

ALTERNATIVE ENERGY INSTALLATIONS FOR VEHICLES

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The article focuses on existing areas of alternative energy installations used for vehicles and their prospects for further improvement.

Power units, alternative fuel, hybrid cars, fuel cells.

Continuing the trend of energy consumption growth is characteristic of the entire world economy. This leads to negative environmental effects, as increasing emissions violates the heat balance of the planet. Thus, the need for a significant reduction in specific energy costs is an important task for all sectors of the economy so particular, and for transport.

To address this promising direction giving up the power plants as hazardous combustion engines and the transition to electrified transport modes [1]. This in turn requires high quality design changes to road transport. In addition, the massive use of electric vehicles requires the appropriate infrastructure for recharging batteries. It should also take into account the fact that the power produced by power plants with modern, much less power all modern cars.

Therefore, an important task is the creation and modernization of power plants vehicles that have been focused on the use of alternative fuels.

The purpose of research - analysis of prospective technical solutions for the power plants of vehicles that allow to minimize energy consumption and ensure high environmental parameters.

Materials and methods research. Given the fact that most energy intensive and environmentally dangerous component of the car is its power plant as the main research areas are determined by two major socio-economic problems [2]:

- Efficient use of fuel oil origin, including replacing it with alternative energy sources;

- Reducing the harmful effects of transport on the environment.

For the analysis of solutions to the problem of energy saving and environmental safety in transport, outlined promising alternative directions, both of which carried out this study.

Results. Solving energy problems of road transport possible primarily through the use of alternative fuels that should be available to the mass market price and based on sufficient raw material resources.

The introduction of environmentally friendly vehicles on fuels such as hydrogen, biogas, ethanol, dimethyl ether, liquefied natural gas and liquefied petroleum gas (propane-butane mixture) can significantly reduce emissions of pollutants.

The International Energy Association (IEA) predicts that by 2030, global production of biofuels will increase to 150 million tons energy equivalent of oil. The annual growth rate of 7.9% amount. As a result, in 2030 the share of biofuels in the total consumption in the transport sector in the world will reach 4 - 6% [6].

However, the most promising energy source is liquid hydrogen, which has the highest known energy density. The unique properties of hydrogen provides the opportunity to improve the efficiency of the internal combustion engine in 1.5-1.7 times compared to conventional gasoline. [7] In internal combustion engines, hydrogen can be used as the main fuel and as an additive to poor hydrocarbon-air mixtures to initiate the combustion process. This is achieved by improving fuel economy and a sharp decrease in toxicity of emissions. Effectively through the use of hydrogen as a vehicle fuel is to create hydrogen fuel cell electric vehicles with and electric.

Modern automotive commonly used scheme that allows to combine traction internal combustion engine and electric motor. This avoids the ICE mode of small loads and implement recuperation of kinetic energy, which improves fuel efficiency propulsion.

Thus, the combined power plant - a system with complex energy. Part of the energy produced by internal combustion engines, transmission is transmitted through the vehicle for movement or change of speed. The rest of the generator shown in the

battery and sent to accumulate. If ICE power is not enough, fueled electric traction energy from batteries. If necessary, reduce the kinetic energy of the vehicle electric machine picks up and sends this energy in the battery. Thus the combined energy power plant is transmitted in several ways across multiple drives, fuel tank, batteries, car (which is the kinetic energy of the battery) [4].

The main advantage of a hybrid vehicle - reducing fuel consumption and emissions. This is achieved by full automatic control mode of the propulsion system for the on-board computer, ranging from timely shutdown of the engine during stops in traffic flow, with the option of driving without his run solely on battery power, and ending with complex mechanism of recovery - the use of motor a generator of electric current to recharge the battery power.

The most promising currently considered electric vehicles equipped with fuel cells - chemical current sources that direct converting fuel energy into electricity, avoiding inefficient combustion process occurring with heavy losses. For modern electrochemical technologies are characterized by a growing share of energy, but their high power density is limited to full internal resistance of the contact area [5].

Conclusions

The introduction of environmentally friendly vehicles on fuels will reduce harmful emissions and reduce energy power plants. Because fuel cells can operate with high efficiency, so their prospects of development of transport related energy that also contribute to the reduction of greenhouse gases and other pollutants.

The use of alternative energy installation in vehicles requires solving complex scientific and technical issues related to the improvement of technological regimes, developing energy efficient adaptive control algorithms to select the mode of operation that will provide a significant improvement in vehicle fuel economy and reduce harmful effects on the environment.