

MULTIFUNCTIONAL PROTECTIVE TECHNOLOGICAL COVERINGS

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Reliability of diesel and gas turbine power plants and water power devices of different functionality to a considerable degree depends on failure-free operation of friction pairs having the functions of sensitive elements of automatic control units, distributors of hydraulic tracking drives, and other critical units.

Development of new enabling restoration techniques for worn-out precision pairs (PP) part surfaces is a topical problem.

Wear of internal PP elements (valves, plungers, pistons, etc.) can be compensated by creating restoring coatings deposited by method of ion-plasma sputtering.

A plunger precision pair of locomotive diesel high-pressure fuel pump was chosen as a subject of research. PP consists of an internal element – a plunger and an external element – a barrel.

The plunger has an initial hardness of 59...63HRC. The researched PP operates in very severe environment. Safe radial clearance of PP coupling does not exceed 2 micrometers. As a rule due to heavy wear the PP plunger is beyond repair.

The authors offer the restoration technology of precision pair parts - valves, plungers and injectors of vehicle fuel pumps. The technology stipulates the creation of a special restoring wear-resistant coating on the basis of Ti – Al – N (titanium-aluminum-nitrogen) deposited by ion-plasma sputtering.

Development application area: diesel engines of railway and auto transport, diesel and gas turbine engines of river and marine vessels, engines of electric power plants, gas-transfer stations, agricultural machinery, road construction machinery as well as water power devices of lifting and transportation equipment.