

Description

This is the current crank arm with the new force of 25lbf evenly distributed along the pedal shaft.

Simulation of Current_Crank_Arm (F)

Date: Tuesday, November 06, 2012

Designer: Nick Higgins

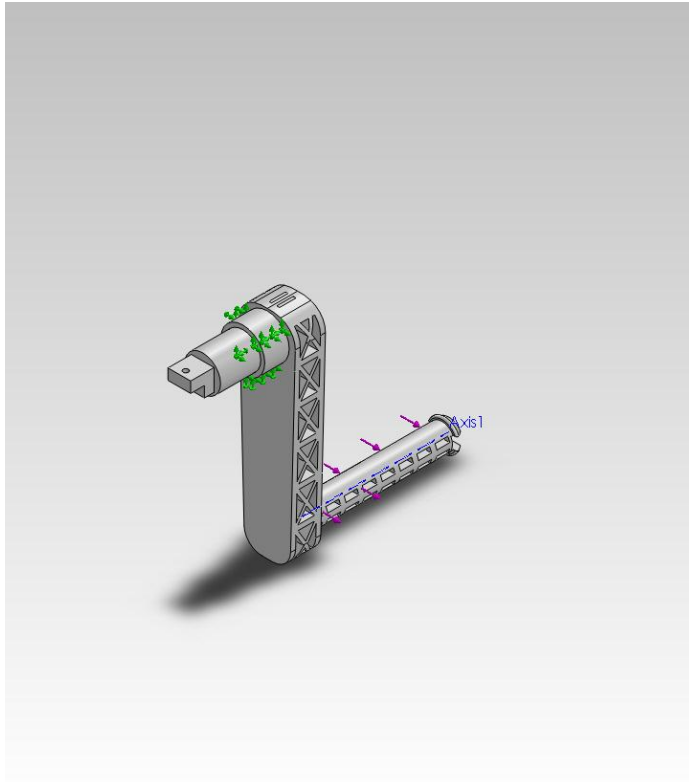
Study name: SimulationXpress Study

Analysis type: Static

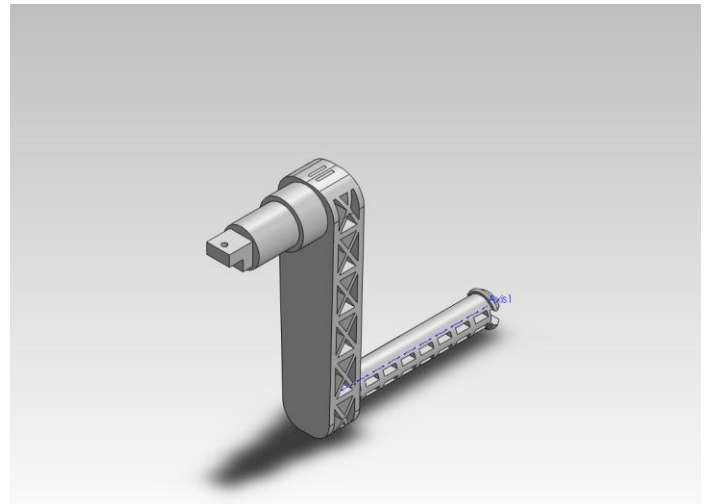
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Assumptions

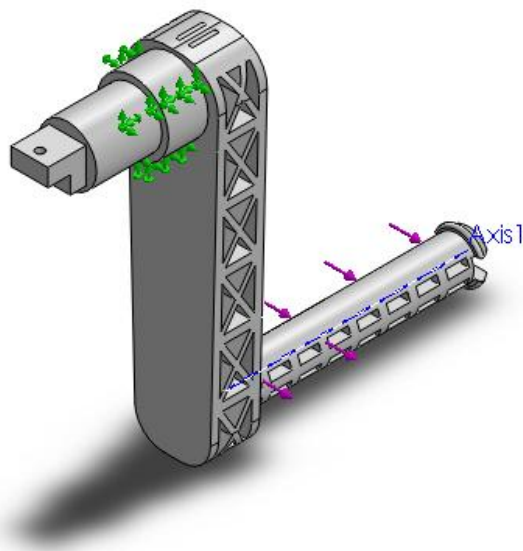


Original Model



Model Analyzed

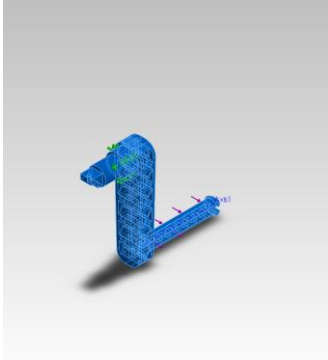
Model Information



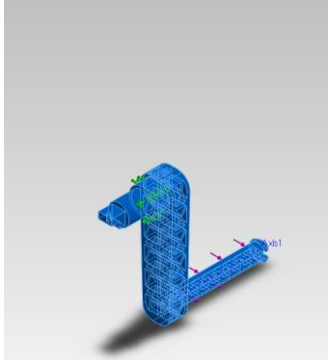
Model name: Current_Crank_Arm (F)
Current Configuration: Default

Solid Bodies

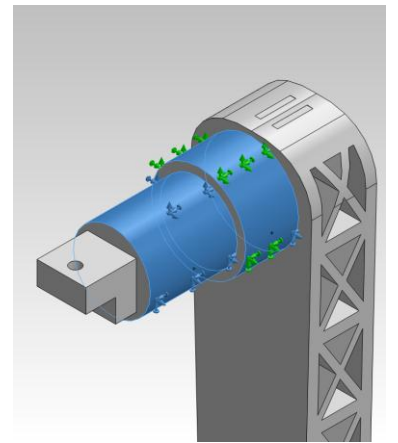
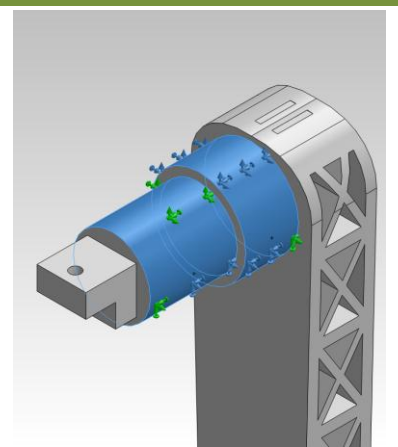
Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
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<p>Cut-Extrude7</p> 	<p>Solid Body</p>	<p>Mass:0.408125 lb Volume:10.8775 in³ Density:0.03752 lb/in³ Weight:0.407849 lbf</p>	<p>E:\Sr. Design\Concept Parts\Current CAD\Current_Crank_Arm (F).SLDPRT Nov 04 17:23:36 2012</p>
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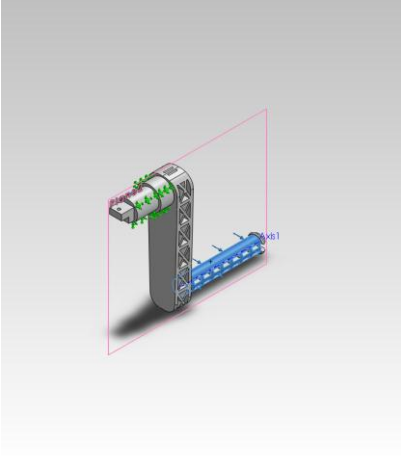
Material Properties

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
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<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 extends to the right. A red rectangular plane is shown on the top surface of the vertical part, with green arrows pointing downwards, representing an applied force. The horizontal part has blue arrows pointing to the right, representing a reaction force. 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: ---, ---, 25 lbf</p>
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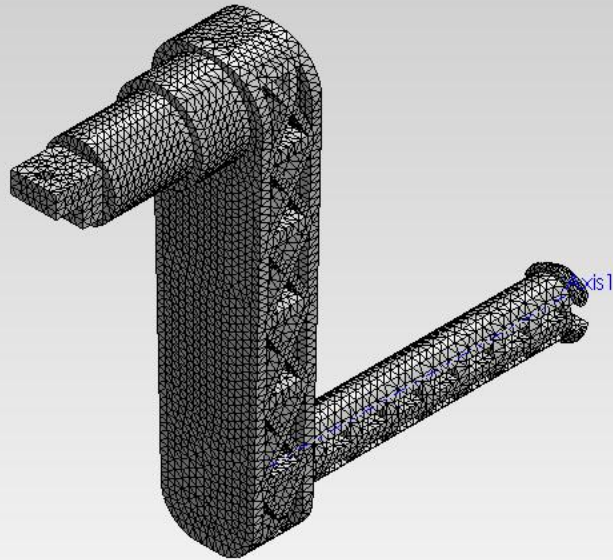
Mesh Information

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

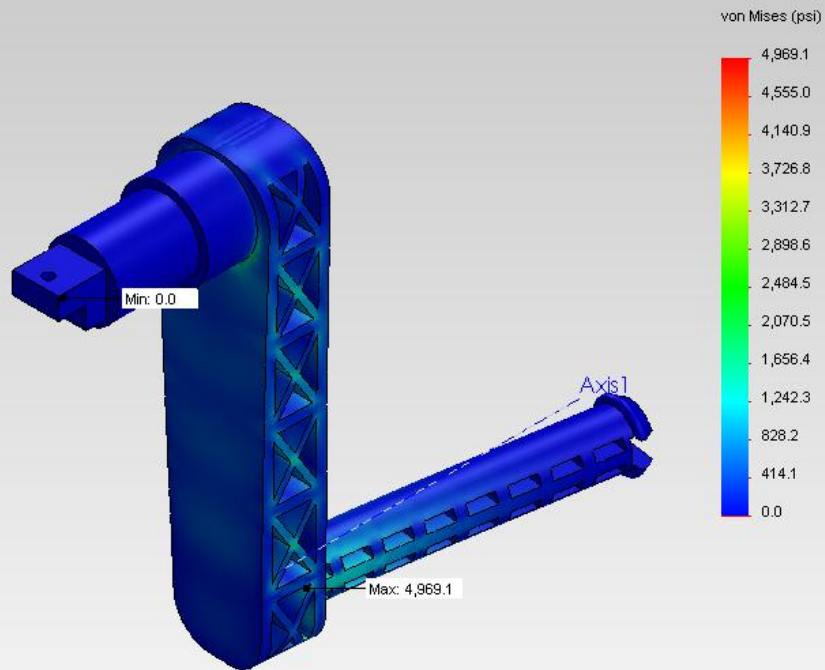
Model name: Current_Crank_Arm (F)
Study name: SimulationXpress Study
Mesh type: Solid mesh



Study Results

Name	Type	Min	Max
Stress	VON: von Mises Stress	5.44832e-006 psi Node: 42179	4969.09 psi Node: 9005

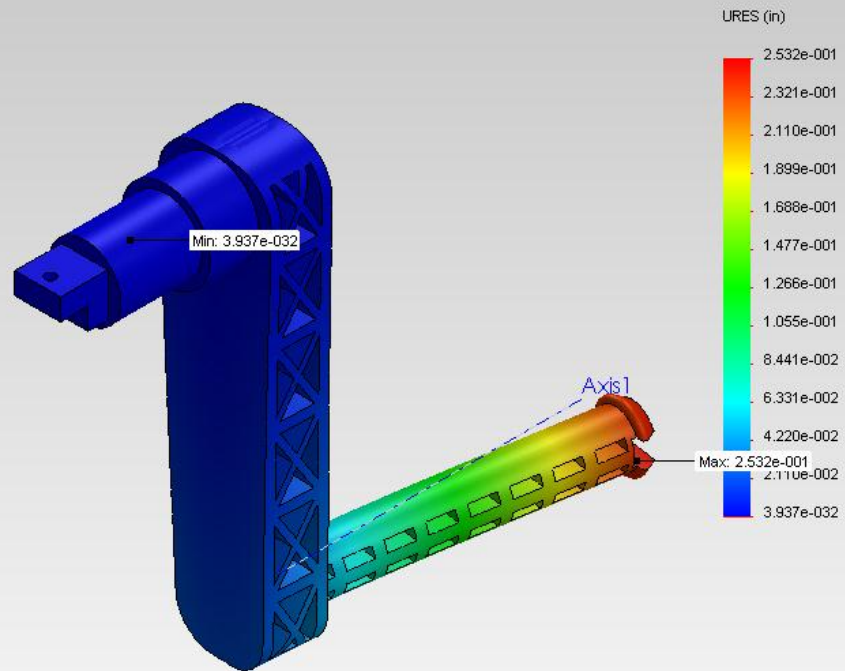
Model name: Current_Crank_Arm (F)
Study name: SimulationXpress Study
Plot type: Static nodal stress Stress
Deformation scale: 3.31506



Current_Crank_Arm (F)-SimulationXpress Study-Stress-Stress

Name	Type	Min	Max
Displacement	URES: Resultant Displacement	0 in Node: 62	0.253226 in Node: 587

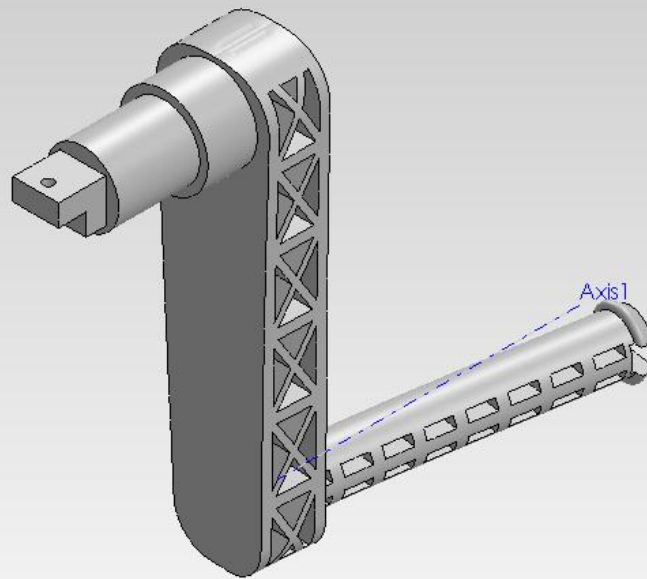
Model name: Current_Crank_Arm (F)
Study name: SimulationXpress Study
Plot type: Static displacement Displacement
Deformation scale: 3.31506



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: 3.31506



Current_Crank_Arm (F)-SimulationXpress Study-Displacement-Deformation

Conclusion