

OPINION

by DSc Eng. Nikolay Dimitrov Menkov

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on a dissertation for an educational and scientific degree "doctor"

in: field of higher education 5. Technical Sciences

Professional field 5.1. Mechanical Engineering

Doctoral program "Methods for controlling and testing materials, products and equipment"

Author: Nikolay Asenov Toshev

Title of the dissertation: Research of active safety systems in cars

Scientific supervisors: Assoc. Prof. Dr. Kaneta Ilieva Paskaleva; Prof. DSc Georgi Atanasov Mishev

1. General presentation of the procedure and the doctoral student

I have been appointed as a member of the scientific jury in the procedure for the defense of a dissertation for the acquisition of the educational and scientific degree of "doctor" on the topic "Research of active safety systems in cars" by Order No. RD-22-1060/09.05.2025 of the Rector of Plovdiv University (PU) "Paisiy Hilendarski". The author of the dissertation is Magister Eng. Nikolay Asenov Toshev, a full-time doctoral student at the Department of Mechanical Engineering and Transport of PU. The procedure is in the field of higher education 5. Technical Sciences, professional field 5.1 Mechanical Engineering, doctoral program "Methods for controlling and testing materials, products and equipment". Scientific supervisors are Assoc. Prof. Dr. Kaneta Ilieva Paskaleva and Prof. DSc Georgi Atanasov Mishev from PU.

The set of materials of Eng. Toshev presented to me on electronic media includes a dissertation, an abstract, a list of publications, a copy of the publications, a certificate of compliance with the minimum requirements of the Law on the Development of the Academic Staff, a declaration of originality and authenticity, a summary in English and complies with the requirements of Art. 36 (1) and (3) of the Regulations on the Development of the Academic Staff of the University of Plovdiv. The documents and materials presented are prepared precisely and correctly. Eng. Toshev's dissertation is presented in a volume of 181 pages, of which 20 pages are appendices with 18 tables and 21 graphs. The work contains an Introduction, four separate chapters, Conclusion, Contributions and a List of publications and is structured logically and correctly.

I do not know Eng. Toshev, but his autobiography shows competence corresponding to the topic of the dissertation.

2. Relevance of the topic

The topic of studying active safety systems in cars is extremely relevant in the context of the growing number of road accidents, the need to increase road safety. With the development of tech-

nology and the introduction of autonomous and semi-autonomous vehicles, active safety systems play an increasingly key role in preventing accidents. Legislative authorities in many countries already require mandatory equipment with certain active systems, which emphasizes their importance. Consumers are also showing increasing interest in car safety, which directly affects their choice when purchasing a new vehicle. In this sense, I believe that the topic of the dissertation is particularly relevant, and the goal set meets modern requirements for a real reduction in the number and severity of road accidents through the use of innovative technologies.

3. Knowledge of the problem

Chapter 1 provides a critical analysis of the current state of the braking, traction and stability control systems, warning and assistance, steering, connection and communications. The section also examines and discusses modern methods for studying the stopping distance and delay and their role in active safety systems. 135 literary sources were used, the majority of which were published after 2015. The presented review demonstrates the author's high competence in the subject, his ability to delve into the current state in detail and to identify and classify problems.

The literature review is summarized in the Conclusion, which allows Eng. Toshev to correctly formulate the aim and objectives of his research.

4. Research Methodology

Chapter 2 presents the methodologies and measuring equipment. Cars of different generations and with different characteristics were used for the research. The research was conducted in real road conditions. The objects of research, the measuring equipment used (basic characteristics, precision, applications) and the conditions of the experiments (testing range, meteorological conditions, etc.) are described in detail and allow their repetition. This gives me reason to believe that the obtained experimental results are reliable and credible.

5. Characteristics and evaluation of the dissertation work and contributions

The work is written in a very good style, I also highly appreciate the quality of the included tabular and graphical material. I accept the contributions formulated by Eng. Toshev, with which he offers original solutions to particular problems with results valid for a group of practical ones and finds solutions to problems with immediate practical applicability.

6. Assessment of the publications and personal contribution

The publications on the dissertation are 4 in number and are sufficient in quantity and quality. In two of the publications, Eng. Toshev is an independent author, and in the remaining two he is the first co-author. This gives me reason to believe that the doctoral student is an initiator and active participant in the published research. One of the publications is in a conference, indexed in Scopus. No citations have been noted, which indicates that the research has not yet found a response in the scientific community.

7. Abstract

The abstract is presented on 32 pages, corresponds to the dissertation work, including all its sections and meets the requirements of Art. 36 (1) of the Regulations for the Development of the Academic Staff of the University of Plovdiv.

8. Recommendations for future use of the dissertation contributions and results

The entire dissertation work has a direct practical focus, which would allow the author to expand his research in many directions in the future. I recommend aiming for publication in more prestigious scientific publications. The work itself is well structured and excellently graphically designed. As known methodological weaknesses, I would note: the lack of comparison of the obtained own results with similar published ones; irritating heterogeneity in the description of literary sources (in some of the titles all words are capitalized, and in others only the first word begins with a capital letter; the year of publication is in different positions). But these minor remarks in no way diminish the value of the work.

CONCLUSION

I believe that Eng. Nikolay Toshev has carried out significant analytical and experimental work in terms of quantity and quality. The dissertation contains sufficient scientifically applied and applied contributions and meets the requirements of the Act on the Development of the Academic Staff, the Regulations for its implementation and the Regulations for the Development of the Academic Staff of the University of Plovdiv. Based on the analysis made, I give a categorically positive assessment of the developed dissertation work and I consider it justified for Mag. Eng. Nikolay Asenov Toshev to acquire the educational and scientific degree "doctor" in the scientific field: 5. Technical sciences, professional field: 5.1. Mechanical engineering, doctoral program: Methods for controlling and testing materials, products and equipment.

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Prepared the opinion:

(Prof. DSc Nikolay Menkov)