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PRINCIPLES OF DEFECTOSCOPIC CONTROL OF PARTS AND METAL STRUCTURES OF MOBILE AGRICULTURAL MACHINERY

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Visual inspection (to detect of visible damage and cracks) is now mostly used to control defects in parts and structural elements of agricultural aggregates. However, it is important to put into practice (regulations) the use of modern defectoscopic devices for maintenance and repair of agricultural machinery that allow to find hidden defects (cracks, sinks, lack of welding, etc.), which can cause sudden failures of machinery and emergency situations, leading to accidents. To assess the risk of operating mobile agricultural machinery, it is necessary to have data on the presence in the parts and structural elements of not only trunk cracks, but also those that can subsequently be expanded to critical values in the part.

Indicators of the safety of operation of tractors and agricultural machines are determined in accordance with the methods approved by national and industry standards, special recommendations, instructions and other documents. These documents include the control Cards of safety indicators of tractors, combines and other machines. In these Cards it is necessary to indicate for the individual units the list of indicators, the periodicity of checking, the normalized indicators that need to be measured during the control of equipment.

According to the requirements of the control Cards of safety indicators of tractors, combines and other machines, it is necessary to periodically check and test such elements of assemblies that determine the safety of operation of the unit:

- completeness of units and absence of corrosion in the details, mechanical damages and defects affecting the job security, in particular road safety;
- braking efficiency of the working and parking brake system;
- activation of trailer braking system in case of emergency braking;
- lack in the steering and its drive of parts and components with residual deformation, cracks, damages and remnants of repair by soldering or welding methods;
- absence of fuel, oil and coolant leakage in the engine, leakage of operating fluid in the hydraulic systems of machines and their working bodies;
- reliable attachment of wheels' elements. Lack of cracks of disks or rims of wheels, etc.

Particular attention should be paid to the technical condition of those components, which damage can result in injury to the machine operators and other workers.

Portable flaw detectors can be recommended to detect defects in unit parts of tractors, combines and agricultural units. As the studies performed in this paper show, preference should be given to portable eddy current flaw detectors.

According to the results of the control it is necessary to compile and constantly update the database of places of potential defects in the details of units of agricultural aggregates. Separate correctly formed databases can be generalized, which will allow you to quickly assess the risk of further exploitation of mobile agricultural machinery after detection of cracks of critical or subcritical length.

The introduction of operational defectoscopic control and methodology for assessing the risk of operation of mobile agricultural machinery with defects of critical length in the components of the units will allow annually to significantly increase the degree of detection of faulty agricultural units, and therefore to reduce the number of injured workers which operate (on fields and roads) and servicing tractors and combines.