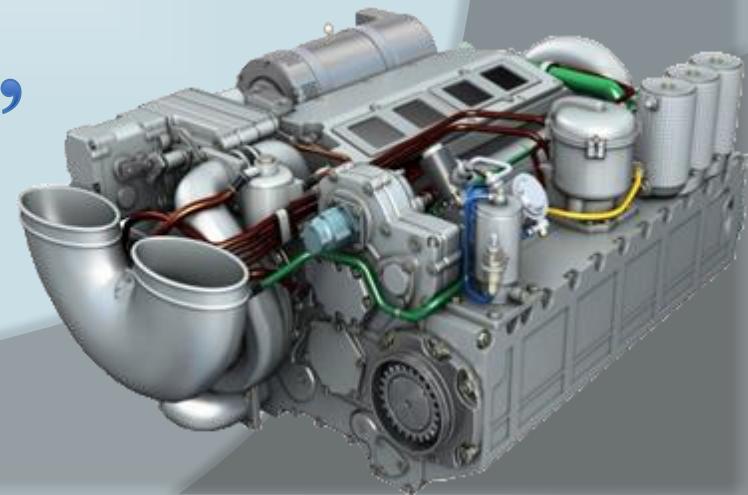


Proposals for cooperation of Internal combustion engine department of NTU "KhPI"





About Internal Combustion Engine department

- Head of the Department Prof., Dr. Vladimir Pylyov
e-mail: dvs@kpi.kharkov.ua

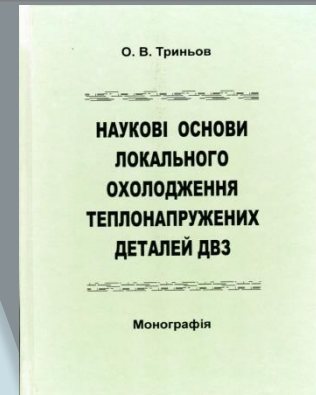
Doctor of Science – 6 persons;
Candidates of Sciences – 14 persons;
Postgraduate – 10 persons;
Doctoral student – 1 person.

- Department provide full-time training and learning [Bachelor (BA); Master's (MA); Doctor of Philosophy (PhD)] by specialties:

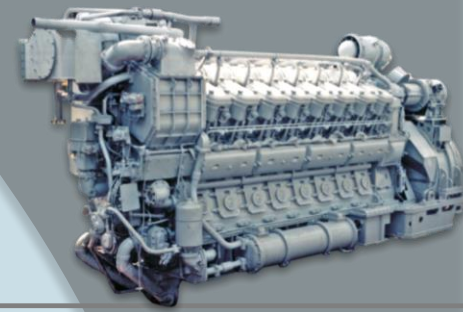
- ✦ Internal combustion engine
- ✦ Exploitation, diagnostics and organization of repair the internal combustion engine

Top publication

1. A series of textbooks in 6 vol.
2. Andrey Marchenko, Alexandr Osetrov, Oleg Linkov and Dmitry Samoilenko. Simulation of Biofuels Combustion in Diesel Engines /Biodiesel - Feedstocks, Production and Applications //Intech. - 2013. P.407–433; ISBN 978-953-51-0910-5
3. Discrete frequency method of power control for HC-CI-engine / Andrey Prokhorenko, Dmitry Samoilenko // Warsaw university of technology. Proceedings of the Institute of Vehicles, No 1(105)/2016. P. 5-12. (Scopus)



Intra-cylinder neutralization of toxic substances of the diesel engine



The purpose – increase in energy efficiency, ecological safety and fuel profitability of diesel engines.

Project tasks

1

Improvement of the methodology of organization of the combustion process in the cylinder of diesel engines in the presence of catalytic materials that control the flow of physico-chemical processes of combustion and inhibiting the formation reactions of NO_x

2

Development of the basic technology of creation on the surface of the combustion chamber aluminum piston of the catalytic coating of mono - and multi-layer of mixed oxides

3

Carrying out a complex of researches on definition of concentration CO , C_nH_m , PM and NO_x in the exhaust gases of engines when using pistons with a catalytic covering

Development of technical solutions to improve the efficiency of the use of alternative fuels in the ICE



The purpose – technical and economic assessment and technical expertise, experimental, design and optimization of engine research process by using alternative fuels.

Project tasks

1

Analysis of the current state of the use of alternative fuels in ICE

2

Experimental research parameters and technical and economic indicators of gasoline, gas and diesel engines using alternative fuels

3

Computational studies intracylinder engine processes running on alternative fuels

4

Multicriterion multiparametric optimization of engine parameters using a certain type of alternative fuel

Development of forecasting methods and increase the resource of high performance ICE combustion chamber parts



The purpose – ensuring work combustion chamber parts uprated engines on the limit strength

Project tasks

1

Research and the impact of operating conditions regime and control parameters on the durability of heat-stressed zones of the combustion chamber parts

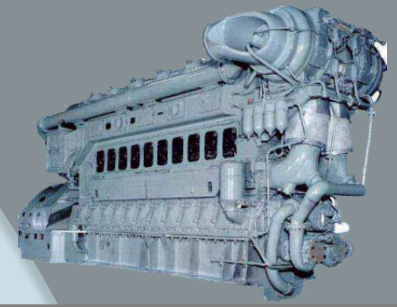
2

Perfection of mathematical models of predict the time before destruction of the engine combustion chamber components for various purposes in conditions of their operation

3

Improving the combustion chamber design parts based on accounting features of the processes of deformation and strength loss

Development and implementation of discrete hardening technology and improve the tribological characteristics of the ICE



The purpose – development of scientific bases of operational development structures and systems of high performance domestic diesel for their high technical and economic indicators

Project tasks

1

Physical and mathematical modeling of physical and mechanical processes in the mating parts

2

Development of models to describe design and technological solutions hardened parts of diesel engines

3

Increasing the tribological characteristics of friction surfaces

Improving control systems of fuel supply and the air in the cylinders of the ICE



The purpose – raising the technical level of transport engines by specifying the optimal regime parameters of the working process on the basis of adaptive algorithms of electronic control fuel and air supply

Project tasks

1

Synthesis of algorithms for electronic control units of the fuel equipment

2

Synthesis a controlled algorithms of turbocharging system control

3

Development of mathematical models and research dynamic qualities of the fuel system, turbocharging, the engine in general

4

Optimization and adaptation control algorithms for specific purpose engines and operating conditions

Department has its own laboratories measurements and fuel equipment, two rooms with 16 motorized stands where installed the mini technique engines, automobile, tractor, tank and other special motors, also compartments of locomotive and ship engines

