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CAR ENGINES IN HOT CLIMATE CONDITIONS ANALYSIS AND IMPROVEMENT OF PERFORMANCE PROPERTIES

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ANNOTATSION

The article discusses changes in the characteristics of the internal combustion engine under the influence of a hot climate, the redistribution of the heat flux in the cylinder during coking of the piston head and changes in the clearance between the piston and the sleeve. The analysis of the performance of the engine in the climatic conditions of Uzbekistan

Keywords: Engine, cylinder, injector, engine power, specific fuel consumption, cylinder-piston group, compression ring, oil scraper ring, liner, piston, piston rings, piston skirt, defects.

INTRODUCTION

Currently, there is no area in which car transport is not used. In particular, cars are used for passenger and cargo transportation and special works. The first generations of cars were designed in the form of horse-drawn carriages, which were equipped with a steam engine to turn the front wheels.

Internal combustion engine - in such engines the process of converting heat energy into mechanical energy takes place inside the engine.

The performance of a car is directly related to the power of its engine. At present, cars are mainly powered by reciprocating engines. One of the main tasks facing professionals today is to increase engine power and increase the car's speed and load-carrying capacity. To do this, it is necessary to increase the basic operational characteristics of the engine, reduce fuel consumption and consumption of operating materials.

S.M.Kadirov's book "Internal combustion engines" analyzes the theory of processes occurring in internal combustion engines of automobiles, tractors, agricultural and road construction machines, as well as the factors influencing their operating cycle, power and fuel consumption. The principles of operation of fuel supply and air mixing devices in carburetor engines, the operation of diesel fuel supply equipment and the processes of formation of combustible mixtures are considered. The kinematics and dynamics of the engine crankshaft mechanism, the issues of balancing and smooth operation of engines, the structure of all systems and details of engines are considered.

An increase in fuel temperature, as well as air temperature at the end of compression, contributes to a reduction in the delay period of spontaneous combustion and an increase in the rate of combustion. In this case, the severity of the process is slightly reduced. At high temperatures, the amount of heat released when the fuel is ignited decreases due to a decrease in the filling of the cylinder with a new charge.

As the air temperature rises, the specific energy consumption increases. When the air temperature rises from 20 to 40 ^{0}C at the inlet, the engine power is reduced by 5%, the hourly fuel consumption is reduced by 2.5%, and the specific fuel consumption is increased by 4%.

These changes are relatively minor and are explained by changes in the operating process and performance of the fuel supply system.

Studies by some scientists show that in most engines, the excess air ratio decreases as the temperature rises during the input cycle. These changes can be explained by the fact that the transmission of light is reduced to a lesser extent than when the cylinder is filled with a new charge.

Fuel supply for engines intended for use in the climatic conditions of Uzbekistan should be changed in such a way that the excess air coefficient remains unchanged. In this case, the economical operation of the engine is reduced and the change in temperature of the process is minimal. However, in this case the engine power will be much lower than in temperate climates. In this case, additional air intake is required due to the deterioration of the consumption characteristics of the machine.

Currently, socio-economic, environmental and energy problems are emerging as a result of the world's growing population and the rapid development of science and technology. Over the next 100 years, humanity's need for energy resources has increased a thousandfold. Today, the energy obtained is mainly due to organic fuels: coal, peat, oil, natural gas and others. There are specific advantages and disadvantages to using this type of energy source. First, the earth's reserves of this type of energy are limited, which will decrease over time. Second, the use of these types of energy sources releases various wastes into the environment. Today, natural fuel consumption is equivalent to 12 billion tons of oil equivalent worldwide. That means about 2 tons of fuel per person

Research conducted by scientists in the field of vehicle operation shows that more than 70% of passenger traffic in the regions of the country falls on Damas cars. These cars are convenient for the population in all respects, fast, compact, small in size, can accommodate many passengers and consume relatively little fuel. The car can accommodate up to 7 people with the driver, but the main goal was to further increase the economy of this car, as its fuel economy exceeds the standards specified in the factory.

The main function of the fuel supply system is to prepare the combustible mixture required for engine operation. In Damas, the main function of equipment that diagnoses the condition of components such as the fuel filter, fuel pump, carburetor, which ensures the reliability of the fuel supply system, is to check that the fuel supply system is working properly, and to control the amount of toxic gases emitted into the environment.

The following methods can be used to increase engine power and economy:

-Increase the frequency of rotations;
-Increase of average effective pressure;
-Increasing the level of compression in gasoline engines;
-Increase the number of valves;
-Increase the number of spark plugs and the power of the spark charge;
- Further compaction of the landing chamber;
- Use the method of ignition with a fork camera;
- Use of other types of products other than petroleum;
- Use of other types of energy sources;
- Ensuring the stability of the engine adjustable bodies and load;

-Reduction of mechanical losses pressure value.

It is almost impossible to implement the above factors in engines at once, as their implementation requires a number of important organizational and constructive solutions. Therefore, they are carried out gradually and alternately. In this area, it is of great practical importance to improve existing car engines by converting them to gas. It is known that a gas car can save from 70 liters to 100 liters of liquid fuel in 1 day. That is why most car plants are now launching the production of cars running on compressed and liquefied gas. Therefore, we also offer to create gas modifications of at least some models of cars produced by GM-Uzbekistan.

The following conclusions and suggestions can be made from the research conducted in the article: From the above, it can be concluded that further improvement of the car supply system, especially the transition to local gas, is a matter of great economic importance. Therefore, in the dissertation we propose to use the method of gas conversion in the engine of the car "Nexia", which fully meets the most current requirements. Increasing its power and economy are the most important factors in further improving the performance of car engines. As engine power increases, its productivity (speed and load-carrying capacity) increases, and the cost of work performed decreases sharply. This, in turn, leads to an increase in the efficiency of car use.

Of particular importance in this area is the creation of a family of engines with different rated power and the same size cylinders in all modifications, as well as a fixed piston track. The creation of such a unified series of engines will create convenience for both their manufacturers and the user and those who carry out repair work. To solve this problem, it is necessary to find ways to increase the liter capacity of the engine.

Increasing the effective power of the engine at a given working volume is currently achieved mainly by increasing the speed of rotation and the average effective pressure. Changing other indicators that affect engine power poses additional challenges, and these indicators are now approaching their limit values. For example, increasing the diameter of the cylinder, the piston line and the number of cylinders is associated with a radical improvement in the quality of materials and a complete change in the structure of the engine.

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