

INVESTIGATION OF GAS CONDENSATE UTILIZATION AS A HIGH-QUALITY MOTOR FUEL

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Ukraine's agriculture is one of the main industries due to its high export potential. One of the components of the production cost is the cost of energy resources. Therefore, the issue of increasing the efficiency of agricultural machinery, including the conversion of engines to cheaper types of fuel in order to reduce costs for the economy, is very relevant.

Until 1991, the agricultural sector of Ukraine's economy developed due to the introduction of more energy, machinery, fertilizers and other materials into production, which was fully justified at the relevant stage. Most of the technologies used were based on the consumption of cheap energy resources, the share of which in costs did not exceed 3%. This was a feature of the economy of the USSR.

The increase in the cost of energy resources to the world level leads to an increase in their share in the cost of production. Thus, at the level of wheat productivity of 40 t/ha, with a harvest price of approximately UAH 12,000.00, the cost of diesel fuel for its cultivation is UAH 1,600.00 or 13.3%. In highly developed countries, this coefficient is lower and amounts to 4...5%, which determines the importance of the introduction of energy- and resource-saving technologies and the reduction of motor fuel costs.

The relatively low content of diesel fractions in oil (no more than 22...24%) and the need to increase the output of fuel for diesel engines from oil led to the appearance of fuels with a wide fractional composition, for the production of which gas condensates are used. Consider the dynamics of hydrocarbon fuel prices in Ukraine.

Gas condensates have a low octane number (60...66), which makes it difficult to use them in spark-ignition engines.

The works of a number of studies on the choice of the type of gaseous fuel established that for vehicles the use of gas condensate (taking into account its special physical and chemical properties) is more rational than natural. Therefore, gas condensate is considered as a fuel for internal combustion engines later in the diploma project.

As a result of the conducted research on the conversion of diesel engines to compound fuel, it was established that for transport diesel engines, the most rational method is the direct injection into the engine cylinder of a fuel mixture consisting of gas condensate (GC), diesel fuel (DP) and additives that intensifies the burning process (hydroperoxide of cumene and butyl nitrate). At the

same time, a less complex reconstruction of the fuel equipment is required, which ensures conversion and facilitates engine regulation.

Let's consider the main component of the gas-diesel mixture - gas condensate (GC 60%). It has its own properties, different from the properties of ordinary fuels.

Gas condensate has a high auto-ignition temperature, which complicates its use in diesel engines. One of the ways to improve the self-ignitability of HC is the use of compounded fuel, which contains the following components: gas condensate, diesel fuel and additives.

For auto-tractor diesels, fuel must have a cetane number of at least 40. This is the minimum allowable value. For smaller values, reliable starting and operation of the engine is not ensured. With a cetane number of 25...30, starting a cold engine is impossible. Moreover, working on such fuels leads to a deterioration of the economic indicators of the engine.

An effective method of improving the self-ignitability of fuel is the use of additives. These can be compounds such as butyl nitrate or cumene hydroperoxide. Adding 1...2% to regular diesel fuel increases the cetane number by 6...12 units.

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