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## MYKOLA HOVORUSHCHENKO (1924–2011): BIOGRAPHY OF A SCIENTIST

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*Abstract.* The article is devoted to the biography of Mykola Yakovych Hovorushchenko (1924–2011). M. Hovorushchenko is known for his role in the development of the first modern stations of automated diagnostics. Under the direction of M. Hovorushchenko there were trained approximately 8500 engineers, more than 80 patents for inventions were obtained.

*Key words:* Mykola Yakovych Hovorushchenko (1924–2011), biography, scientist, contribution to science.

## МИКОЛА ГОВОРУЩЕНКО (1924–2011): БІОГРАФІЯ НАУКОВЦЯ

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*Анотація.* Статтю присвячено огляду біографії та наукового доробку Миколи Яковича Говоруценка (1924–2011) – професора, доктора технічних наук, заслуженого діяча науки.

*Ключові слова:* Микола Якович Говоруценка (1924–2011), біографія, науковець, науковий внесок.

## НИКОЛАЙ ГОВОРУЩЕНКО (1924–2011): БИОГРАФИЯ УЧЕНОГО

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*Аннотация.* Статья посвящена обзору биографии и научного вклада Николая Яковлевича Говоруценка (1924–2011) – профессора, доктора технических наук, заслуженного деятеля науки.

*Ключевые слова:* Николай Яковлевич Говоруценка (1924–2011), биография, ученый, научный вклад.

The Honored Worker of Science, Doctor of Technical Sciences, Professor Mykola Yakovych Hovorushchenko [1–8] was born on May 24, 1924 in the village of Klynove, Borisov District, Belgorod Region. He graduated from high school in the city of Belgorod in 1940 and entered Kharkiv Automobile and Highway Institute (KhADI). His studies did not last long before they were interrupted the war. Hovorushchenko began his military service in the 381<sup>st</sup> Reserve Regiment in Pugachev, in the rank of sergeant. After working for several months as a teacher in the preparatory section of the regiment, the young man volunteered for the front, where he served his way from an ordinary

infantryman to a regimental staff officer. From February 1943 to November 1945 he fought on the 3rd and 4th Ukrainian fronts, took part in the liberation of Kharkiv, served as a topographer, military interpreter, head of secret record keeping, and Komsomol organizer at the regimental headquarters.

In September 1945, Hovorushchenko was demobilized as a student who had finished his 1st year of university studies. He returned home in November of that year [1]. From 1946 to 1950 Hovorushchenko was a student at KhADI. As an honors student, he was offered an opportunity to pursue a postgraduate degree. In

1954, at the Moscow Automobile and Road Institute (MADI), he successfully defended his candidate thesis on evaluating the fuel efficiency of automobiles on uneven roads. In the same year Hovorushchenko became chair of the Department of Motor Vehicle Operation and Maintenance at KhADI.

At that time he already began exploring issues related to the diagnostics of motor vehicles for improving their maintenance and repair. He led the development of modern automated diagnostic stations for cars and trucks, as well as the construction and deployment of several dozen sets of diagnostic equipment in different cities of Ukraine and the former USSR. The 1950s were a particularly fruitful period in the scientific and educational work of the department. In cooperation with the Department of Road Construction and Maintenance, research was begun on the interaction between the motor vehicle and the road. An automated lab for handling complex research problems in various road and traffic conditions, unique for that time, was created [5, p. 4; 9, p. 9].

From 1957 to 1959, Hovorushchenko served as Dean of the Faculty of Distance Education, and from 1962 to 1964 – Dean of the Faculty of Motor Vehicles, KhADI's leading faculty. In 1965 he defended his doctoral thesis on «The Theoretical Basis for Operational Calculations of Vehicle Movement on Roads with Varying Degree of Evenness» [9, p. 6]. Gradually, a strong scientific school emerged under the leadership of Mykola Yakovych, numerous theses were defended under his direction.

In 1965, on the orders of the Minister of Automotive Transportation of the Ukrainian SSR, a sector research lab for the basic problems of motor vehicle operation and maintenance was set up at KhADI, where critical issues of diagnostic theory and the theoretical foundations for methods and regimes of preventive maintenance and repair of motor vehicles were explored. Hovorushchenko became the head of the lab. In 1973, by then a renowned and accomplished scientist, he was sent to Mongolia as a UNESCO expert to organize an institute of technology there.

Hovorushchenko is known for his important role in the development of the first modern stations of automated diagnostics, begun in 1965. In 1970, the work prepared by the Department of

Motor Vehicle Operation and Maintenance, entitled «The Development and Application of Methods and Means for Diagnosing the Maintenance Condition of the Motor Vehicle Stock» was a contender for the Ukrainian SSR State Award for Science and Technology [4].

Under the direction of Mykola Hovorushchenko, the department held the first Union-wide science and technology conference on the diagnosis and prognosis of the condition of motor vehicle stock in September 1967, which formulated the theoretical foundations of diagnosis and the basic principles of a new approach to the preventive maintenance and repair of motor vehicles on the basis of reliable diagnostic information [4, p. 21].

In 1970–1971, at the Department of Motor Vehicle Operation and Maintenance, in the sector lab of Ukraine's Ministry of Automotive Transportation, the first experimental model of a mobile station for diagnosing the maintenance condition of cars (PDS-I) was designed and produced under Hovorushchenko's direction. The KhADI model PDS-I was designed for determining the technical condition of privately owned vehicles by traffic control authorities and for annual mandatory maintenance inspections. The station consisted of a special diagnostic trailer and a truck. The equipment in the trailer allowed to diagnose all the basic systems and aggregates of a vehicle based on 60 parameters. Two operators were able to process up to 50 cars per shift. The data of the express-diagnosis were recorded on a tape that was later deciphered by the operators. The driver received a completed diagnosis card with a statement on the maintenance condition of the vehicle based on 72 parameters and recommendations for fixing the defects [10]. Another advantage of the station was its complete autonomy and independence from external power supply. It could be set up in 30 minutes.

From May 23 to June 6, 1973 PDS-IV was demonstrated at the international exhibition Autoservice-73 in Moscow, attended by representatives from 25 countries. The KhADI model was recognized as the first in the Soviet Union and widely considered one of the most interesting items at the exhibition. The diagnosis station received praise from foreign representatives (USA, Japan, the Federal Republic of Germany, et al.). Versatility, portability, high degree of automation, small

size and cost were named as the main advantages of the model [11, p. 61; 12–28].

On May 24, 1974 the State Committee on Science and Technology of the USSR and the Council of Ministers of Ukraine resolved to create in KhADI the only research lab for the problems of the diagnosis of motor vehicle maintenance condition in the Soviet Union. Since 1974, more than 30 models of diagnostic equipment were developed at the lab, more than 60 patents for research in the field of diagnostics were received. Much of this work was done under the direction of Hovorushchenko.

Hovorushchenko authored more than 300 works, including over 40 monographs, textbooks, and manuals. He received more than 50 patents. One of his first works was the collective monograph *Operational Characteristics of Highways* (Moscow, Autotransizdat 1961) [29], summarizing research on the performance of motor vehicles in various road and traffic conditions. Continued research in this direction was presented in Professor Hovorushchenko's textbook *Basic Theory of Automobile Operation and Maintenance* (1971) [30; 9, p. 9; 11, p. 53].

Mykola Yakovych published numerous works on the diagnosis of motor vehicles. His first monograph on this subject came out right before the opening of the first Union-wide conference on «The Foundations of Motor Vehicle Maintenance Diagnosis» (M. Y. Hovorushchenko, A. V. Gogayzel, B. I. Klimetz, 1967). The results of further research on this subject in our country and abroad are summarized in Professor Hovorushchenko's monographs *Diagnosis of the Technical Condition of Automobiles* (Moscow, 1970) [31] and *Automobile Diagnosis: Today and Tomorrow* (1976) [32]. In 1984, he published a textbook on the *Operation and Maintenance of Motor Vehicles* [33; 5, p. 6–7].

Beginning in 1982, Mykola Yakovych was involved in the development of the Comprehensive Program of Scientific and Technological Progress in the Area of Transportation in Ukraine to 2005. For 13 years (1977–1990) he was a member of the Expert Council on Transportation at the Higher Attestation Commission of the USSR [2]. In the mid-1980's the Department of Motor Vehicle Operation and Maintenance under his direction continued to develop highly useful scientific

projects, the results of which were actively implemented by the industry.

Financial hardship that prevailed in the 1990 s caused serious difficulties in conducting applied research in motor vehicle diagnosis at the department. The department's faculty under Hovorushchenko's direction had to focus their work on theoretical issues related to the design and operation of transportation systems and machines.

In 1993, Professor Hovorushchenko became Academician of the Transportation Academy of Ukraine and Academician of the Academy of Transportation of Russian Federation. In the late 1990s the department performed the first series of studies on the theory of motor vehicle operation and transportation systems engineering and published (in collaboration with the Department of Motor Vehicles) the monograph *Transportation Systems Engineering*, as well as works on the *Economic Cybernetics of Transportation and Technological Cybernetics of Transportation* [34; 35; 36].

In October 1997, the department under the direction of Professor Hovorushchenko hosted a conference on the protection of air quality from harmful vehicle emissions. In 1998 the department organized a nation-wide conference on systems engineering in road transportation, which coincided with the 65th anniversary of the department. The department also received accreditation certificates for their fuel and operation materials research and analysis lab, as well as for the mobile diagnosis station [4, p. 22].

In the year 2000, the Department of Motor Vehicle Operation and Maintenance was renamed Department of Systems Engineering and Diagnosis of Transportation Machinery. In recent years, the faculty have been actively working on the theoretical principles of systems engineering and on the technological and economic cybernetics of transportation.

The Department of Systems Engineering and Diagnosis of Transportation Machinery under the direction of Mykola Hovorushchenko become one of the leading departments of the present-day KhNADU. It includes 13 teaching and research laboratories, including the Problem Lab for the Diagnosis and Prognosis of the Technical Condition of Motor Vehicles and two

laboratories accredited by the State Standard Commission of Ukraine. The Problem Lab for the Diagnosis and Prognosis of the Technical Condition of Motor Vehicles developed and helped to implement approximately 30 models of diagnostic equipment, constructed diagnostic stations, and formulated the foundations of a new approach to maintaining motor vehicles in good technical condition, based on a monitoring system of diagnostics.

The department, and Professor Hovorushchenko in particular, have trained approximately 8500 engineers, 61 candidates of science and 9 PhDs. More than 80 patents for inventions have been received, more than 40 monographs, textbooks, and manuals have been published. The department's faculty developed a comprehensive program of scientific and technological progress in the sphere of transportation and its socio-economic results for the period from 1985 to 2005.

To his last days, Mykola Hovorushchenko continued working in the field he loved, the field that shaped his life [37–41]. He made an important contribution to the science of motor vehicles in Ukraine and Eastern Europe [8].

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