

1. Record Nr.	UNINA9910438310003321
Autore	Belousov Boris N.
Titolo	Heavy-duty wheeled vehicles : design, theory, calculations / / by Boris N. Belousov, Sergei D. Popov ; translated from Russian to English by Leonid Schukin
Pubbl/distr/stampa	Warrendale, Pa. (400 Commonwealth Dr., Wallendale PA USA) : , : Society of Automotive Engineers, , [2014] [Piscataqay, New Jersey] : , : IEEE Xplore, , [2014]
Edizione	[1st ed.]
Descrizione fisica	1 PDF (xxiii, 553 pages) : illustrations
Collana	Society of Automotive Engineers. Electronic publications
Disciplina	629.224
Soggetti	Trucks - Design and construction Four-wheel drive vehicles - Design and construction
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references (pages 537-542).
Nota di contenuto	Part I. Evolution of heavy-duty wheeled vehicles -- Chapter 1. History of HDWVs. 1.1. General design-layout solutions; 1.2. Hydromechanical transmissions (HMT); 1.3. Electric transmissions (ETs); 1.4. Hydrostatic transmissions (HSTs); 1.5. Steering systems -- Chapter 2. Multi-support vehicles. 2.1. Overview; 2.2. Transmission; 2.3. Supports; 2.4. Steering system -- Chapter 3. Heavy- and super-heavy-duty dumpers. 3.1. Overview; 3.2. Transmission; 3.3. Undercarriage; 3.4. Steering system; 3.5. Brake system; 3.6. Cabin; 3.7. Dumpers made by MoAZ -- Chapter 4. Evolution of multi-axle chassis. 4.1. History and evolution of the multi-axle chassis for monocargoes; 4.2. Hovercrafts; 4.3. General design and layout solutions; 4.4. Designs of special wheeled chassis in the 1980s -- Part II. Overview of HDWVs -- Chapter 5. HDWV general design methods. 5.1. General provisions; 5.2. Hierarchical structure of SWC as a complex technical system; 5.3. Process of forming the appearance of SWCs; 5.4. Structure of a HDWV mathematical model; 5.5 HDWV appearance formation algorithm; 5.6. Characteristics of the "Formation of HDWV appearance" project stage -- Chapter 6. Conditions and areas for using HDWV. 6.1. Techno-economic feasibility for using HDWVs for cargo hauling; 6.2. Conditions for using HDWVs; 6.3. Basic requirements for traffic routes -- Chapter 7. Basic

requirements for HDWV consumer properties. 7.1. General provisions; 7.2. Traction-speed properties and fuel efficiency; 7.3. Weight and dimensions; 7.4. Maneuverability, ease of steering, and road passing ability; 7.5. Safety; 7.6. Ergonomics -- Chapter 8. Main technical criteria and efficiency evaluation of HDWV solutions. 8.1 Analysis of technical criteria of vehicle excellence; 8.2. Methods for assessing vehicle designs; 8.3. Mathematical model of the SWC's representative route; 8.4. Mathematical model of the SWC's motion; 8.5. Comparing SWC mobility on different routes -- Part III. Fundamental HDWV theory and design -- Chapter 9. Basic principles of HDWV general layout. 9.1 Trends in overall layout; 9.2. Fundamentals of modular designing; 9.3. Theory for building HDWV families. 9.4. Future transport-and-process wheeled vehicle; 9.5. Weight equations of a multi-wheel vehicle and its elements; 9.6. Calculating the weight of wheeled vehicles-- Chapter 10. Power plants of wheeled vehicles. 10.1 General characterization of power units; 10.2. Engine development trends; 10.3 Fundamentals of HDWV engine designs; 10.4 Features of mathematical modeling a diesel engine and gas-turbine power plants for HDSVs; 10.5. State of things with electrochemical engines -- Chapter 11. Fundamental theory and calculation of power transmission from engine to wheeled mover. 11.1 General overview, classification, and requirements for transmissions; 11.2. Trends in designs of mechanical transmissions; 11.3. Brakes-retarders of transmission type; 11.4. Main principles of power distribution in transmissions of modern and future HDSVs; 11.5. Optimization of the power transfer to the wheeled mover; 11.6. Promising electric transmissions -- Chapter 12. Oscillations in multi-axle wheel chassis with resilient tires. 12.1. Characteristics of vertical- and longitudinal-angular oscillations; 12.2. Characteristics of lateral-angular oscillations; 12.3. Frequency characteristics of oscillation velocities; 12.4. Frequency characteristics of oscillation accelerations; 12.5. Spectral analysis of oscillations; 12.6. Spatial models of oscillations; 12.7. Spatial model of oscillations in a multi-axle saddle road train -- Chapter 13. Fundamental theory and design of springing systems for HDWV wheels. 13.1. Function, classification, and requirements for wheel suspensions; 13.2. Analysis and calculation process of wheel suspensions; 13.3. Active and regulated suspensions and platform stabilization systems; 13.4. Choice of damping and rigidity parameters for long-stroke suspensions; 13.5. Designing long-stroke wheel suspensions for support-running modules (SRM); 13.6. Analysis of the results of experimental trials on HDWV hydropneumatic suspensions; 13.7. Designing and calculating suspensions -- Chapter 14. Curvilinear motion of multi-axle wheel chassis. 14.1. Terms and definitions; 14.2. Equations of plane curvilinear motion in multi-link wheeled chassis; 14.3. Motion stability of multi-axle wheeled chassis; 14.4. Steady motion stability in multi-axle wheeled chassis; 14.5. Steady motion stability in a multi-axle wheeled chassis. 14.6. Non-stationary motion stability in a multi-axle wheeled chassis -- Chapter 15. Fundamental theory and design of HDWV steering systems. 15.1. General provisions; 15.2. Basic requirements for steering systems; 15.3. Initial data for StS calculation; 15.4. Selection and mathematical justification of functionality of flexible StS; 15.5. Study of turning ability, maneuverability, and motion of HDWVs with different StSs; 15.6. General design of automated control systems for curvilinear motion; 15.7. All-wheel steering system for a 12x12 HDWV.

technical solutions used for electric and hydrostatic transmissions,  
steering systems, and active safety of these vehicles.