Western European Journal of Modern Experiments and Scientific Methods
Volume 2, Issue 6, June, 2024
https://westerneuropeanstudies.com/index.php/1
ISSN (E): 2942-1896 Open Access| Peer Reviewed

THE PROBLEM OF ENVIRONMENTAL PROTECTION AND THE HARMFUL EFFECTS OF MOTOR TRANSPORT ON THE ENVIRONMENT

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Abstract
The escalating issue of environmental degradation has drawn significant attention to the adverse impacts of motor transport on our ecosystem. This article delves into the multifaceted relationship between motor vehicles and environmental harm, exploring the primary pollutants emitted by internal combustion engines, including carbon dioxide (CO_2), nitrogen oxides (NO_x), particulate matter (PM), and volatile organic compounds (VOCs). These pollutants contribute to air quality deterioration, climate change, and a myriad of health problems. Furthermore, the article examines the lifecycle of motor vehicles, highlighting the environmental costs associated with production, operation, and disposal. The discussion extends to the social and economic implications of motor transport pollution, stressing the need for robust regulatory frameworks and innovative technological solutions. Emphasis is placed on sustainable transport alternatives, such as electric vehicles (EVs), public transportation, and non-motorized modes of travel, which offer promising avenues for reducing the environmental footprint of transportation. This comprehensive analysis aims to underscore the urgency of addressing motor transport's environmental impact and advocates for integrated policies and practices to foster a cleaner, healthier future.
Keywords: toxic gases, harmful waste, environment, engine, carburetor, gasoline, gas (methane), diesel engine, carbon monoxide, unburned hydrocarbons.

Introduction

The rapid development and proliferation of motor transport have revolutionized human mobility, enabling unprecedented convenience and economic growth. However, this progress has come at a significant environmental cost. Motor vehicles are a major source of pollution, contributing substantially to air quality deterioration, greenhouse gas emissions, and global climate change. The combustion of fossil fuels in internal combustion engines releases a variety of harmful pollutants, including carbon dioxide (CO_2), nitrogen oxides (NO_x), particulate matter (PM), and volatile organic compounds (VOCs). These emissions have far-reaching impacts on human health, ecosystems, and the planet's climate system [1-3].

The environmental ramifications of motor transport extend beyond atmospheric pollution. The production, maintenance, and disposal of vehicles impose additional burdens on natural resources and generate waste, further exacerbating environmental degradation. As the global vehicle fleet continues to expand, the urgency to address these challenges becomes increasingly evident [4-7].

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This article aims to provide a comprehensive examination of the harmful effects of motor transport on the environment. It explores the sources and types of pollutants emitted by vehicles, the environmental and health consequences of these emissions, and the broader ecological footprint of the automotive industry. Additionally, it discusses the current regulatory landscape and evaluates the effectiveness of various mitigation strategies, including technological advancements and policy measures. By highlighting the critical need for sustainable transportation solutions, this article seeks to contribute to the ongoing discourse on environmental protection and advocate for concerted efforts to mitigate the adverse impacts of motor transport [8-11].

The main part

In the late 19th and early 20th centuries, the problem of environmental protection began to appear as a result of the rapid development of industry and automobile transport on earth. If plants and factories pollute only certain areas in one specific place, cars affect all the places within reach of human feet.

When burning any fuel, various combustion emissions are released. These wastes have a major impact on human health and the environment. Factories, factories and transport companies in the city are the main sources of environmental pollution. Road transport is currently considered a more polluting source than factories and plants.

In the use of motor vehicles, 3 different sources of environmental pollution can be seen: exhaust gases, crankcase gases, and harmful substances formed as a result of fuel evaporation (from the fuel tank, carburetor, etc. Fig. 1) [12-14].

Exhaust gases make up 65-70% of harmful substances released into the environment as a result of car operation, and crankcase gases make up 20%. The biggest problem that needs to be solved at the moment is to reduce harmful emissions from the use of cars.

It has been determined that there are more than 200 harmful emissions in the gas produced by the combustion of fuel in the car engine. The most harmful of these include carbon monoxide - CO, unburned hydrocarbons - CH, nitrogen oxides - NOx.

Many countries have regulations to allow these wastes. In the CIS countries, the regulation of emissions from fuel combustion was introduced in 1970 based on the directive issued by the UN Economic Commission for Europe (ECEOON).

Waste gases also contain harmless oxygen, carbon dioxide, nitrogen, and sulfur. But nitrogen at high temperature and pressure forms nitrogen oxides, which are very harmful. Harmful products in exhaust gases are not always in the same volume for many reasons. It depends on the type of engines, the mode of operation, the level of tuning, the technical service provided to the engine and the quality of the fuel [15-19].

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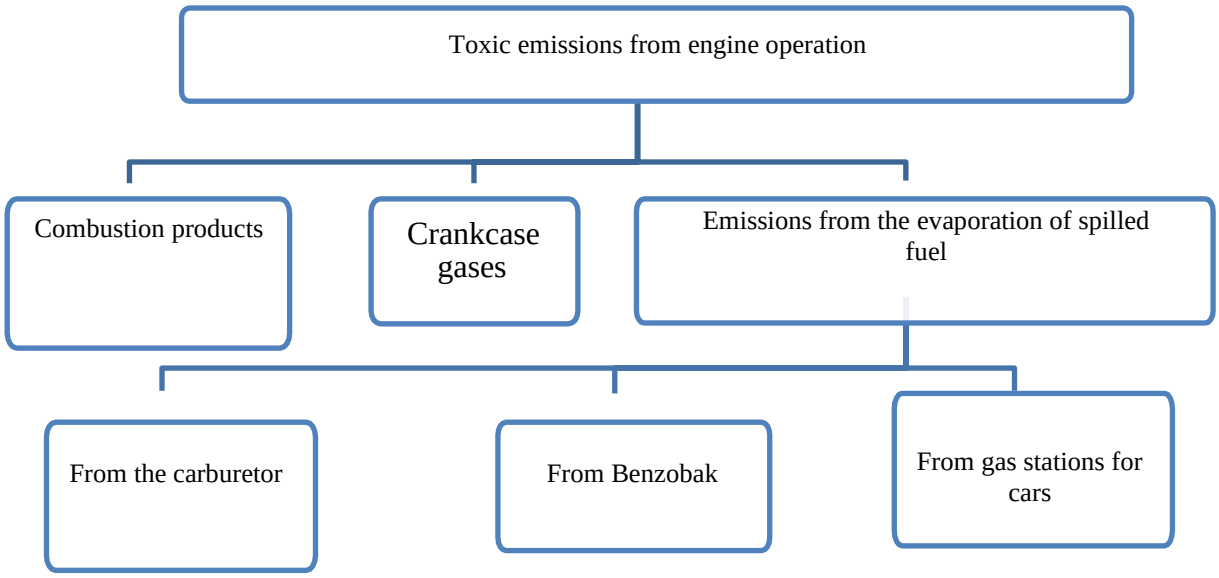

Figure 1. Harmful waste generated as a result of the operation of vehicles

A diesel engine is less harmful than a carburetor engine. During the operation of diesel engines, harmful gases such as CO, NOx and CH are released less, but the volume of the body, which contains harmful benzopyrene, is greater. Carburetor engines release lead compounds and diesel engines release barium compounds.

These compounds are formed as follows:

- as a result of adding ethyl alcohol to increase the anti-detonation properties of gasoline (ethyl alcohol contains lead);
- as a result of adding a special barium anti-smoke substance to reduce the ignition of diesel fuel.

Engine operating conditions play a major role in whether exhaust gases are harmful or harmless. The largest emission of CO is produced in the engine's pure operation mode, when the engine is running on an enriched fuel mixture. At the same time, as a result of improper installation of the combustion system in carburetor engines, voltage (spark) is transferred to the spark plug earlier or later than normal, which leads to incomplete combustion of the combustible mixture. A change in the distance between the switch contacts from the norm also causes a decrease in the voltage in the candles and a weakening of the spark, which also leads to incomplete combustion of the combustible mixture, as a result of which the amount of CO in the combustion products increases [20].

The change in the pre-spraying angle of the combustible mixture of diesel engine injectors and the irregularity of the spray angle (if the angle is low, the fuel spray speed increases and the fuel partially sits on the piston, if the angle is large, the fuel i does not reach all parts of the combustion chamber) leads to deterioration of the combustible mixture and incomplete combustion of fuel. In these cases, the amount of harmful substances in exhaust gases also increases.

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Indicators of the amount of exhaust gases in combustion products as a result of the operation of carburetor and diesel engines are presented in Table 1.

Waste gases ingredients	The composition of waste gases, %	
	Gasoline engines	Diesel engines
Nitrogen	74-77	76-78
Oxygen	0.3-8.0	2-18
Water	3.0-5.5	0.5-4.0
Liglerod-2	5-12	1-10
Carbon monoxide	1-10	0.02-0.50
Nitrous oxide	0-0.8	0.001-0.400
Hydrocarbons	0.20-0.30	0.1-0.10
Sulfur gas	0 -0.02	0-0.3
Body, g/m3	0 -0.4	0.1-1.5
Benzopyrin, g/m3	0.0002	0.00001

Indicators comparing the harmfulness of exhaust gases from carburetor and diesel engines (by volume)

Protection of the environment from the harmful effects of motor transport is mainly carried out in 2 different directions:

- improvement of cars and its engine designs;
- fight against the harmful operation of vehicles in operation.

Improvement of the construction of cars and its engine, improvement of the engine operation mode, use of various auxiliary equipment and high-quality fuel, timely and high-quality performance of maintenance and repair work, as well as low-hazard gas turbine, external combustion - Stirling engine , is carried out by the production of electric cars, injection engines. The fight against the harmful operation of vehicles in operation consists mainly of limiting the amount of harmful substances emitted by cars by the relevant legislation and controlling the observance of these standards.

According to the World Health Organization, 142 million people die in the United States every year. t harmful substances are released into the atmosphere, of which 86 mln. tons are generated as a result of the operation of cars.

GOST 16533-70, introduced on January 1, 1971, limits the volume of CO, which is the composition of exhaust gases released as a result of the operation of gasoline engines [3].

GOST 21393-75 limits the emissions of diesel engines, 1980 GOST 16533-70 was replaced by a new state standard 17.2.2.03-77, which also limits the amount of CO in the exhaust gases of gasoline engines. This applies to trucks, cars and buses running on standard gasoline.

According to the new GOST, the volume of CO should not exceed 1.5% for all cars, and the inspection of the content of CO in the exhaust gases, with a population of more than 300 thousand and in capital cities, resorts, when 2-TX is carried out, maintenance after repair during

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construction, it is carried out by specialists of motor transport enterprises and employees of YPX.

When checking the harmfulness of exhaust gases, the engine must be warmed up according to the regulations. After that, the sampling tube should be inserted into the car extinguisher by 300 mm while the engine is running.

The reading of the measuring instrument should be between 0 and 5 % or between 0 and 10 %, and the error should not exceed ±5 %. Measuring instruments must pass state control after a certain period of time and have a sign of this [3].

According to calculations, if GOST 17.2.2.03-77 is followed, CO in exhaust gases can be reduced by 20%, which in turn will reduce gasoline consumption.

All ATKs should have posts that determine the composition of exhaust gases. On the other hand, private car owners must be given a special pass based on the results of the inspection. It is necessary to note that exhaust gases are not above the norm.

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