

ANSYS - Crank 9 Validate the results Content

Step 9: Validate the results

It is **very important** that you take the time to check the validity of your solution. This section leads you through some of the steps you can take to validate your solution.

Simple Checks

Does the deformed shape look reasonable and agree with the applied boundary conditions? We checked this in step 8.

Do the reactions at the supports balance the applied forces for static equilibrium? To check this, select

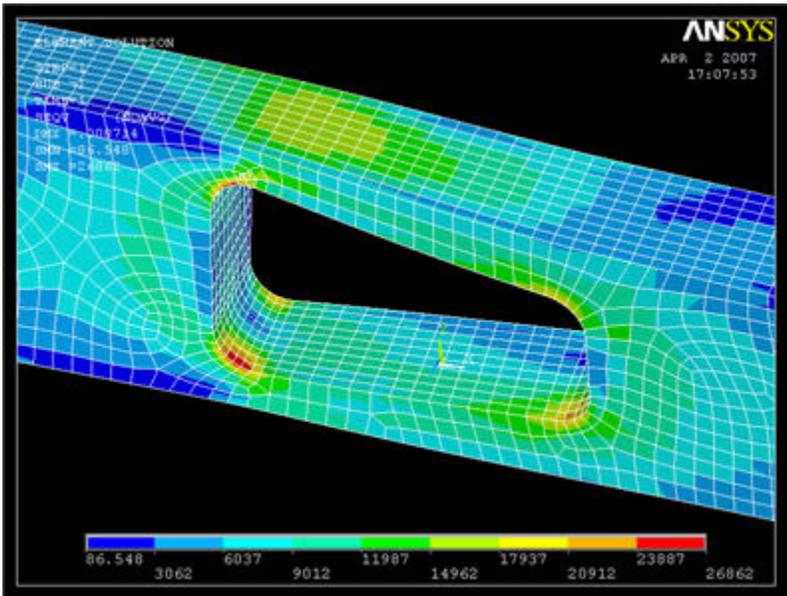
Main Menu > General Postproc > List Results > Reaction Solu

Select All struc forc F for Item to be listed and click OK. The forces in the X and Z directions are essentially zero and the total Y-reaction is 100.00 (lbf) as expected.

Refine Mesh

Let's repeat the solution on a finer mesh with more divisions in the z-direction. Repeat the mesh steps for the MESH200 element, but this time use smart size 3 and element size of 0.08. Repeat the mesh steps for the SOLID45 element and set the element edge length to 0.05 instead of 0.125. This will create 10 divisions through the thickness of the crank instead of 4. When warned that the picked volumes are already meshed, check Yes and click OK to remesh.

Obtain a new solution and plot the elemental solution of the von Mises stress:



	Coarser Mesh	Finer Mesh
DM X	0.026188in	0.026652 in
SMX	28883psi	26862psi

The maximum displacement at the tip of shaft is 1.8% greater and the maximum stress is 7.0% less at the upper-left corner of the cutout. We need to further refine the mesh to validate the solution.

Exit ANSYS

Utility Menu > File > Exit

Select Save Everything and click OK.