

THE IMPROVEMENT OF THE SMOOTHNESS PARAMETERS OF CAR MOTION (CATEGORY M1)

Suspension systems serve different purposes — reduction of the vehicle's loading, increasing of active safety and drive comfort, and keeping vehicle passengers well isolated from road noise, bumps, and vibrations, etc. These rates generally badly interact within one system, so the choice of suspensions involves finding the right compromise. It is important for the suspension to keep the road wheel in contact with the road surface as much as possible, because all the road or ground forces acting on the vehicle do so through the contact patches of the tires. The suspension also protects the vehicle itself and any cargo or luggage from damage and wear. That is why we have proposed a new suspension design. New suspension vehicle will provide improvement of comfort and traffic safety.

It was created on the basis of the four-links lever mechanism. Traditional elastic element 1 Suspension installed inside lever mechanism 2 (Fig. 1). Dynamic load is transmitted to the road through the kinematic chain with lever mechanism 2 and longitudinal rails 3, while the elastic element 1 gets doubled deformation, resulting in increased power consumption of the suspension and improves ride.

Dynamic loading of the road is transmitted to the spring-mounted mass through the kinematic chain of the lever mechanism and longitudinal rails. A 4-link suspension can give an adjustable stiffness. There are a lot of versions in the basic design of a 4-link suspension to provide the desired road handling characteristics that will improve most driving styles. A 4-link suspension can give a nonrigid ride in contrast to others. And a 4-link suspension can even compete with a spring suspension as for its smoothness.

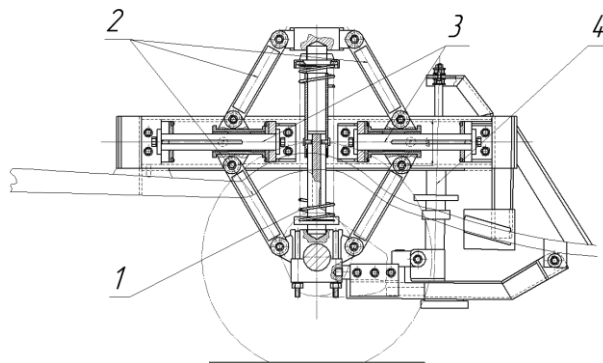


Fig. 1. Suspension from four-links lever mechanism

It was created a full-sized suspension design, which must be installed on the rear axle of the car IZH-2715.

First test was conducted and the parameters of the existing suspension of the car IZH-2715 were obtained to be implemented for comparison with the parameters of a new suspension. Rates of controllability and stability of the car IZH-2715 will be assessed by methods according to GOST R 52302-2004 "vehicles". It is planned to apply the following test methods to check the controllability and stability: jerking of the wheel; turning and rearranging.

Conclusions. Vehicle suspension based on four-links lever mechanism was designed. Full-scale tests of the car IZH-2715 were conducted and rates of controllability and stability were received.