

Description

This is the current crank arm with the new force of 9 lbf evenly distributed along the crank arm handle.

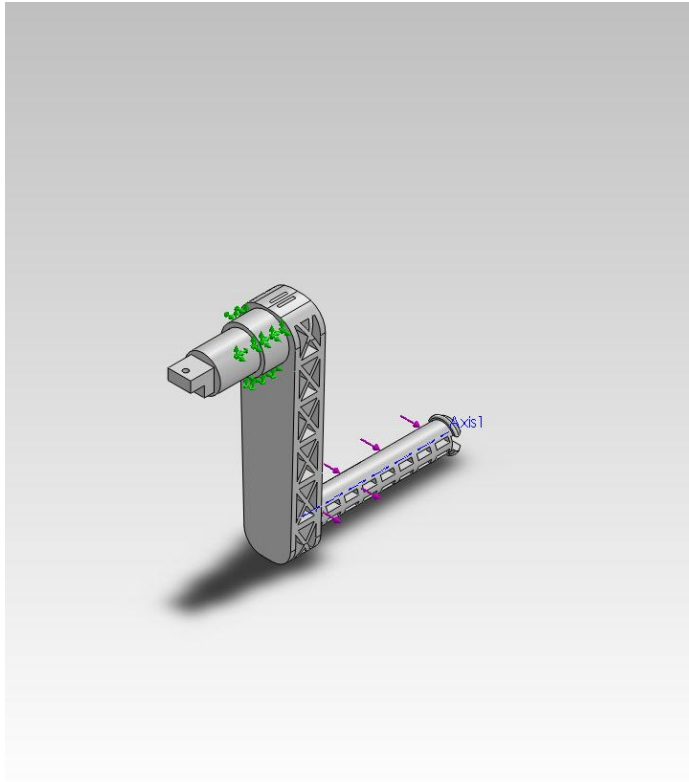
Simulation of Current_Crank_Arm (F)

Date: Tuesday, November 06, 2012
Designer: Nick Higgins
Study name: SimulationXpress Study
Analysis type: Static

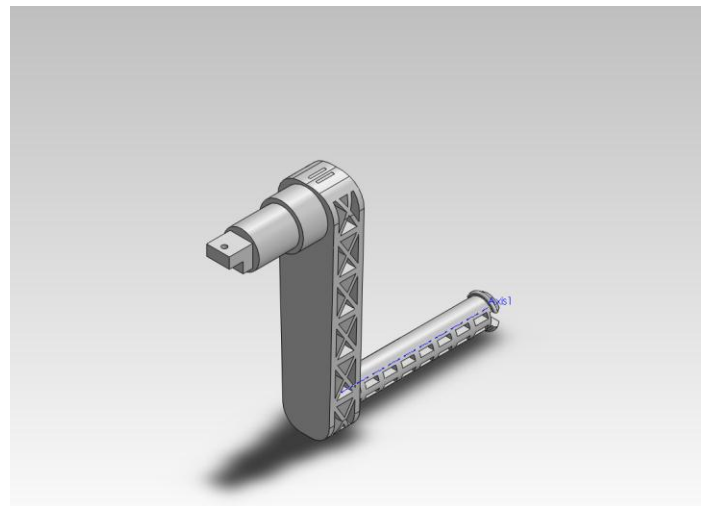
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Assumptions

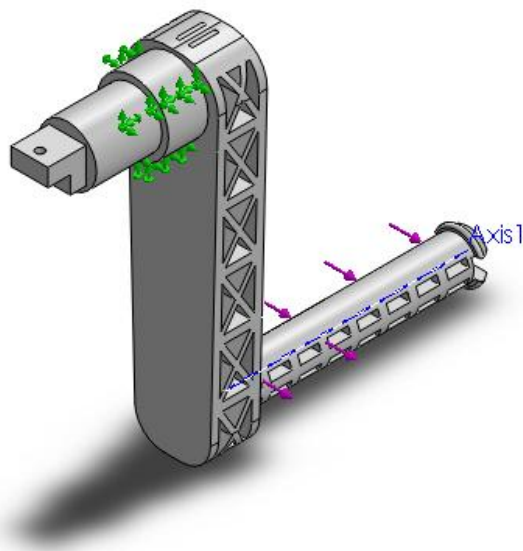


Original Model



Model Analyzed

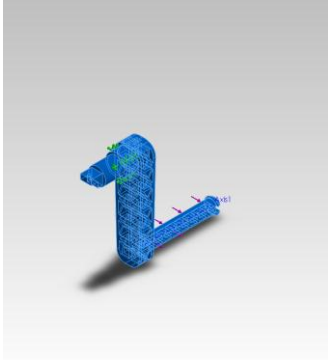
Model Information



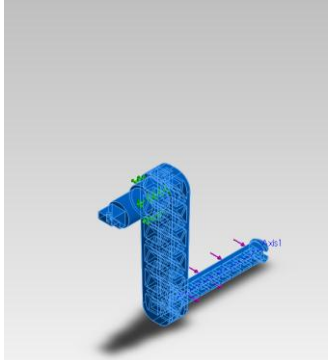
Model name: Current_Crank_Arm (F)
Current Configuration: Default

Solid Bodies

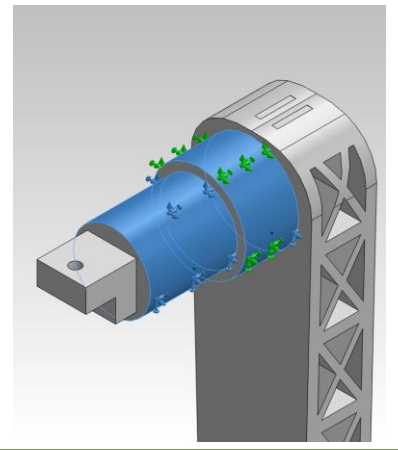
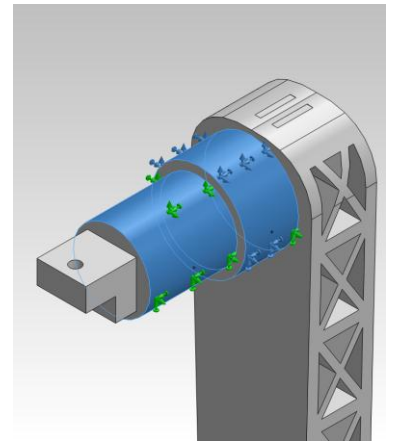
| Document Name and Reference | Treated As | Volumetric Properties | Document Path/Date Modified |
|-----------------------------|------------|-----------------------|-----------------------------|
|-----------------------------|------------|-----------------------|-----------------------------|

| | | | |
|---|-------------------|---|--|
| <p>Cut-Extrude7</p>  | <p>Solid Body</p> | <p>Mass:0.408125 lb Volume:10.8775 in³ Density:0.03752 lb/in³ Weight:0.407849 lbf</p> | <p>E:\Sr. Design\Concept Parts\Current CAD\Current_Crank_Arm (F).SLDPRT Nov 04 17:23:36 2012</p> |
|---|-------------------|---|--|

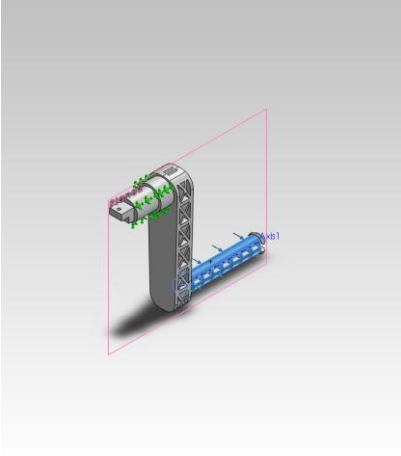
Material Properties

| Model Reference | Properties | Components |
|--|--|---|
|  | <p>Name: HARBEC Plastic Model type: Linear Elastic Isotropic Default failure criterion: Max von Mises Stress Tensile strength: 10700 psi</p> | <p>SolidBody 1(Cut-Extrude7)(Current_Crank_Arm (F))</p> |

Loads and Fixtures

| Fixture name | Fixture Image | Fixture Details |
|--------------|--|---|
| Fixed-1 |  | <p>Entities: 2 face(s) Type: Fixed Geometry</p> |
| Fixed-2 |  | <p>Entities: 2 face(s) Type: Fixed Geometry</p> |

| Load name | Load Image | Load Details |
|-----------|------------|--------------|
|-----------|------------|--------------|

| | | |
|----------------|--|--|
| <p>Force-2</p> |  A 3D CAD model of a crank arm, which is an L-shaped component. The vertical part is on the left, and the horizontal part is on the right. A red rectangular plane is shown on the top surface of the vertical part, with green arrows pointing downwards, indicating the application of a force. The horizontal part has blue arrows pointing to the right, indicating a reaction force or constraint. The label 'Force-2' is visible in the left column of the table. | <p>Entities: 1 face(s), 1 plane(s) Reference: Plane2 Type: Apply force Values: ---, ---, 9 lbf</p> |
|----------------|--|--|

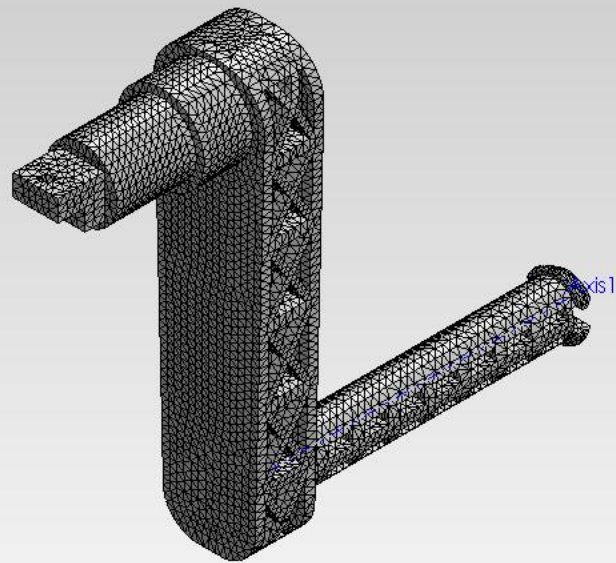
Mesh Information

| | |
|--------------------------|---------------|
| Mesh type | Solid Mesh |
| Mesher Used: | Standard mesh |
| Automatic Transition: | Off |
| Include Mesh Auto Loops: | Off |
| Jacobian points | 4 Points |
| Element Size | 0.111355 in |
| Tolerance | 0.00556773 in |
| Mesh Quality | High |

Mesh Information - Details

| | |
|--------------------------------------|----------|
| Total Nodes | 101685 |
| Total Elements | 61890 |
| Maximum Aspect Ratio | 15.27 |
| % of elements with Aspect Ratio < 3 | 99.3 |
| % of elements with Aspect Ratio > 10 | 0.0145 |
| % of distorted elements(Jacobian) | 0 |
| Time to complete mesh(hh:mm:ss): | 00:00:31 |
| Computer name: | TWCVIA07 |

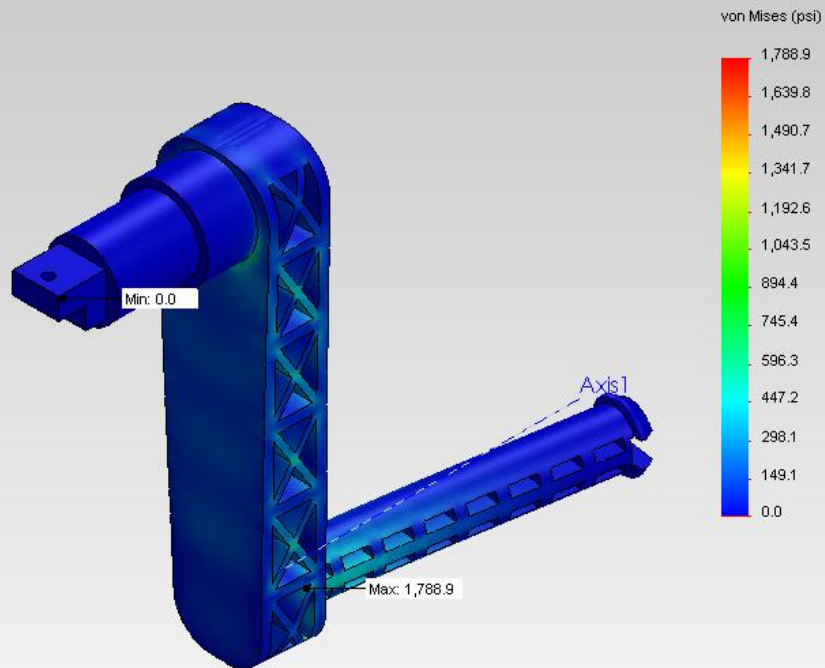
Model name: Current_Crank_Arm (F)
Study name: SimulationXpress Study
Mesh type: Solid mesh



Study Results

| Name | Type | Min | Max |
|--------|-----------------------|---------------------------------|---------------------------|
| Stress | VON: von Mises Stress | 1.96153e-006 psi Node: 42179 | 1788.87 psi Node: 9005 |

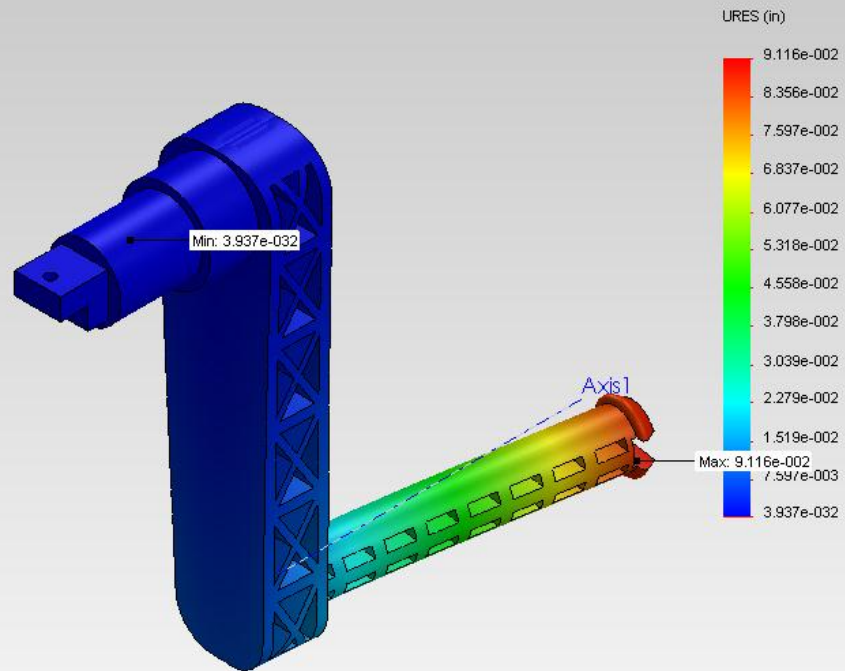
Model name: Current_Crank_Arm (F)
Study name: SimulationXpress Study
Plot type: Static nodal stress Stress
Deformation scale: 9.20849



Current_Crank_Arm (F)-SimulationXpress Study-Stress-Stress

| Name | Type | Min | Max |
|--------------|------------------------------|------------------|---------------------------|
| Displacement | URES: Resultant Displacement | 0 in Node: 62 | 0.0911613 in Node: 587 |

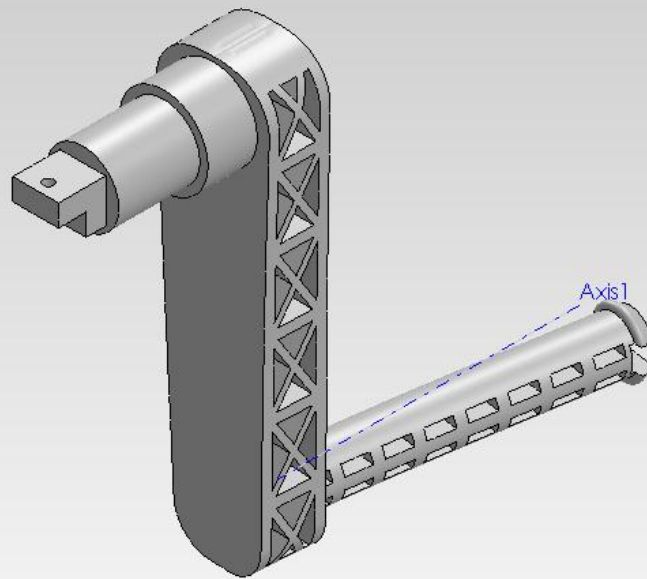
Model name: Current_Crank_Arm (F)
Study name: SimulationXpress Study
Pic type: Static displacement Displacement
Deformation scale: 9.20849



Current_Crank_Arm (F)-SimulationXpress Study-Displacement-Displacement

| Name | Type |
|-------------|----------------|
| Deformation | Deformed Shape |

Model name: Current_Crank_Arm (F)
Study name: SimulationXpress Study
Pic type: Deformed Shape Deformation
Deformation scale: 9.20849



Current_Crank_Arm (F)-SimulationXpress Study-Displacement-Deformation

Conclusion