ABOUT THE LIMIT OF EXHAUST GAS RECIRCULATION IN DIESEL ENGINES

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Abstract: The method of exhaust gas recirculation in thermal power plants is used to reduce the emission of nitrogen oxides. The larger the quantity of recirculated gases, the lower the emission of nitrogen oxides. To enhance the effect, cooling of recirculated gases is used. However, with gas recirculation, emissions of incomplete combustion products increase. For diesel engines, the limiting amount of recirculated gas will depend on the amount of residual oxygen in the exhaust gas and on the rigidity of environmental requirements for the emissions of incomplete combustion products. The article contains research materials which show the possibility of replacing air supplied to the engine with recirculated gas by 80% in certain regimes. At the same time, in the rated power mode, exhaust gas recirculation is impractical due to an increase in the smoke level in the exhaust gas. In addition, this allows one to maintain the level of fuel economy in diesel engines. To automatically track the required degree of recirculation, it is suggested to use its dependence on the temperature of the exhaust gas.

Keywords: diesel engine; recirculation; exhaust gas; oxygen concentration; concentration of nitrogen oxides; exhaust gas temperature

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