

Russian Federation

Kuban State Testing Station of Agricultural Machineries

**Safe and ergonomic
harvester design**

The main determinants in assessing the safety and ergonomics of combine harvester design

- Angle of transverse static stability
- Load on the steering wheels
- Effectiveness of braking systems
- Illumination
- Installation of lighting and light signaling devices
- Cabin structure
- Cab equipment
- Means of access to the workplace
- Design of systems, components and assemblies
- Sound-noise level in the operator's workplace
- Vibration parameters at the operator's workplace
- Steering wheel play
- Excessive pressure in the operator's cabin
- Resistance forces to movement of controls and adjustments
- Parameters of microclimate in the cabin and test conditions
- Determination of dust content in the air of the working area

1. Transverse static stability angle

Determination of the angle of transverse static stability is carried out with a hydraulic lifting platform using a measuring device. The purpose is to compare the data obtained with the data declared by the manufacturer in the technical documentation



2. Load on the steered wheels

It is determined by the use of a scales undergoing certification. Combine in a machine with an adapter



3. The efficiency of the braking systems

The aim is to determine the efficiency of service and parking brakes in accordance with existing procedures and to compare the data with established standards. When measuring, determine the braking distance and the maximum speed of the combine.



4. Illumination

Illumination is defined on the site with a grid marked out according to the procedures. The combine is set up in accordance with the established and current methods. For measuring a device "Luxmeter" is used



5. Installation of lighting and light signalling devices

Inspection and geometrical measuring are performed according to the normative technical documentation.



6. Cabin design

By means of the method of examination and linear measurements in accordance with the requirements of GOST the location of the controls, emergency exits, door openings, inner dimensions of the cabin and the dimensions of the seat are determined.



7. Cabin equipment

The method of inspection and testing in accordance with the technical documentation to determine the equipment of the cabin. The presence of basic components for cabin equipment established by GOST, is an integral part of the requirements.



8. Means of access to the workplace

The method of inspection and measurement in accordance with current regulations establishes the basic requirements for means of access to the workplace. The presence of stairs, handrails, handrails, platforms, free access to the operator's seat shall be determined, and the location of these means of access shall be measured.



9. Design of Systems, Assemblies and Aggregates

Check the structure of systems, components and assemblies of the harvester by means of inspection in accordance with technical documentation. Obtained data are compared with the established current requirements



10. Sound-noise level at operator's workplace

Determined by measuring equipment. Combine harvester with adapter parked. Working tools are switched on. Obtained data is compared with established indicators of normative and technical documentation.



11. Parameters of vibration at the operator's workplace

To determine this parameter a measuring device is used. Measurements are taken while the harvester is performing the technological operation. The purpose is to get the data and compare it with the existing standards



12. Steering wheel play

Determined with a gauge. The combine harvester is stationary with the steering wheels in a straight line. Obtained data are compared with the established indicators of the technical documentation.



13. Overpressure in the operator's cabin

Determined using a measuring device. Obtained data is compared with the established indicators normative and technical documentation.



14. Resistance forces to movement of controls and adjustments

Determined by means of a measuring device. Measurement of the resistance force of the steering wheel movement is done with the combine moving with a certain speed and curvilinear trajectory. The drag force of other controls is measured in place with the engine running. The purpose is to obtain data and compare it with the established current standards.



15. Parameters of the microclimate in the cabin and test conditions

The microclimate parameters and test conditions are determined by means of a measuring device. Temperature, relative humidity, air velocity and temperature of the interior surface of the cab shall be checked when the harvester is in operation. The test conditions are determined in accordance with the technical documentation. The data obtained are compared with the current standards.



16. Determination of dust content in the air of the working area

The control is carried out by measuring method in accordance with technical documentation. To determine this parameter the measuring device is used. Measurements are made when the harvester is in operation. The data obtained are compared with the current standards.



**Thank you
for your attention!**

