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Design and analysis of hull (chassis) lathe model TN50BR

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Abstract:
CNC machine tools, which for shaving and shaping the pieces of wood and metal usually used rotating. Shaving is a common technique used in the industry.
The main task of turning the change in the size, frame them, finishing with one or several pieces cut is prepared by adjusting the grate. By assembling equipment and parts on CNC machines scope expanded so it can be done by various operations such as by placing tools such as electric, Tapping and drilling operations like Brqvkary, Qlavyzzny and drilling on the lathe is easily done
It is influenced by forces and factors are at work so use this to check the working condition should be under engineering analysis. Therefore, the analysis of its components such as the chassis and it is very important.
Topics discussed at the end of ¬Namh, design and analysis of side frames lathe model TN50BR and check the status of your device while loading the device's chassis. The device has been designed using CATIA software and ABAQUS engineering analysis was done by software.
Keywords: lathes - static analysis - Dynamic Analysis.

Introduction:

Machines that the quality, consistency and efficiency increases as high bed. Resistant to static loads and dynamic Nyrvhhay gears and length of time tables have been plating and grinding. The main driving engine with a power of 7.5 kW.

By equipping the device with a variety of equipment for the vehicle turns. For operations such as copy machines Rvtrashy masonry masonry masonry drilling and milling cutters is suitable gear. Turning the machine to perform a variety of operations are known and can be used in the production of single and series.

It is influenced by forces and factors are at work so use this to check the working condition should be under engineering analysis. Therefore, the analysis of its components such as the chassis and it is very important.

Topics discussed in the research, design and analysis lathe model chassis TN50BR and check the status of your device while loading the device's chassis. The device has been designed using CATIA software and ABAQUS engineering analysis was done by software.

Figure 1 - lathe model TN50BR

Catia software to design chassis and we lathes step format stores and chassis for analysis ABAQUS environment we must enter the map.

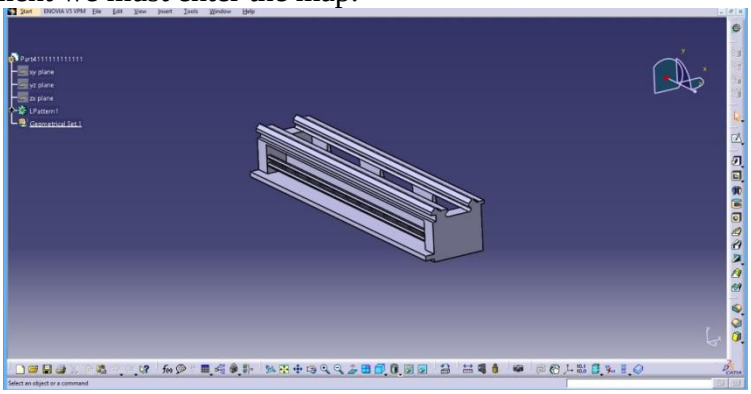


Figure 2 - Map milling machine

After entering the environment map on the homepage of ABAQUS to import model, and by the file located in the toolbar, the map we Abaqus environment.

Definition of mechanical properties:

After entering the environment map Abaqus and mechanical properties of the material should be determined ، Here the material is cast iron and cast iron properties of the article is extracted, the way it works is:

Cast iron

Property => create material => Cast iron

1-General => density = 7250 kg/m^{-3}

2-Mechanical => elasticity => elastic => young's modulus = 100 Gpa & Poisson's ratio = 0.25

Analysis:

In the first mode of vibration and vibration analysis and obtain the natural frequencies of vibration in the chassis and get the tension and then turn static analysis chassis.

Loading and boundary conditions:

In the next section should define loading and boundary conditions

Heading into the load and create boundary condition:

Due to the geometry of the boundary conditions in the application the following conditions apply**.**

Mesh:

Then we enter the Mesh

Finite element solution to this is to first model the elements too small to divide.

For this problem to be solved in several different positions in a number of different elements and the result is compared with each other based on the number of elements. We realize that the number of elements from a number of other significant changes in answer to the question will not be seen after just computing time have increased.

According to the German elections pyramid (Tet), seems more appropriate. The size of each element of maximum 10 mm and is 0.1 mm in certain places.

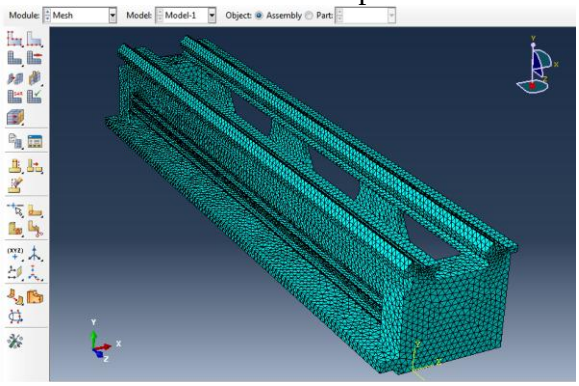


Figure 3: Mesh(a)

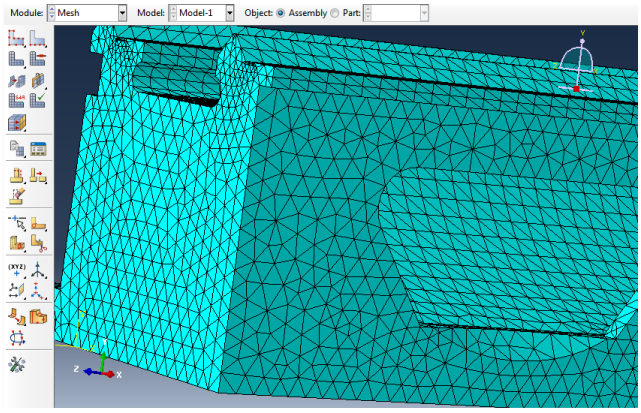


Figure 4: Mesh(b)

Problem-solving and results:

In the final step to resolve the issue and get results.

The analysis started with the construction of a Job and wait 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

Vibrational modes:

The first mode (normal frequency: 27.152 cycle / time)

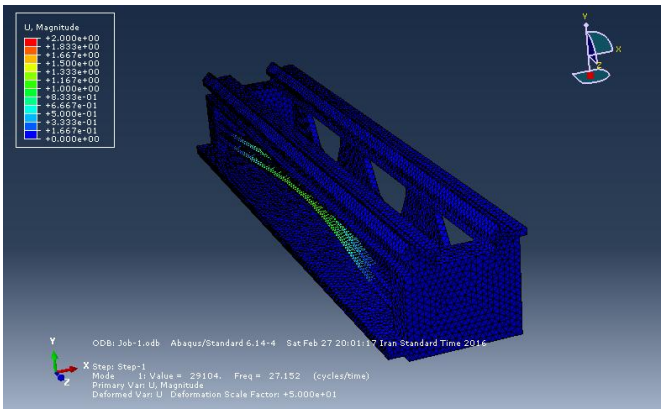


Figure 5: The first mode (normal frequency: 27.152 cycle / time)

Fashion XI: (natural frequency: 146.32 cycle / time):

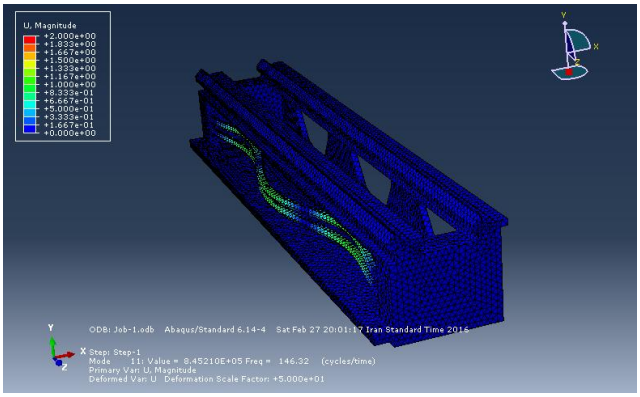
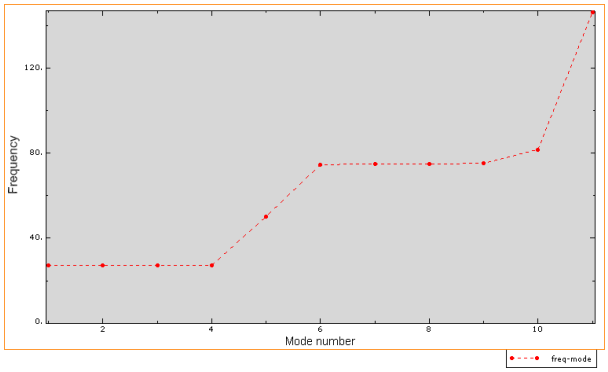


Figure 6: Fashion XI: (natural frequency: 146.32 cycle / time):

Chart Number Frkans- fashion:



Stresses in dynamic mode in 3 modes with the highest value is placed on the following:

Cantor tension in the vibrational mode (mode 1):

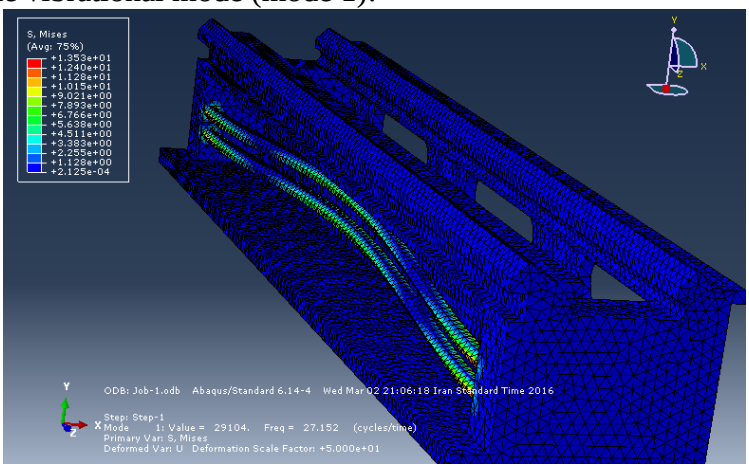


Figure 7: Cantor tension in the vibrational mode (mode 1)

Cantor tension in the vibrational mode (mode 5):

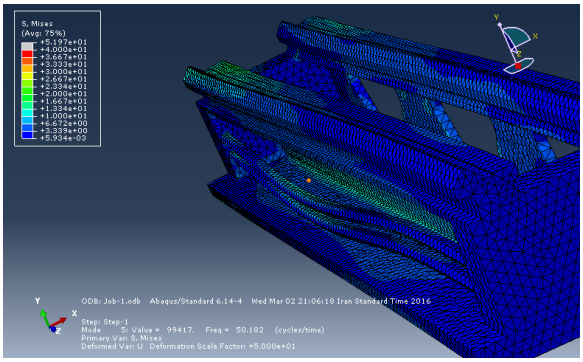


Figure 8: Cantor tension in the vibrational mode (mode 5)

Cantor tension in the vibrational mode (mode 10):

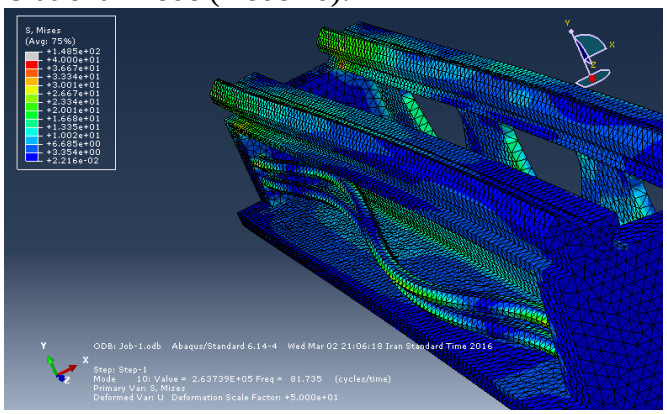


Figure 9: Cantor tension in the vibrational mode (mode 10)

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