2nd INTERNATIONAL CONFERENCE ON
RESEARCH IN SCIENCE AND TECHNOLOGY
Istanbul-Turkey 14 March 2016
RSTCONF
دومین کنفرانس بین المللی
پژوهش در علوم و تکنولوژی
ترکیه - استانبول ۲۴ اسفند ۱۳۹۴

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

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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

Introduction:

The main tasks of a vehicle, move, rotate and stop there. Steering is done by rotation system. Despite Bsyardratvmbyl systems, steering system on the performance of the vehicle is one of the most influential systems. Steering system which allows the driver to adjust the car. Therefore, how to design the vehicle control command system is effective. And vehicle control set by the factions, which will leverage the steering wheel to the steering wheel stuck together.

Steering systems:

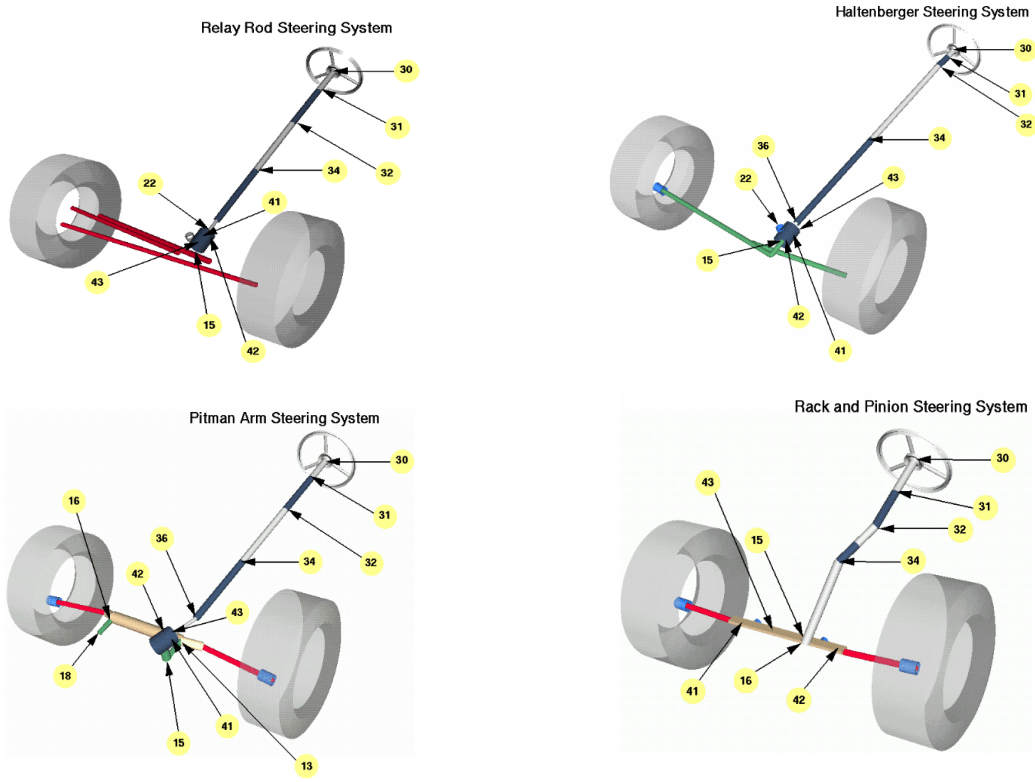

Figure 1- command systems

Steering system has three main components:

1. steering wheel and steering wheel spiral movement of the driver's steering Jghbh pass.

2. steering the steering wheel rotary motion into linear motion is converted.

3. lever steering: linear motion into Shghaldst transmissions.

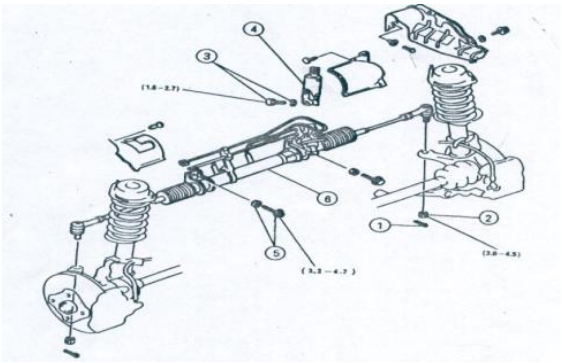

Figure ۲ - components of the steering system and Swivel Display

In the next step to mapping and part preparation rack shell component of SolidWorks software's Pride command box and continued with the extension parts store and to analyze the environment Abaqus step was.

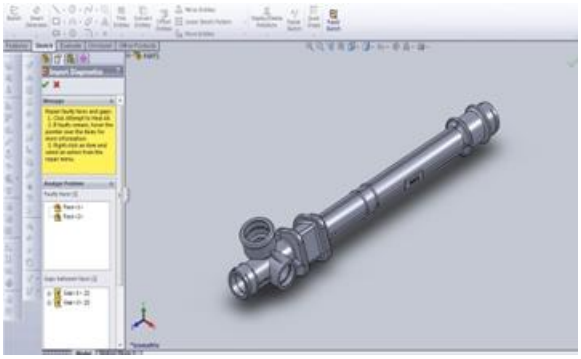

Figure ۳ - Swivel design

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

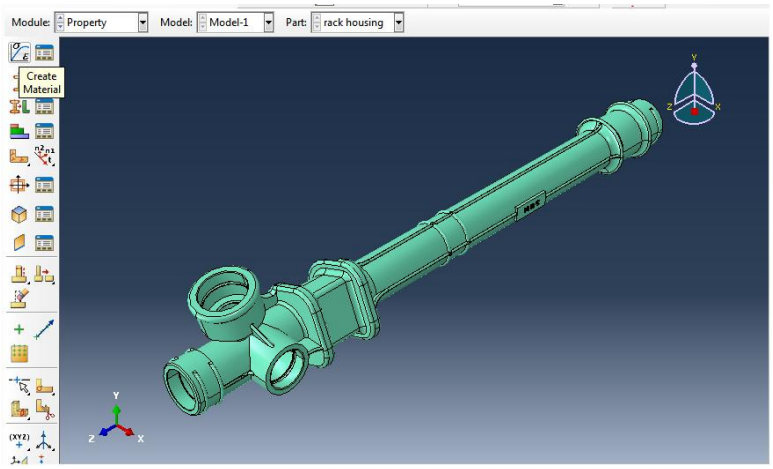

Figure ۴ – Definition of mechanical properties

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 Mrzymsylh conditions in the application the following conditions apply.

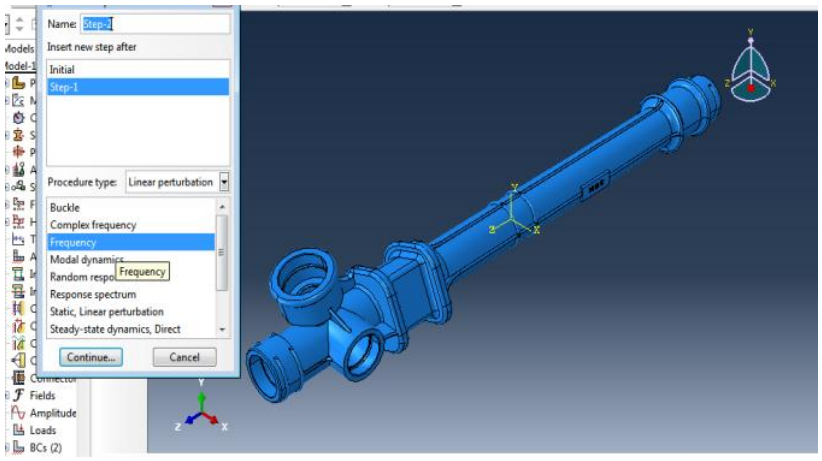

Figure ۵- Loading and boundary conditions

Mesh:

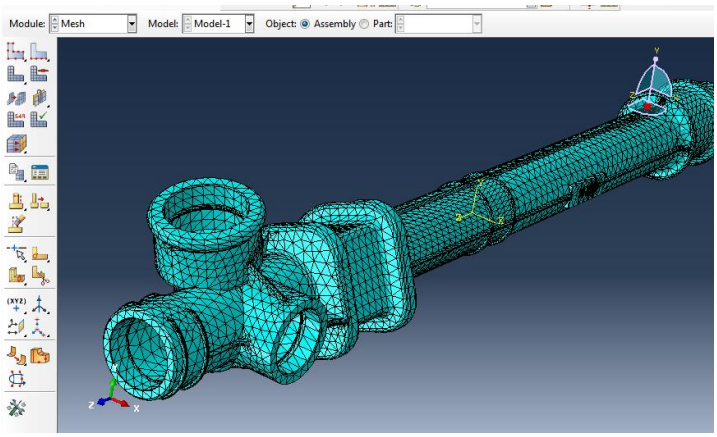

Figure ۶- Mesh

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.

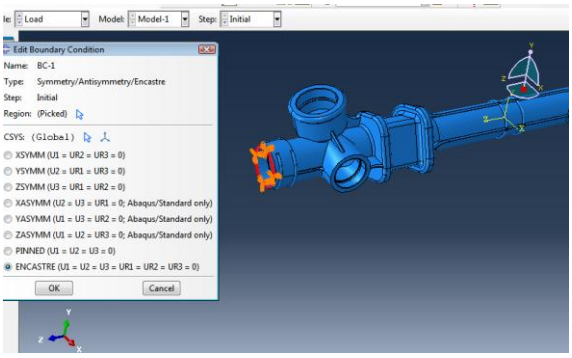

Figure ۷- Problem-solving and results

Vibrational modes:

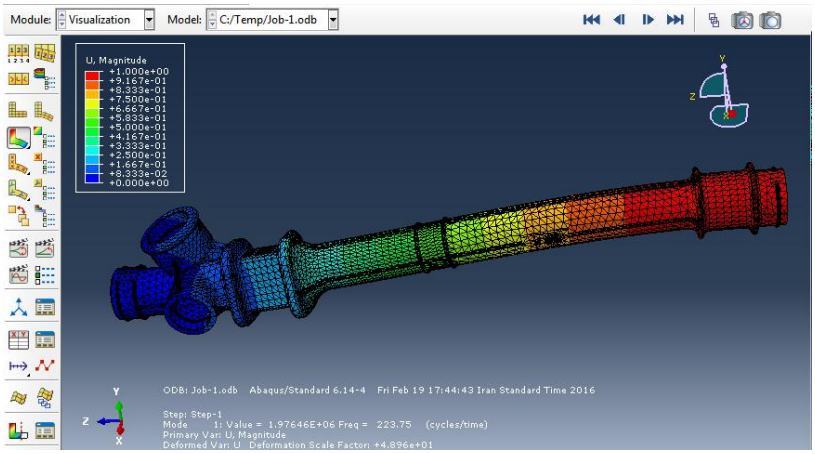

Figure ۸- The first mode (normal frequency: 223.75 cycle / time)

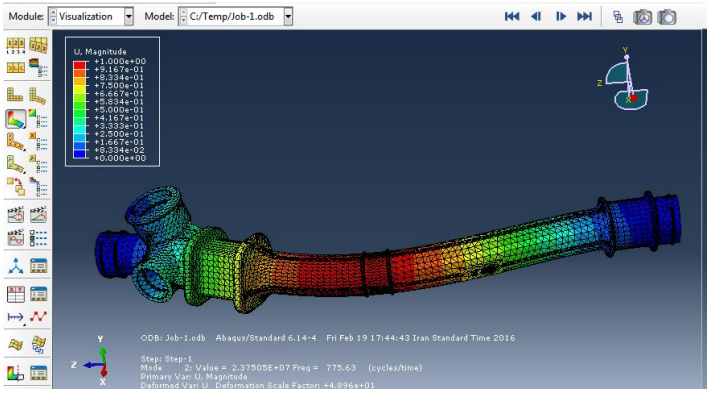

Figure ۹- The second mode (normal frequency: 775.63 cycle / time)

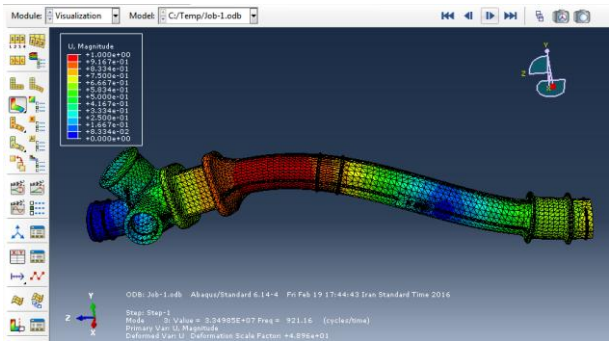

Figure ۱۰ - The third mode (normal frequency: 921.16 cycle / time)

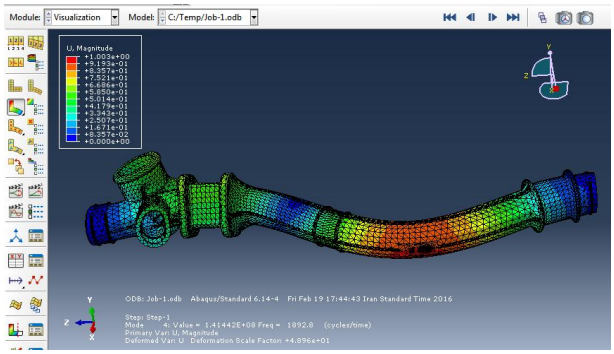

Figure 11 - The fourth mode (normal frequency: 1892.8 cycle / time)

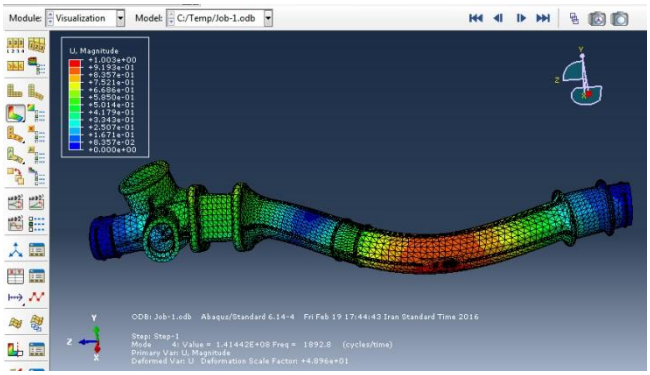

Figure 12 - Fashion fifth (natural frequency: 2074.6 cycle / time)

Chart Number Frkans- fashion:

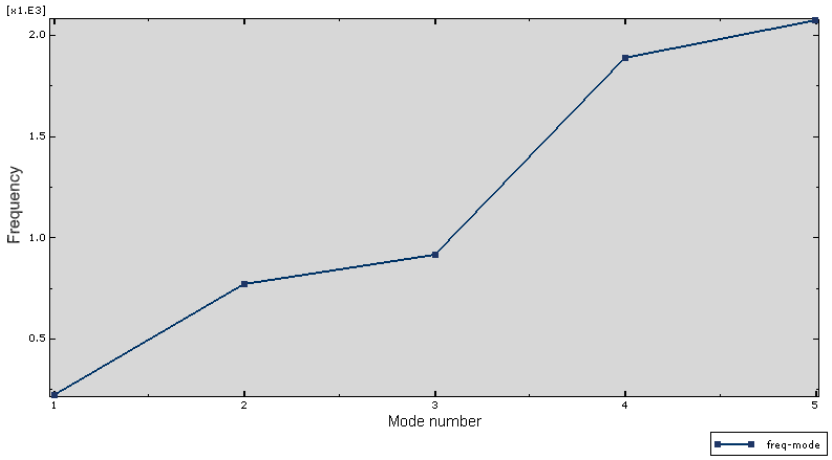

Figure 13 - Chart Number Frkans- fashion

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