УДК 621.43.01

THE INTERNAL COMBUSTION ENGINE

Derevlev Y.A., student
Koturenko A.I., student
Scientific supervisor – Pinchuk I.V., lecturer
English language department №1
Belarusian National University of Technology
Minsk, Republic of Belarus

The internal combustion engine (ICE) is the most common type of engine in the world. It powers airplanes, ships, boats, and other vehicles as well as agricultural machines and, of course, cars. ICE plays an important role in military technologies. Let's take a closer look at how it functions.

As for the basic principles of operation of internal combustion engines, the main component of it is one or more metal cylinders in which fuel is combusted.

There is a piston within the cylinder, whose diameter is slightly smaller than that of the cylinder. This allows the piston to move freely within the cylinder. The piston is a metal cylinder, surrounded by a spring-loaded piston ring that is inserted into the rod. The purpose of it is to prevent the entry of gas formed during the combustion of fuel into the space between the piston and the cylinder wall [1, p. 205]. The piston is connected to a metal rod (also known as a “finger”), which transfers vertical force from the piston to the crankshaft. Two upper channels in the cylinder are sealed off by valves.

The fuel and air mixture is supplied through an intake duct, while the exhaust products are released through another outlet channel. There is a spark plug located in the upper portion of the cylinder. This component plays a crucial role in igniting the combustible mixture, as sparks are produced at a great distance between the electrodes within the candle. The first piston engine was created in 1807 by François Isaac de Rivaz.

Let’s look at the principle of operation of this device. When only the intake valve in a cylinder opens, and the piston moves toward the crankshaft, the atmospheric pressure drastically increases the amount of air expelled into the space from the cylinder. The air flows out of the nozzle (the carburetor tube) at a high speed and mixes with gasoline. As a re-

sult, a combustible mixture of gasoline and air is created. The spark from the spark plug ignites the mixture, creating a micro-explosion, which in turn causes the incandescent combustion products (gas) to spread and be pushed by the piston. This process produces a useful output. The internal energy from the gas mixture is transformed into mechanical energy by the piston. The piston transfers power through a connecting rod connected to the crankshaft. It creates a crank that transfers this force to the wheels (screws, propellers, etc.)

A four-stroke internal combustion engine has a single-roller machine. However, different types of engines for cars, tractors, and other vehicles with 4-, 6-, and 8-cylinder engines, have been invented. The operating cycle of a cylinder consists of four strokes: intake stroke, compression stroke, combustion stroke, exhaust stroke. We consider that only one of these strokes is useful (essential). Therefore, the engine comprises four cylinders that operate alternately, such that at least one cylinder is active during each engine cycle. There are several types of internal combustion engines in use. In addition to conventional internal combustion gasoline engines, there are other less popular engine types that also have certain advantages [2, p. 24].

In order to ensure the continuous operation of an internal combustion engine in a vehicle, it is crucial to remember that the engine's cooling system, fuel supply system, air supply system, and exhaust sys-tem must also function effectively. In modern vehicles, the computerized control unit plays a significant role in monitoring and managing the parameters of these important systems.

This computerized unit provides for each system to operate at optimal levels, thus contributing to the overall efficiency of the vehicle. It is essential to maintain and service these systems regularly to ensure optimal performance and longevity of the engine [3, p. 9].

The ICE is an amazing device that changed the world.

References

1. E. Eckermann, The World History of the Automobile // Germany: Society of Automotive Engineers, 2001, p. 102 – 371.

2. How a Gas Turbine Works // General Electric Power Generation. General Electric, 2016, p. 3 – 36.

3. M. Hilgers, The Diesel Engine // Commercial vehicle technology, 2020, p. 1 – 24.