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MODEL ESTIMATES BASED DESIGN HOTOVNOSTINA residual life ODYNYTSMASHYN Forestry TO WORK

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In the article the features of analytical approaches to the study of technical readiness assessment model based on the remaining resource units for the Forestry machines work.

Recovery, performance, forestry machine.

Formulation of the problem. The nature of the changes to the technical readiness (work - TG) system and its elements influenced by various factors, first of all, such as the reliability of technical facilities, operation, intensity of use and more. However, the nature of the changes TG will be determined mainly operations maintenance (hereinafter - TOR), since their implementation achieves technical condition (hereinafter - TS) on the designated resource efficiency.

Analysis of recent research. It must be emphasized that the characteristics of the concept TG will be complete in the event that it will consider not only the assessment of the actual state of resources [1], and costs [2] that are associated with recovery resource efficiency, performance efficiency is taken into account [3] . In general, the object can be characterized TG residual designated resource [4], the largest expenditure [5] the full resources previously spent updated items Object $Q_P(t_n)$ - Operating a function of time (working hours) - t_n or magnitude of costs [6] for the projected period of operation $Q_P(t_n)$ as a function of the forecasted period t_n [7].

This approach to the analysis of what constitutes TG will be evaluated largest remaining resource $t_{зал.}$ for the proposed period of stay in a position that is analyzed - t [8, 9]. In this case, the quantitative indicator TG output probability can be considered residual life $t_{зал.}$ during $t : P(t \le t_{зал})$ or the amount of costs incurred during the renovation t Resource elements and machine components for Forestry works TCO: $Q_P(t)$ [10].

The purpose of research - Describe the features of analytical approaches to study technical readiness assessment model based on the remaining resource units for the Forestry machines work.

Results. TG assessment system as a whole, taking into account the proposed approach in assessing TG system elements associated with determining the total complexity of maintenance and repair $H(\tau)$ on time

$$H_{mo}(\tau) = \sum_{j=1}^{N} \sum_{i=1}^{n} H_{ij}^{TO}, \quad (1)$$

where: $j = 1,..., N$ - The number of items subject to maintenance and repair for a certain period (τ - Year extension, the entire period of operation);

$i = 1,..., n$ - Maintenance of species j th element of the machine that are performed for a certain period;

H_{ij}^{TO} - complexity i th type of maintenance j th element of the machine for a certain period τ people h).

Similarly, the total complexity of repairs is:

$$H_P(\tau) = \sum_{j=1}^{N} \sum_{k=1}^{m} H_{kj}^{P}, \quad (2)$$

where: $k = 1,..., m$ - The number of types of repair systems that run on a designated period τ.

H_{kj}^{P} - complexity k -On repair j th element of the system for the designated period (folk h).

It follows:

$$H(\tau) = \sum_{j=1}^{N} \sum_{i=1}^{n} H_{ij}^{TO} + \sum_{j=1}^{N} \sum_{k=1}^{m} H_{kj}^{P}. \quad (3)$$

The total complexity of maintenance and repairs for the designated period of operation allows for consistent impact properties of sustainability, reliability and remontozdatnosti and fairly tight control reflects the effectiveness of TG and their elements.

Time and complexity of TOR system objectively determines the nature of TG changes its basic elements. One indicator of assessment may serve TG factors which characterize the TC system changes depending on the resources of the main system elements $t_{зал}$ and $t_{назн}$ and time of operation:

$$K_{TG} = \frac{t_{зал}}{t_{назн}}, \quad (4)$$

where: $t_{зал}$ and $t_{назн}$ - Accordingly appointed and the remaining resource.

Residual life $t_{зал} = t_{назна} - t_в$ where $t_в$ - Wasted resource. Spent resource can be represented by the product rate hit its resources on actual time (lifetime) or developments T:

$$K_{ТГ} = \frac{t_{назн} - t_р}{t_{назн}} = 1 - \frac{V_s T}{t_{назн}}. \quad (5)$$

If we accept $K_{ТГ}$ equal to 0, the point of complete exhaustion of the resource object (achievement HS) will be equal to:

$$t_{pi} = \frac{t_i}{V_{si}}, \quad (6)$$

where: t_{pi} - Time to start j Recovery, defined as residual lifetime prohnozuyemyy i th element of the system to repair;

t_i - Headroom i th element;

V_{si} - Term resource depletion i th element.

Start time j th repairs should be installed in the basic and fundamental elements of machines Forestry works that are on time and resource estimates smallest for which $K_{ТГ}$ will be approximately equal to the minimum value or residual life.

Output operating system for recovery of TG should be at the same value $K_{ТГ}$, Since the $K_{ТГ} < K_{ТГ\min}$ there may be emergency situations.

Premature withdrawal system repair reduces its performance indicators, increasing the cost of restoring and maintaining TG system.

In developing definitions of technical readiness of complex technical systems at the technical readiness machines Forestry works or subsystems to perform a given functional tasks will understand the characteristics of TC, in which during the time machine Forestry works or subsystems will be able to perform these tasks with probability, defined designated resource efficiency.

Conclusion. The above analysis of different approaches to assessing TG factors and features that affect this figure suggests their variance at different levels - components, parts, subsystems and differences depending on mode and conditions.

List of references

1. MV Moon Scientific bases of maintenance and repair of machinery in agriculture / MV New Moon. - Kirovograd: Izd CODE, 2009. - 180 p.

2. Kanarchuk VE Fundamentals of maintenance vehicles. - The 3-story book. Book. 1. Theoretical basis. Technology: Textbook / VE Kanarchuk, OA Ludchenko, AD Chyhrynets. - K .: Izd "High School", 1994. - 342 p.
3. AV Ascheulov Analysis intensity otkazov hydraulic equipment / AV Ascheulov // Gidravlika pneumatic and Drives. - 2010. - № 1 (3). - C. 8-9.
4. GOST 2860-94 Reliability engineering. Terms and definitions. [Electronic resource]. - Available onhttp://www.budinfo.org.ua/doc/1812459/DSTU-2860-94-Nadiinist-tekhniki-Termini-taviznachennia/
5. JA Darsht Methods and models avtomatyzyrovannoho analysis and synthesis of elements hydropryvoda: Dis. Doctor of technical sciences: 05.13.12 / Darsht James Adolfovych. - Vladimir, 2005. - 426 p.
6. Dynamics of volume hidropnevmosystem general-purpose / Z.YA. Lurie, AI Gasyuk. - H .: NTU "HPI", 2008. - 112 p.
7. Andrenko PM The development of scientific bases of machines with hydraulic systems for hydraulic oscillation: Author. Dis. on competition sciences. the degree of Doctor of Engineering. Sciences specials. 05.02.08 "Engineering" / PM Andrenko. - K., 2009. - 35 p.
8. Remarchuk MP Energy-efficient power transmission construction and road machines: Author. Dis. on competition sciences. the degree of Doctor of Engineering. Sciences specials. 05.05.04 "Machines for earthworks, road works and Forestry" / MP Remarchuk. - H., 2008. - 36 p.
9. Rybak SA Modeling and optimization of hydromehanycheskyh mobylnыh machines and production equipment: Author. Dis. soyskanye to the degree of Doctor of Engineering. Sciences specials. 05.02.02 "Mashynovedenye, system drives and machine parts" / SA Rybak. - Krasnodar, 2008. - 46 p.
10. AA Starыh Synthesis nelyneynoho regulator control system neopredelennыm parametric object: Author. Dis. on soyskanye degree candidate. Sc. Sciences specials. 05.13.06 "Automation and Process Management and Production tehnolohycheskymy" / AA Starыh. - Tomsk, 2009. - 19 p.

Features Considered in Article Analytical approaches for justification model otsenki Tehnicheskoe readiness based on the final resource units machines for lesotehnycheskyh works.

Restoration, disability, Lesnaya machine.

In paper the considered features of analytical approaches to justification of model of assessment of technical readiness on basis of residual resource of units of mashines for timber works.

Restoration, working capacity, forest mashine.