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THE INFLUENCE OF THE HYBRID POWER PLANT ON THE PERFORMANCE PARAMETERS OF THE CAR

Abstract. One of the promising directions in the automotive industry is the use of hybrid power plants (HPP) to increase fuel efficiency. HPP are a combination of an internal combustion engine (internal combustion engine) and an electric motor that work together to ensure the movement of the car. In such systems, the energy source is the internal combustion engine, which drives the generator armature. The generator generates electrical energy, which is then accumulated by batteries. In turn, the electric motor drives the driving wheels of the car. The use of hybrid power plants can significantly reduce fuel consumption and emissions of harmful substances. Increasing environmental requirements and the need to reduce dependence on fossil fuels make the use of hybrid cars increasingly relevant.

Keywords: automobile transport, battery, hybrid power plant, internal combustion engine, fuel, operational parameters, energy, efficiency.

THE FORMULATION OF THE PROBLEM

Determining the degree of influence of a hybrid power plant on the key performance parameters of a car in comparison with cars equipped with traditional internal combustion engines will allow us to assess their contribution to improving the efficiency of road transport.

The purpose of the article is to study the effectiveness of using a hybrid power plant in road transport.

THE MAIN MATERIAL

Modern cars with a hybrid power plant differ significantly from the models of the first generations, in which the electric drive acted more as an additional option. A modern hybrid car has a fairly capacious battery, and the internal combustion engine is more used in situations where it was not possible to charge the battery in a timely manner [5].

During a trip along a country highway, when atmospheric pollution is not so critical, an internal combustion engine is running, driving an electric car and recharging the battery. In the city, traffic is generated from a traction battery [6].

The hybrid power plant of the car has a significant impact on its operational parameters. Here are a few key aspects of the impact:

1. Hybrid cars offer several advantages in terms of fuel economy. Firstly, they use a combination of electric and traditional motors, which allows for more efficient use of energy. This means that the car can travel a longer distance on one tank of fuel.

Secondly, hybrid cars usually have higher fuel efficiency compared to cars with traditional engines. This is due to the fact that the electric motor provides higher efficiency, as well as the possibility of regenerative braking, which allows you to convert kinetic energy into electrical energy and store it in batteries.

In addition, hybrid cars can use various driving modes [2], such as an electric vehicle mode, when the car is driven only by electric traction, or a hybrid engine mode, when a gasoline or diesel engine works together with an electric one. This allows you to choose the most economical driving mode depending on the conditions of the trip.

2. Hybrids produce fewer emissions of harmful substances into the atmosphere because they use electricity, which is produced using more environmentally friendly energy sources.



3. Electric hybrid car engines tend to be quieter than traditional internal combustion engines.
4. A hybrid car can drive a certain distance on electric traction before switching to a gasoline engine. This increases the distance of the trip at one gas station.
5. Hybrid cars often require less maintenance, as they have fewer moving parts than traditional cars, and their electrical components usually have a longer service life.
6. Some hybrid cars use electric motors to provide additional power during acceleration, which makes the car more dynamic.
7. The possibility of charging from the mains for parallel hybrid vehicles with external charging (PHEV, Plug-in Hybrid Electric Vehicle) from the household power supply system which may be convenient for those who live in areas with limited access to gas stations [3].
8. Reducing engine wear through the use of electric motors, hybrid cars can reduce the wear of the internal combustion engine, since it only works when necessary.

In general, the hybrid powerplant provides a number of advantages for the vehicle's operating parameters, including fuel economy, improved environmental conditions, reduced noise levels and increased travel distance at one gas station.

The disadvantages of cars with a hybrid power plant include [1]:

1. Significant difficulties in the disposal of the battery. A lot of energy is spent on the process of recycling batteries: almost ten times more than for their production, which again increases the load on power plants [4].
2. The overestimated cost of the battery with its limited life.
3. Inefficient carrying out of necessary repairs, maintenance and diagnostics, as well as their high cost.
4. The complexity of the design.

CONCLUSIONS

Hybrid power plants have a significant impact on the performance parameters of the car, making it more economical, efficient and environmentally friendly. Despite some challenges related to their maintenance and cost, these innovations are a promising direction for the development of the automotive industry in the context of striving for sustainable and efficient use of resources.

It is important to note that the transition to hybrid cars is not just a matter of economic efficiency or environmental responsibility, but also an important step towards the sustainable development of the automotive industry.

In general, hybrid engines represent a promising direction in the automotive industry, which helps to reduce dependence on traditional fuels, as well as improve the environmental situation.

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ВЛИЯНИЕ ГИБРИДНОЙ СИЛОВОЙ УСТАНОВКИ НА ЭКСПЛУАТАЦИОННЫЕ
ПАРАМЕТРЫ АВТОМОБИЛЯ

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Аннотация. Одним из перспективных направлений в автомобильной промышленности является использование гибридных силовых установок (ГСУ) для повышения топливной эффективности. ГСУ представляют собой комбинацию двигателя внутреннего сгорания (ДВС) и электрического двигателя, которые работают вместе для обеспечения движения автомобиля. В таких системах источником энергии служит ДВС, который приводит в действие якорь генератора. Генератор вырабатывает электрическую энергию, которую затем аккумулируют батареи. В свою очередь, электрический двигатель приводит в движение ведущие колеса автомобиля. Использование гибридных силовых установок позволяет существенно снизить расход топлива и выбросы вредных веществ. Повышение экологических требований и необходимость снижения зависимости от ископаемых видов топлива, делает использование гибридных автомобилей все более актуальным.

Ключевые слова: автомобильный транспорт, аккумуляторная батарея, гибридная силовая установка, двигатель внутреннего сгорания, топливо, эксплуатационные параметры, энергия, эффективность.

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