at vineyards. Ecological efficiency was measured.

Sprayer, energy, resource, ecology, pesticides, vineyard.

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CLASSIFICATION OF TECHNOLOGICAL PROTECTION MEASURES IN THE DESIGN OF MOBILE AGRICULTURAL MACHINERY

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We describe the classification of technological protection measures in the design of tractors and combines agricultural land as a defining link in security work. The basic requirements for the design and installation of technological protection measures on mobile agricultural machinery.

Technical data protection, mobile agricultural machinery, protective fencing, emergency stop devices.

Problem. Safety technology system "man-machine-environment" on mechanized agricultural production depends on the dangers inherent in each of its subsystems and related to the operation of the machine, machine operators and activities of the working environment. Each subsystem includes a large number of industrial dangerous and harmful factors whose effects can reduce the use of means of safety [1].

In the context of modern agricultural production mechanized works almost always a risk of an accident [2] through participation in the technological process rights of its emotional, physiological and psychological traits. Because labor involves the study of behavior of the operator, as a potential source of danger because of his fatigue, the error performance of business operations, lack of knowledge of safe methods of work

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and so on. However, hardware safety should play a crucial role in solving the complex problems of reducing the risk of injury to mechanized agriculture, which can be considered as a given problem and a new date.

Analysis of recent research. Now study the impact of the availability, functionality, serviceability and technical security measures to ensure the level of safety standards not pay enough attention [3]. Following statistics on causes of occupational injuries in agriculture that point as decisive (70%) organizational causes injury to plants agricultural

sector [4], main pratseohoronnoyi preventive work focused on the development and implementation of information methods of supervision activities of safety, methodology for monitoring working conditions, improved organizational principles of safety management. But the underlying causes of occupational accidents is the lack of mobile machines, protective devices or their failure [5] - a modern development of technology allowing them to equip agricultural machines, preventing erroneous actions worker operator.

The main technical security measures to prevent occupational injuries are protecting, protection, and brake interlock devices and testing of machines to identify operational defects [6]. Among the requirements [7] who make the technical security measures, you must specify: reducing the degree of danger and harm while performing manufacturing operations and maintenance of equipment (equipment); ensure the reliability of the units subject to the strength (hardness) of parts and elements of design, ease of maintenance of equipment during and remedies; the labor productivity; compliance with technical aesthetics and so on.

Based on the analysis of the various types of means of safety in the home and foreign tractors and harvesters should be proposed optimization approach to ensure protection of agricultural systems technical units with regard to improvement of occupational hazards machine in the absence (exhaustion of resources) such systems [8].

The purpose of research - Present classification of technological protection measures in the design of tractors and combines, in service of agricultural enterprises.

Results. Now generally accepted axiom is that the degree of availability of foreign agricultural units technological protection measures significantly higher than domestic [9]. However, the introduction of modern devices protect workers in domestic tractors and combines constrained for several reasons. And not only in trying to reduce the cost of most agricultural machine, often at the expense of the health and sometimes life of the employee. Mistakenly believe that the quality of manufacturing (assembly) and the technical level is determined mostly only performance and reliability of the unit. But forget that technology or reliability, such as precision sowing grain crop depend not only on the quality of metal gears or structural features of the unit, but also on the health and safety of machine, such as its samochuttya, psycho-physiological state. We must understand that the only hardware security officer warn of rash or erroneous actions, which is especially important during operation and maintenance of modern mobile agricultural units, when the reflection and hesitation employee remains lead time. Effects of technological protection measures must ensure the safety of workers

from the start of the process to its completion and not stop before offsetting dangerous or harmful factors.

Another aspect of the operation of means of safety for tractors and combines is that resource available to farms technology to expire (it reached a critical point) [10]. After 10 years or more of service life for the realities of agricultural production in Ukraine propelled tractors and other farm machinery is already obsolete and outdated, the last decade of machines and tractors farms decreased quantitatively, it does not ensure timely implementation of mechanized operations, leading to increasing occupational risk. Many scholars in the field of labor in agriculture believe that avoiding risky situations in mechanized agriculture today is impossible. This also contributes to the fact that during repairs question of means of restoring safety do not pay enough attention.

The list of safety devices in Annex 10 to Technical Regulations safety of machines and equipment [6]. Next, a brief description of some safety devices on tractors, self-propelled agricultural machines and other mobile units.

Protective fencing for removable devices transmission [11]. The removable mechanical transmission devices from connecting node universal self-propelled machinery (or tractor) to the first bearings driven machine to be developed and set so that all moving parts during operation are protected throughout their length. PTO of the self-propelled machinery (or tractor), which is connected removable mechanical transmission device must be protected by a fence, mounted on self-propelled machine (or tractor) and related. To provide access to the removable mechanical transmission device, protective fencing suit vidkryvnymy.

Mechanized removable fence blocking [12]. After installing a removable device must be sufficient space to prevent damage to the fence during transmission shaft of the machine (or tractor). The input shaft of the driven machine close guard assigned to this machine. Attach torque limiters or Freewheel for the transfer of the universal joint is only allowed by the driven machine. This removable mechanical transmission device required under mark (mark). The system joining the removable device must be such that if you disconnect the machine unit and its protective fence was not poshkodzhuvalysya from contact with the ground or the machine.

Fences and protective devices to protect people from moving machinery. The surface of the protective fence should be installed so that they do not turn with the removable mechanical transmission device. Protective fencing has closed transmission: the internal edges forks joints - in the case of simple universal joints and at least to the middle of the outer joint or joints - in the case of wide-angle universal joints. If you

need access to jobs near removable mechanical transmission device, the transmission fence forbidden to use as a ladder, unless they specifically developed for this purpose and installed.

Exhaust system for exhaust machines [13, 14]. In the cabins of tractors outdated models used mostly tidal fans that reduce air temperature in the cabin of a few degrees. During the summer field work in booths tractors and combine harvesters equipped with this type of ventilation, the temperature may exceed external to 8-20 ° C. Therefore, the need tractors and combines effective means of normalizing the air in the cabin, including for removing harmful gases. These facilities are equipped with the normalization of microclimate foreign tractors and harvesters. In the tractor cab best foreign manufacturers normalize microclimate using freon air conditioners, which are characterized by a wide range of temperature control in the cockpit and provide comfortable working conditions of machine.

Emergency stop devices [15]. For example, to reduce the risk of injury to employees serving Combine harvest, arrange emergency stop system combine harvesters. This sudden stop Reaper is necessary if the danger zone falling objects or in the area of the Reaper appear outsiders.

The safety mechanism is triggered by pressing a special button combiner, arranged in the cabin. Then triggered magnet, pulling the anchor is connected to the sector suspension mechanism. The last element keeps the dog that after his release by the spring and fall into a groove ratchet is mounted on an inclined shaft drive cameras combine next starred drive. After gearing dog with ratchet drive shaft inclined combine camera stops immediately.

Equipment maintenance people on the seats. In the workplace machine in the tractor cab and harvesting should arrange safety belts, whose main role is to control the movement of the human body in the event of a collision with an obstacle unit. If seat belts mechanic moves a certain distance due to deformation of the front of the mobile machinery (unit) and dampening properties of the belt. The effectiveness of seat belts is high enough - the number of injuries is reduced by 75-80%, significantly reduced the severity of consequences and also accidents.

Systems and devices for reducing noise and vibration generated. It was established that the level of noise in the cabins of tractors outdated models after 5 years of operation the permissible 3-6 dBA. Tractors and combines modern models of noise and vibration is less than standard rates Equivalent vibration level was exceeded by 1-5 dB only on tractors MTZ-82, UMZ 8071, T-150 K, MTZ-80 during the mechanical treatment of the soil [16]. Is effective in arranging cabs means zvukoizolyuvannya and absorption [17], establishing effective silencing of noise and so on.

Protection of machine when turning the unit [18] provided rigidity frame cabin and the employment of devices for keeping people in the seats.

Designs for protection from objects falling. Machinery must be designed and manufactured so that even in case of partial or complete termination or suspension of supply machine operator happens dangerous bias or uncontrolled and unexpected drop in cargo.

Conclusion. Based on the analysis of the functioning of means of safety in the home and foreign tractors and harvesters should be offered optimization approach to ensure protection of agricultural systems technical units with regard to high-risk professional mechanics.

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Described classification tehnycheskyh Individual protection constructions in tractors and combine selskohozyaystvennoho purpose opredelyayuscheho Zveniv As a labor safety. Predstavlenы Basic requirements for constructions and devices tehnycheskyh Individual protection to mobylnoy selskohozyaystvennoy technology.

Individual protection Tehnycheskye, mobylnaya selskohozyaystvennaya Technology, protective fence, Device avaryynoy ostanovka.

Classification of technical equipments of defence in construction of tractors and combines of agricultural setting as qualificatory link in safety of labour is described. The basic requirements to construction and arranging of technical equipments of securing for mobile agricultural machinery are presented.

Technical equipments of defence, mobile agricultural machinery, protection enclosure, devices of emergency stopping.