

KOMUNIKÁCIE

C O M M U N I C A T I O N S

SCIENTIFIC LETTERS OF THE UNIVERSITY OF ŽILINA

Volume 23



1/2021

A - OPERATION AND ECONOMICS

- ASSESSING THE ENERGY EFFICIENCY OF AN ELECTRIC CAR** A1
F. Synák, M. Kučera, T. Skrúcaný
- INFLUENCE OF SELECTED FACTORS ON IMPLEMENTATION OF THE PPP PROJECTS IN TRANSPORT** A14
B. Zagożdżon, A. Rogowski
- THE TRANSPORT SERVICE OF SMALL TOWNS** A21
J. Gnap, J. Kupčuljaková, L. Černický, G. Dydkowski
- ANALYSIS OF TRANSPORTATION COMPANIES IN THE CZECH REPUBLIC BY THE KOHONEN NETWORKS - IDENTIFICATION OF INDUSTRY LEADERS** A32
J. Horák, P. Šuleř, J. Vrbka
- MODELLING OF THE TRAFFIC FLOW BASIC CHARACTERISTICS AT THE ROAD NETWORK SELECTED SECTION** A44
A. Kalašová, S. Skřivánek Kubíková, V. Harantová
- CONSOLIDATION OF CARGOS IN THE ROAD TRANSPORT AS A KEY METHOD TO SUCCESS** A54
Z. Łukasik, A. Kuśmińska-Fijałkowska, J. Kozyra, S. Olszańska
- OPTIMISATION OF DISTRIBUTION ROUTES: A CASE STUDY** A62
R. Kampf, M. Hlatká, P. Gross

B - MECHANICAL ENGINEERING

- INFLUENCE OF THE LOAD DISTRIBUTION AND SIZES ON THE WHEEL GEOMETRY IN PASSENGER CARS** B1
J. Goner, J. Napiórkowski, K. Ciborowski
- ANALYSIS OF TRAFFIC NOISE IN TWO CROSS-SECTIONS AT THE ROAD CROSSING THE CITY** B13
A. Bąkowski, L. Radziszewski
- DYNAMIC PROPERTIES AND WEAR ANALYSIS OF A RAIL VEHICLE WITH WHEELS' SELF-LUBRICATING COATINGS** B22
R. Melnik, A. Chudzikiewicz, S. Koziak, M. Opala, J. Dižo
- MODELLING OF CRITICAL VELOCITIES OF THE CARDAN MECHANISM USING TRANSFER MATRIX METHOD** B33
P. Hrubý, T. Náhlík
- AN EXAMPLE OF REPARATORY SURFACE WELDING OF THE MINING MACHINE VITAL PART** B39
D. Arsić, R. Nikolić, V. Lazić, S. Aleksandrović, L. Radović, N. Ilić, B. Hadzima
- DEVELOPMENT OF A METHOD FOR DIAGNOSING INJECTORS OF DIESEL ENGINES** B46
I. Gabitov, A. Negovora, S. Nigmatullin, A. Kozeev, M. Razyapov

**CALCULATION OF THE VEHICLES STRESS-DEFORMED STATE WHILE
TRANSPORTING THE LIQUID CARGO**

O. Grevtsev, N. Selivanova, P. Popovych, L. Poberezhny, O. Shevchuk, I. Murovani, A. Hrytsanchuk,
L. Poberezhna, V. Zapukhliak, G. Hrytsuliak

B58

USE OF THE BEZIER CURVES FOR A VEHICLES DRIVING CYCLES' MODELING

V. Dembitskyi

B65

C - ELECTRICAL ENGINEERING

**DESIGN AND CONSTRUCTION OF HIGH-QUALITY CAPACITOR FOR HIGH
FREQUENCY AND POWER APPLICATION**

M. Zavřel, V. Kindl, T. Kavalír, P. Drábek

C1

OPTIMIZED CONTROL OF ENERGY FLOW IN AN ELECTRIC VEHICLE BASED ON GPS

M. Danko, B. Hanko, P. Drgoňa

C7

ESTIMATING THE POSITION OF AN IMAGE WITH UNKNOWN INTENSITY SHAPE

Y. E. Korchagin, V. N. Vereshchagin, A. V. Terekhov, K. A. Melnikov

C15

D - CIVIL ENGINEERING IN TRANSPORT

**TECHNICAL FEASIBILITY OF DECEIT WHILE A VEHICLE IS WEIGHED IN MOTION
WITH A VERY LOW SPEED**

Z. Lozia

D1

**METHOD OF THE FINITE-ELEMENT MODEL FORMATION CONTAINING
THE 3D ELEMENTS FOR STRUCTURAL CALCULATIONS OF THE REINFORCED
CONCRETE STRUCTURES CONSIDERING THE CRACK OPENING**

S. N. Nazarenko, G. A. Grudcina

D15

E - MANAGEMENT SCIENCE AND INFORMATICS

**IMPROVING INITIAL POPULATION FOR GENETIC ALGORITHM USING THE MULTI
LINEAR REGRESSION BASED TECHNIQUE (MLRBT)**

E. Alkafaween, A. B. A. Hassanat, S. Tarawneh

E1

STUDY ON THE VEHICLE LINEAR DYNAMIC INTERVAL IN A TRAFFIC FLOW

O. F. Danilov, V. I. Kolesov, D. A. Sorokin, M. L. Gulyaev

E11

F - SAFETY AND SECURITY ENGINEERING

**"ROAD SAFETY SEQUENCE" - A NEW CONCEPT OF THE ROAD SAFETY
MANAGEMENT IN POLAND**

A. Szymanek

F1

**SAFETY OF OPERATION AND MAINTENANCE ACTIVITIES OF ROLLING STOCKS
BY THE EXAMPLE OF ELECTRIC MULTIPLE UNITS EN96**

A. Kalinowski, N. Radek, J. Bronček

F11

**OPTIMAL ROUTE DETERMINATION TO PROVIDE RELIEF FOLLOWING
AN EARTHQUAKE USING THE TRAFFIC DENSITY RATIO (CASE STUDY:
ISFAHAN'S FIRE STATIONS)**

S. A. Almasi, M. M. Khabiri, M. F. Tafti, M. Akbarzadeh

F20

KOMUNIKÁCIE

C O M M U N I C A T I O N S

SCIENTIFIC LETTERS OF THE UNIVERSITY OF ŽILINA

Volume 23



2/2021

A - OPERATION AND ECONOMICS

- THE NORTHERN SEA ROUTE AS A NEW ROUTE FOR MARITIME TRANSPORT BETWEEN THE FAR EAST AND EUROPE** A74
A. Dávid, A. Galieriková, J. Tengler, V. Stupalo
- THE VISCOSITY EFFECT ON VELOCITY OF A MACROSCOPIC VEHICULAR TRAFFIC MODEL** A80
E. J. Lopez-Sanchez, N. Y. Sanchez-Torres, P. E. Olivera Martinez
- THE MODEL OF CONTAINER FEEDER LINE ORGANIZATION FOCUSED ON THE NATURE AND PARAMETERS OF EXTERNAL CONTAINER FLOWS** A94
O. Drozhzhyn, Y. Koskina
- COVID-19 GROUNDED AIRCRAFT - PARKING AND STORING** A103
F. Serrano, A. Kazda
- UNDERSTANDING HOUSEHOLD'S TRAVEL COSTS BUDGET FRONTIER IN BANDA ACEH, INDONESIA** A116
S. Sugiarto, Lulusi, M. Isya, F. Apriandy, F. Ramadhan

B - MECHANICAL ENGINEERING

- CORROSION BEHAVIOUR OF PRESERVED PEO COATING ON AZ31 MAGNESIUM ALLOY** B76
F. Pastorek, M. Štrbák, D. Kajánek, M. Jacková, J. Pastorková, Z. Florková
- OPTIMIZATION OF INGREDIENTS UPON DEVELOPMENT OF THE PROTECTIVE POLYMERIC COMPOSITE COATINGS FOR THE RIVER AND SEA TRANSPORT** B89
A. Buketov, S. Yakushchenko, A. Menou, O. Bezbakh, R. Vrublevskyi, Y. Kalba, T. Cherniavska, D. Zhytnyk, O. Danylyuk
- GENERAL CHARACTERISTICS FOR LOADING THE WORKING ELEMENTS OF DRILLING AND MILLING MACHINES WHEN MOVING IN THE CLAY SOLUTION** B97
A. Kadyrov, Z. Zhunusbekova, A. Ganyukov, I. Kadyrova, A. Kukesheva
- POSSIBILITIES OF ENERGY HARVESTING FROM THE SUSPENSION SYSTEM OF THE INTERNAL COMBUSTION ENGINE IN A VEHICLE** B106
J. Caban, G. Litak, B. Ambrozkiewicz, L. Gardyński, P. Stączek, P. Wolszczak
- FUZZY LOGIC METHOD FOR THE SPEED ESTIMATION IN ALL-WHEEL DRIVE ELECTRIC RACING VEHICLES** B117
A. Bonfitto, S. Feraco, M. Rossini, F. Carlomagno
- ASSESSMENT OF TECHNICAL CONDITION OF AN ACCUMULATOR COMMON RAIL INJECTOR BY TEMPERATURE OF ITS UNITS** B130
I. Gabitov, A. Negovora, A. Valiev, V. Ilin, D. Plotnikov, M. Razyapov
- INTERPRETING THE MAIN POWER CHARACTERISTICS CHOICE OF THE WHEEL VEHICLES GUIDED CUSHIONING SYSTEM** B139
B. Sokil, O. Lyashuk, M. Sokil, Y. Vovk, V. Dzyura, V. Aulin, R. Khoroshun

FORMING COMFORTABLE MICROCLIMATE IN THE BUS COMPARTMENT VIA DETERMINING THE HEAT LOSS B150
O. Kravchenko, I. Hrabar, J. Gerlici, S. Chuiko, K. Kravchenko

DYNAMICS AND CONTROL OF THE GYROSCOPIC HEAD USED FOR THE LASER ILLUMINATION OF A GROUND TARGET FROM THE QUADCOPTER DECK B158
Z. Koruba, I. Krzysztofik

C - ELECTRICAL ENGINEERING

A FRAMEWORK COUPLING VISSIM AND OMNET++ TO SIMULATE FUTURE INTELLIGENT TRANSPORTATION SYSTEMS C23
T. Petrov, I. Finkelberg, N. Zarkhin, P. Pošta, L. Buzna, A. Gal-Tzur, T. Kováčiková, T. Toledo, M. Dado

MODELS OF THE COMPUTER INTELLECTUALIZATION OPTIMAL STRATEGY OF THE POWER SUPPLY FAST-FLOWING TECHNOLOGICAL PROCESSES OF THE RAILWAYS TRACTION SUBSTATIONS C30
A. Stasiuk, V. Kuznetsov, L. Goncharova, P. Hubskeyi

ENERGY CHARACTERISTICS OF THE DC DISTRIBUTED POWER SUPPLY SYSTEMS C37
V. Sychenko, V. Kuznetsov, A. Rojek, P. Hubskeyi, Y. Kosariev

CLASSIFICATION ACCURACY ENHANCEMENT BASED MACHINE LEARNING MODELS AND TRANSFORM ANALYSIS C44
H. A. R. Akkar, W. A. H. Hadi, I. H. Al-Dosari, S. M. Saadi, A. I. Ali

MATHEMATICAL MODELLING OF OSCILLATORY PROCESSES IN TRANSMISSION OF MOVEMENT OF AN ELECTRIC DRIVE WITH NON-LINEAR LONG ELASTIC ELEMENTS C54
A. Chaban, T. Perzynski

IMITATION MODELING OF AN INTER-TURN SHORT CIRCUIT OF AN ASYNCHRONOUS MOTOR STATOR WINDING FOR DIAGNOSTICS OF AUXILIARY ELECTRIC DRIVES OF TRANSPORT INFRASTRUCTURE C65
S. Goolak, J. Gerlici, O. Gubarevych, T. Lack, M. Pustovetov

D - CIVIL ENGINEERING IN TRANSPORT

MEASUREMENT AND ANALYSIS OF THE NOISE LEVEL IN SELECTED ZONES OF BUS STOPS IN THE CITY OF RADOM D26
T. Perzyński

E - MANAGEMENT SCIENCE AND INFORMATICS

THE GPS / EGNOS POSITIONING QUALITY IN APV-1 AND LPV-200 FLIGHT PROCEDURES E23
G. Grunwald, A. Ciecko, K. Krasuski, R. Kaźmierczak

F - SAFETY AND SECURITY ENGINEERING

SELECTED ASPECTS OF THE ROAD TRAFFIC SAFETY MANAGEMENT SYSTEM F33
M. Stoma, J. Caban, A. Dudziak, A. Kuranc

A CASE STUDY INTO THE SAFETY COMPLIANCE WITHIN THE ROAD FREIGHT TRANSPORT SECTOR WITH REGARDS TO SECURING CARGO

J. Ližbetin, M. Stopková

F43

G - TRAVEL AND TOURISM STUDIES IN TRANSPORT DEVELOPMENT

USING DATA ON BIKE-SHARING SYSTEM USER STOPOVERS IN SMART TOURISM: A CASE STUDY

K. Banet

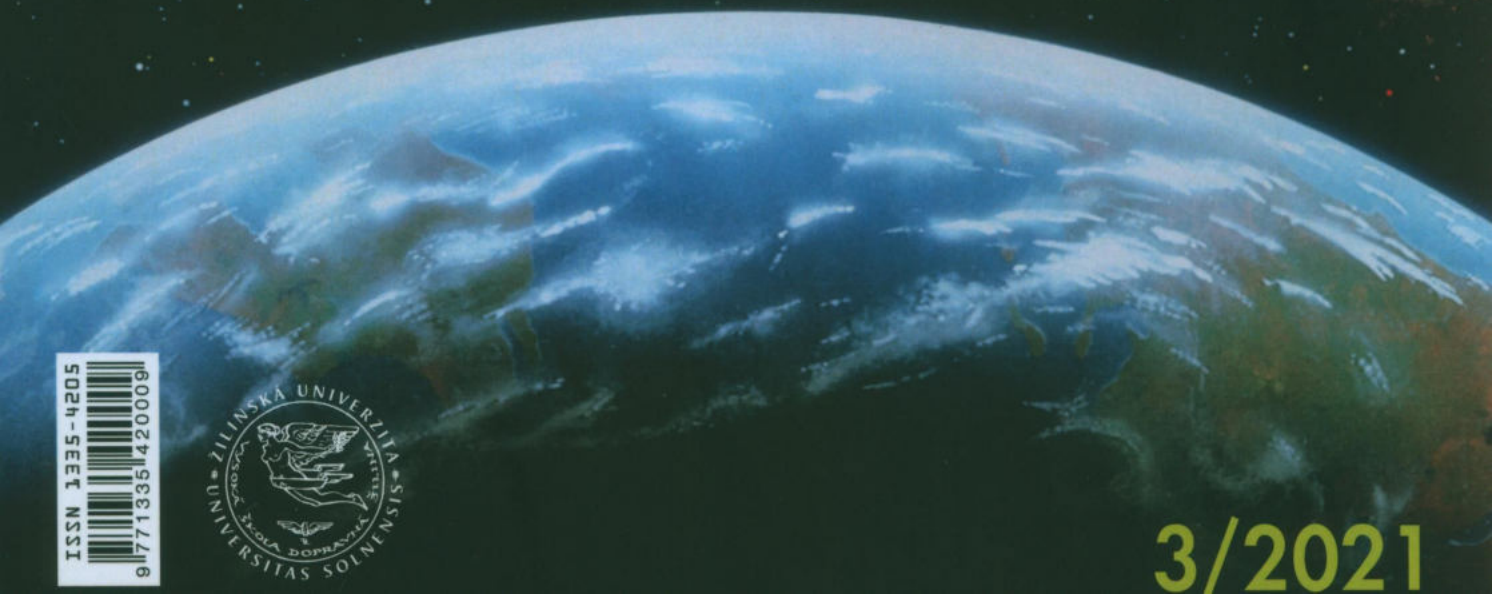
G1

KOMUNIKÁCIE

C O M M U N I C A T I O N S

SCIENTIFIC LETTERS OF THE UNIVERSITY OF ŽILINA

Volume 23



3/2021

A - OPERATION AND ECONOMICS

- ON-SITE TRAFFIC MANAGEMENT EVALUATION AND PROPOSALS TO IMPROVE SAFETY OF ACCESS TO WORKPLACES** A125
J. Paľo, O. Stopka
- ELECTRIFICATION OF PUBLIC TRANSPORT BUS FLEET: IDENTIFICATION OF BUSINESS AND FINANCING MODELS** A137
G. Dydkowski, J. Gnap, A. Urbanek
- FUZZY-LOGIC APPROACH TO ESTIMATE THE PASSENGERS' PREFERENCE WHEN CHOOSING A BUS LINE WITHIN THE PUBLIC TRANSPORT SYSTEM** A150
V. Naumov, B. Zhamanbayev, D. Agabekova, Z. Zhanbirov, I. Taran
- EXTERNAL ECONOMIC EFFECTS OF AIR TRANSPORT DEVELOPMENT DUE TO THE LIBERALIZATION** A158
O. Ovsak, M. Vysotska
- IMPROVEMENT OF THE LOGISTIC PROCESSES USING THE REVERSE LOGISTICS CONCEPT** A174
Z. Lukasz, A. Kuśmińska-Fijałkowska, S. Olszańska
- THE IMPACT OF INFRASTRUCTURE SPENDING ON ECONOMIC GROWTH: A CASE STUDY OF INDONESIA** A184
M. Syadullah, D. Setyawan
- OPTIMIZING THE CHOICE OF MEANS OF TRANSPORT USING OPERATIONAL RESEARCH** A193
P. Gorzelanczyk, H. Tylicki, T. Kalina, M. Jurkovič

B - MECHANICAL ENGINEERING

- A DATA-DRIVEN METHOD FOR VEHICLE SPEED ESTIMATION** B165
A. Bonfitto, S. Feraco
- DIAGNOSTICS OF THE ON-VEHICLE SHOCK ABSORBER TESTING** B178
M. Guzek, P. Zdanowicz
- LABORATORY TESTS OF THE CONTROL OF THE CHILD SEATS USING METHOD FOR THE VIBRATION COMFORT OF CHILDREN TRANSPORTED IN THEM** B187
A. Zuska, E. Szumska
- ASSESSMENT OF THE CONSTRUCTIONALITY OF THE STRUCTURE IN THE ASSEMBLY PROCESSES** B200
J. Matuszek, T. Seneta, L. Dulina, E. Bigošová
- FUZZY LOGIC METHOD FOR THE SPEED ESTIMATION IN ALL-WHEEL DRIVE ELECTRIC RACING VEHICLES** B117
A. Bonfitto, S. Feraco, M. Rossini, F. Carlomagno
- RESEARCH ON CURVILINEAR MOTION OF AUTOMOBILE WITH THE APPLICATION OF ON-BOARD CAN BUS DATA** B211
H. Sar, M. Brukalski, K. Rokicki

THEORETICAL AND EXPERIMENTAL STUDY OF OPERATION OF THE TANK EQUIPMENT FOR ULTRASONIC PURIFICATION OF THE INTERNAL COMBUSTION ENGINE EXHAUST GASES

A. Kadyrov, A. Ganyukov, I. Pak, B. Suleyev, K. Balabekova

B219

NUMERICAL SIMULATION OF TEMPERATURE DISTRIBUTION IN THE GAS TURBINE BLADE

D. Jakubek

B227

DYNAMIC BEHAVIOR OF THE FULL-CAR MODEL IN THE J-TURN MANEUVER BY CONSIDERING THE ENGINE CYROSCOPIC EFFECTS

A. Shahabi, A. H. Kazemian, S. Farahat, F. Sarhaddi

B237

C - ELECTRICAL ENGINEERING

DRONE CONTROL USING THE COUPLING OF THE PID CONTROLLER AND GENETIC ALGORITHM

M. Elajrami, Z. Satla, K. Bendine

C75

E - MANAGEMENT SCIENCE AND INFORMATICS

RTK KINEMATIC POSITIONING ACCURACY WITH DOUBLE PHASE DIFFERENCE OF SIS GNSS SIGNALS

L. Setlak, R. Kowalik

E35

E1 SIGNAL PROCESSING OF THE GALILEO SYSTEM IN THE NAVIGATION RECEIVER

L. Setlak, R. Kowalik

E46

F - SAFETY AND SECURITY ENGINEERING

STUDY ON A BRAIN-CONTROLLED PNEUMATIC ACTUATOR TO ASSIST EMERGENCY BRAKING OF A VEHICLE

R. Dindorf, J. Takosoglu, P. Wos

F49

ANALYSIS OF VEHICLE MOVING PARAMETERS IN VARIOUS ROAD CONDITIONS

R. Jurecki, T. Stańczyk

F58

CLASSIFICATION OF THE SOCIO-PSYCHOLOGICAL ASPECTS OF PROTECTING SOFT TARGETS: A CASE STUDY FOR EVACUATION OF THE RAILWAY TERMINALS

A. Šplíchalová, T. Karásek, T. Apeltauer

F71

THE METHODOLOGY TO EVALUATE A RESCUE AND TRAINING PHANTOM FOR THE ROAD RESCUING ORGANIZED BY POLICE OFFICERS AS EXEMPLIFIED BY CRASH KELLY

P. Gromek, M. Nepelski

F83

ASSESSMENT OF STATIC RESILIENCE OF OBJECTS IN THE RAIL TRANSPORT

Z. Dvořák, N. Chovančíková, K. Hoterová, M. Szatmári

F96

TRANSPORT RISK IDENTIFICATION AND ASSESSMENT

J. Kubáňová, I. Kubasáková

F109

PREVENTION OF MAJOR ACCIDENTS OF MOBILE RISK SOURCES

K. Mäkkä, K. Kampová, J. Dworzecki

F116

KOMUNIKÁCIE

C O M M U N I C A T I O N S

SCIENTIFIC LETTERS OF THE UNIVERSITY OF ŽILINA

Volume 23



UNIVERSITY
OF ŽILINA



4/2021

A - OPERATION AND ECONOMICS

- SINGLE EUROPEAN RAILWAY AREA AND THE PROBLEM OF RAIL INFRASTRUCTURE CHARGES – CASE STUDIES IN V4 COUNTRIES** A208
A. Dolinayová, I. Dömény, J. Jansák, P. Šulko
- VARIOUS APPROACHES PROPOSED FOR ELIMINATING DUPLICATE DATA IN A SYSTEM** A223
R. Čerešňák, K. Matiaško, A. Dudáš
- GDP EFFECT ON B2C E-COMMERCE TURNOVER AND NUMBER OF EXPRESS SHIPMENTS IN SELECTED EUROPEAN POST-COMMUNIST COUNTRIES** A233
M. Novotná, D. Gottwald, L. Švadlenka
- DELIVERY TIMES AND DELAY IN DELIVERY OF CONSIGNMENT UNDER THE CONDITIONS OF INTERNATIONAL CARRIAGE** A248
J. Sosedová, Z. Otáhalová, A. Dávid, A. Galieriková
- THE CASE STUDY OF INTERNATIONAL TRANSPORT BY THE FREIGHT FORWARDER IN FRANCE** A256
I. Kubasáková, J. Kubáňová, P. Kollárová
- IMPACT OF KEY MARKETING TOOLS ON GLOBAL CAR MARKET DEVELOPMENT** A264
O. Savych, T. Shkoda

B - MECHANICAL ENGINEERING

- NANOINDENTATION AS A METHOD FOR DETERMINING THE MECHANICAL PROPERTIES OF COLD SPRAY COATINGS** B250
M. Makreněk
- BRICKLAYING ROBOT LIFTING AND LEVELLING SYSTEM** B257
P. Wos, R. Dindorf, J. Takosoglu
- EMISSION OF SELECTED EXHAUST GAS COMPONENTS AND FUEL CONSUMPTION IN DIFFERENT DRIVING CYCLES** B265
A. Kuranc, J. Caban, B. Šarkan, A. Dudziak, M. Stoma
- NUMERICAL AND ANALYTICAL INVESTIGATION OF STABILITY OF THE REINFORCED PLATE** B278
G. A. Manuylov, S. B. Kositsyn, I. E. Grudtsyna
- EXPERIMENTAL RESEARCH OF THE COAGULATION PROCESS OF EXHAUST GASES UNDER THE INFLUENCE OF ULTRASOUND** B288
A. S. Kadyrov, B. K. Sarsembekov, A. A. Ganyukov, Z. Z. Zhunusbekova, K. N. Alikarimov
- EXPERIMENTAL ANALYSIS OF VERTICAL VIBRATIONS OF A RAILWAY BOGIE** B299
M. Dumitriu, I. C. Cruceanu
- EFFECT OF THE RME BIODIESEL ON THE DIESEL ENGINE FUEL CONSUMPTION AND EMISSION** B308
D. Kurczyński

**ESTIMATION OF WHEELS' NORMAL REACTION FORCES OF AUTOMOBILE
IN STEADY-STATE CURVILINEAR MOTION** B317
P. Fundowicz, H. Sar, M. Brukalski

**PRACTICAL APPLICATION OF THE NEW APPROACH TO FMEA METHOD
ACCORDING TO AIAG AND VDA REFERENCE MANUAL** B325
D. Plinta, E. Golińska, L. Dulina

**ELECTRO-HYDRAULIC PROPORTIONAL SYSTEM REAL TIME TRACKING CONTROL
DEVELOPMENT BASED ON PULSE WIDTH MODULATION METHOD** B336
E. E. Ibrahim, T. Elnady, M. S. Hassan, I. Saleh

**INVESTIGATION OF THE IMPACT STRENGTH OF THE EPOXY-POLYESTER
MATERIAL FOR USING IN AGGRESSIVE ENVIRONMENTS IN THE WATER
TRANSPORT** B346
S. Yakushchenko, M. Brailo, A. Buketov, A. Sapronova, O. Sapronov, A. Menou

C - ELECTRICAL ENGINEERING

**SIMULATION VERIFICATION OF BALANCING SYSTEM BASED ON NUMBER
OF CELLS** C83
M. Šimčák, M. Danko

D - CIVIL ENGINEERING IN TRANSPORT

**COMPARATIVE LIFE CYCLE ANALYSIS OF HYBRID AND CONVENTIONAL
DRIVE VEHICLES IN VARIOUS DRIVING CONDITIONS** D34
E. M. Szumska

E - MANAGEMENT SCIENCE AND INFORMATICS

**OPTIMIZATION OF ENERGY MANAGEMENT IN A CITY BUS POWERED
BY THE HYDROGEN FUEL CELLS** E56
A. Malek, R. Taccani, D. Kasperek, J. Hunicz

TWO OBJECTIVE PUBLIC SERVICE SYSTEM DESIGN PROBLEM E68
J. Janáček, M. Koháni, D. Grygar, R. Fabricius

G - TRAVEL AND TOURISM STUDIES IN TRANSPORT DEVELOPMENT

**FATHERS' PREDOMINANCE IN TRANSPORT ARRANGEMENTS
FOR FAMILY TOURISM: E-CHAID-BASED PROFILING IN EAST ASIA** G13
Y.-F. Lan, Ch.-J. Su

**CREATIVE CITIES AND KNOWLEDGE MANAGEMENT APPROACH
TO CULTURE-BASED URBAN REGENERATION IN SLOVAKIA: A MODEL** G25
M. Tajtáková, M. Olejárová

**INCREASED INTEREST IN MILITARY TOURISM ON SELECTED EXAMPLES
FROM THE AREA OF NORTHERN AND NORTHEASTERN POLAND** G38
A. Zienkiewicz, T. Podciborski, R. Kaźmierczak