

Stress Analysis Report



Analyzed File:	Viga_I_Variável.iam
Autodesk Inventor Version:	2017.2 (Build 212233000, 233)
Creation Date:	29/11/2016, 21:24
Study Author:	Walter A. Kapp
Summary:	

Project Info (iProperties)

Summary

Title	Auto financiado
Subject	Robo EngeMOVI serial de 7 juntas
Author	Walter A. Kapp
Manager	Walter A. Kapp
Company	EngeMOVI

Project

Part Number	Viga_I_Variável
Project	RES
Designer	Walter A. Kapp
Engineer	Walter A. Kapp
Cost	R\$ 0,00
Date Created	08/11/2016

Status

Design Status	WorkInProgress
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Custom

Cliente	EngeMOVI
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Physical

Mass	110,527 kg
Area	2932360 mm ²
Volume	14097800 mm ³
Center of Gravity	x=474,099 mm y=343,759 mm z=23,7867 mm

Note: Physical values could be different from Physical values used by FEA reported below.

Static Analysis:1

General objective and settings:

Design Objective	Single Point
Study Type	Static Analysis
Last Modification Date	29/11/2016, 20:50
Detect and Eliminate Rigid Body Modes	No
Separate Stresses Across Contact Surfaces	No
Motion Loads Analysis	No

Mesh settings:

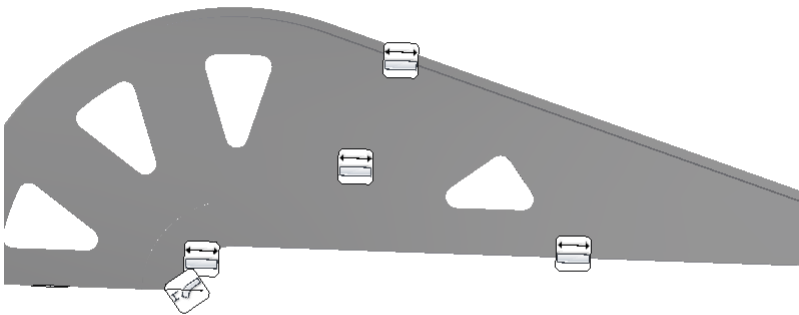
Avg. Element Size (fraction of model diameter)	0,1
Min. Element Size (fraction of avg. size)	0,2
Grading Factor	1,5
Max. Turn Angle	60 deg
Create Curved Mesh Elements	No
Use part based measure for Assembly mesh	Yes

Material(s)

Name	Aço ABNT1020~1030	
General	Mass Density	7,84 g/cm ³
	Yield Strength	245 MPa
	Ultimate Tensile Strength	441 MPa
Stress	Young's Modulus	207 GPa
	Poisson's Ratio	0,295 ul
	Shear Modulus	79,9228 GPa
Part Name(s)	alma Longarina_interna Longarina_externa Longarina_interna Raiz curva Reforço raiz Nariz Nariz	

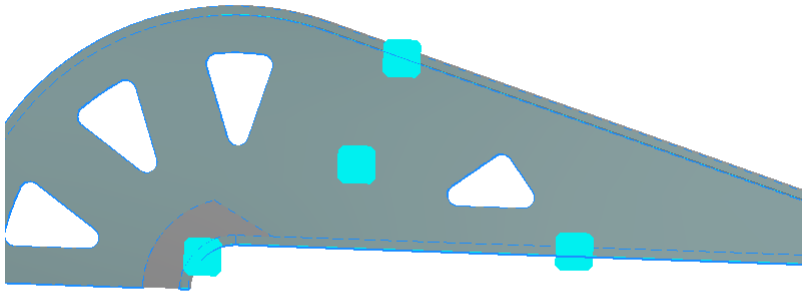
Operating conditions**Force:1**

Load Type	Force
Magnitude	15000,000 N
Vector X	0,000 N
Vector Y	15000,000 N
Vector Z	0,000 N

Selected Face(s)**Frictionless Constraint:1**

Constraint Type	Frictionless Constraint
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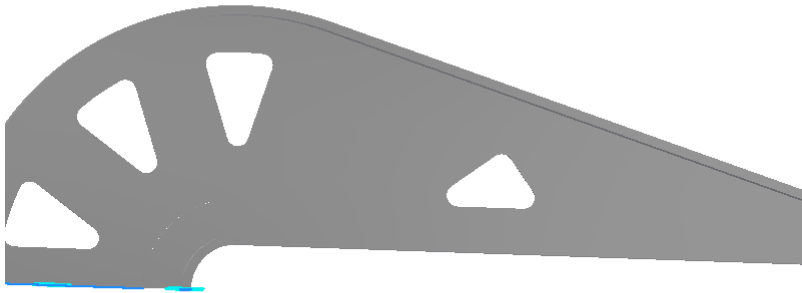
Selected Face(s)



Frictionless Constraint:2

Constraint Type Frictionless Constraint

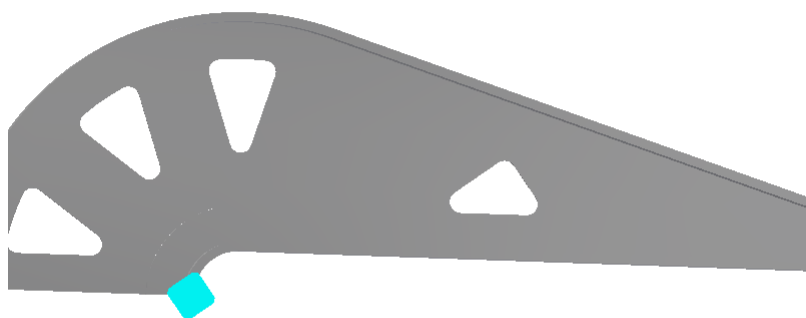
Selected Face(s)



Fixed Constraint:1

Constraint Type Fixed Constraint

Selected Face(s)



Results

Reaction Force and Moment on Constraints

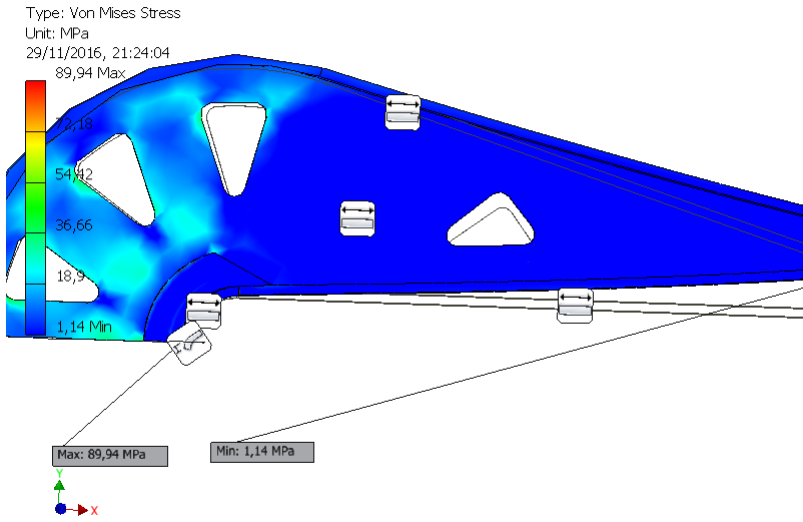
Constraint Name	Reaction Force		Reaction Moment	
	Magnitude	Component (X,Y,Z)	Magnitude	Component (X,Y,Z)
Frictionless Constraint:1	3527,55 N	-464,834 N	65955,3 N m	-55332,6 N m
		789,954 N		35195 N m
		-3406,39 N		-7050,59 N m
Frictionless Constraint:2	17507,5 N	239,767 N	2138,39 N m	-748,727 N m
		-17015,9 N		-531,754 N m
		4112,97 N		-1931,16 N m
Fixed Constraint:1	51,9486 N	-0,060472 N	0 N m	0 N m
		-0,20952 N		0 N m
		51,9481 N		0 N m

Result Summary

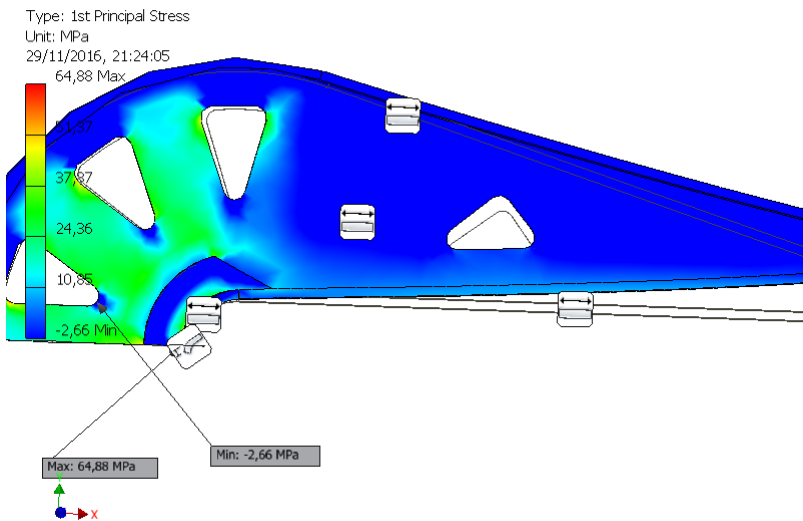
Name	Minimum	Maximum
Volume	14097800 mm ³	
Mass	110,527 kg	
Von Mises Stress	1,13651 MPa	89,9413 MPa
1st Principal Stress	-2,65864 MPa	64,8817 MPa
3rd Principal Stress	-58,4995 MPa	19,6333 MPa
Displacement	0 mm	1,982 mm
Safety Factor	2,724 ul	15 ul
Stress XX	-36,0361 MPa	55,2895 MPa
Stress XY	-22,7903 MPa	21,4834 MPa
Stress YY	-33,1214 MPa	63,2049 MPa
Y Displacement	-0,0369217 mm	1,98194 mm
Contact Pressure X	-106,9 MPa	100,143 MPa
Contact Pressure Y	-205,046 MPa	73,4538 MPa

Figures

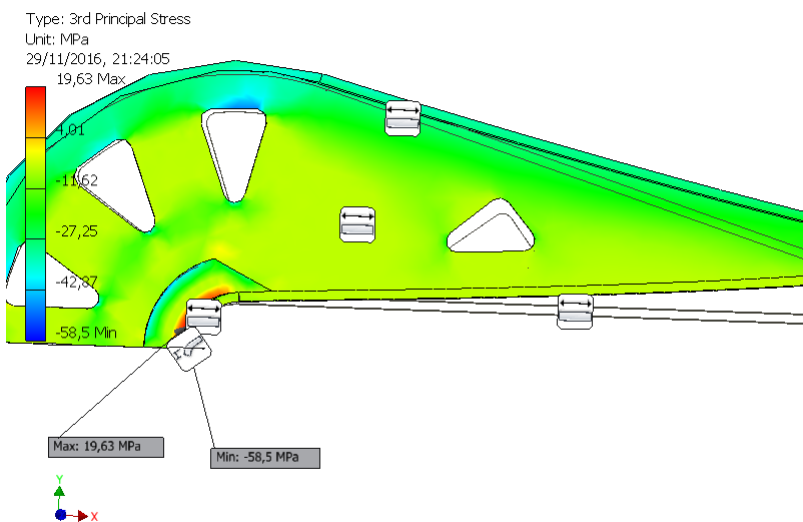
Von Mises Stress



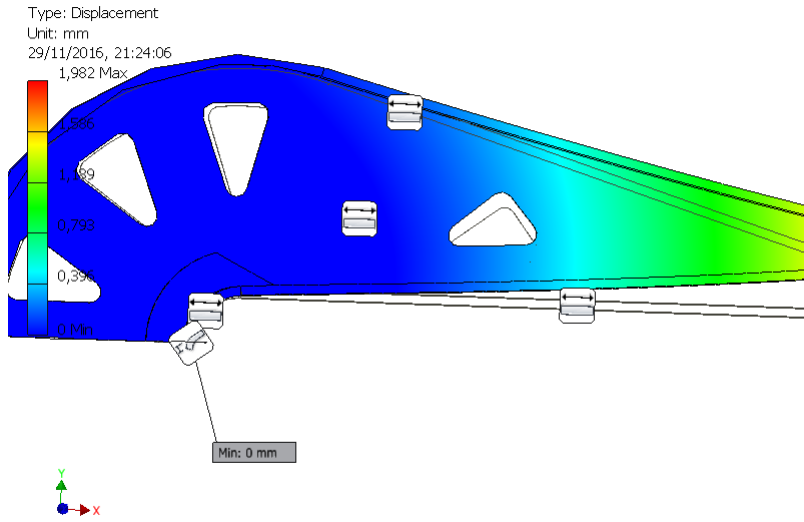
1st Principal Stress



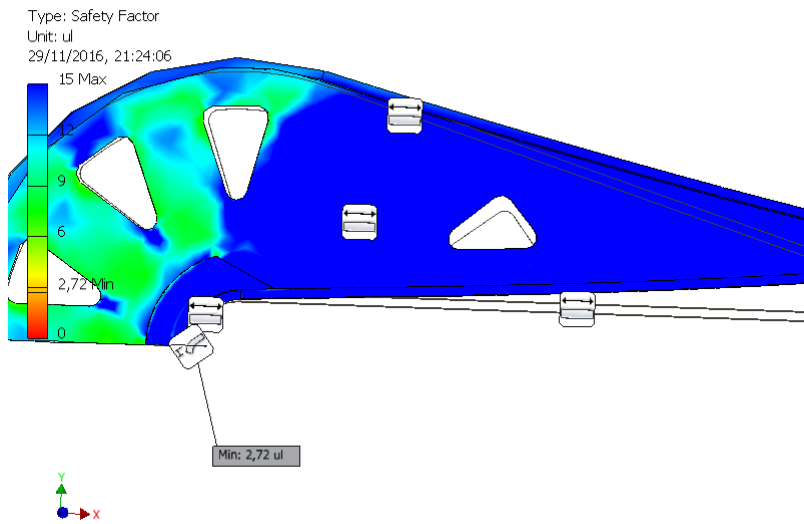
3rd Principal Stress



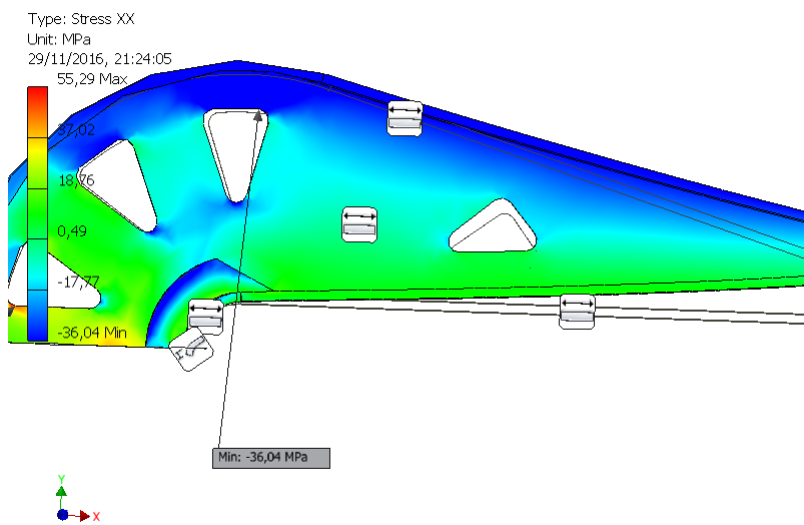
Displacement



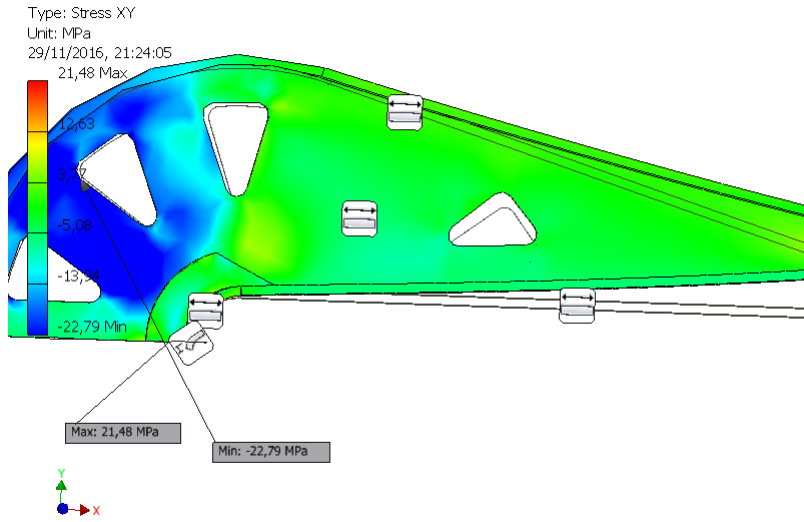
▣ Safety Factor



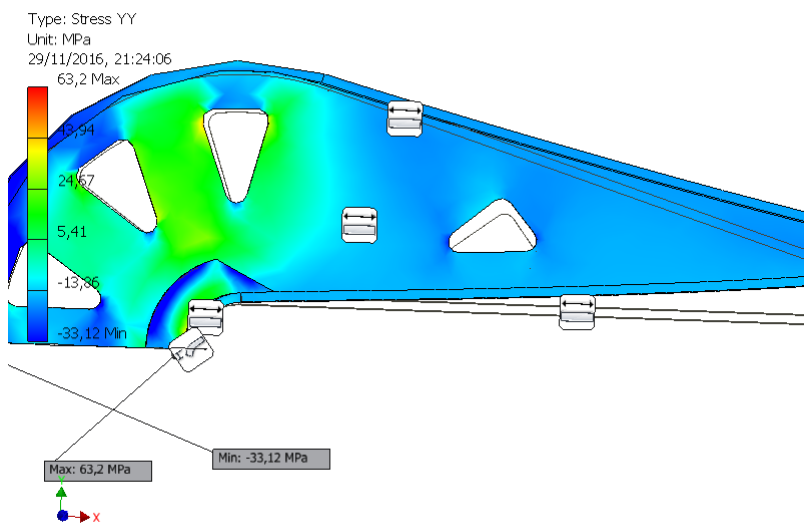
▣ Stress XX



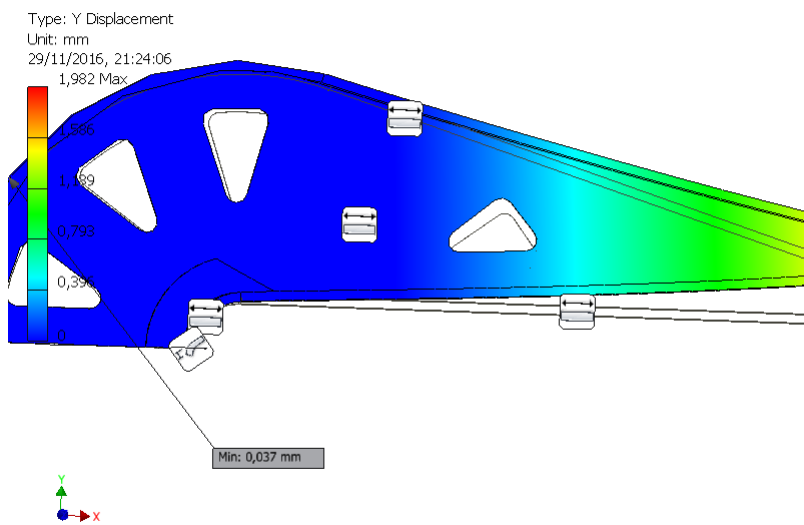
▣ Stress XY



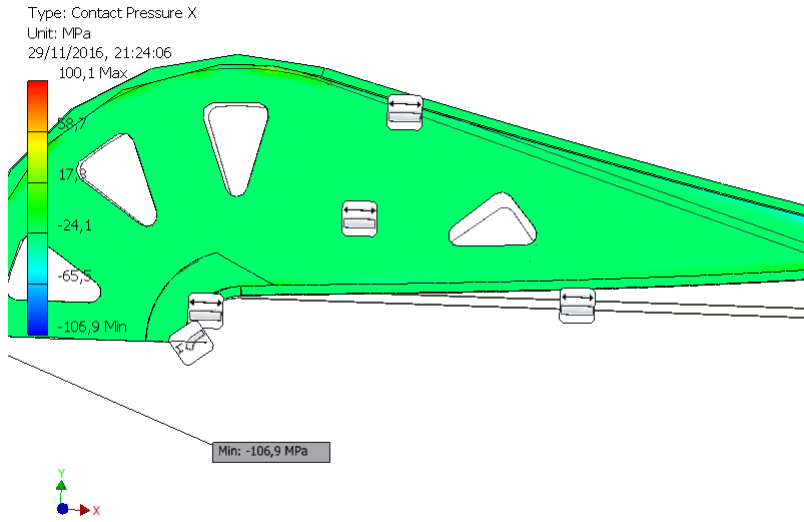
Stress YY



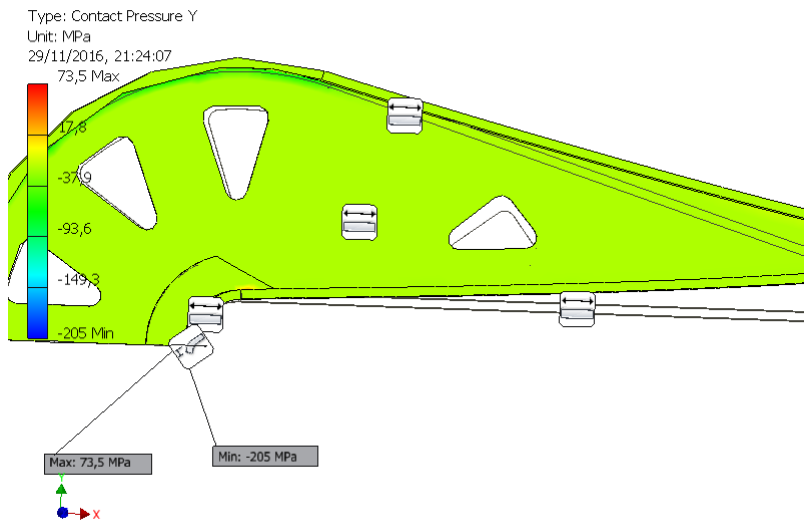
Y Displacement



Contact Pressure X



☐ Contact Pressure Y



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