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ELECTROPHYSICAL UNSTEADY PROCESSES IN THE SYSTEM TO REDUCE RESIDUAL STRESSES WELDS

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Abstract

A three-dimensional integral-differential mathematical model of the process of capacity discharge to the electromagnetic system with inductance coil and electrode, connected in series, was developed. The magnetic field of the coil excites the eddy currents in the electrically-conductive plate which is mounted under the coil, generating, as a result, the electromagnetic force which presses the electrode against the surface. The optimal circuit parameters were established to generate the pressing force. An electrodynamic treatment of welded joints was carried out, the modes were determined, at which the change of tension force to compression force is achieved, the fatigue strength of welded joints under the cyclic loading was increased more than twice. References 9, figures 9.

Key words: welding residual stresses, electrode system, current pulse, Maxwell's equations, method of integral equations, electrodynamic forces

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