



Altair

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**HyperWorks**

## HM-3690: Remeshing Domains After Morphing

### Model Files

This exercise uses the `arm2D.hm` file, which can be found in the `hm.zip` file. Copy the file(s) from this directory to your working directory.

### Exercise: Remeshing Domains After Morphing

Depending on the morphing being performed, there is a possibility that the mesh can get distorted. For such cases, HyperMorph provides a remeshing capability. The advantage of this remeshing is that the newly created elements are automatically a part of the original domain. This provides continuity to the morphing process along with proper element quality.

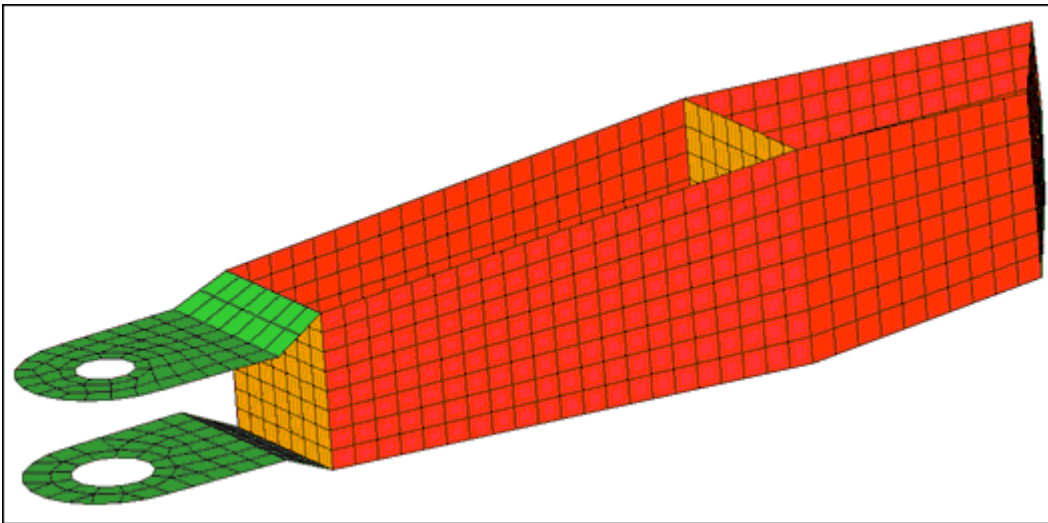


Figure 1: Model

#### Step 1: Load and review the model.

Open the HyperMesh file `arm2D.hm`.

#### Step 2: Set the morph options.

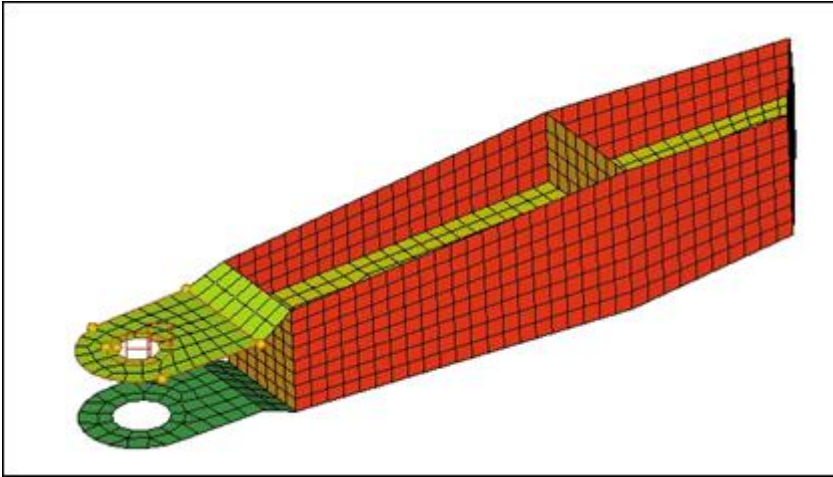
1. From the menu bar select **Morphing > Assign > Morph Options**.
2. Select the **auto qa** subpanel.
3. Switch **auto quality check** to **2D jacobian**.
4. Set **limit =** to **0.7**.

#### Step 3: Create domains and handles.

1. From the menu bar select **Morphing > Create > Domains**.
2. Switch the creation type to **2D domains**.
3. Switch from **all elems** to **elems**.

4. Use **elems >> by sets** and select **set\_1**.
5. Click **select**.
6. Click **create** to create the domain.
7. Use **elems >> by sets** and select **set\_2**.
8. Click **select**.
9. Click **create** to create the domain.

**Note:** Two **2D domains** are created.



#### Step 4: Translate the washer.

1. From the menu bar select **Morphing > Morph**, then select **move handles**.
2. Switch the mode to **translate**.
3. Switch the **along** option to **along vector**.
4. Select **N1** and **N2** as shown in figure 2.

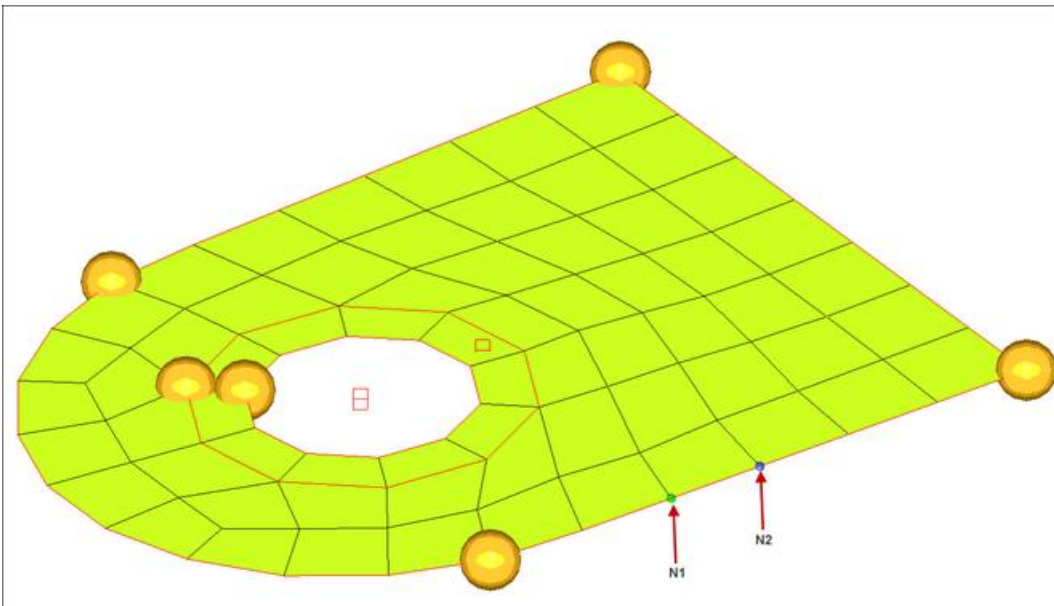


Figure 2: Selecting N1 and N2 for the translate vector

5. Set **dist = 0.25**.

6. Select the two handles on the washer.
7. Click **morph** to morph the washer.

The elements outside the washer get compressed as the washer moves. Also, as the elements fail (jacobian < 0.7) they are highlighted (figure 3).

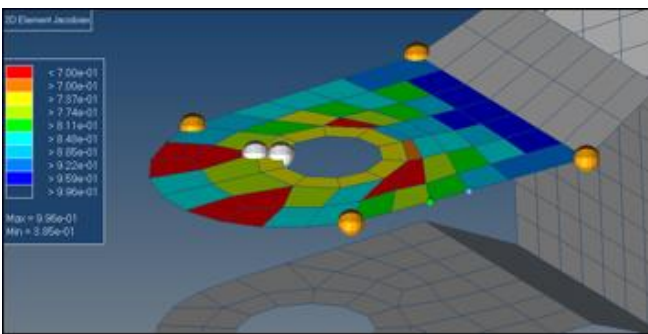
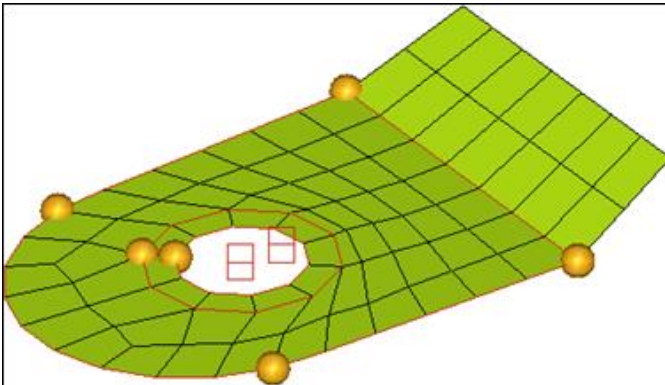
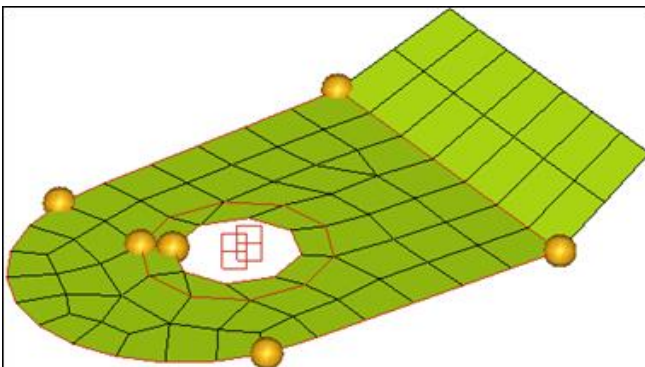


Figure 3: Elements after morphing and quality check on Jacobian 2D

### Step 5: Remesh the domain.

1. From the menu bar select **Morphing** > **Create** > **Domains** and then select the **update** subpanel.
2. Switch the update option to **remesh 2D/3D**.
3. Switch **new mesh type:** to **quads**.
4. Select both 2-D domains on the model.
5. Click **calc avg** to get the average element size.
6. Click **remesh** to remesh the domain.



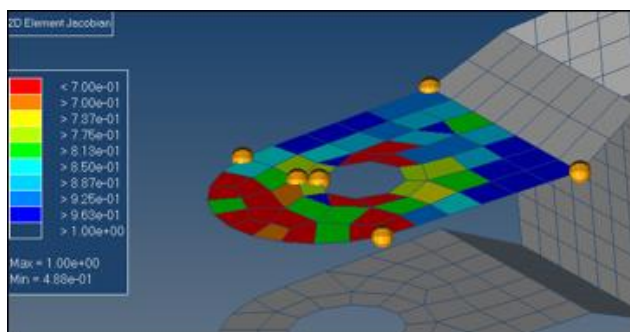


Figure 4: Updated mesh and quality check

The mesh is updated.

## Summary

Using this technique, you can update the mesh in regions that might have undergone excessive elemental deformation during morphing. Since the domains and handles are maintained, it allows you to conduct further morphing if need be.