Studies, freight lohystycheskye Processes, zernouborochnыe kombaynы, Tractor-trailers overheating-zhately, cars, zernovozы, models, Efficiency, konsaltynhovыy package recommendations.

Powered principal results of research performed in accordance with the development of efficient technologies for the transportation of grain from combines to farmers and collective farms.

Study, of transport and logistics processes, combine harvesters, trailers, cranes, car-grain model, efficiency consulting package recommendations.

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ROLE AND OBJECTIVES OF THE DEPARTMENT OF TECHNICAL SERVICE AND ENGINEERING MANAGEMENT MI. MP MOMOTENKA In deciding INCREASE EFFICIENCY agroindustrial production

VD Voytyuk, PhD

The results of research of teaching staff of the department aimed at improving the efficiency of the performance of tractor fleet by developing a new system of technical service, its assets and facilities as well as prospects for research and development strategy department.

Science, research department, innovation, technical service.

Problem. In connection with the formation in Ukraine agricultural enterprises (AEs) with an extremely wide range of areas of arable land and elimination system "Agriculture", which provides planning and preventive system maintenance (TOR), reduced energy supply mechanized processes and the advent of sophisticated energy-technology different manufacturers, the need develop flexible technical service that would be able to adapt to new conditions of machines, tools and facilities for work with TOR. To solve such a complex problem, in 2001 the structure of the Technical Education and Research Institute was created Department of Technical Service at APC them. MP Momotenka, which in 2007 was reorganized into the Department of Technical Service and Engineering Management.

Analysis of recent research. Over the past decade scientists of the department, as part of the Research Institute of engineering and technology, uniting leading scientists technological research institute,

were made following hozdogovornye, budget and proactive research work: "To develop the concept and structure justify maintenance energy-service agricultural machinery market conditions "(AS number - 0100 002 341 U)," Develop and justify certification requirements for agricultural machinery on the results of diagnostics and statistical quality control and on alternative grounds "(AS number - 0105 007 496 U)," Guidelines . Work to assess the residual disability agricultural machinery "(AS number - 0105 005 900 U," To develop scientific and methodological recommendations on the calculation of damages on a simple agricultural machines "(AS number - 0106 008 717 U)," Stand develop complex computer diagnostics status internal combustion engines of mobile agricultural machinery "(AS number - 0106 005 710 U)," Develop a mobile laboratory for diagnosing and monitoring the technical condition of mobile agricultural machinery "(AS number - 0108 001 981 U)," explore and develop scientific and methodological principles of engineering systems APC "(number AS - 0107 012 055 U)," Research and development of methods for the maintenance and restoration of agricultural machines shvydkoznoshuvalnymy working bodies "(number AS - 0111 007 059 U). On the basis of guidance were developed 29.3-37-75: 2005" Work to assess the residual disability agricultural machinery "[1] and recommendations "Standards technological needs in agricultural technology" [2].

The purpose of research. Improving the efficiency of mechanized agricultural processes through the development of tools and services will and practical implementation of technical services (TS) agricultural machinery (BHT), adapted to modern conditions of machines.

Results. As a result of studies found that the condition of service in Ukraine and abroad indicates that production systems and the use of BHT TC in Ukraine are characterized by a low level of interaction, insufficient supply of tractors and agricultural works company cars, fleet structure which inhibits the sustainable development of agriculture .

It was determined that one of the most efficient ways to improve the readiness and effectiveness of BHT production system is TOP-serving timeliness of repairs and ensuring quality indicators in accordance with applicable standards. To ensure the effective operation of BHT one of the most pressing problem is the rational development of technical and technological base of the TC.

On the basis of restructuring the field of agricultural engineering necessity of developing the national concept of TC BHT, which would ensure efficiency intersystem interactions enterprises in manufacturing technology, service units and SHP.

Department researchers (Miller II, Voytyuk VD, Demko AA) developed the concept of TC BHT [2-4], which takes into account

intersystem interactions at the national, regional (interregional) level and at the enterprise level (Figure . 1-3).

The above structure provides the relationship between TC Coordinator (Ministry of Agriculture and Food of Ukraine) with the state regulatory interactions between systems manufacturing, maintenance, repair and use of BHT, manufacturing plants, educational and science, inspection bodies, formations and consumers TOP technology.

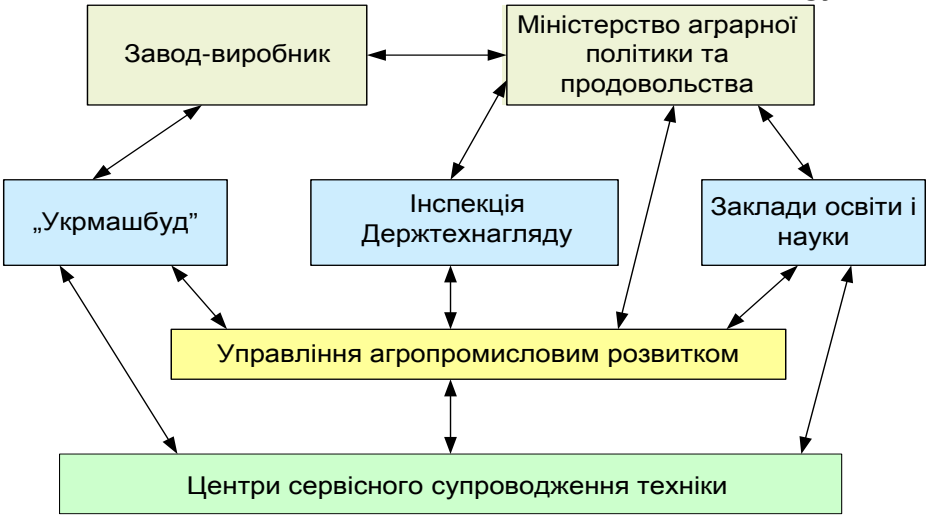

Fig. 1. Structure of intersystem interactions at the state level.

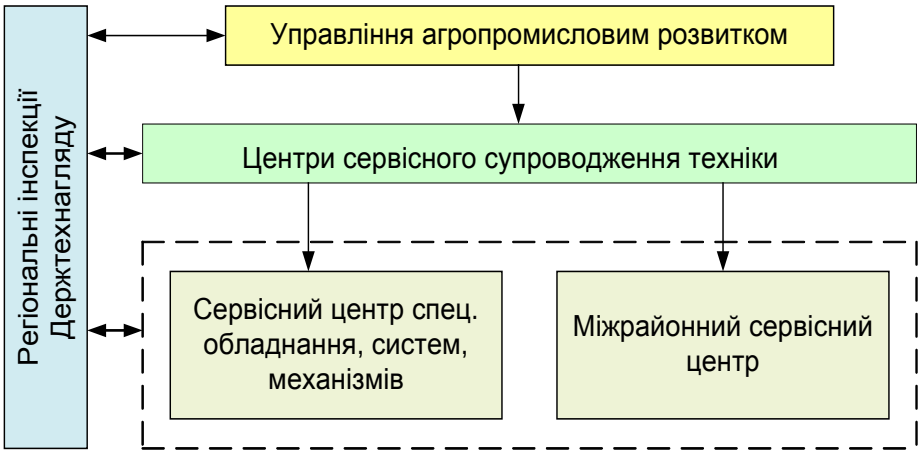

Fig. 2. Structure of intersystem interactions at the regional (interregional) level.

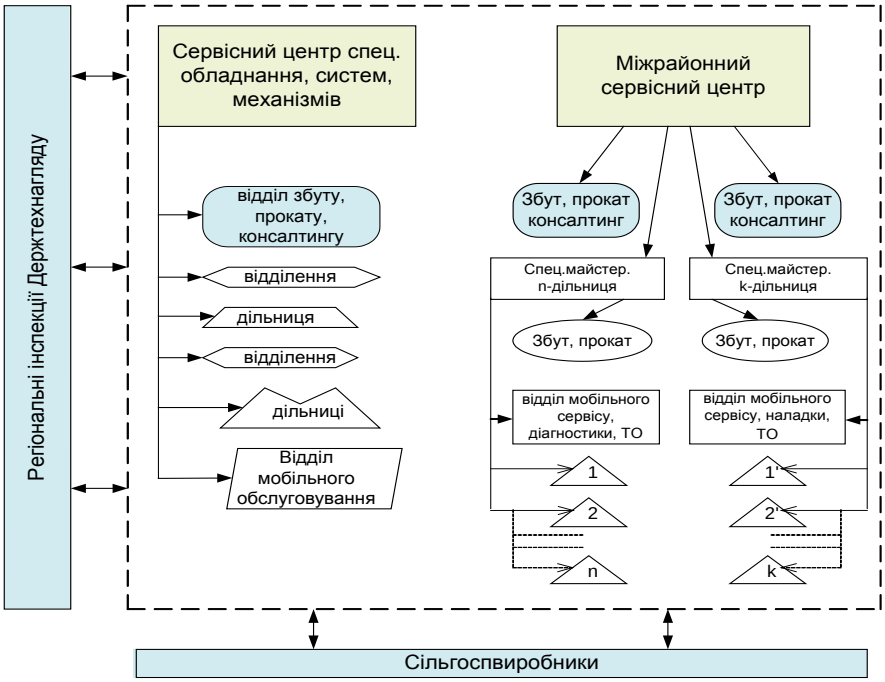

Fig. 3. Structure of intersystem interactions at the enterprise level.

To ensure efficient intersystem interactions in the future, based on the developed system TS defined process needs SHP in engineering [5]. To this end, the scientists of the department (Miller II, Voytyuk VD, VD Hrechkosiy, Cooper SM, Shatrov RV) developed and further improved the method of calculation based on indicators TOP of the system, including technical readiness coefficient as one of the indicators of TOP quality system. In calculating the EGR technology needs into account in engineering: its climatic zone structure acreage, land area, and used technology. In the method considered arable land CST. Determined that for small and medium CST priority is to use technology mainly domestic production. It is proved that for large agricultural holdings and CST should be used mainly foreign super-power technology, which is unique not produced engineering plants Ukraine. Accordingly, the need for engineering calculations recommended to both domestic and a foreign technology. A necessary condition for improving the efficiency of mechanized agricultural processes are reliability BHT. To ensure the scientists of the Department (Rublev VI, Voytyuk E) were grounded certification requirements for the BHT on the results of diagnostics and statistical quality control and on alternative grounds [6-8]. It analyzes the state of quality management and certification of agricultural machinery and state certification as part of the quality management of agricultural machinery. Based on the analysis of the technique of modern research to justify certification requirements BHT and identified methods for assessing the quality of agricultural technology in its certification.

One of the perspectives of development of TC is the transition from a planned preventive system TOR system maintenance BHT on the

results of diagnosis (the actual state) or preventive maintenance. For its implementation requires the development of tools and objects of TC by which it was possible to realistically assess the status of components and assemblies BHT.

To accomplish the task academics department (Voytyuk VD, Demko AA) was designed stand complex technical diagnostics OK-1 (Rys.4-5) [9].

Stand comprehensive computer diagnostics OK-1 works on basis of the comprehensive diagnostic methods based on the theory of vibroacoustic diagnostic parameters of energy-units and units of agricultural machinery, established diagnostic parameters to be decided on its assessment of the real technical condition.

This stand provides vibroakustuchne and ultrasound determination of geometric coordinates of the location of the defects of the object by its ultrasonic radiation, and its state of vibration in a specific area of diagnosis. The electronic unit provides switching, conditioning, amplification, filtering, analog-to-digital conversion and input the measured data into the computer. The frequency of each channel survey - more than 70,000 times per second.

Fig. 4. Diagnosing engine on the stand OK-1.

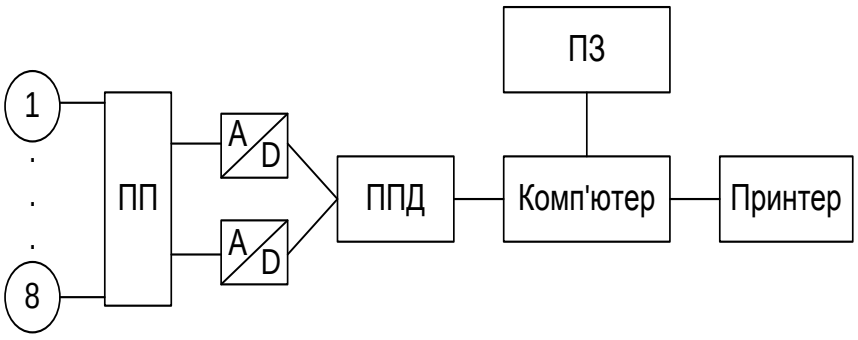

Fig. 5. Block - scheme OK-1: 1-8 sensors; PE device conciliatory; A / D- analog-to-digital converters; PPD - device data; Software - software.

Stand OK-1 provides vibroakustuchne and ultrasound determination of geometrical coordinates of the location of an object by its defects ultrasonic radiation, and its state of vibration in a specific area of diagnosis. The electronic unit provides switching, conditioning, amplification, filtering, analog-to-digital conversion and input the measured data into the computer. The frequency of each channel survey - more than 70,000 times per second. With stand conducted assessing the degree of wear of the engine and running gear, bearing defects, state designs nodes pneumatic and hydraulic systems, electrical circuits and state assemblies, candles condition heating diesel engines, determined the absolute and relative compression (power) engines, dynamic pressure fuel pumps at injection and engine temperature readings. Operational test stand OK-1 conducted certified laboratory showed that a prototype stand meets diagnostic equipment and can be used to evaluate energy-operability of agricultural machinery in accordance with the requirements of ISO. For its effective use of the technology of diagnosis. To improve the efficiency of diagnosis and improvement of economic indicators designed, manufactured and tested mobile diagnostic laboratory (TL) (Rublev VI, Voytyuk E) (Fig. 6) [10]. The method of testing for the diagnosis and SW of technical state of BHT to ensuring the safety of diagnostic equipment and working conditions of the operator. The laboratory was operating straighten-accommodated in a certified laboratory. Cost-effectiveness of implementing PL achieved through elimination of CST for moving equipment to diagnostic stationary points. It is proved that the use of submarine manned a booth OK-1 takes you from planning and protective systems TOR TOR preventive system to the actual state of the art.

Fig. 6. The mobile diagnostic laboratory.

As a result it is possible to diagnose forecasting technical condition of components and assemblies BHT. The department (Voytyuk VD, Rublev VI, Demko AA) developed a method for predicting the residual capacity of employers BHT [11-12].

This method takes into account $\Delta П$ - rate change to the surfaces conjugations period prypratsyuvannya. During this period the surface roughness can be changed into two classes, and hardness increased to four times.

Proved that the residual life, which depends on $\Delta П$,if known developments from the start of operation is determined from the expression:

$$t_з = t_н\left(\left(\frac{З_{гр} - \Delta П}{З(t_н) - \Delta П}\right)^{\frac{1}{\alpha}} - 1\right), \qquad (1)$$

where $t_і$ - Working out part of that check from the beginning of its operation until the diagnosis; *From*December- marginal change parameter condition; $Ç(t_і)$ - change parameters of the time of diagnosis (after working hours $t_і$) Units of measurement parameter; α - exponent functions change to the state.

In the case of unknown time between the start of operation to determine the residual life limit and the nominal value of the parameter, as in the previous case, is determined by the results of diagnosis:

$$t_з = (t_x + t_m)\left[\left(\frac{З_{гр}}{З_2}\right)^{1/\alpha} - 1\right], \qquad (2)$$

where t_x - Working hours from the start of operation to the first check operating hours; tm - mizhkontrolne operating time (in time between the first and second inspections), operating hours; CO2 - change the parameter of the start of operation to review.

The remaining resource facility for diagnosing any confidential probability determined by

$$t_з = t_н\left(\left(\frac{(З_{гр} - \Delta П)(Б\sigma + 1)}{З(t_н) - \Delta П} + Б\sigma\right)^{\frac{1}{\alpha}} - 1\right), \qquad (3)$$

where B - one of the characteristics of the distribution of the residual life, dependent on the confidence probability; σ - Standard forecasting error.

Given the fact that the work should be carried out with TOR time and on time, and that simple BHT leads to inevitable loss of crops and to improve interactions between systems and making use of technology and to refine and further develop the "Methodology of calculation of parking day or losses from idle machines ", approved by the Cabinet of

Ministers of Ukraine of 12 July 2004 p. № 885, the department (Voytyuk E) the method of calculating losses due to downtime of machines for technical reasons, the warranty period of operation.

Over the last ten years, the department (Rublev VI) designed to order the Department of Engineering and Technology Policy Agrarian Policy of Ukraine, the following recommendations: to control the technical state-plows PLN 3 PLN 5 statistical methods; technical state control cultivators PCC-4 statistical methods;

Much attention is paid to improving the efficiency of combine harvesters (Demko AA). Method was developed efficiency combine harvesters Challenger 647 with the control and optimization of mechanical losses by threshing instrument (ahrobudivelnyy Alliance "Astra" Shepherds settlement Kyiv region and agricultural firm "Dawn" s. Nepedivka Koziatyn region Vinnytsia region) and the method control efficiency combine harvesters PAL "Radivske" (Kalinowski district, Kyiv region).

Over the years of existence of the department prepares highly qualified specialists. Over the last decade at the department professors Melnyk II, JM Mikhailovich, Demydkom MO, Fryshevym SG prepared seven Ph.D. (Cooper SM, Shatrov RV, locusts V. Moroz AI Bondarev SI Zubko VN, Tripe AM) is protected by one doctoral dissertation (Voytyuk E).

Much attention is scientific and pedagogical staff of the department paid training masters. Since 2007 thesis Master's student Klimenko TS (Supervisor Voytyuk E) on "Restoration of parts by thermoplastic deformation" was recognized as the best among university students III-IV accreditation levels of the Ministry of Agrarian Policy of Ukraine, specialty 8.091902 "Agricultural Engineering".

Designed stand complex diagnostic and mobile diagnostic laboratory at the International Exhibition "Agro-2008" and "Agro-2010" awarded gold medals and diplomas Ministry of Agriculture Ukraine and Ukrainian Academy of Agrarian Sciences in the nomination "For the development and introduction of new technologies for repair and maintenance of agricultural machinery."

The results of the above research implemented Agrarian Policy of Ukraine, SE "Ukragrostandartsertifikatsiya" and State Inspection "Derzhtehnahlyad" Agrarian Policy of Ukraine NAC "Ukragroleasing" Yagotynske Katerinopolsky and district administrations, VLP "Ukrahropostach", LLC "AHROTEKHSERVIS" and found a favorable response to international exhibitions: "InterAGRO - 2005», «SIA - 2005 2006 ""AutoTech Service - 2006", "AGRO - 2004-2011", "autumn Kiev and Ukraine Grain - 2006-2009".

Conclusion. Over the last decade at the Department of Technical Service and Engineering Management University. MP Momotenka were made and used in the production of a large number of innovative research. The strategy of further innovative scientific research is as follows. For sustainable development of the technical services necessary to conduct studies aimed at determining the relationships between systems manufacturing, use and maintenance-repair BHT. They should take into account the volume of units using BHT system, its performance and lifespan. Another of the main areas of research will be to require field work to a serving-term maintenance interventions with regard agrotechnological conditions. Department researchers are studies on the impact of biofuels energy-performance BHT. For reliability and objectivity of test results will BHT studies in the field of quality management techniques, its standardization and certification. Particular attention of scientists of the Department will focus on innovative active popularization of scientific development through participation in exhibitions and sales, scientific conferences, and implementation of processes in agricultural production in the experimental farms NUBiP Ukraine. All of the foregoing may be subject to systematic work on preparing a research oriented masters, postgraduate and doctoral students.

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Results of research Pryvedenы nauchnыh scientific Teaching staff of the department, napravlennыh on Increase of the effectiveness эkspluatatsyonnыh characteristics of machines and tractors putem development Novaya system tehnycheskoho service, ego funds and objects, as well as prospects nauchnыh of research and development Strategy of the department.

Science, Studies, Department, innovations, tehnycheskyy SERVICE.

The results of scientific research and teaching staff of the department aimed at improving the efficiency of performance tractor fleet by developing a new system of technical service, its facilities and objects as well as the prospects for research and development strategy for the department.

Keywords: science, research department, innovation, technical service.

UDC 539.3

Question K AKTYVYZATSYY DRIVING MINING fluid and VOLNOOBRAZOVANYY PROVODYASCHYH paths High society in plants

DG Voytyuk, corresponding member of the Academies
Y. Chovniuk, JO Gumenyuk, AP Hutsol,
kandydatы tehnycheskyh Sciences

Powered physicochemical mehanycheskoe rationale aktyvatsyy DRIVING transport liquids and volnoobrazovanyy provodyaschyh paths High society in plants. Techenye liquids (ksylemnoho and floэmnoho juice) obespechyvaetsya mechanical factors and usylyvaetsya pod