

THE IMPACT OF THE AUTOMOTIVE ENVIRONMENT ON THE ENVIRONMENT AND METHODS OF IMPROVING THE ENVIRONMENTAL SAFETY OF CARS

The aim of this study was to investigate the problem of the state of the planet's ecology as a whole. As a result of the scientific and technological revolution, humanity suffers from excessive pollution of the environment: air, water and land resources with harmful substances. In particular, transport is not the last link that poses a real threat to the atmosphere in terms of pollution by emission gases and the formation of "holes" in the ozone layer of our planet.

Gas emissions from motor vehicles are very harmful to people and the environment. In recent years, the global vehicle fleet has increased significantly, reaching up to 28 million vehicles annually. This leads to serious air pollution, especially in places with high population density where emissions are concentrated. Car exhaust gases contain toxic components that remain in the atmosphere from ten days to six months, worsening air quality and human health [1].

The exhaust gases of internal combustion engines of cars contain more than 1200 toxic chemical compounds, most of which are various hydrocarbons. Because of this diversity and difficulty in identifying individual compounds, the most represented components or groups of components are usually accepted for consideration.

Sulfur compounds and nitrogen oxides emitted into the atmosphere with the exhaust gases of car internal combustion engines undergo chemical transformations, forming various acids and salts. Such substances return to earth in the form of "acid" rain. It has now been proven that acid precipitation causes significant damage to aquatic ecosystems, leads to the destruction of fauna, causes increased corrosion of metals and destruction of building structures.

Harmful substances contained in the exhaust gas emissions of internal combustion engines of cars that consume the bulk of oil refining products and some part of the processing of coal and gas have an extremely negative impact on human health.

The impact of road transport on the environmental situation in our country has reached a critical point – the indicators of air and environmental pollution exceed all permissible indicators of world norms and standards.

Analysis of statistical data and estimates of the negative impact of road transport on the environment and the population shows that emissions of pollutants by road transport on average per year amount to about 5.5 million tons (39% of total emissions in Ukraine). In large cities, air pollution from exhaust gases sometimes reaches up to 90% of the total level of pollution. In addition, more than 20% of ATMs are operated in excess of the established standards for the content of harmful substances in exhaust gases. More than 270 different harmful substances have been found in the exhaust gases emitted by cars, among which carcinogenic benzopyrenes, nitrogen oxides, lead, mercury, aldehydes, carbon and sulfur oxides, soot, carbohydrates and others are particularly safe [2].

In Ukraine, there is a program to reduce the negative impact of road transport on the environment, which states that motor transport is one of the largest polluters of atmospheric air and defines the main measures for the implementation of this program within ten years. The efficiency of safe use of fuel for humans and its impact on the environment is currently the main task of modern research in transport technologies.

The sources of emissions of harmful substances from internal combustion engines are: exhaust gases; crankcase gases, evaporation from power systems, uncontrolled spillage of operating materials on the ground.

The main components of the negative impact of road transport on the environment and human health at the present stage of development of the world production and operation of motor vehicles are:

- the activity of the bulk of road transport is concentrated in places with a high population;
- harmful emissions from cars are carried out in the lower, surface layers of the atmosphere, where the main human activity takes place;
- Exhaust gases from car engines contain highly concentrated toxic components, which are the main pollutants of the atmosphere [3].

Harmful emissions from road transport significantly depend on the mode of operation of the engine and the quality of the fuel used, on the serviceability of systems and mechanisms.

Toxic components of the polluted environment enter the human body by inhaling air and are absorbed into the bloodstream, affecting the respiratory tract and lungs. Carbon reduces the ability of blood to carry oxygen to tissues, contributes to the exacerbation of symptoms of cardiovascular diseases, and impairs breathing.

So, the daily operation of cars consists in the use of operating materials, petroleum products, natural gas, atmospheric air, and all this is accompanied by negative processes, namely: air pollution; Water; lands and soils; noise, electromagnetic and vibration effects; release of unpleasant odors into the atmosphere; release of toxic waste; thermal pollution.

The impact of road transport on the environment is manifested by: when cars are moving (especially in cities, at intersections); during maintenance; in the functioning of the infrastructure that ensures its operation.

The priority areas for improving the environmental safety of road transport are:

- various ways to reduce emissions of toxic components into the environment;
- constant increase in the amount of environmentally friendly materials in production and control over the use of materials with harmful substances in the construction of cars;
- timely maintenance and precise adjustment of the ignition and power supply system of internal combustion engines;
- reducing the harmful impact of toxic substances on the environment during operation due to the introduction of the latest systems for neutralizing harmful emissions;
- widespread use of liquefied natural gas, alternative fuels, new vehicles – electric vehicles;

- introduction of various additives and neutralizers into the fuel composition, which ensure its smokeless combustion;
- use of the latest ignition systems that contribute to the complete combustion of fuel;
- Improvement of the environment in Ukraine by meeting the requirements of environmental legislation [4].

Conclusions: Ukraine needs to actively work on improving the operation of motor vehicles and improving the quality of fuel for internal combustion engines in accordance with the regulatory framework. To improve the quality of atmospheric air, it is important to reduce emissions from road transport by 40% and prevent lead emissions, especially in cities, resort areas and large cities, in particular in Kyiv. It is necessary to give priority to passenger electric transport in large cities, with a consistent reduction in bus routes. It is also important to develop technologies and tools to assess and protect the environment from pollution in road transport enterprises.

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