

DIAGNOSTIC PARAMETERS OF A VOLUME HYDRAULIC DRIVE INSTALLED ON FORESTRY MACHINES

Voitov A. Ph.D., Associate Prof.
State Biotechnological University

Technical condition of the volume hydraulic drive such as HST, which is expressed in a change in the pump flow rate and motor efficiency affects a decrease in the performance of agricultural machines with a simultaneous increase in fuel consumption [1].

The hydraulic drive of the mounted system of the forestry machines is described by an oscillatory link, while the technical condition can be assessed by the characteristics of the transient process. Analyzing the transfer functions of the hydraulic drives of the steering, hinged system and gearbox, the authors of the works [2, 3] conclude that the listed systems can be considered as dynamic oscillatory systems with a small damping coefficient. The quality of the transition process can be determined by the following indicators: transient time; the time at which the pressure reaches its maximum value; the time it takes for the fluid pressure to reach the static pressure value for the first time; overshoot value; steepness of the characteristic; damping period.

Developed a mathematical model of a volume hydraulic drive HST-90,112, which takes into account the design features of the hydraulic pump and the hydraulic motor and their mutual influence on each other through the elastic properties of the hydraulic fluid circulating in a closed volume. Therefore, the mathematical description of such dynamic systems should be sought in the joint interaction of the pump-motorhydraulic fluid, which determines the relevance of this study.

References

1. Boiko I. G., Voitov A. V., Vojtov V. A. Structural identification of the mathematical model of diagnostic capacity hydraulic drive HST-90.112 //Scientific Bulletin of National University of Life and Environmental Sciences of Ukraine. Series: APC equipment and energy-K. – 2015. – №. 226. – С. 124-132.
2. Voitov A.V. Modeling of the dynamics transient processes and validation diagnostic parameters of the technical condition of the capacity hydraulic drive HST90, 112. / Technical service the agricultural, forestry and transport systems. Kharkiv: HNTUSG. 2016. №4. pp. 101-112.
3. Voitov A. V. Diagnostics volume hydraulic drive HT-90,112 set on forestry machinery. Kharkiv: HNTUSG. 2020 pp. 80-81.