

UDC 62-214

INNOVATIVE FUEL INJECTION SYSTEM

Dubina L.P.

Belarusian State Agrarian Technical University, Minsk

Innovation is transforming the idea that is found and created respectively by the discovery and the invention into a commercial product which the clients would like to buy. Differently from the discovery or invention, innovation is described as a new creation that has social and economic importance. Innovation is one of the most important tools to ensure social and economic development, and especially through environmentally friendly innovations, we could not only improve the efficiency of production, but also use natural resources effectively. The tractor is one of the vehicles on which innovation is most often applied in agriculture. Due to technical improvement, the tractor is no longer limited to a towing vehicle; it has been transformed into a machine that can perform many operations. This improvement in tractors has contributed significantly to the increase in agricultural mechanisation [1].

It should not be undermined that technological improvements, especially in manufacturing, have led to improvements in the engine framework. In particular, innovations in injectors have paved the way for a reduction in exhaust emissions thanks to lower fuel consumption and better combustion. Electronically controlled injectors also allow more sensitive control of the pressure and start of injection of the fuel required as a function of changing load conditions.

Fuel injection technology is a system for channelling the fuel-air mix into the cylinder of a combustion engine. In terms of the function it serves, it is an alternative to the carburettor, and has long been preferred in car engines. A better understanding of fuel injection requires an overview of how an engine functions.

Achieving optimum engine performance depends not only on the fuel used, but also on the amount of air it is combined with. Much of the fuel circulating in an engine acts as a catalyst, helping the oxygen in the air to react with the hydrocarbon particles in the fuel. Consequently, the most important requirement for fuel in an engine is that it is in the right place at the right time - and in the right quantity. Only a perfectly proportioned air-fuel mixture will ensure fast, complete combustion and allow the engine to operate at its full potential. Getting this mix right is the key to designing powerful, reliable engines.

One way to achieve the perfect air-fuel mixture in an engine is through a carburettor. This is a long established technology that is deceptively complex; a carburettor is a mechanical component that relies mainly on the pressure differential between intake and atmospheric pressure. A properly tuned carburettor will run smoothly, but it is important to be aware of factors that can adversely affect the carburettor's performance. These include changes in altitude and temperature, a dirty air filter, engine wear or fuel quality.

Whereas a carburettor uses pressure differences to mix fuel with air, fuel injection technology delivers fuel via an injector valve directly into the crankcase or intake manifold. The injection pump keeps the fuel pressure constant, ensuring that the injector delivers exactly the right amount of fuel at all times.

The electronic fuel injector is the new innovative concept used for automobile diesel engine vehicles for injecting the fuels to the engine cylinder. In diesel engines, fuel injection occurs after the compression process. Today we use a mechanical arrangement for the fuel injection system. The input source for these drives is taken from the engine. Due to this setup there will be some mileage drop occurs on the engine. Normally if we apply any external load the mileage drop will occur. So to avoid these external loads from the engines we are using the electronic system for the fuel injection system. This system is applicable for only the diesel engines. This project consists of sensor, fuel tank, fuel injection pump and control unit are the parts used [2].

Fuel injection systems are widely used in modern vehicles. In this system, fuel is injected into the intake ports before the intake valves. This allows for more precise control over the amount

of fuel delivered to the engine, resulting in better fuel efficiency and performance. The system sprays fuel into the intake ports, where it mixes with air before entering the combustion chamber.

Fuel injection systems are known for their reliability, ease of maintenance, and ability to deliver fuel efficiently to the engine. They have largely replaced carbureted fuel systems due to their improved fuel economy and lower emissions. This system is also more responsive and can adapt to changing driving conditions more effectively.

Unlike carburetors, which rely on the venturi effect to mix fuel with air, fuel injection systems atomise fuel more efficiently, resulting in better fuel economy, reduced emissions and improved engine performance.

Technological innovations continue to be made in tractors, the most important source of power in agriculture. However, farmers in both developed and underdeveloped countries have been slow to adapt in recent years. One of the most salient factors in this fact is that while technological innovations in tractors have been realized at a high rate of speed, farmers have been less encouraged to adapt to these new technologies. Poorly designed policies slow down the process of adaptation and adoption. Successful coordination requires leadership from non-governmental organisations and the government itself. Developments and innovations in tractor technologies increase the welfare of farmers involved in agriculture, facilitate farming and create a balance between agricultural inputs and outputs. Mechanisation applications focus on increasing efficiency, reducing input use and costs, and environmental awareness.

References

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УДК 629.366:613.164

УЛУЧШЕНИЕ УСЛОВИЙ И ПОВЫШЕНИЕ БЕЗОПАСНОСТИ ТРУДА ПРИ ЭКСПЛУАТАЦИИ МОБИЛЬНОЙ СЕЛЬСКОХОЗЯЙСТВЕННОЙ ТЕХНИКИ

Горячко К.А., студент, **Нижемеренко Н.А.**, студент,
Мисун Ал-р Л., к.т.н., доцент, **Мисун Ал-й Л.**, к.т.н., доцент
Белорусский государственный аграрный технический университет, г. Минск

Обеспечение безопасных условий труда, повышения производственной безопасности, является приоритетной задачей в сельскохозяйственном производстве. Однако, несмотря на принимаемые меры, уровень травматизма в АПК остается достаточно высоким. Полностью ликвидировать вредные и опасные производственные факторы, имеющие место на рабочем месте оператора мобильной сельскохозяйственной техники (МСХТ) практически невозможно, так как, некоторые из них являются неотъемлемой частью технологического процесса. В тоже время вредное их воздействие может и должно контролироваться.

Из известных опасных и вредных производственных факторов оператор МСХТ подвергаются воздействию шума, вибрации и др. Повышенный уровень шума на рабочем месте оператора может негативно сказываться на его способности выполнять производственные задачи. Предельно допустимый уровень шума, не вызывающий при ежедневном воздействии в течение всего периода работы заболеваний или отклонений в состоянии здоровья оператора, составляет 80 дБ, шумы интенсивностью более 95 дБ отрицательно влияют на организм оператора, в том числе, ухудшают его внимание, способствуют быстрой утомляемости, могут быть причиной производственных травм и т.д. В конечном итоге это приводит к снижению безопасности труда.