

СЕКЦІЯ 4. ФУНДАМЕНТАЛЬНІ ТА ПРИКЛАДНІ ПРОБЛЕМИ ТРАНСПОРТНОГО МАШИНОБУДУВАННЯ

SYNTHESIS OF DEVICES FOR ESTIMATING TECHNICAL CONDITION OF FUEL INJECTION NOZZLES

Borisenko A.N., Borisenko E.A., Sergienko N.E., Tanko E.V.

Medvedev N.G. *, Nazarov A.I.**

National Technical University

“Kharkiv Polytechnic Institute”

**Kharkiv State Automobile and Highway College,*

*** Kharkiv National Automobile and Highway University,*

Kharkiv

Two options for structures of diagnostic devices, which are based on an assessment of the technical condition of the nozzle by the speed of movement of its needle, are proposed in the paper [1]. Too high speed of its movement to the stop and reduced speed when moving into the nozzle seat indicate a weakened return spring (or its tightening), decrease in the speed of the needle to stop at a normal speed of landing in the seat is an indicator of reduced fuel supply pressure. The reduced speed of the needle in both directions indicates increased friction against the nozzle body, caused, for example, by deformation of the needle, etc. The needle speed is estimated by E.M.F. of the self-induction arising on the measuring coil due to a change that penetrates it when the needle moves the magnetic flux. The latter can be created with a permanent magnet or magnetizing winding. During operation of the nozzle, the gaps between its units can change, causing a change in the magnetic resistance of the nozzle, which can be considered as a magnetic circuit. In addition, the magnetic induction created with the permanent magnet may decrease. To take into account and compensate for the influence of these factors on the accuracy of diagnosis, special measures can be taken, for example, a corresponding increase in the magnetizing winding current.

To solve this issue, telemetry information transmission tools were proposed [2], taking into account the design, operation and installation of nozzles, and a stand for the diagnosis of internal combustion engines [3].

The proposed devices have successfully passed experimental studies on 10D100, 2D70, 3D70, 5D70 diesel generators, on automobile and tractor diesel engines with power of 110-176 kW.

References:

1. Borisenko A.N. Theory and practice of computerized information-measuring systems for control and diagnostics of diesel generators: thesis of Doctor of Eng. sciences. Kiev, 2010. T1. 337 p.
2. Sergienko N.E., Bezpalko A.Yu., Miroshnichenko N.V. Features of transmission of telemetric information during tests of motor vehicles. Bulletin of the National Technical University “KhPI”: Collection of research papers, Kharkov: NTU “KhPI”, 2011. No. 56: Automobile and tractor engineering. P.106-109.
3. Borisenko A.N., Sergienko N.E., Kubrick B.I., Sobolev E.F. Stand for the diagnosis, management and evaluation of internal combustion engines. Information technology: science, technology, technology, education, health. Lecture notes of XXVI International Research-to-Practice Conference (May 16-18, 2018, Kharkiv). Kharkiv: NTU “KhPI”, 2018. Part 1. P. 149.