***OK***.

    **Note**:   When performing Manual part replacement, you have the flexibility to modify the component pairing using add/remove pairing option in component pairing window; whereas, when performing Automatic part replacement, you cannot modify component pairing.

    | | Existing | Incoming |
    | --- | --- | --- |
    | 1 | 26_bumper-2000132 | 26_bumper.1-10001008 |
    | 2 | 39_bumperbrktr-2000133 | For_PR_6000001-10001009 |
    | 3 | 40_bumperbrktL-2000134 | For_PR_6000002-10001010 |
    | 4 | 32_framefrontcapR-2000135 | For_PR_6000003-10001011 |
    | 5 | 31_framefrontcapL-2000137 | For_PR_6000004-10001012 |
    | 6 | 43_radiatorframeR-2000144 | For_PR_6000006-10001013 |
    | 7 | 44_radiatorframeL-2000145 | For_PR_6000007-10001014 |

7.  In the **Entities Selection** dialog, specify replacement methods for incoming/existing entities and click ***OK***.

    External entities are shared with other components, along with the selected components that are being replaced (example: sets, groups, output blocks, and so on). Internal entities are specific to the components being replaced (example: sets, groups, output blocks, and so on).

    •   **Accept incoming entities (existing entities deleted)** deletes all of the internal entities on accept.

    •   **Accept existing entities (Incoming entities deleted)** deletes all of the incoming entities on accept.

    •   **Merge existing and incoming entities (no entities deleted)** retains both existing and incoming entities on accept.

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**Note:**      When performing Automatic part replacement, HyperMesh automatically selects the **Accept incoming entities (existing entities deleted)** method.
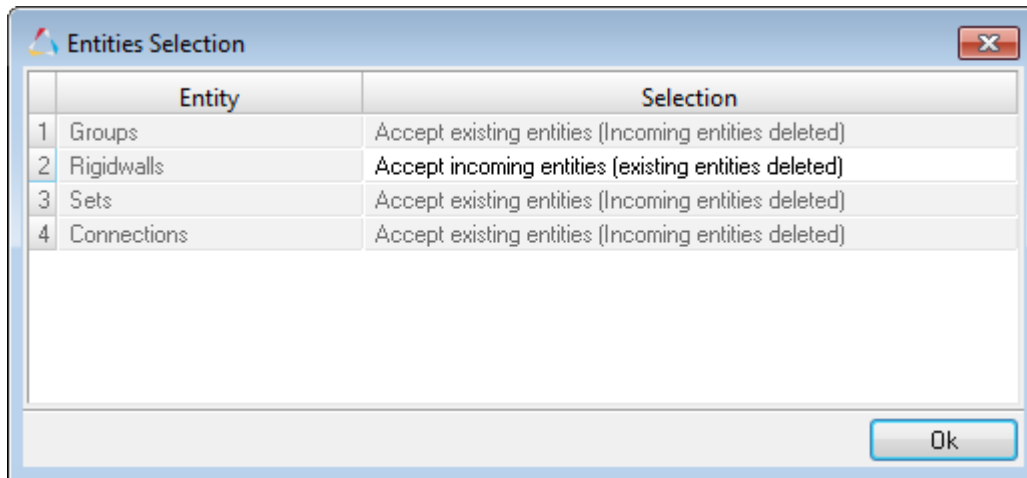


8.    Check the status of each entities.

       **Note:**      All internal entities are deleted, and all external entities are updated.
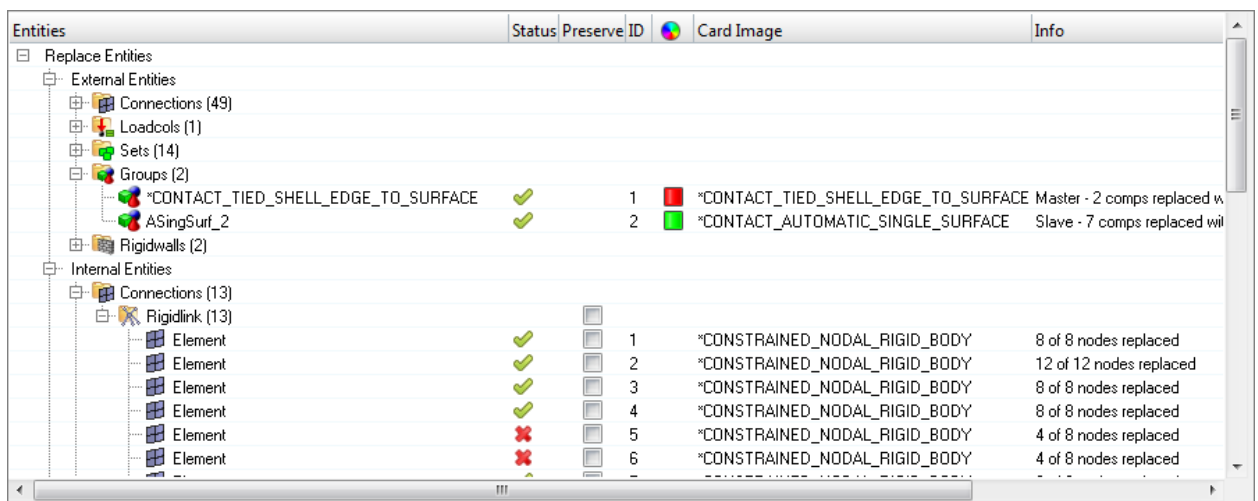


## Step 4: Review ID Ranges

1.    Click *ID Manager* to invoke the **ID-Manager**, from which you can review existing ID ranges defined for the components.

2.    Modify ID ranges as needed.

3.    Click *Close*.

## Step 5: Run Model Checker Post Part Replacement

1.    Under **Advanced options**, enable the ***Invoke Model Checker after Accept*** checkbox to automatically run the **Model Checker** after you click **Accept** in the **Part-Replace** dialog.

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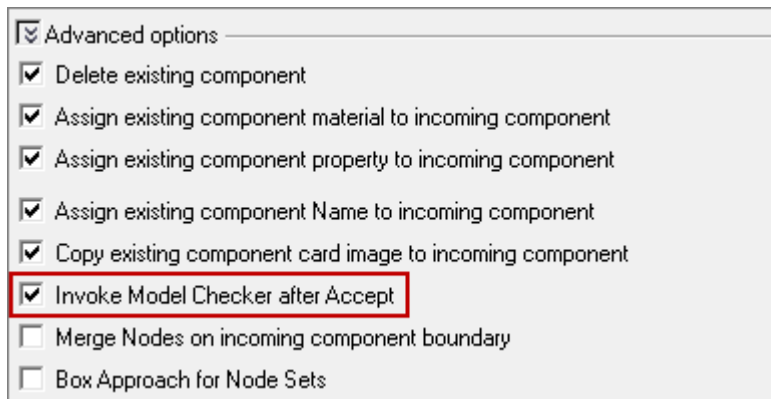
## Step 6: Accept Part Replacement Changes

1.  Click *Accept*. The source part is deleted and the connection of the new part to the model is accepted.