

FUEL CONSUMPTION ASSESSMENT MODEL FOR VEHICLE OPERATION IN CITY CONDITIONS

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Abstract:

Today, Uzbekistan is expanding with various new vehicles - buses, trucks, cars, special and specialized vehicles. The lack of a fuel consumption estimation model for many commercial vehicle models in use in the Republic, in particular, for domestically produced vehicles, leads to a violation of the objectivity of fuel consumption, including operational calculation and fuel consumption statistics, and worsens the mutual calculation system, while vehicles and fuel and energy negatively affects the efficiency of resources.

Key words: Drive cycle, fuel consumption, vehicle, evaluation model.

Evaluation of operating conditions, including fuel economy of cars in city and highways and the amount of harmful gases coming out of the car, is carried out using standard driving cycles.

is increased. One of the unique aspects of estimating the fuel economy of vehicles through driving cycles is that the method covers the fuel consumption of all driving modes of the vehicle. Effective use of fuel in many ways to the extent of its moderation depends. The purpose of regulation is to organize resource saving, rational distribution and efficient use. Researches to determine the fuel consumption rate of the car under the conditions of given parameters of the driving conditions of

the car are complicated requires long-term experimental research. Current state of information technologies and a number of computing software provides an opportunity to evaluate existing processes by means of simulation modeling. The mode of movement of cars has its own characteristics in different conditions, while it is confirmed by the normative status in foreign countries [1,3]. Europe, Japan, the United States and other developed countries have approved their own regulatory action cycles.

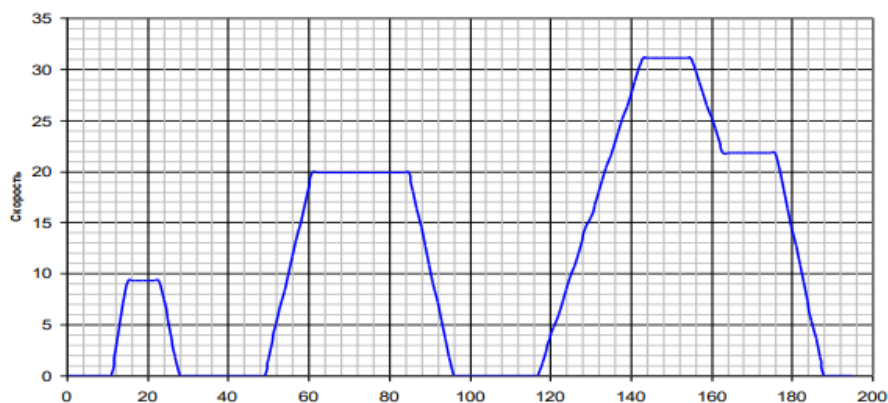


Figure 1. *European Normative Cycle ECE*

The motion cycle reflects the modes and parameters of the vehicle. In the motion cycle, parameters such as acceleration/deceleration, constant speed values, motor cycle time, or expressed in horizontal road conditions in the traveled road section. In this article, the impact of the speed change over time on the fuel consumption value of a certain car from the composition of the traffic cycle parameters was modeled using the MatLab program.

The values of the speed and time in the movement cycle, parameters of the evaluated vehicle were accepted as input data of the formed model. It is possible to change the input data, thereby evaluating the vehicle in different driving cycles or different vehicles can be evaluated in one driving cycle [2].

"Backward model" was also used in the formation of this model. In the "Backward model" application, a model for estimating the fuel consumption of a car is formed (Fig. 2).

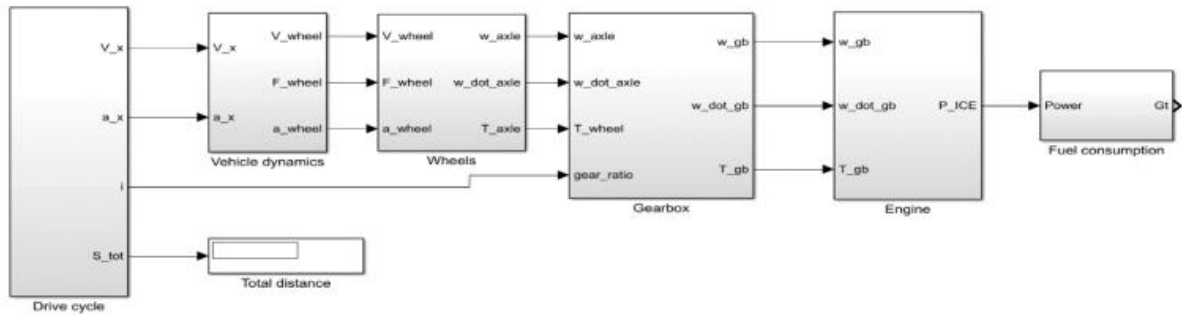


Figure 2. Vehicle fuel consumption estimation model in Backward model application.

Each section above is a mathematical representation of a part of the car. Each of them is formed separately and "Subsystem" forms are created. A model created using the MatLab Simulink computer program, i.e. Nexia in the vehicle fuel consumption estimation model in the driving cycle. The fuel consumption value of the passenger car when driven according to the requirements of the NEDC cycle made it possible to record the result of 5.69 l/100 km (Fig. 3).

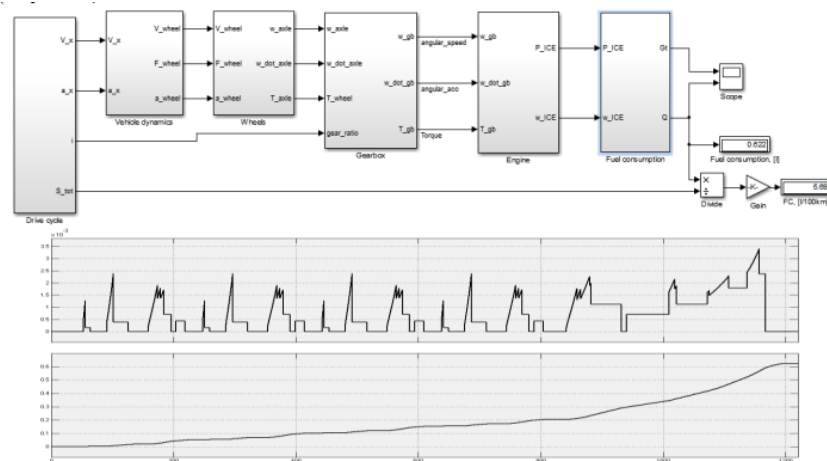


Figure 3. When driven according to the NEDC driving cycle requirements of the Nexia passenger car the amount of fuel consumed.

A study of the complications arising during the vehicle movement and the consideration of various external conditions for fuel economy several indicators are used at the time. Based on the analysis, it can be concluded as follows:

- due to the increasing number of unstable driving modes in the city, it is appropriate to evaluate the fuel efficiency and environmental characteristics of cars through driving cycles;

- fuel efficiency and environmental safety of cars Aerodynamic feature tests are conducted on drum stands does not consider resistance forces. Modern information technology taking into account the development of vehicles, fuel consumption and determination of the amount of harmful gases coming out of the car in road conditions it is desirable to improve and introduce the method.

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