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RESEARCH OF THE METAL CUTTING EQUIPMENT DYNAMICS IN PARTS

Wide use of cooperation in the creation of machine structures is an actual development direction of the world mechanical engineering. Modern metal-cutting equipment (machines, robots and other machines) are also assembled from individual units (modules) manufactured centrally. In the world, there are many centralized productions of complete assemblies for various machines, including metalworking ones.

Important nodes of machine tools, robots and other technological machines are spindle nodes, rotary tables, mechatronic modules, which largely determine the quality of these machines, especially dynamic ones.

In nodal studies of elastic systems of processing machines, it is necessary to have reliable information about the dynamic characteristics of their nodes [1]. Existing methods do not allow obtaining experimental characteristics of nodes, because they are mainly intended for computational studies.

The purpose of the conducted research is the development of methods for the analysis of elastic systems of machines and, based on it, methods for the nodal experimental and computational determination of their dynamic characteristics (in the form of amplitude-phase frequency characteristics and others) [2].

Based on the conducted research, the following were developed:

- methods and techniques of nodal analysis of dynamic characteristics of metalworking machines (machines, robots and others);
- technical means, which are necessary for the experimental implementation of the developed methods of nodal research of machines;
- practical recommendations regarding the use of the specified methods for nodal studies of metalworking machines.

The developed methods of analysis ensure the reliability of experimental static and dynamic characteristics of both individual nodes and machines as a whole, which is necessary for a reliable assessment of their dynamic quality [3].

The use of the developed methods of research of metalworking equipment by parts (nodes) will allow to increase the accuracy of determining the dynamic characteristics of machines, which will ensure the high quality of manufactured structures during their aggregate production.

References

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