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| Steering Rack FEA 04/25/2019Assumptions |

* Resultant force of 2000N applied at a 15 degree angle
* Support reaction occurs on the face of a single tooth
* Rack surface is a frictionless slider

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| Material Properties  |  |  | | --- | --- | | ****Model Reference**** | ****Properties**** | |  | |  |  | | --- | --- | | ****Name:**** | **6061-T6 (SS)** | | ****Model type:**** | **Linear Elastic Isotropic** | | ****Default failure criterion:**** | **Unknown** | | ****Yield strength:**** | **2.75e+008 N/m^2** | | ****Tensile strength:**** | **3.1e+008 N/m^2** | | ****Elastic modulus:**** | **6.9e+010 N/m^2** | | ****Poisson's ratio:**** | **0.33** | | ****Mass density:**** | **2700 kg/m^3** | | ****Shear modulus:**** | **2.6e+010 N/m^2** | | ****Thermal expansion coefficient:**** | **2.4e-005 /Kelvin** | | |

**Mesh Details**

* **Mesh Type: Automatic**
* **Number of Cells: 13875**
* **Refinement: No**
* **Topology Criteria: NA**
* **Topology Percentage: NA**

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| **Loads and Fixtures**  | ****Fixture Name**** | ****Fixture Image**** | ****Fixture Details**** | | --- | --- | --- | | **Fixed-5** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Fixed Geometry** | | | **Roller/Slider-4** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Roller/Slider** | |  | ****Load Name**** | ****Load Image**** | ****Load Details**** | | --- | --- | --- | | **Force-3** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Apply normal force** | | Value: | **1930 N** | | | **Force-4** |  | |  |  | | --- | --- | | Entities: | **1 face(s)** | | Type: | **Apply force** | | Values: | **520 N** | | |

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| Study Results  | Name | Type | Max | | --- | --- | --- | | Stress | VON: von Mises Stress | 1.648e+007N/m^2 | |  | | |  | Name | Type | Max | | --- | --- | --- | | Displacement | URES: Resultant Displacement | 2.464e-002mm | |  | | | |