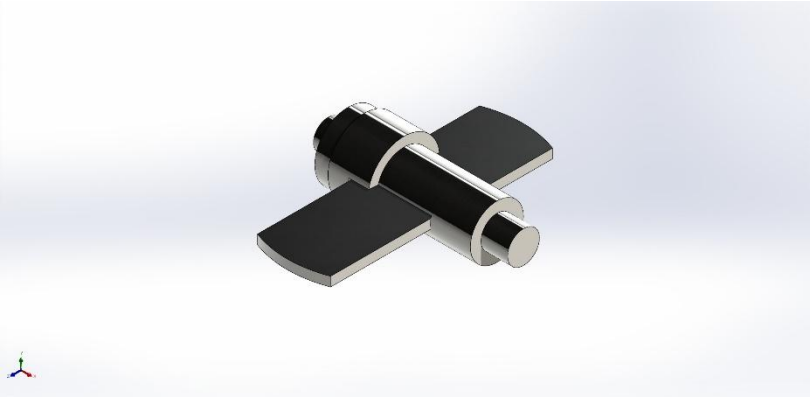


Simulation of Assem3

Date: 26 January 2025
Designer: Solidworks
Study name: Static 1
Analysis type: Static

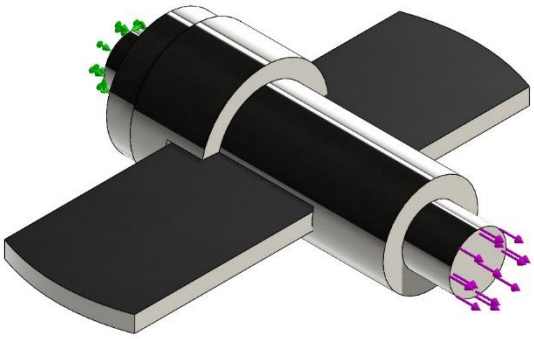
Table of Contents

Description

No Data

Assumptions

Model Information



Model name: Assem3
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
Boss-Extrude1	Solid Body	**Mass:0.521519 kg** **Volume:6.68615e-05 m^3** **Density:7,800 kg/m^3** **Weight:5.11089 N**	**C:\Users\pushk\Documents\DME-Lab\Lab2_Cotter.SLDPRT** Jan 26 19:10:09 2025
Cut-Extrude1	Solid Body	**Mass:0.862154 kg** **Volume:0.000110533 m^3** **Density:7,800 kg/m^3** **Weight:8.44911 N**	**C:\Users\pushk\Documents\DME-Lab\Lab2_Socket.SLDPRT** Jan 26 20:47:19 2025

Cut-Extrude1	Solid Body	**Mass:0.5277 kg** **Volume:6.76538e-05 m^3** **Density:7,800 kg/m^3** **Weight:5.17146 N**	**C:\Users\pushk\Documents\DME-Lab\Lab2_Spigot.SLDPRT** Jan 26 20:29:05 2025

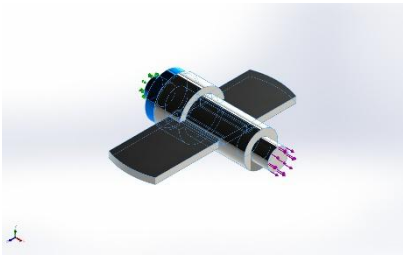
Study Properties

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	Off
Compute free body forces	On
Friction	Off
Use Adaptive Method:	Off
Result folder	SOLIDWORKS document (c:\users\pushk\appdata\local\temp)

Units

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

Material Properties

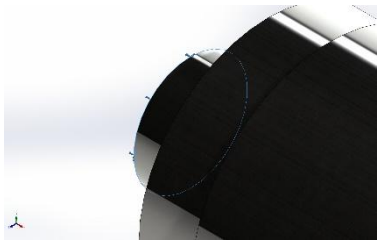
Model Reference	Properties		Components
	**Name:**	Plain Carbon Steel	SolidBody 1(Boss-Extrude1)(Lab2_Assembly_Cotter-joint-1/Lab2_Cotter-1), SolidBody 1(Cut-Extrude1)(Lab2_Assembly_Cotter-joint-1/Lab2_Socket-1), SolidBody 1(Cut-Extrude1)(Lab2_Assembly_Cotter-joint-1/Lab2_Spigot-1)
	Model type:	Linear Elastic Isotropic	
	Default failure criterion:	Max von Mises Stress	
	Yield strength:	2.20594e+08 N/m^2	
	Tensile strength:	3.99826e+08 N/m^2	
	Elastic modulus:	2.1e+11 N/m^2	
	Poisson's ratio:	0.28	
	Mass density:	7,800 kg/m^3	
	Shear modulus:	7.9e+10 N/m^2	
	Thermal expansion coefficient:	1.3e-05 /Kelvin	
Curve Data:N/A			

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1 (Imported|Lab2_Assembly_Cotter-joint-1|Static 1)		**Entities:** 1 face(s) **Type:** Fixed Geometry

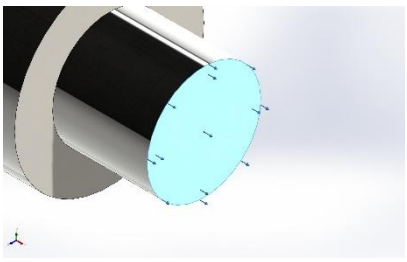
Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	-140,000	-0.00109863	0	140,000
Reaction Moment(N.m)	0	0	0	0

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

Resultant Forces

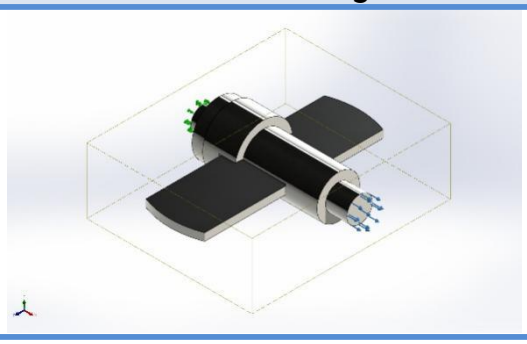
Components	X	Y	Z	Resultant
Reaction force(N)	-140,000	-0.00109863	0	140,000
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Force-1 (Imported|Lab2_Assembly_Cotter-joint-1|Static 1)		**Entities:** 1 face(s) **Type:** Apply normal force **Value:** -70,000 N
Force-2		**Entities:** 1 face(s) **Type:** Apply normal force **Value:** -70,000 N

Connector Definitions

No Data

Interaction Information

Interaction	Interaction Image	Interaction Properties
Global Interaction		**Type:** Bonded **Components:** 1 component(s) **Options:** Independent mesh
Component Interaction-0 (Imported|Lab2_Assembly_Cotter-joint-1|Static 1)		**Type:** Bonded **Components:** 1 component(s) **Options:** Independent mesh

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Blended curvature-based mesh
Jacobian points for High quality mesh	16 Points
Maximum element size	10.9541 mm
Minimum element size	6.25947 mm
Mesh Quality	High
Remesh failed parts independently	Off

Mesh information - Details

Total Nodes	4206
Total Elements	2045
Maximum Aspect Ratio	4.5347
% of elements with Aspect Ratio < 3	96.2
Percentage of elements with Aspect Ratio > 10	0
Percentage of distorted elements	0
Time to complete mesh(hh;mm;ss):	00:00:03
Computer name:	PUSHKIN

Sensor Details

No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	-140,000	-0.00109863	0	140,000

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	0.00050354	-0.00157166	-0.00189209	0.00251071

Free body moments

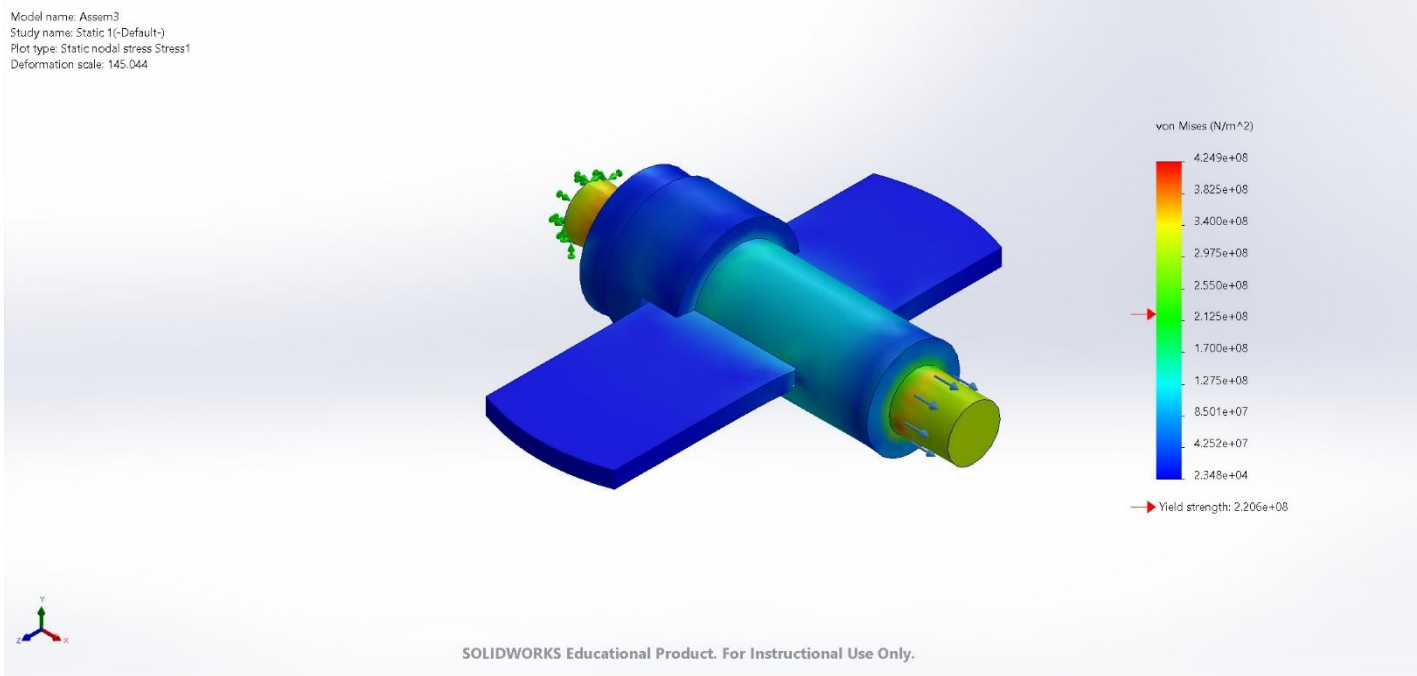
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	1e-33

Beams

No Data

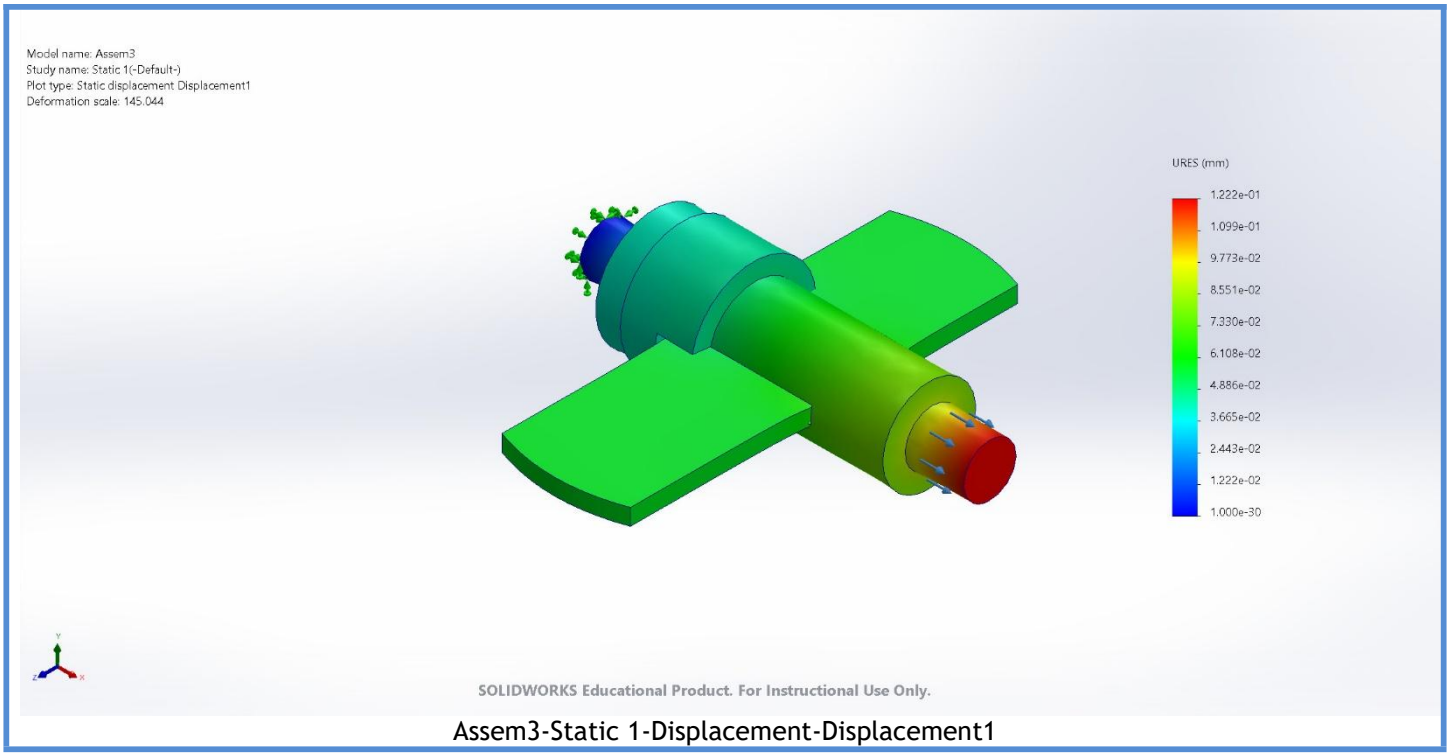
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	2.348e+04N/m^2 Node: 1053	4.249e+08N/m^2 Node: 4018



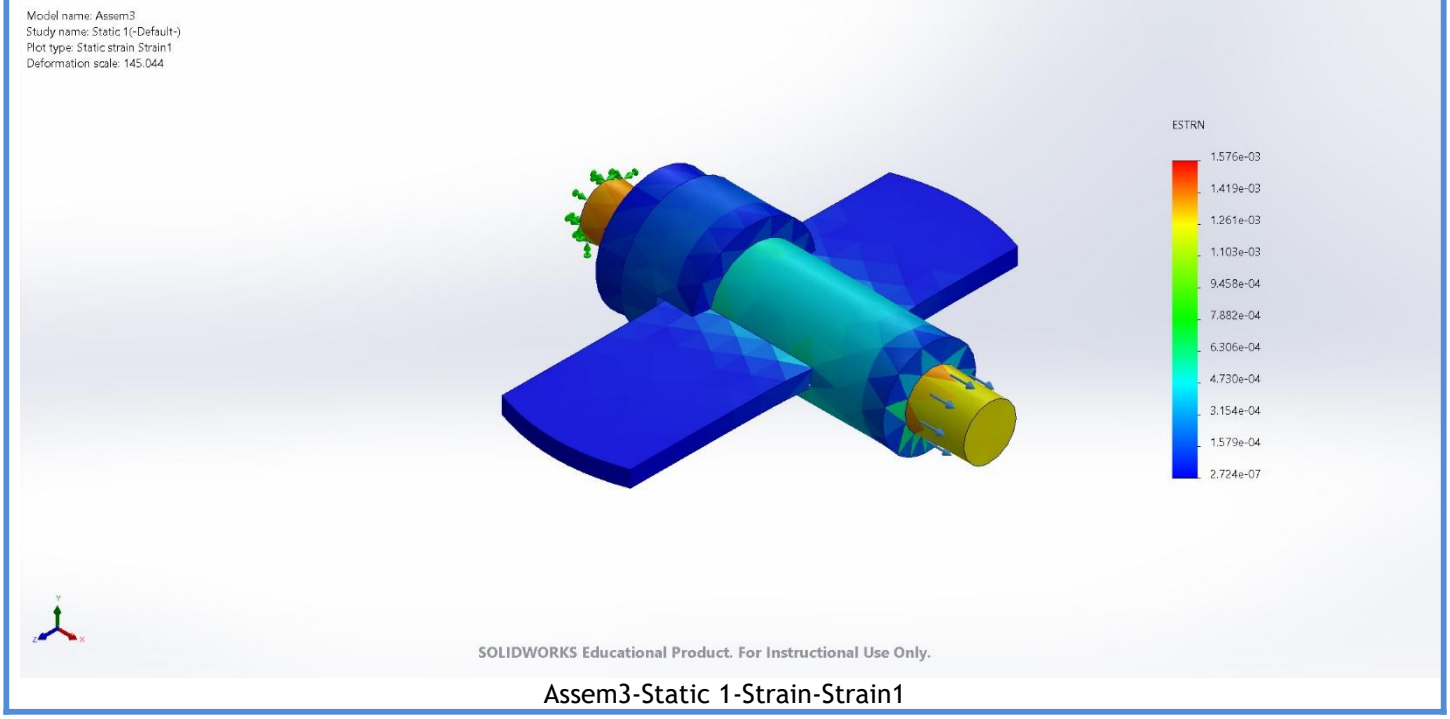
Assem3-Static 1-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+00mm Node: 3125	1.222e-01mm Node: 1292



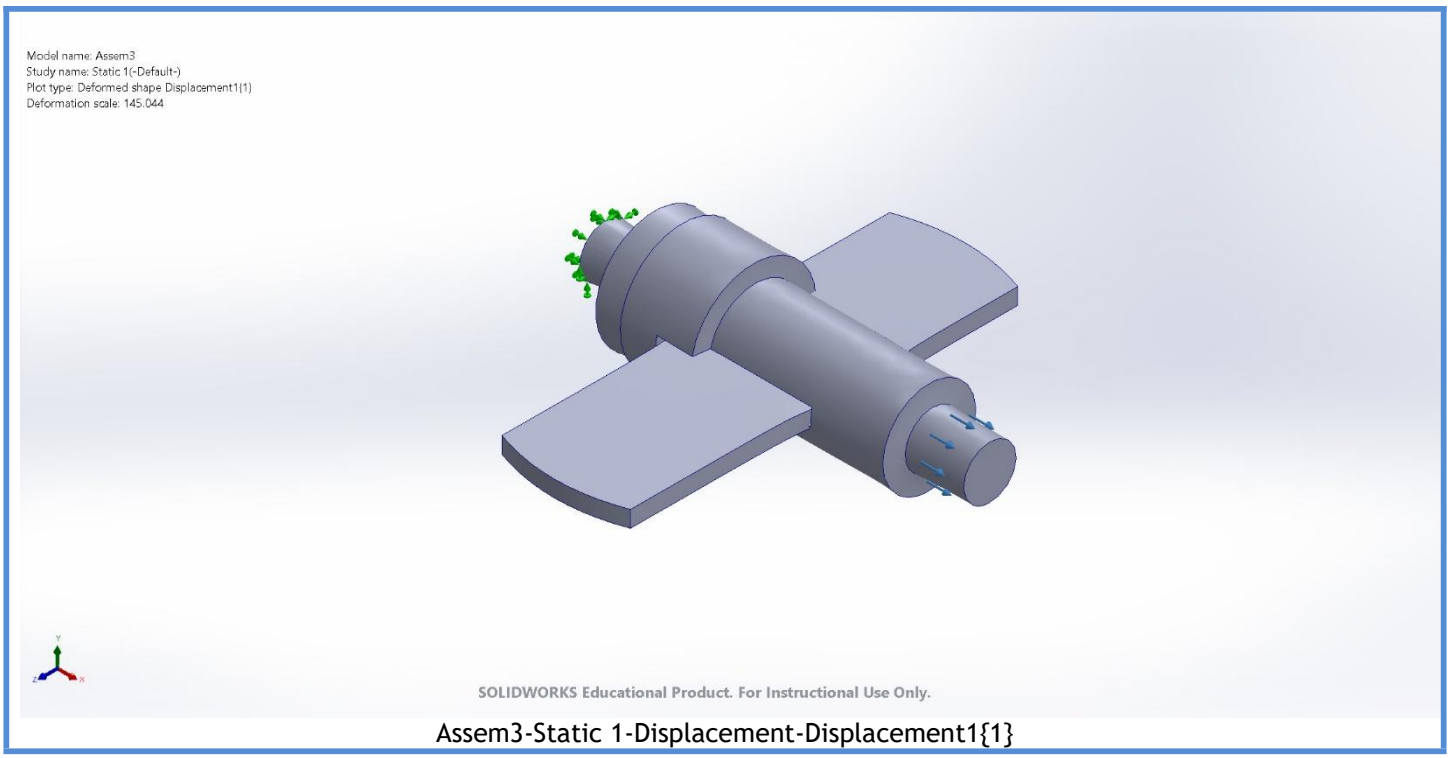
Assem3-Static 1-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	2.724e-07 Element: 342	1.576e-03 Element: 1795



Assem3-Static 1-Strain-Strain1

Name	Type
Displacement1{1}	Deformed shape



Assem3-Static 1-Displacement-Displacement1{1}

Conclusion