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ANALYSIS OF THE FACTORS AFFECTING DAMAS CAR RESSORS ON THE BASIS OF COMPUTER PROGRAMS

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Annotation

This article discusses the factors affecting the suspension of Damas vehicles and analyzed based on the Solid Edge ST and ANSYS 12.0 computer programs.

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Introduction. The suspension is part of the car ride section and connects the body with the road. The suspension has the task of reducing the pulling and braking forces to the normative level and reducing the amplitude and duration of the oscillation, taking turtlenecks that are formed from road irregularities. The suspensions consist of three pieces: the directing part, the elastic part, the absorbing part. One of the devices included in the elastic part of the suspension is the ressor. Ressors are most common as an elastic part of the suspension. It is a slippery (elastic) device that softens the vibrations that transport machines generate from the unevenness of the road. The splitting of lists with different lengths and curvature of the ressors leads to the fact that when the ressora is assembled, the chips approach each other and the main list is less loaded, and also holds the lists. Graphite is applied so that it does not rust and in order to reduce friction between the lists. In light cars, non-metallic gaskets are inserted between the lists. The ends of the main list of Ressora are fastened to the frame with a screw, as a result of which it has the opportunity to change its length during the period of movement. In heavy-lift cars, an additional subsurface ressorption is also attached to the ressora. The reason for its installation is to change the BIC of the ressora in accordance with the change in load, as a result of which the car will improve its ride fluency. Ressora is used in hangers, not independent, and the fact that at the same time the elastic also performs the function of directing parts is its advantage. There are metal, hydraulic and pneumatic Hillary. Metal ressora is common; it is bulinable to listli, spring-loaded, and torsion Hils. Listli ressora is made of special pulat bands of different lengths. [1-5]

Putting the problem. Depending on the defect character of the ressora list, which is the main part of the hangers, they can be repaired or replaced. Characteristic defects of Ressor lists include decreased salinity as a result of loss of ressor elasticity. In this they appear cracked, and some lists break. In addition, an edibility occurs in terms of the hole in which their vtulka is fixed, the edges of the ears, and the scales on the lists themselves.

Ressor's own lists work in heavier conditions than others. That is why they break a lot (Figure 1).

Figure 1. Failures of the ressora.

The fracture condition of the ressora can be attributed to its road conditions and the fact that the force exerted on the ressora, that is, increased from the norm of loading.

Object of study. In this article, we tried to project the ressora of the Damas car using computer programs, calculating the state of its fracture under the influence of force and the bikrity of the ressora. We did it as follows.

The solution to the problem. Forces acting on the ressora:

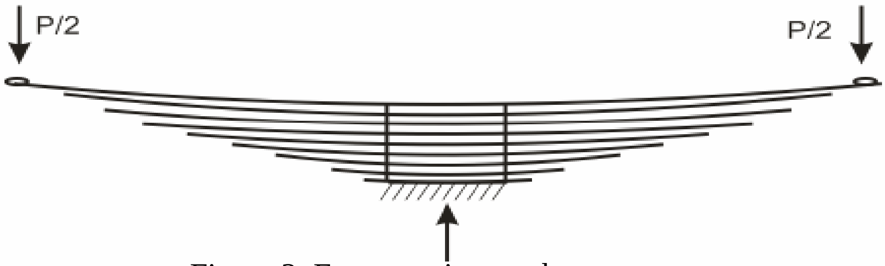


Figure 2. Forces acting on the ressora.

We can get the ressora in this picture as a maybe. The length of the balcony is L=1350 mm, the width is b=70 mm and the thickness is 10 mm. Fastened from the middle to the arrow. Ressora is being influenced by force R = 39839 n (Figure 2).

We return to the construction of the balcony, consider how the static load acting on the balcony is affected. Geometrically, it can be said that tension and displacement are evenly distributed over the region. The force exerted on the Listli ressora can be characterized by bending , bending fr, and stiffness Sr.

We calculate the maximum bending and tension of symmetric semi-elliptic Multi-List ressors by the following formulas[6-10].

$$\sigma_u = \frac{1.5 P_p L}{nbh^2} \qquad \sigma_{uneped} = \frac{1.5 \cdot 14541 \cdot 1350}{7 \cdot 70 \cdot 10^2} = 601 \frac{H}{мм^2}$$

$$f_p = \frac{\delta P_p L^3}{4Enbh^3} \qquad \sigma_{u.з.} = \frac{1.5 \cdot 39839 \cdot 1300}{10 \cdot 70 \cdot 10^2} = 1110 \frac{H}{мм^2}$$

$$f_p = \frac{\delta P_p L^3}{4Enbh^3} \qquad f_p = \frac{1.25 \cdot 14541 \cdot 1350^3}{4 \cdot 2.05 \cdot 10^6 \cdot 7 \cdot 70 \cdot 10^3} = 11.13$$

$$c_p = \frac{P_p}{f_p} = \frac{Enbh^3}{4\delta L^3}$$

$$f_p = \frac{1.25 \cdot 39839 \cdot 1350^3}{4 \cdot 2.05 \cdot 10^6 \cdot 10 \cdot 70 \cdot 10^3} = 19.06$$

$$c_p = \frac{14541}{11.13} = 1306.5 \frac{H}{мм}$$

$$c_p = \frac{39839}{19.06} = 2090.1 \frac{H}{мм}$$

where: L is the full length of the Ressora; n is the number of lists; E is the Yung module (2.05 MPa); B is the list width; H is the list thickness; – bending coefficient (1.25).

Maximum balcony tension and displacement: 19.06 mm, 1110 N/mm2.

It is now widely used in solving technical Masas and conducting scientific research using the finite element method (ChEU). That is why we can see Solid Edge ST and ANSYS 12.0 from ChEU in determining the bikrity of ressora. we applied their programs [11-14].

To do this, we designed the lists of ressora in the Solid Edge ST program (Figure 3):

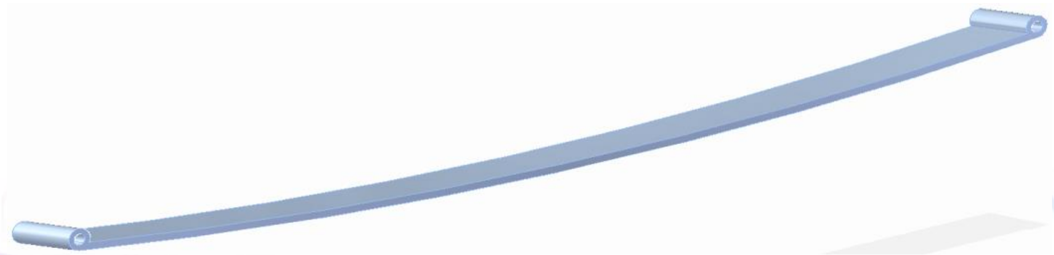
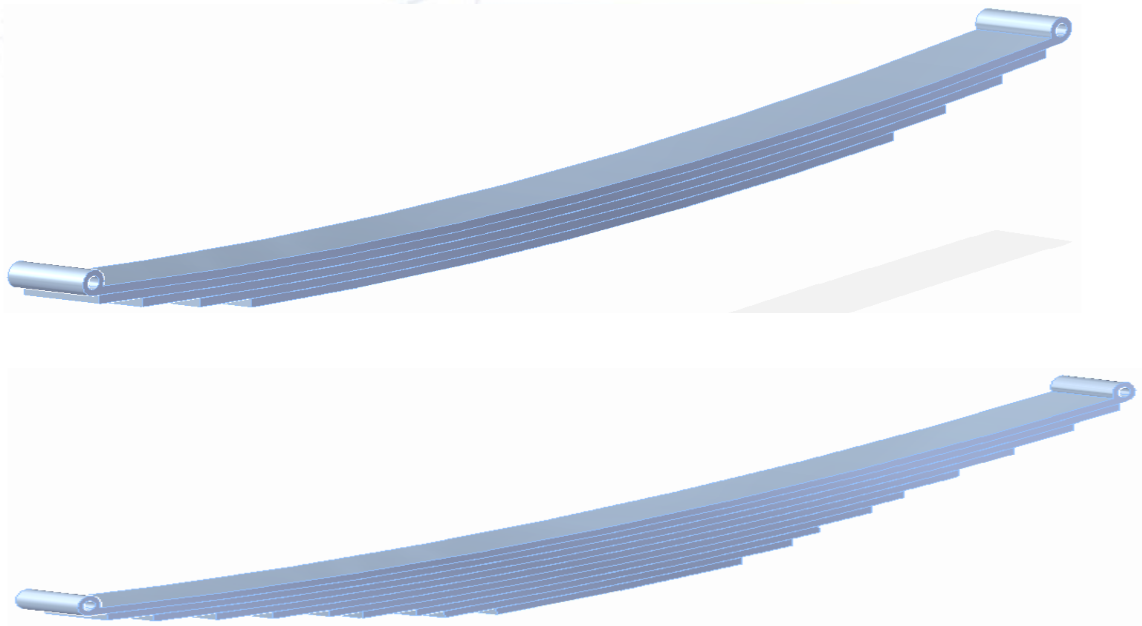


Figure 3. Korennoy list

After that, we designed the remaining lists of the Ressora of the Damas car in sequence in the Solid Edge ST program and assembled them (Figure 4).



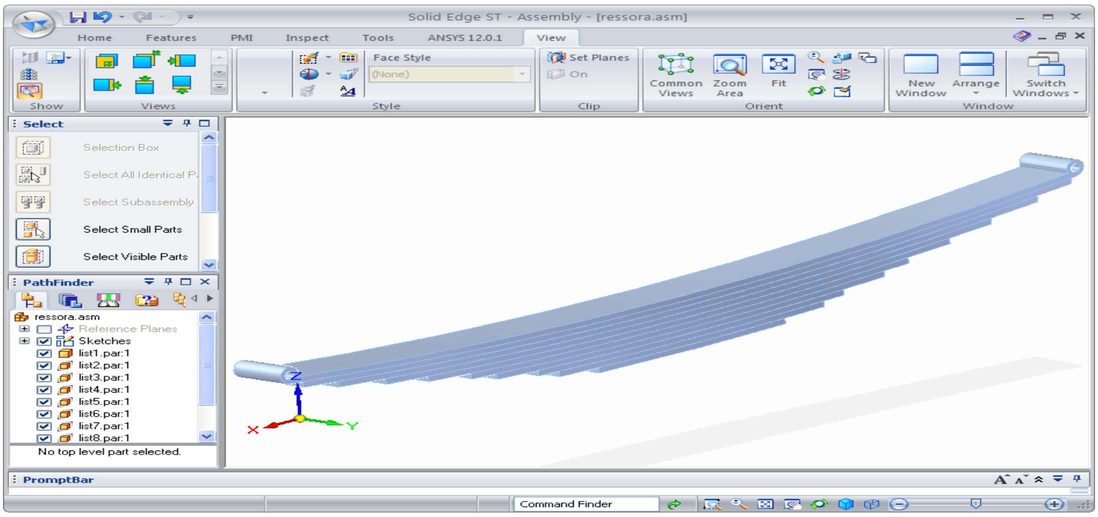


Figure 4. Solid Edge ST software assembled ressora.

Then ready ressorani ANSYS 12.0. we export to the program:

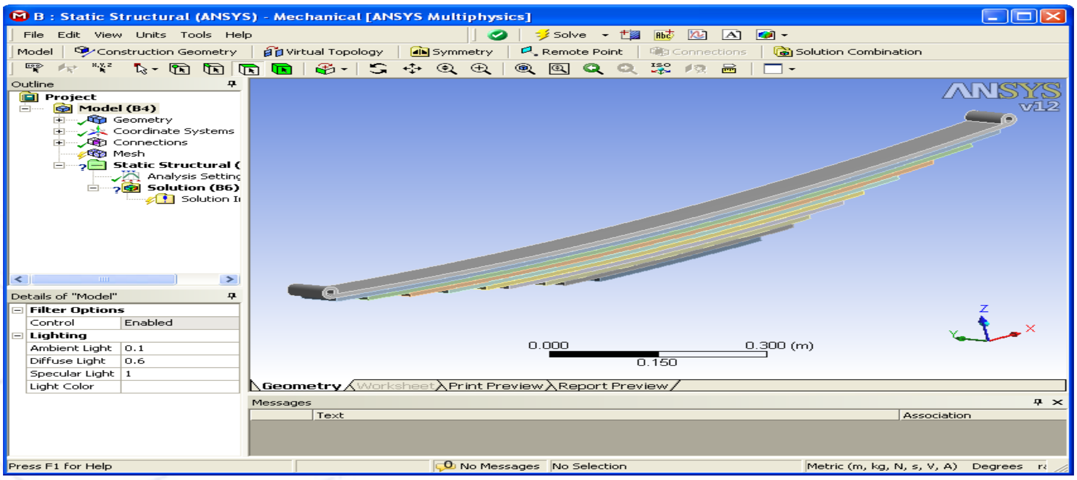


Figure 5. ANSYS 12.0. ressora view exported to the program.

ANSYS 12.0. it will be necessary to harden the bottom of the ressora exported to the program. For this, ANSYS 12.0. in the program, we press the Fixed Support button from the Supports section and fix it by marking the base of the ressora (Figure 6).

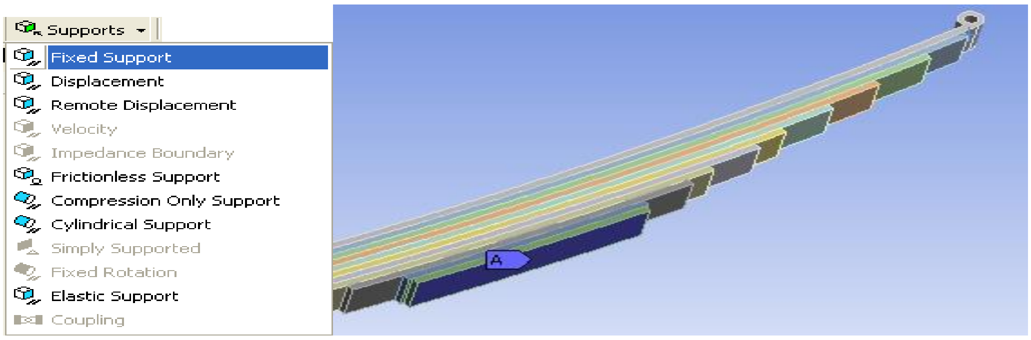


Figure 6. Solidification status of the ressora tag part using the Fixed Support button.

After that, we exert force on the part of the ressora where rama solidifies and simmulate. We can see this in Figure 7.

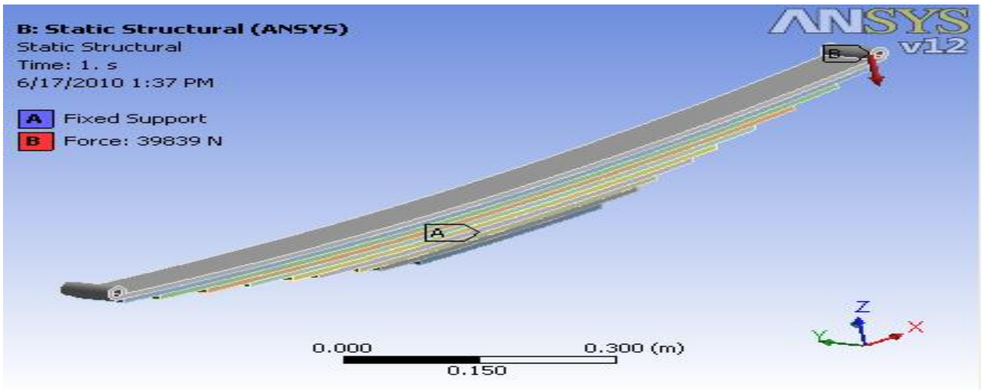


Figure 7. The force exerted on the ressora and the state of the hardened ressora.

ANSYS 12.0. by simulating (simulating) a ressora in its program, we can obtain the results of equivalent stress (Equivalent stress), total deformation (Total deformation) and strength resistance (Safety Factor) of the ressora. The results of this simulation (Figure 8) Give us a definition of how much force a ressora can withstand and from where it breaks [15-17].

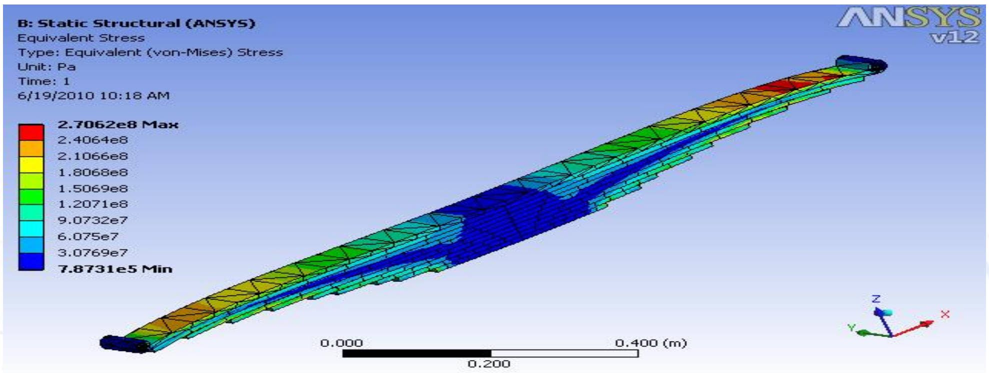


Figure 8. A simulated view of the ressora.

Conclusion. In conclusion, we can say that the computational work can see that the ressora breaks when a pressure of 2.7062 Pa is given. It is required to create an optimal model of the suspension mechanisms of the Damas car based on the conditions of exlpution. As a result of our account and real exploitation, the broken state of ressora is right. We can see this through Figure 1 Above.

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