

ABSTRACTS OF D.SC. AND PH.D. THESES

Selected abstracts of D.Sc. and Ph.D. theses submitted at Russian University of Transport

Garmash, Yu. V. Perfection of systems of electric equipment of cars on the basis of electronic converters of electric energy. Abstract of D.Sc. (Eng) thesis. Moscow, 2017, 46 p.

The scientific novelty of the research consists in development of new principles for construction of electrical equipment and theoretical provisions for improving the operational characteristics of vehicle's on-board electrical equipment, which consist in organizing a differentiated supply of consumers by means of impulse adaptive energy sources that are regulated by the parameters of the object; mathematical model of the electric start-up system of an internal combustion engine with a capacitor storage of energy over a wide range of voltages exceeding the nominal ones; mathematical models and proposed on their basis devices of the ignition system, containing for the start-up frequency range a boost converter, and for the operating frequency range — a down converter, whose voltages provide a constant value of the safety factor for the secondary voltage.

The author proposes a number of technical solutions for the power supply system based on a pulse-width regulator, providing, in view of the temperature regime, an increase in the degree of charging and prolongation of the service life of the battery, as well as the separation of voltages applied to the consumers of electricity generated by the secondary power source.

Boldbaatar Nandinzetseg. The economic substantiation of variants of organization of cargo transportation in container trains. Abstract of Ph.D. (Economics) thesis. Moscow, 2017, 24 p.

Comparison of the economic performance of railway transport with different technologies for organization of container transportation has been performed, the values of economic losses of cargo owners, transportation costs and freight charges have been calculated for each of them. When comparing the options, the threshold values for the prices of 1 ton of goods transported are determined, which allow to divide the goods by the criterion of expediency of applying a technology for their transportation, while the influence on the threshold values of the value of the credit rate and the range of cargo transportation is determined. The economic principles of justifying the use of different technologies for organization of container transportation by rail with account of the interests of cargo owners are developed.

Efimov, R. A. Evaluation of thermal loads of a solid wheel of a car during braking. Abstract of Ph.D. (Eng) thesis. Moscow, 2017, 24 p.

A method for computer simulation of the course of thermal processes and changes in the structural

composition of a solid wheel during the implementation of various braking regimes, taking into account the current speed of movement, the dependences of the intensity of thermal loads and the distribution of temperature fields in the wheel are obtained, the degree of influence of individual factors on the heat dissipation in the contact «wheel — brake shoe» and the flow of thermal processes in a solid wheel during braking. The influence of the geometry of a wheel disc on the nature of displacements during long braking on a long descent is studied.

Malyutin, A. Yu. Application of low-voltage converters in the power supply system of auxiliary circuits of electric locomotives of alternating current. Abstract of Ph.D. (Eng) thesis. Moscow, 2017, 24 p.

The author proposes a mathematical model of an asynchronous motor with a deep-band winding of a rotor, which makes it possible to study the operation of such engines in the starting and transient modes, and also a mathematical model for studying electromagnetic processes in the auxiliary machine system of the 2ES5K electric locomotive, which takes into account the effect of the traction load and the parameters of the contact network on operation modes of electrical equipment. A technique for estimating the influence of parameters of capacitor phase disintegrators on the performance of asynchronous motors and the control system for a low-voltage converter ensuring a minimum asymmetry of the three-phase supply voltage of auxiliary electric locomotives are developed.

Ospanbekov, B. K. Increase of energy efficiency and performance indicators of electric vehicles. Abstract of Ph.D. (Eng) thesis. Moscow, 2017, 24 p.

A complex mathematical model of STE EM for qualitative and quantitative evaluation of charge-discharge regimes of a battery is developed, calculation and experimental methods for determining operational modes using the Matlab (Simulink) software environment, which allows to rationalize the analytical and estimated estimates of electric vehicle indicators, reduce the time and effort required for computing. The thermal regimes of a single battery in the battery module for a prospective type of lithium-ion batteries have been calculated. A technique is proposed for determining the life of traction batteries, taking into account operational conditions in standardized driving cycles and in real experimental operation conditions.

Rogova, E. V. Methods to improve the quality of service for cargo owners on the basis of improving the system of interaction between transport companies. Abstract of Ph.D. (Economics) thesis. Moscow, 2017, 24 p.

The system of quality indicators for the conditions of servicing cargo owners of transport companies has been adapted, an algorithm for cooperation in the joint provision of services to customers has been proposed. The system of indicators for assessing the economic effectiveness of concerted actions of companies aimed at improving the quality of servicing cargo owners as a mutually beneficial strategic task of the partnership is grounded. ●