

Analysis of stress acting on the steering box components Pride with software ABAQUS

Ali Beygpour (1) ، Ebrahim Ebrahimi (2)

ali.beygpour@gmail.com

Department of Mechanic, kermanshah branch ،Islamic Azad university, kermanshah , Iran

Abstract:

In most cars and industrial machines behavior and purposeful movements Ajza'vaza' complex, dynamic system is going to create.

In the first step the design engineer aversion to the motion analysis and force through this stage where the Ndard.az which eventually phases of design optimization and standardization ... is available.

In the analysis of dynamical systems reliability and accuracy of the results depends on high levels of abstention simplifying assumptions of the model. Achieving reliable results and ensure it Jz'az-related products through the use of advanced industrial applications, very difficult and costly and perhaps impossible in conditions of global competition industry.

Keywords: Stress - steering - Optimization

This diagram illustrates the assembly of a vehicle chassis, showing various components and their assembly sequence. The components are numbered 1 through 7, with some numbers indicating specific sub-assemblies or ranges of parts.

- 1**: A small component, possibly a pin or bolt, located near the bottom right.
- 2**: A component, possibly a spring or shock absorber, located near the bottom right.
- 3**: A component, possibly a pin or bolt, located near the top left.
- 4**: A component, possibly a pin or bolt, located near the top left.
- 5**: A component, possibly a pin or bolt, located near the bottom left.
- 6**: A component, possibly a pin or bolt, located near the bottom left.
- 7**: A component, possibly a pin or bolt, located near the bottom left.

Additional labels and notes include:

- (1.8 - 3.7)**: A range of values or specifications, located near the top left.
- (3.8 - 4.5)**: A range of values or specifications, located near the bottom right.
- (5.2 - 6.7)**: A range of values or specifications, located near the bottom left.

www.SID.ir

Definition of mechanical properties:

To define the material that

Aluminum 2024-T4

Is the path to follow (the profile of this article is taken)

Property => create material

1-General => density = 2770 kg / m-3

2-Mechanical => elasticity => elastic => young's modulus = 73.1 Gpa & Poisson's ratio = 0.33

If Nyaz3- Mechanical => plasticity => plastic

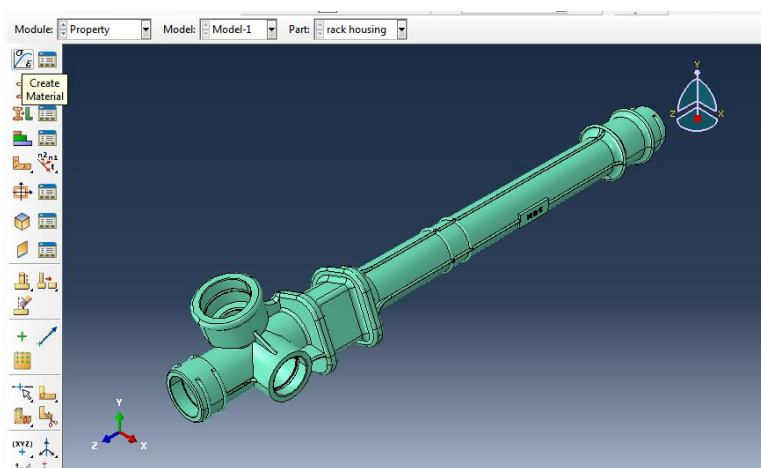


Figure ۴ – Definition of mechanical properties

Analysis:

Step into the field and we have created step:

In the first mode of vibration analysis and obtaining natural vibration and frequency analysis model that we in this fashion it obtains 5 (you can also obtain more modes)

Loading and boundary conditions:

Heading into the load and create boundary condition:

Because of the geometry Mrzmysylh conditions in the application the following conditions apply.

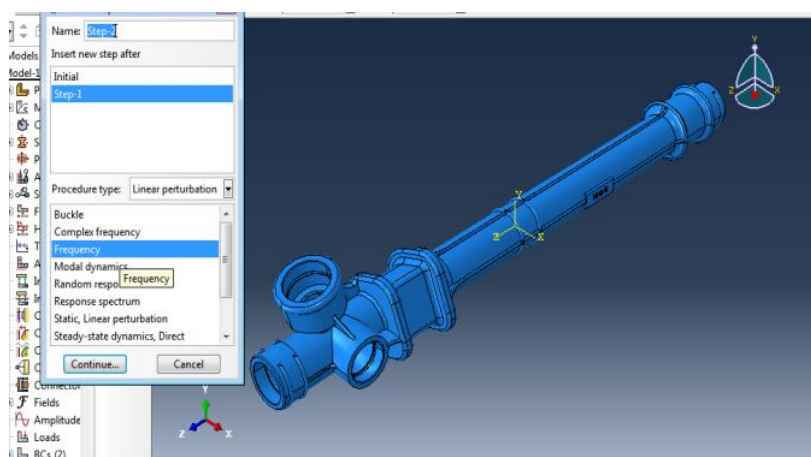


Figure ۵- Loading and boundary conditions

Mesh:

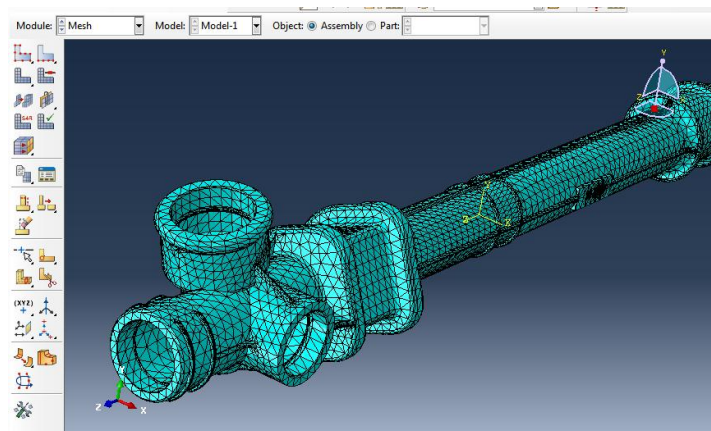


Figure ۶- Mesh

Problem-solving and results:

Start by making a Job and wait analysis that the analysis is completed

In the visualization to analyze outputs and results discussed

According to the type of analysis (frequency) we derive the most relevant results.

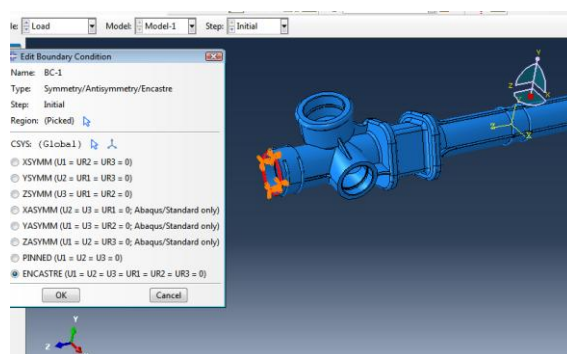


Figure ۷- Problem-solving and results

Vibrational modes:

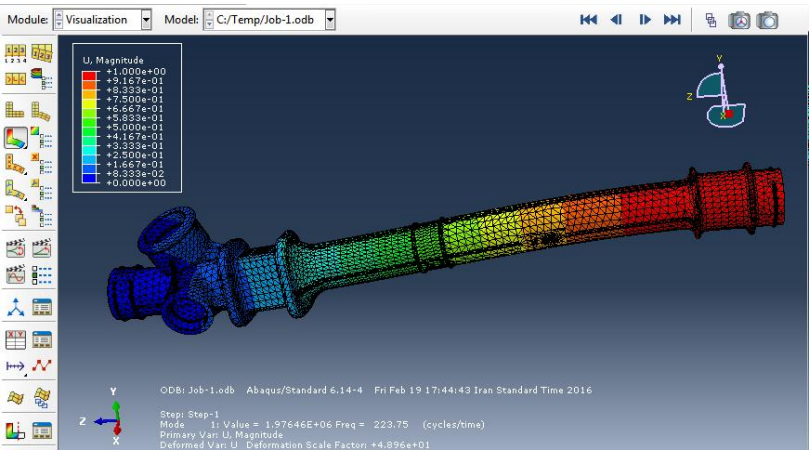


Figure ۸- The first mode (normal frequency: 223.75 cycle / time)

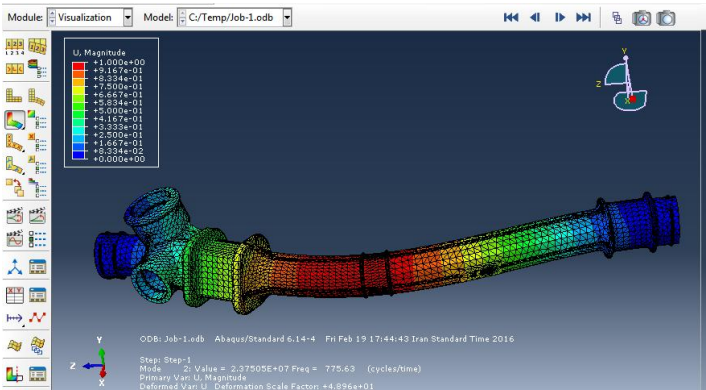


Figure ۹- The second mode (normal frequency: 775.63 cycle / time)

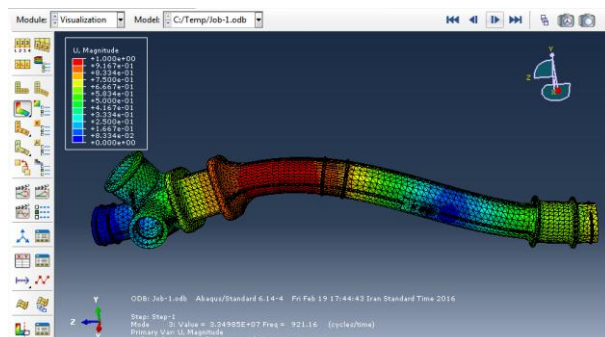


Figure 10 - The third mode (normal frequency: 921.16 cycle / time)

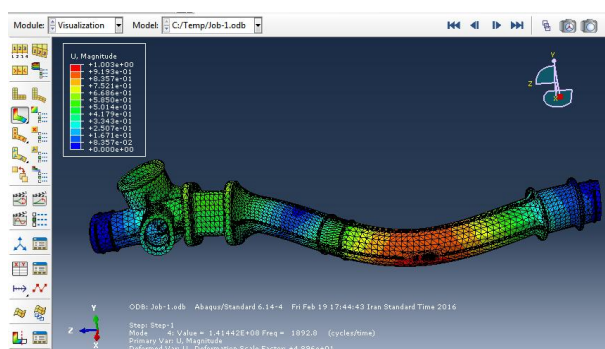


Figure 11 - The fourth mode (normal frequency: 1892.8 cycle / time)

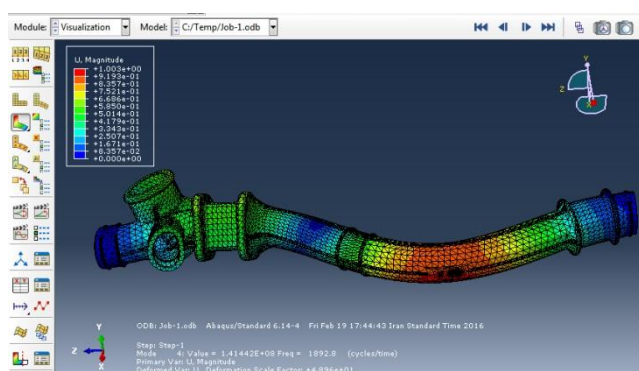


Figure 12 - Fashion fifth (natural frequency: 2074.6 cycle / time)

Chart Number Frkans- fashion:

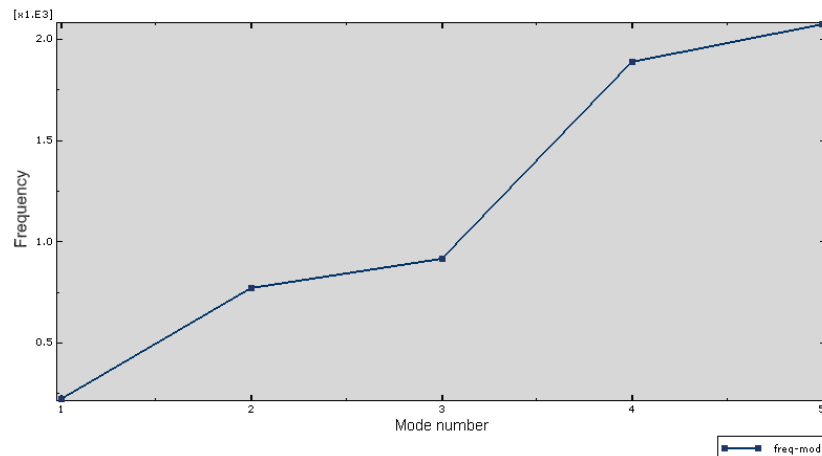


Figure 13 - Chart Number Frkans- fashion

References:

1. marpich bakhtar company, www.mbc1.ir
2. aluminum rack housing strength analysis of rack and pinion steering system
3. k.kajiware:koyo engineering journal,167E (2005) 35
4. k.kajiware:koyo engineering journal,162E (2003) 47
5. abaqus inc: abaqus/standard user,s manual