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Motor Transport Department
Thermal Engines and Power Units Subdepartment

«УТВЕРЖДАЮ»
Проректор по научной работе
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REPORT ON SCIENTIFIC STUDY WORK

Study of InOIL-B chemical fuel structurizer impact on operating process, environmental and energy indicators of an automotive gasoline engine

Subject of Scientific Research Work No.3288/14

Customer – InOIL LLC, Moscow

Scientific Work Leader
Doctor of Technical Sciences, Professor
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CONCLUSIONS AND RECOMMENDATIONS BASED ON THE RESULTS OF WORK

Based on the results of testing undertaken the following conclusions and recommendations may be made.

1. The single-cylinder engine indicating showed that with the use of InOIL-B additive the increase of the maximum combustion pressure in cycle p_z reaches 12.5 % to 27 % (at various timing angles). The point of maximum pressure in cycle p_z for all cases moves closer to the TDC. The maximum pressure buildup in this case also increases significantly (by 24...85 %), which testifies to the increased efficiency of the cycle.

2. The road tests showed that while the time of accelerating the vehicle with the driver and one passenger from 0 to 90 km/hour using the standard Ai-92 gasoline amounted to 26 sec, with the addition of InOIL-B additive to gasoline it reduced to 24.3 sec (i.e. by 6.5 %).

3. In the process of road testing during the sufficiently prolonged use of InOIL-B additive its high anti-incrustation and detergent properties have been identified, which allows recommending the additive for permanent use.

4. Testing the OKA VAZ-11113 vehicle chassis dynamometer in driving cycle showed a reduction of component toxicity when using the InOIL-B additive as follows: hydrocarbons CH - 25 %, carbon monoxide CO - 31 %, nitrogen oxide NO - 17 %.

5. On the whole, the use of InOIL-B additive in fuel undoubtedly leads to positive results at various speeds and loads of gasoline engine operation. One can forecast its highest efficiency when the car engine is operated in the conditions of intensive urban traffic (in the area of relatively low shaft speeds (up to 2500...3500 min-1) and low loads), at which the automotive engine operates almost 90 % of the time during the intensive urban traffic.

6. The successful results of the work performed showed that it is desirable to conduct further more in-depth, fundamental studies of the mechanism of impact of the multifunctional fuel additive InOIL-B on gasoline properties and on physical-

and-chemical processes of mixture combustion in the engine combustion chamber. In particular, it is desirable to study the impact of additive concentration at various speed modes of engine operation (i.e., at various levels of charge turbulence in the cylinder), operation at various compositions of the fuel-and-air mixture, using various values of the timing angle etc.