

SUMMARIEAS

ANALYSIS OF SPHERICAL FIVE-BAR HINGED MANIPULATOR WITH TWO DEGREES OF FREEDOM AND DWELLS OF OUTPUT LINK. **N. Davitashvili**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 5-11, (Engl.).

Is stated the kinematic study of spherical five-bar manipulator with two degrees of freedom. Are determined the positions, velocities and accelerations of output links, their points and gripper. The manipulator is also considered as a mechanism with one degree of freedom with a long dwell of output link with the identification of the girder’s motion nature on the surface of a sphere. 2 ill. Bibl. 12. Engl.; sum. in Russian.

METHOD OF DETERMINATION OF STRENGTH OF BLOW AT RADIAL FORGING OF AXIS SYMMETRIC BILLETS. **T. Natriashvili, S. Mebonia, M. Baakashvili-Antelava**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 12-16, (Engl.).

The questions of determination of forces of shock interaction are considered at radial forging of axis symmetric billets by radial - forging machines. It is shown that the maximum force of blow at radial forging of axis symmetric billets is proportional to the given kinetic energy of mobile parts of the forging block of the radial - forging machine and is defined by mechanical properties of the processed material, the specified mass of the colliding bodies and speed of mobile parts of the forging block of the machine. 2 ill. Bibl. 8. Engl.: sum. in Russian.

ON ISSUE OF PARAMETRIC SYNTHESIS OF VESSEL COURSE CONTROL SYSTEM. **T. Mchedlishvili, I. Romanadze, O. Tedoradze, N. Nakashidze, L. Tediashvili**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 17-22, (Engl.).

One of the representatives of the automated drive systems used in modern vessels, is an electromechanical control system of towing devices designed for towing of vessel or barge. The reliability operation of towing arrangement and effective control represents important factors in ensuring the safety of vessel. In the present work are considered issues related to advanced dynamic modeling of the system under study. 2 ill. Bibl. 4. Engl.; sum. in Russian.

DIAGNOSIS OF ALL-WHEEL-DRIVE CAR TRANSMISSION DURABILITY BY WAY OF RATIONAL CHOICE OF COUPLING DAMPER PARAMETERS. **M. Tevzadze, Z. Chkhartishvili**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 23-30, (Engl.).

The paper dwells on the method for calculating transmission coupling damper of the all-wheel-drive car by rational choice of parameters. There is shown that when transmission operates in the resonant behavior the amplitude of torsional oscillations increases that in turn, causes an increase in strain of car transmission elements. The carried out diagnosis of car transmission durability in the resonant behavior has shown that it is possible to avoid torsional oscillations by means of artificial decrease of the oscillation amplitudes. It has been established that if the parameters of torsional oscillations are approached to their rational values, then the oscillation amplitude decreases significantly, but transmission durability goes up. 7 ill. Bibl. 3. Engl.; sum. in Russian.

MATERIAL AND ENERGY-EMISSIONS ASSESSMENT MODEL OF PASSENGER CAR PRODUCTION STAGE. **Malgorzata Mrozik**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 31-37, (Engl.).

The article refers to the current issue of the material and energy-emission assessment of passenger cars in terms of their production stage. Production of these kind of vehicles, like any other manufactured products, affects not only energy consumption but also the environment. That is why the aim of this paper is to analyze selected material, energy and emission aspects of the production phase of a particular example of the passenger car and to provide a simplified methodology for the material decomposition and determining the level of energy consumption and the emission level. 5 ill. Bibl. 19. Engl.; sum. in Russian.

ORGANIZATIONAL AND TECHNOLOGICAL BASICS OF LOGISTIC OPERATIONS EXECUTION. **O. Gelashvili, M. Zurikashvili, G. Tabatadze, G. Tsertsvadze, T. Shubitidze.** “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 38-40, (Engl).

In the article is considered the role of logistics for effective operation of transport system and is grounded that logistics represents a significant part of the company, which by goods and information flow in delivering chain regulating improves the quality of service and makes more effective the transportation process. Are defined the organizational and technological measures for carrying out logistics operations due that Georgia has unique geopolitical location in the modern world map that represents a road transport junction between Europe and Asia. Therefore, transit and internal transportation must meet the general principles and requirements for functioning of international transport corridor, for that are necessary to implement organizational and technological activities for logistics operations. Bibl. 7. Engl.; sum. in Russian.

ON ONE CHARACTERISTIC PROBLEM FOR AN EQUATION OF NONLINEAR OSCILLATIONS PROBLEM. **R.G. Bitsadze, S.G. Bitsadze.** “Problems of Mechanics”. Tbilisi, 2015, № 1 (58), pp. 41-47, (Engl).

One nonlinear variant of characteristic problem for an equation of nonlinear oscillations problem is studied in the work. The conditions of the problem are set forth on non-intersecting arcs of curves characteristic to various families. The problem makes it possible to simultaneously define regular solutions and its extension domains. Bibl. 3. Engl.; Sum. In Russian.

THE EFFICIENCY OF ALTERNATIVE FUELS APPLICATION ON MOTOR TRANSPORT. **O. Gelashvili, M. Zurikashvili, G. Tabatadze, T. Shubitidze, M. Koplataidze.** “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 48-50, (Engl).

In the article are considered the possibilities of application of alternative fuels on motor transport, and is defined the probably economic effects from complex solving the mentioned problems grounded on application of alternative types of fuels on motor transport because it performs the most share of passenger and freight transportation. The passenger and freight transportation are attributed to the most energy consuming fields of national economy that spends more than 50% of the allocated to the total transport system energy resources. The specific measures and recommendations for transition of motor transport on alternative fuels are developed. Bibl. 6. Engl.; sum. in Russian.

INTEGRAL METHOD FOR EVALUATION AND PREDICTION OF TORNADO. **A. Aptsiauri.** “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 51-59, (Engl.).

In this paper by schematization of occurring in tornado processes is given the solution of reflecting mentioned processes differential equations. Based on them is proposed integral method of tornado calculation and prediction that makes it possible to develop applicable to engineering method for quick practical estimating calculation. The proposed method gives the possibility analytically

evaluate the prerequisites of natural phenomena origin, define its basic parameters and devastating effect. In addition, is possible the preliminary orientation prediction of the tornado distribution area. 2 ill. Bibl. 9. Engl.; sum. in Russian.

ENERGY AUDIT OF THE POLISH FISHING FLEET. **Przemyslaw Rajewski, Marcin Szczepanek**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 60-71, (Engl.).

Ship Energy Efficiency Management Plan (SEEMP) is a part of Annex VI of the MARPOL Convention. The requirement has been applicable to all ships (both new and existing ones) of 400 gross tonnage or above commencing on January 1st, 2013. The plan is intended to be a practical measure supporting ship-owners and crew in the management of vessel environmental performance. However, the main goal of SEEMP is to improve ship operational efficiency. It means the reduction of fuel consumption, maintenance costs and emission volume, reducing the total cost of operation. The implementation of SEEMP is not obligatory for small vessels. However, energy audits, being a part of SEEMP, provide fishermen with possibilities in the scope of energy efficiency improvement for their vessels. The article presents the results of the first part of energy audits carried out on the representative vessels of the Polish fishing fleet on the Baltic Sea. 12 ill. Bibl. 7. Engl.; sum. in Russian.

DETERMINATION OF CRITICAL LOADING AT MODE OF DEFORMATION OF HAVING RECTANGLE CUT STRUCTURE. **G. Kipian, B. Churchelauri, Z. Churchelauri**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 72-75, (Engl.).

Based on the method of taking into account of cuts is developed the methodology of consideration as four cuts, creating the closed rectangular contour simulates the rectangle openings. As result are obtained algorithms and design formulae that gives the possibility to study the influence of values and arrangement of opening on load bearing capability of plate and to determine the coefficient of reduction of critical loading due existence of opening. Bibl. 5. Engl.; sum. in Russian.

ON SOLVABILITY OF AN EQUATION OF NONLINEAR OSCILLATIONS PROBLEM. **R. Bitsadze, S. Bitsadze**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 76-82, (Engl.).

General integral is constructed in the work for an equation of nonlinear oscillations problem. The classical characteristic method is used for these purposes. Bibl. 3. Engl. Sum. In Russian.

HOW TO IMPROVE ENERGY EFFICIENCY OF THE POLISH FISHING VESSELS DUE TO ENERGY AUDIT IMPLEMENTATION. **Marcin Szczepanek, Przemyslaw Rajewski**. “Problems of Mechanics”. Tbilisi, 2015, № 1(58), pp. 83-95, (Engl.).

The Maritime University of Szczecin drafted the energy audit sheet which has been used during energy audits performed at ten fishing vessels. The vessels were selected as representative for standard Polish fleet vessels operating at the Baltic Sea. The audit results were analysed and they indicated that it is essential to simplify the sheet form, to implement new methods for determining the energy efficiency of fishing vessels and to change the weight of audit areas. The paper presents the results and includes a proposal how to define the audit goals in a different manner and simple methods to improve the energy efficiency of the Polish fishing fleet. 13 ill. Bibl. 10. Engl.; sum. in Russian.