

ABSTRACT OF PhD THESIS

”THE COMPARATIVE STUDY OF AUTOMOTIVES START-UP EQUIPPED WITH ON-BOARD COMPUTER”

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The paper approaches a major problem from automotives field, the start-up representing the kind of movement which allows establishing automotives dynamic performances. In addition, PhD thesis deals in a comparative manner start-up and regular movement, the last one named in the paper non star-up, in order to catch the characteristics of the two types of movement frequently appeared in real running of automotives.

In chapter 1 there are presented a synthesis of the approached topic and main objectives of PhD thesis. There are highlighted paper characteristics in comparison to the approaches from field specialty literature. Also, there are presented main elements regarding experimental research, which can offer a database with functional parameters and cover main situations encountered during driving in case of start-up and normal driving, called non start-up. Experiments were conducted with a Logan Laureate automotive equipped with petrol injection engine with on-board computer, being held 50 start-up experimental samples and 50 non start-up samples.

In chapter 2 of paper is performed a comparative time analysis of start-up, which has allowed highlighting time variation character of different functional parameters, comparisons regarding different driving situations and two types of movement, conclusions regarding the way an electronic control engine is running etc. To this purpose, type I statistical characteristics were frequently being used in specialty literature and for other elements whereby mathematical statistics operates.

In chapter 3 is performed a comparative spectral analysis of start-up, which allowed establishing frequency spectres for different functional parameters, establishing harmonic elements with high energetic intake from dynamics experimental arrays, establishing sampler frequency, comparing the behavior in frequency field for different driving situations, establishing correlation in frequency domain by applying coherence analysis, highlighting non linear character of automotive dynamic behaviour. For this end it is used the Fourier monospectral frequency analysis, coherence analysis, bispectral frequency analysis and time-frequency analysis.

In chapter 4 is presented the topic of different factors influence on start-up. To this effect it is used correlation analysis, informational analysis, variance analysis and sensitivity analysis. It is dealt the driving style influence on automotives dynamics and fuel saving efficiency performances. There are defined and established the values of frequently used criterion in specialty literature in order to estimate driving style. The manner of approach is different from specialty literature, where for the study of some factor's influence it is considered that all other parameters remain constant.

Chapter 5 is intended to comparative analysis of start-up energy efficiency. There are established values of appreciation criterion for the dynamics and fuel savings used in specialty literature. There are defined and established values of 13 appreciation criterion for automotive energy efficiency in case of the two targeted movements, start-up and non start-up.

Chapter 6 presents general conclusions and main contributions brought in the comparative study, theoretical and experimental, for automotive start-up. There are highlighted some openings offered by the PhD thesis. It is highlighted the dissemination of research results and it is presented the list of the 22 papers published during doctoral preparation.