Modeling Bolt Threads Using Contacts Instead of the Thread Geometry

A useful feature introduced in Ansys 15.0 is the ability to model bolt threads using contacts instead of modeling the actual thread geometry in Workbench.

Modeling and meshing threaded interfaces is a time consuming and difficult analysis and many times can be unnecessary when the bolt is used simply as a means to transfer loads. In Ansys 15.0, bolt threads can be implemented but also greatly simplified through the use of the Contact Geometry.
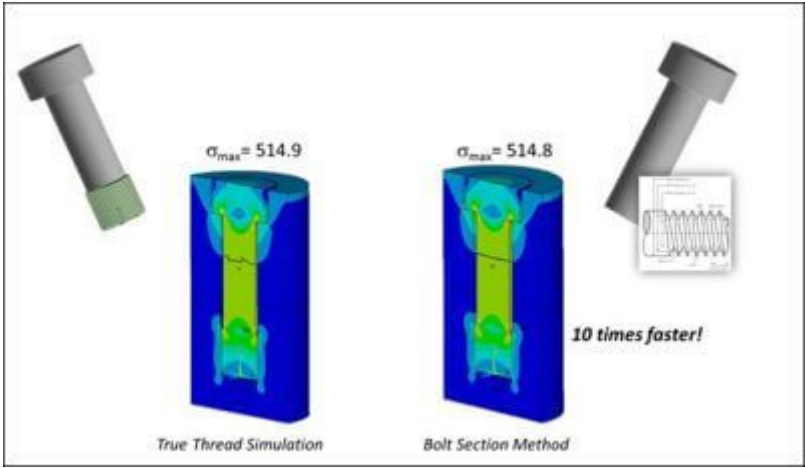

Make use of the Bolt Thread Geometry

To make use of the Bolt Thread Geometry Correction the user will model straight cylinders for the threaded portion of the bolt interface. Contacts are setup per usual and then under the details section the user defines the thread properties as shown in the figure below.

## Things to Note: Bolt Threads

There are a few things to know about this feature. First, all contact type settings are available except Bonded. Also, in order to obtain more accurate results, it is recommended that the mesh quality in the threaded region is at least 1/4 of the pitch distance.


The Bolt Thread Geometry Correction saves significant time by not having to model the threads and create a highly refined mesh. Likewise, solve times are much quicker using this feature and the results are near the accuracy of a true threaded–bolt model. As the figures illustrate above, the max stress from both analyses are almost equal and the stress contour bands look very similar.
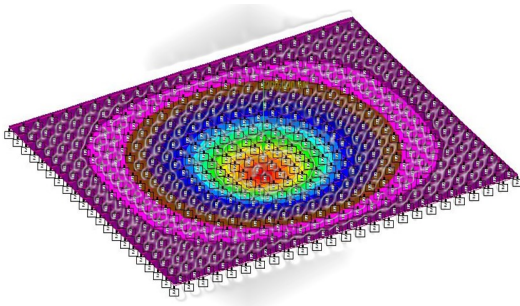
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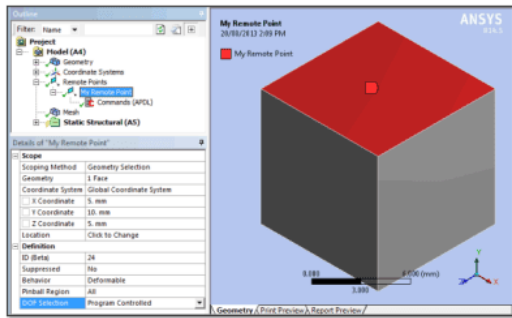
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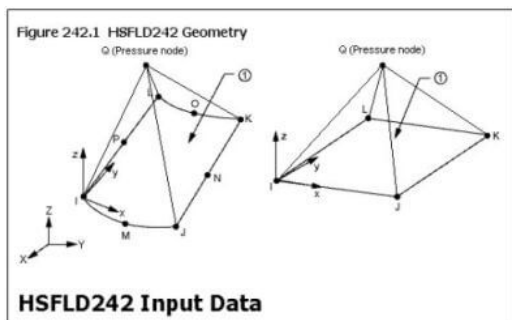
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