Tymchik G., Filippova M., Demchenko M. Correcting the position of piezoelectric transducers during acoustic control of the stressed-strained rolled sections

With the increasing pace of construction, there is a growing need for the development and use of new methods and means to ensure their integrity, reliability, performance efficiency, safety, which will make it possible to conduct in a short time diagnostics of critical elements of constructions.The main indicator of technical condition of a building, which is responsible for its performance, is the stressedstrained state (SSS) of structural elements. As the bearing elements of modern buildings of civil and industrial purpose, metal structures (MS) are used, made of welded and rolled shaped sections (SS) [1–4].
All structural elements of steel SS of MS work on bend. Maximum values of stress occur in places of the largest bend. To provide for reliability, when designing MS, the permissible values of stresses are calculated that would not lead to the occurrence of critical stresses in the areas of maximum concentration. However, a change in SSS of a building's MS is caused by several factors: change in the purpose of a facility, reorganization of a technological process with a change in technological lines in the building, operation of facility beyond the limits of design modes, natural disasters, and changes in regulatory requirements.
To ensure integrity of a structure, it is necessary to carry out current control of the technical condition by identifying real values of the stresses in places of their concentration [5, 6]. Therefore, of particular importance is the development of operational methods of non-destructive control, which would allow diagnosing the value of SSS of SS with high reliability.
The relevance of the work is in a comprehensive study of the impact of SSS and the SS geometry on the change in the measurement base for the entire nomenclature row of SS, which will enable designing means for diagnosing SSS of SS under operation conditions.
Keywords: piezoelectric transducer, stressed-strained, structural element, stressedstrained state, acoustic testing

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