THE RESULTS OF COMPLEX CRITERIAL FUEL AND ECOLOGICAL ASSESSMENT OF AUTOTRACTOR DIESEL ENGINE 2Ch10.5/12

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For performing of calculated assessment of ecological safety level of exploittation process of power plants with piston ICE and functioning efficiency of ecological safety management system of that process are necessary appropriate criteria [1, 2]. The most useful in number of known such criterion is prof. Parsadanov complex fuel and ecological criteria K_{FE} [3].

The results of calculated assessment of criteria K_{FE} values, which based on experimentally obtained data, for autotractor diesel engine 2Ch10.5/12, that operates on 13-modes standardized steady testing cycle (UNECE Regulation № 49) shows, that ratio between monetary equivalents of compensation of ecological damage costs Z_e, motor fuel costs Z_f and total fuel and ecological costs Z_{fe} are vary from mode to mode of testing cycle and reaches maximum on modes of minimal idling (modes № 1, 7, 13). Values of K_{FE} criteria without taking into account weight factor value WF reaches maximum on the mode of nominal power (mode № 8) and with taking into account WF value – on the mode of maximal torque (mode № 6). Exploitation of diesel engine 2Ch10.5/12 on loading characteristic with crankshaft speed of mode of maximal torque (modes № 2 – 6) by K_{FE} criteria value is less preferred, than its exploitation on loading characteristic with crankshaft speed of mode of nominal power (modes № 8 – 12). Exploitation of that diesel engine on modes with zero effective power (modes № 1, 7, 13) and also on modes with low effective power (modes № 2, 12) is characterized by extremely low fuel and ecological effectiveness. Middle exploitation value of K_{FE} criteria (e.i. with taking into account distribution of value WF by modes of testing cycle) is $43,989 \cdot 10^{-3}$, and middle value (e.i. in case of equality of value WF for all modes of model of diesel engine exploitation) is $41,204 \cdot 10^{-3}$.

References:

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