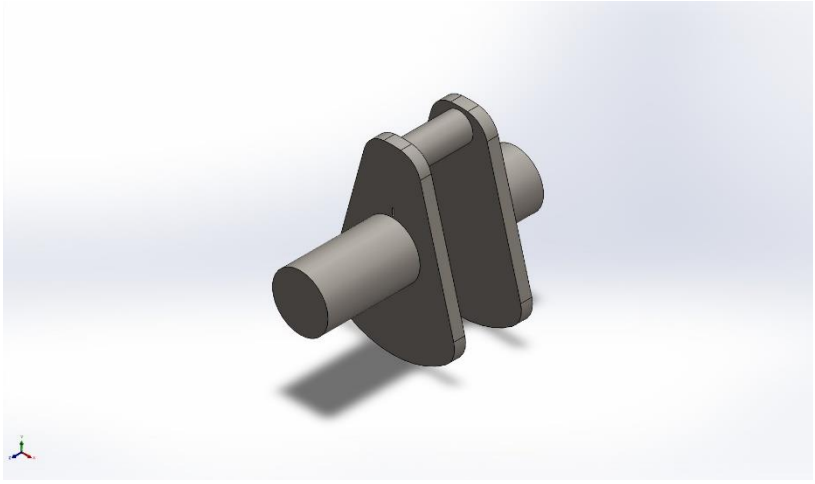


Simulation of crankShaft

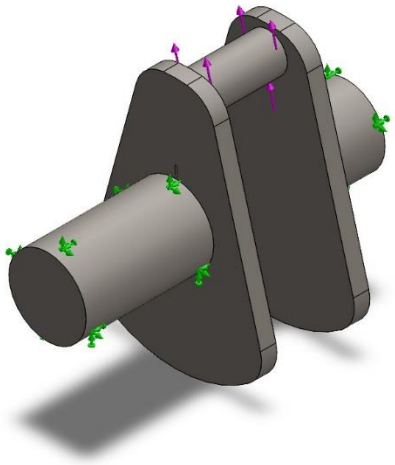
Date: 07 March 2024
Designer: Solidworks
Study name: Static 1
Analysis type: Static

Table of Contents

Description

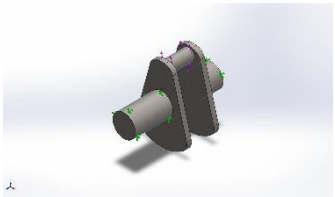
Analysis of crank-shaft with crank pin subjected to forces transmitted by connecting rod.

Model Information



Model name: crankShaft
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	
Cut-Extrude1 	Solid Body	**Mass:0.00205798 kg** **Volume:2.6727e-07 m^3** **Density:7,700 kg/m^3** **Weight:0.0201682 N**	

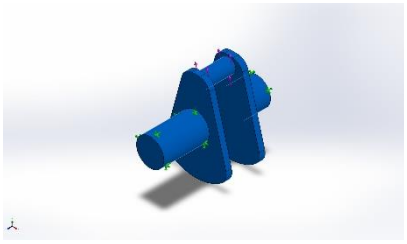
Study Properties

Study name	Static 1
Analysis type	Static
Mesh type	Solid Mesh
Thermal Effect:	On
Thermal option	Include temperature loads
Zero strain temperature	298 Kelvin
Include fluid pressure effects from SOLIDWORKS Flow Simulation	Off
Solver type	Automatic
Inplane Effect:	Off
Soft Spring:	Off
Inertial Relief:	Off
Incompatible bonding options	Automatic
Large displacement	On
Compute free body forces	On
Friction	Off
Use Adaptive Method:	Off

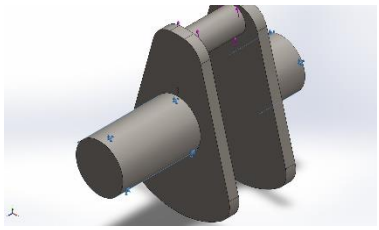
Units

Unit system:	SI (MKS)
Length/Displacement	mm
Temperature	Kelvin
Angular velocity	Rad/sec
Pressure/Stress	N/m^2

Material Properties

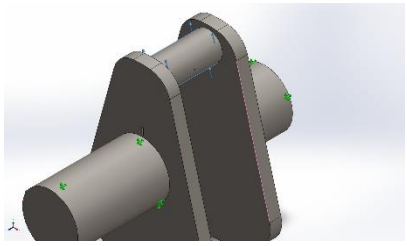
Model Reference	Properties		Components
	**Name:** **Model type:** **Default failure criterion:** **Yield strength:** **Tensile strength:** **Elastic modulus:** **Poisson's ratio:** **Mass density:** **Shear modulus:** **Thermal expansion coefficient:**	Alloy Steel (SS) Linear Elastic Isotropic Max von Mises Stress 6.20422e+08 N/m^2 7.23826e+08 N/m^2 2.1e+11 N/m^2 0.28 7,700 kg/m^3 7.9e+10 N/m^2 1.3e-05 /Kelvin	SolidBody 1(Cut-Extrude1)(crankShaft)
Curve Data:N/A			

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1		**Entities:** 2 face(s) **Type:** Fixed Geometry

Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	15,755.8	-57,889.6	-1.11643	59,995.4
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Force-1		**Entities:** 1 face(s) **Reference:** Edge< 1 > **Type:** Apply force **Values:** ---, ---, 60,000 N

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Blended curvature-based mesh
Jacobian points for High quality mesh	16 Points
Maximum element size	0.853922 mm
Minimum element size	0.64447 mm
Mesh Quality	High

Mesh information - Details

Total Nodes	7021
Total Elements	3913
Maximum Aspect Ratio	13.626
% of elements with Aspect Ratio < 3	98.4
Percentage of elements with Aspect Ratio > 10	0.0256
Percentage of distorted elements	0
Time to complete mesh(hh;mm;ss):	00:00:04
Computer name:	Amol Kamal

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	15,755.8	-57,889.6	-1.11643	59,995.4

Reaction Moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	0

Free body forces

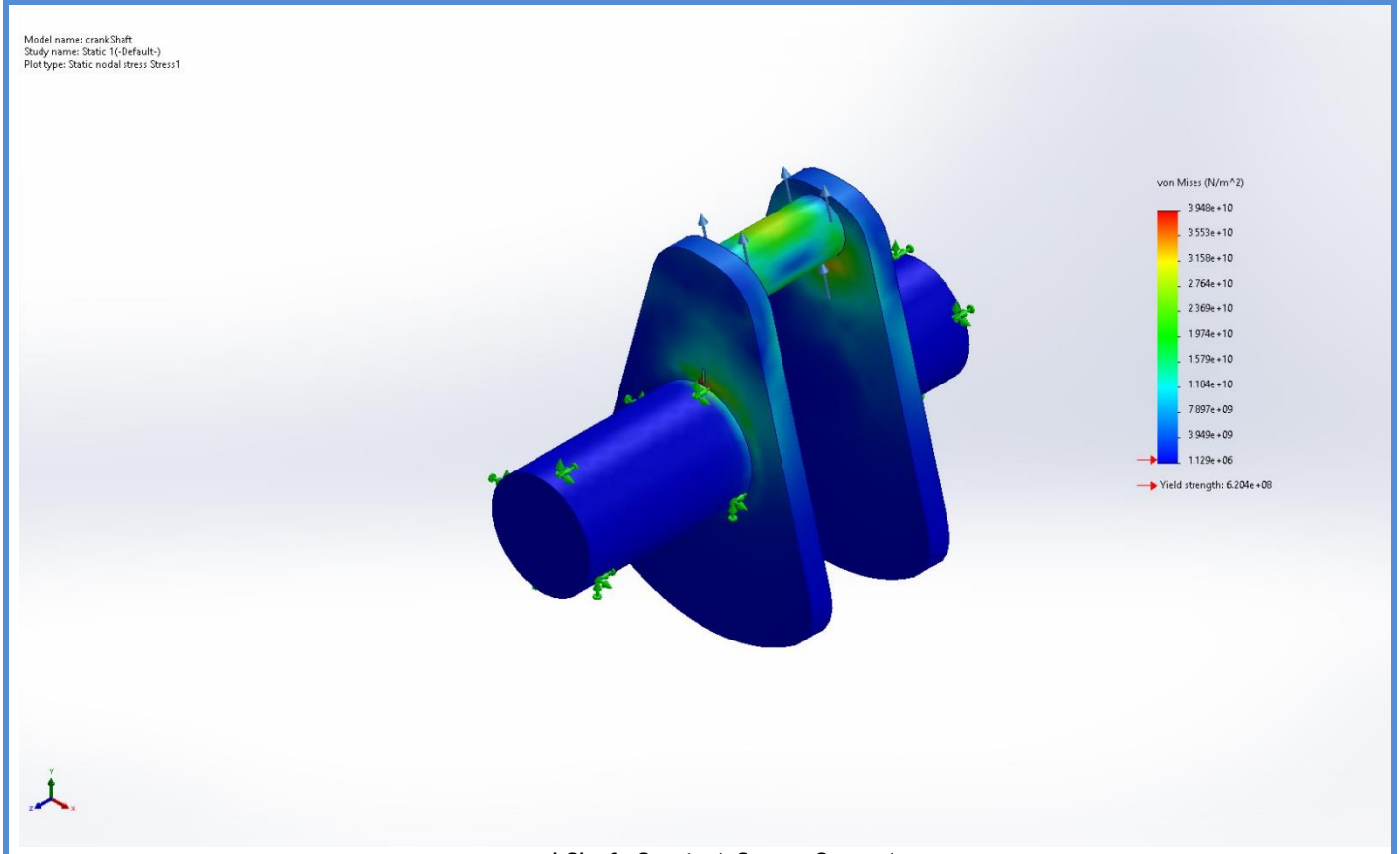
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	0	0	0	0

Free body moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	0

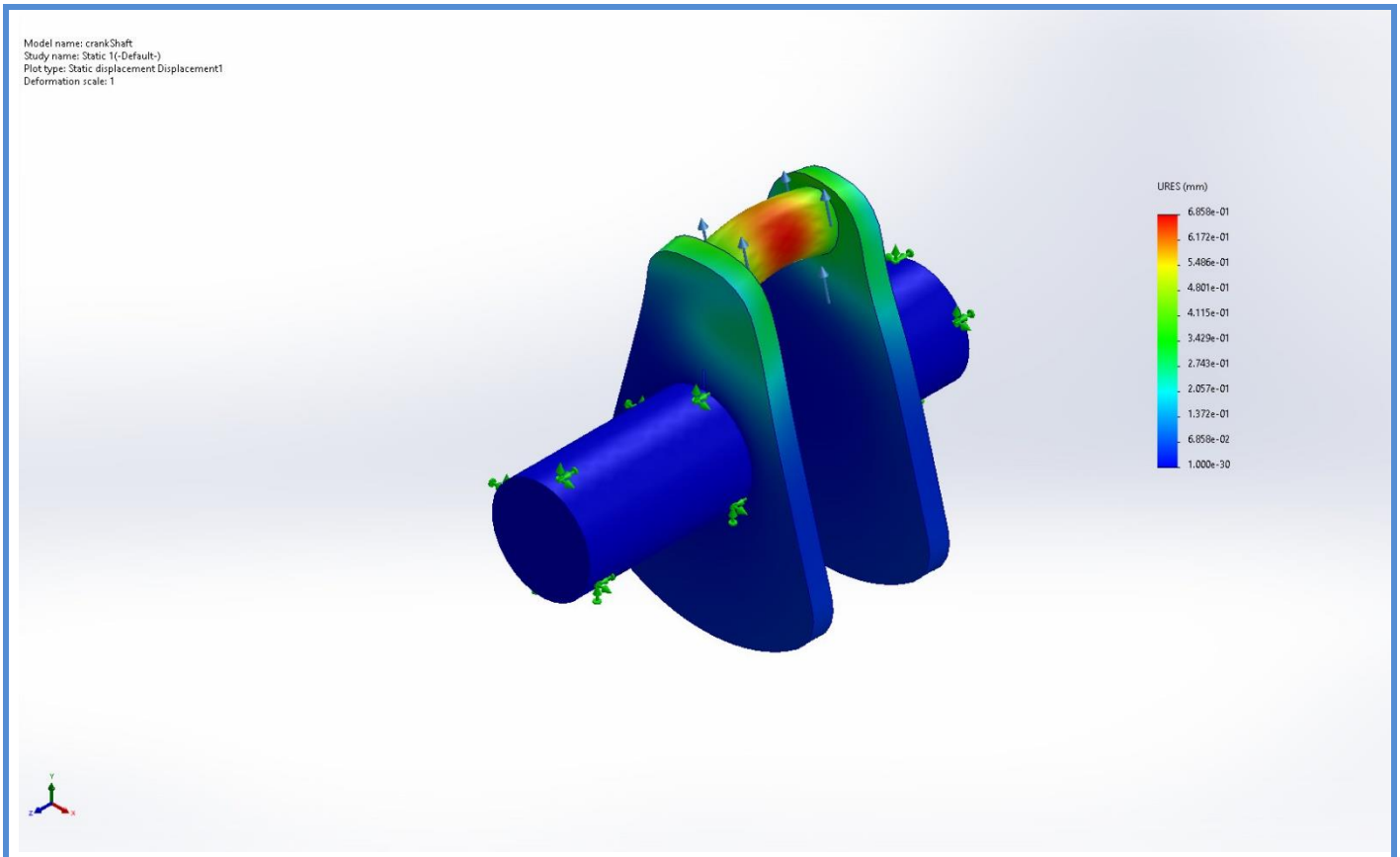
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	1.129e+06N/m^2 Node: 2358	3.948e+10N/m^2 Node: 4379



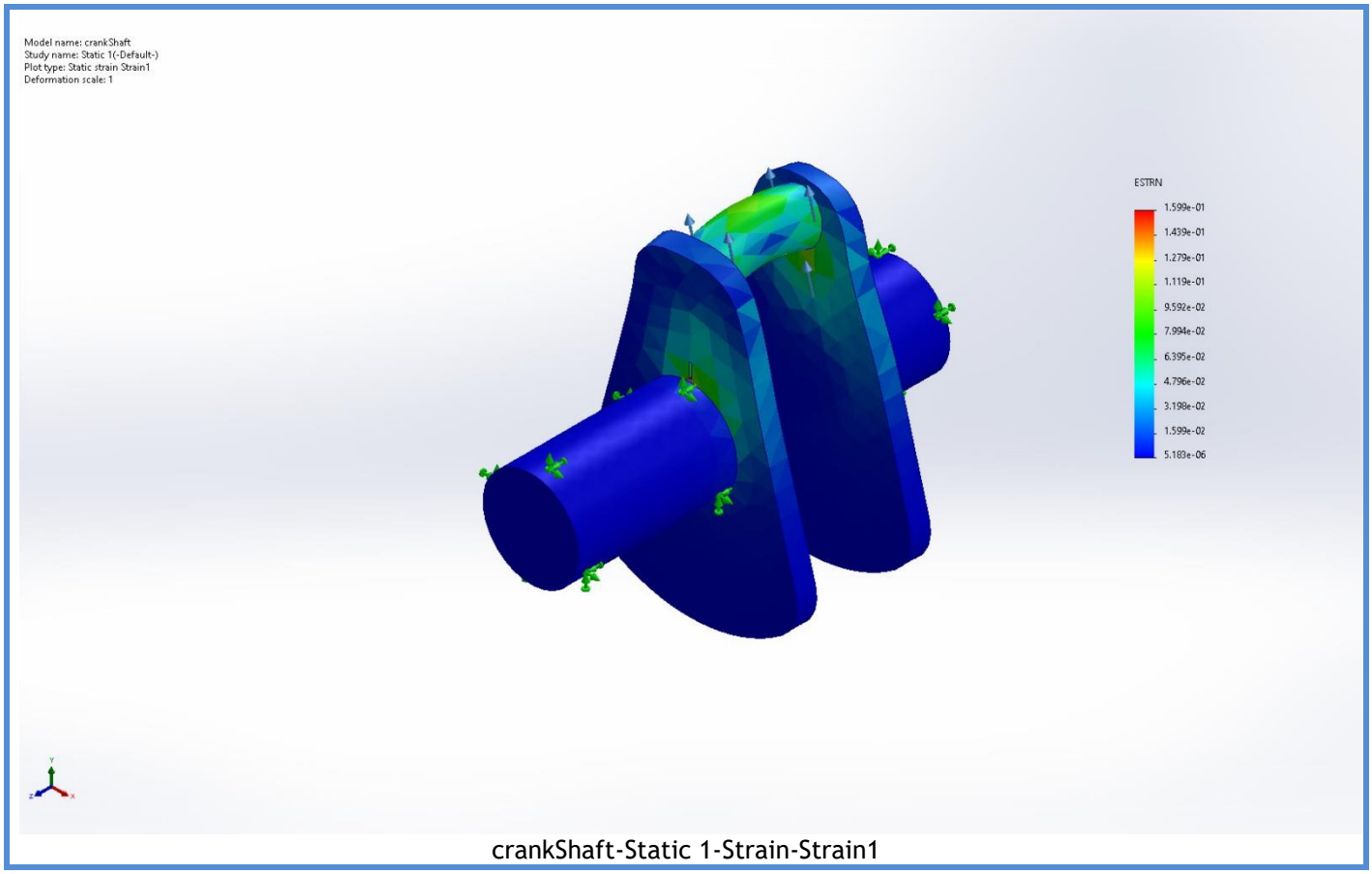
crankShaft-Static 1-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+00mm Node: 19	6.858e-01mm Node: 367



crankShaft-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	5.183e-06 Element: 3307	1.599e-01 Element: 1272



crankShaft-Static 1-Strain-Strain1