

units. Regardless of whether a combine harvester, a forage harvester or a silage trailer is involved – older harvesting machines can also be connected to the fleet management system using flexibly configurable telematics modules.

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THE ROLE OF MAINTENANCE IN IMPROVING PRODUCTIVITY AND SERVICE LIFE OF AGRICULTURAL MACHINERY

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Abstract. The article deals with agricultural machinery maintenance and its role in agricultural production. Technical and economic factors determining the possibility of repair as well as basic types of repairs are described.

Keywords: agricultural machinery maintenance, repair, machines, service life.

Introduction

Agricultural machinery maintenance plays a decisive role for successful agricultural production as it guarantees the safety of operations and availability of machines and related equipment for different farming operations. Moreover, it is one major cost for agriculture operations. The timing of tillage, cultivation, fertilizing, harvesting and planting of crops depends on qualitative agricultural machinery maintenance, which affects the yield and its quality. Machines used in agricultural processes must be ready for operation on time – otherwise, there could be significant losses to the farm as a whole. In addition, facilities meant to process and store foodstuffs must be kept safe, clean, and structurally sound in order to guarantee that the farm's product is safe for consumption.

Main part

Agricultural maintenance is the main link in the overall system of measures aimed at maintaining machines in working condition. It includes a set of opera-

tions to avoid premature wear and breakage of machines, ensures their uninterrupted operation during the entire repair period. During maintenance, running-in, washing, cleaning, control, diagnostic, adjustment, lubrication, refueling, fastening and assembly and dismantling works are performed, as well as work on the conservation and deconservation of machines and their components.

The reliability of agricultural machines during operation depends not only on the perfection of the design and the quality of manufacture, but also on the quality of maintenance during its use and storage. Only under the condition of timely and high-quality maintenance of the machines are its normal reliability indicators guaranteed. In practice, there are frequent cases of violation of the terms of maintenance, failure to perform a complete list of operations or performing them in violation of technical requirements [1].

The possibility and efficiency of repairing agricultural machines are due to technical and economic factors.

The main technical factor determining the possibility of repair is the difference between the resource of machine parts and assemblies obtained during manufacture and the residual resource due to uneven wear and loss of properties during operation. So, any machine may have wear-resistant parts and assemblies that require periodic replacement, such as bearings and sealing devices, and parts, such as basic ones, which are preserved due to a high margin of safety usually during the entire service life of the machine. It is potentially possible to restore up to 60–70 % of machine parts, therefore, the refusal of repairs would lead to a significant underutilization of their consumer value.

An economic factor of the possibility and efficiency of repairing agricultural machines implies that during the operation of the parts, only a part of the surfaces is worn out and subject to restoration. This makes it possible to restore parts at a lower consumption of materials and labor costs than during manufacture, which makes repair production cost-effective.

Basic types of repairs include current repairs and major repairs [2].

Current repairs designed to restore operability, maintain in good and working condition mainly the external parts of the equipment. During the current repair, a partial disassembly of the machine is carried out, individual components and worn-out parts are replaced with new or previously repaired ones, equipment mechanisms are adjusted and etc. The current repair should ensure the normal operation of farming machines until the next scheduled repair.

Major repairs ensure the serviceability and full or close to full life of the machine by restoring and replacing any assembly units and parts, including basic ones. After major repairs, the main components of the machine and the machine as a whole are subjected to running-in, adjustment, testing and painting.

Maintenance and repair of agricultural machines contain activities to ensure the operability of machines and tools. In order to meet this requirement, it is necessary to:

a) determine the indicators of the technical condition of the machines, that is, changes in the indicators of the condition during work and in between work.

b) strive to ensure that the technical condition indicators that determine performance do not decrease faster than some predetermined value or even improve. Such measures include, for example, running-in of machines, timely replacement of lubricants, etc;

c) if the actual values of the technical condition indicators that determine the performance of the machines reach the limits of technical, technical and economic failure, but this machine is not yet subject to write-off, then care should be taken to restore the original or, from the point of view of operation, satisfactory values of the technical condition indicators of the machine. As a rule, this is achieved by repairing machines, including the use of the latest recovery technologies [3].

In recent years, a new form of servicing agricultural enterprises has become widespread i. e. mobile mechanized teams that perform work directly on farms. Mobile mechanized brigades allow maintaining farm machinery directly in the fields where tractors and lorries work. This type of maintenance allows quickly identifying and eliminating one or another type of malfunction, and allowing the machine to continue working.

A technical (periodic) inspection of agricultural machines is carried out on the farm once or twice a year. Its main task is to check how the rules of use, maintenance and storage of machines are being fulfilled, to determine their condition and technical readiness. Inspection of machines is carried out by specialists with the participation of foremen and tractor drivers of the enterprise. A good organization of inspection, timely and thorough preparation of machines, and verification of technical documentation, high demands and an objective assessment of the actual state of the equipment contribute to its best preservation and highest productivity.

One of the important factors for maintenance of agricultural machinery to be productive is necessity to provide an incentive for the staff. Stimulation involves the creation of the necessary working conditions and motivational mechanisms for the effective work of each employee. Firstly, it is necessary to organize the work so that there is no loss of working time and production labor. Secondly, it is necessary to ensure optimal psychophysiological characteristics of the workplace.

Conclusion

Agricultural machinery maintenance plays a vital role in agriculture by keeping equipment in reliable working conditions. The costs of maintaining machines in technically sound condition with high operational reliability, assigned to the repair services of various agro-technical enterprises, exceed several times the costs of manufacturing new machines. Therefore, the role of maintenance in improving productivity and service life of agricultural machinery is ever increasing. The productivity of repair works, while simultaneously

improving the quality of work and the efficiency of the entire production can be achieved by the introduction of the latest technologies using modern high-performance equipment, complex mechanization and automation of maintenance and repair of machines.

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PREVENTIVE FARM MACHINERY MAINTENANCE ACTIVITIES

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Abstract. The article is devoted to the preventive farm machinery maintenance activities. Types of preventive maintenance are described in the article.

Keywords: farm machinery, maintenance, preventive maintenance, a time-based approach, a usage-based approach, a condition based maintenance.

Farm machinery maintenance is a vital aspect of agricultural operation and production, which has been neglected or handled without caution. Agricultural machines operate in a most unpleasant environment and must be adequately maintained in order to perform its desired functions effectively. The service life and reliability of any machine in performing its desired function depends so much on how much maintenance practices were observed in operating such machine.

Farm machinery maintenance involves regular servicing of equipment, routine checks, repair work, and replacement of worn or non-functional parts. Machines to be maintained include both heavy-duty equipment and simple hand-operated machines.

Preventive farm machinery maintenance is performed in order to prevent equipment breakdown. It is a planned maintenance of plants resulting from periodic inspection in order to prevent unnecessary wear out of parts and keep time