

Study Report



Analyzed File	Monorail Chasis (Body frame/Base frame) v0
Version	Autodesk Fusion 360 (2.0.3174)
Creation Date	2019-05-04, 19:26:16
Author	MR ROBOT

☐ Project Properties

Title	Studies
Author	MR ROBOT

☐ Monorail Chasis (Body frame/Base frame) v0:1

☐ Study 2 - Static Stress

☐ Study Properties

Study Type	Static Stress
Last Modification Date	2019-05-04, 19:22:31

☐ Settings

☐ General

Contact Tolerance	0.1 mm
Remove Rigid Body Modes	No

☐ Mesh

Average Element Size (% of model size)	
Solids	10
Scale Mesh Size Per Part	No
Average Element Size (absolute value)	-
Element Order	Parabolic
Create Curved Mesh Elements	No
Max. Turn Angle on Curves (Deg.)	60
Max. Adjacent Mesh Size Ratio	1.5
Max. Aspect Ratio	10
Minimum Element Size (% of average size)	20

☐ Adaptive Mesh Refinement

Number of Refinement Steps	0
Results Convergence Tolerance (%)	20
Portion of Elements to Refine (%)	10
Results for Baseline Accuracy	Von Mises Stress

☐ Materials

Component	Material	Safety Factor
.Driver Base (1):1/Bodies:1	Steel	Yield Strength

☐ Steel

Density	7.85E-06 kg / mm ³
Young's Modulus	210000 MPa
Poisson's Ratio	0.3
Yield Strength	207 MPa
Ultimate Tensile Strength	345 MPa
Thermal Conductivity	0.056 W / (mm C)
Thermal Expansion Coefficient	1.2E-05 / C
Specific Heat	480 J / (kg C)

☐ Mesh

Type	Nodes	Elements
Solids	83535	35811

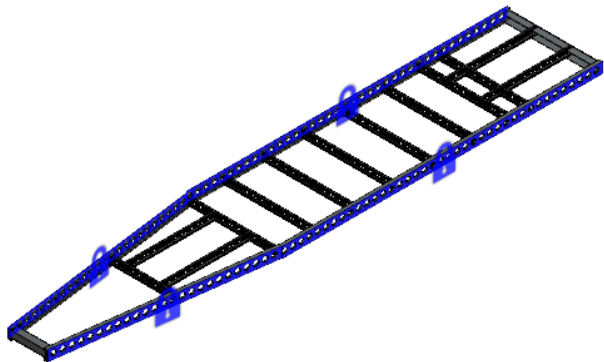
☐ Load Case1

☐ Constraints

☐ Fixed1

Type	Fixed
Ux	Yes
Uy	Yes
Uz	Yes

☐ Selected Entities

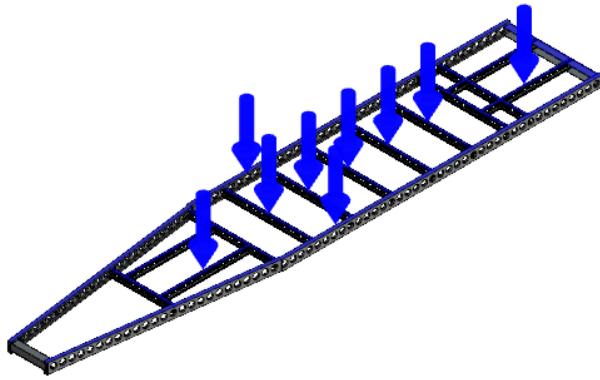


▣ Loads

▣ Force1

Type	Force
Magnitude	300000 N
X Value	-3.507E-27 N
Y Value	-300000 N
Z Value	-7.421E-11 N
Force Per Entity	No

▣ Selected Entities




Results

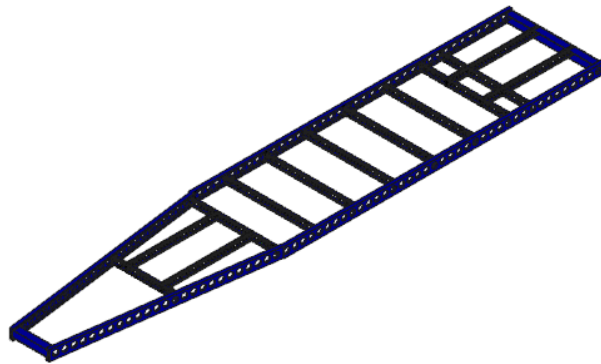
Result Summary

Name	Minimum	Maximum
Safety Factor		
Per Body	5.067	15
Stress		
Von Mises	4.296E-05 MPa	40.85 MPa
1st Principal	-6.551 MPa	43.94 MPa
3rd Principal	-44.93 MPa	7.347 MPa
Normal XX	-16.87 MPa	16.11 MPa
Normal YY	-40.32 MPa	38.96 MPa
Normal ZZ	-22.22 MPa	23.82 MPa
Shear XY	-10.71 MPa	11.63 MPa
Shear YZ	-20.53 MPa	19.73 MPa
Shear ZX	-7.635 MPa	6.724 MPa
Displacement		
Total	0 mm	0.7486 mm
X	-0.07299 mm	0.05666 mm
Y	-0.7451 mm	0.00145 mm
Z	-0.02657 mm	0.0266 mm
Reaction Force		
Total	0 N	9214 N

X	-2018 N	2080 N
Y	-505.3 N	2632 N
Z	-8999 N	9149 N
Strain		
Equivalent	3.137E-10	2.955E-04
1st Principal	-7.98E-08	2.795E-04
3rd Principal	-2.744E-04	3.883E-06
Normal XX	-5.659E-05	7.839E-05
Normal YY	-1.731E-04	1.672E-04
Normal ZZ	-1.017E-04	1.077E-04
Shear XY	-1.326E-04	1.44E-04
Shear YZ	-2.542E-04	2.443E-04
Shear ZX	-9.453E-05	8.325E-05

Per Body

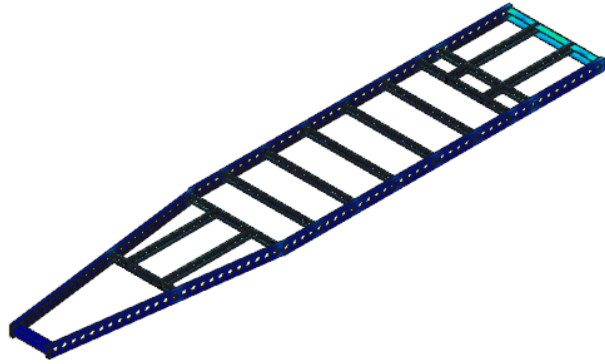
0  8




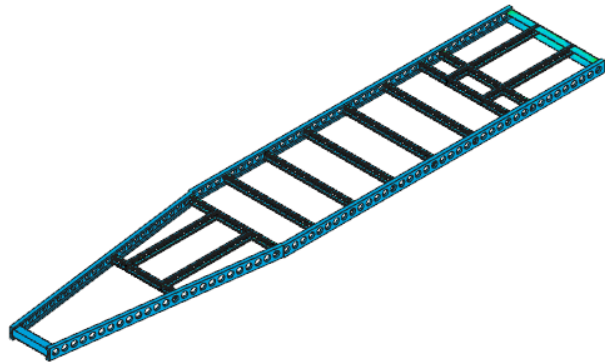
Stress

Von Mises

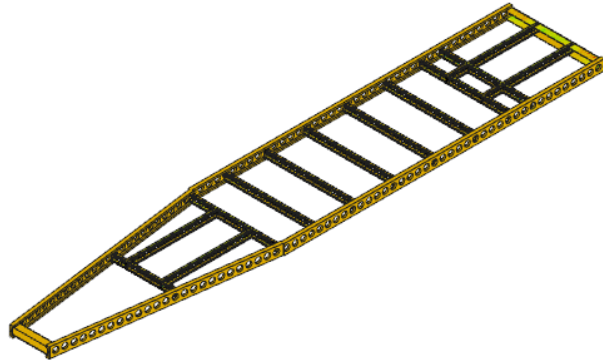
[MPa] 0  40.85



☐ **1st Principal**
[MPa] -6.55  43.94



☐ **3rd Principal**
[MPa] -44.93  7.35



☐ **Displacement**

☐ **Total**

[mm] 0  0.7486

