Design and simulation of a rotary power steering system

For improvement of contactless power transformer which is used in rotary steering system, this paper uses simulation method to study on the influence of the shape of the ferrite, the number os turns and installation position on the efficiency and power of the contactless power transformer.

In the context of automated driving, Electric Power Steering (EPS) systems represent an enabling technology. They introduce the ergonomic function of reducing the physical effort required by the driver during the steering maneuver. Furthermore, EPS gives the possibility of high precision control of the steering system, thus paving the way to autonomous driving ...

Two Dimensional Modeling of a Rotary Power Steering Valve 1999-01-0396. ... Hydraulic Power Steering System Design and Optimization Simulation. ... The Design Concept of an Integral Power Steering System for Heavy Duty Trucks. 770673. View Details. TECHNICAL PAPER Articulated Loader Stored Energy Steering System. 730768. View Details.

The modeling details of the mechanism subsystem, hydraulic supply lines subsystem and the rotary spool valve subsystem are provided and included in the integrated steering system ...

The results show that the electronically controlled hydraulic power steering system can significantly improve high-speed steering feel compared with the hydraulic power steering system while ...

The steering system of a vehicle impacts on the vehicle performance, safety and on the driver"s comfort. Moreover, in off-road vehicles using hydrostatic steering systems, the energy dissipation ...

Directional drilling is a common and essential procedure of major extended reach drilling operations. With the development of directional drilling technologies, the percentage of recoverable oil production has increased. However, its challenges, like real-time bit steering, directional drilling tools selection and control, are main barriers leading to low drilling efficiency ...

This paper presents a control technique for Electric Power Steering System (EPS) using Permanent Magnet Synchronous motor (PMSM) for steering application, which provides the additional assist torque along with the driver input to steer the vehicle. This paper presents a control technique for Electric Power Steering System (EPS) using Permanent Magnet ...

In [], it was shown that previous controls of electric steering systems often have a low robustness against nonlinear characteristics and degrees of freedom of the plant which are unconsidered in the control design.Therefore, a control of the driver"s steering torque of electromechanical power steering (EPS) systems was presented in [1, 2] that solves this ...

in Static Push-type Rotary Steering Drilling System. ... Contactless power transformer; Simulation; Experiment The execution system of the static push-type rotary steerable drilling system consists of a non-rotating casing and a rotating shaft, and does not rotate the relative rotation between the casing and the rotating shaft, and the ...

Hydraulic integrated power using signals from wheel speed sensors and wheel torque steering (HIPS) program has been developed using basic sensor and the application of HIPS for design optimization is demonstrated. Hydraulic rack and pinion power steering system is a high This increases the differential pressure acting on the power bandwidth servo with stringent ...

The diagram of EHAS system is shown in Fig. 1, including hydraulic structure and mechanical structure.The hydraulic pump is driven by assist motor and deliver hydraulic oil to the rotary valve. The rotation of the steering wheel makes the difference in port area of rotary valve, which causes the pressure difference between the two sides of the rotary valve.

In order to analyze the assist performance of a rotary valve hydraulic power steering system, a co-simulation model of the hydraulic power steering vehicle was established in AMESim and LMS Virtual.

The simulation results show that dead zones, hysteresis, and frequency response of control valve have great influence on the steering performance, and the servo solenoid valve is proper for this ...

Nowadays, almost every modern vehicle uses a power steering system to help the driver steer. The most popular power steering systems in the automotive market can be divided into three types, namely, hydraulic power steering (HPS) system, electrohydraulic power steering (EHPS) system, and electric power steering (EPS) system. 1-6 The HPS system was ...

1. Introduction. The vehicle steering system is a bridge and link connecting the human-vehicle-road closed-loop system. Its performance not only affects the handling feeling [1], [2] but also is an important part of the vehicle energy flow [3].With the increasing requirements for energy conservation, environmental protection and safety, the energy saving and ...

The steering system includes a variety of structural types, such as mechanical, hydraulic, electronic, and electro-hydraulic power steering systems (EHPSS). 3-5 Mechanical and conventional hydraulic steering systems are unable to meet the requirements of flexibility and stability in multi-axle vehicles very well. Electronic power steering systems cannot effectively ...

Classical definitions from fundamental physics including Newton"s third law, beam bending analysis, bit force analysis, rate of penetration (ROP) modeling are employed to ...

A novel system to combine Toyota"s Variable Gear Ratio Steering (VGRS) system with Electric Power

Steering (EPS) on a single electric motor was also conceptualized and detailed design shall be ...

power system. A hydraulic power steering (HPS) uses hydraulic pressure supplied by an engine-driven pump to assist the motion of turning the steering wheel. Electric power Design and Simulation of Four Wheel Steering System for LMV K. Ruban #1, V. Sathishkumar #2, R. Shanmugavelan #3, S. Srinath #4 and R. Ramesh *5

The paper introduces a comprehensive mathematical model for power steering systems mounted on cars. Dynamic modelling for the steering system is studied in consideration of nonlinear friction forces in the system such as friction in the steering column, friction in the steering mechanism (gear and rack), friction between tires with road.

IJSART - Volume 2 Issue 7 -JULY 2016 ISSN [ONLINE]: 2395-1052 Design and Simulation of Manual Rack and Pinion Steering System Prashant L Agrawal1, Sahil Shaileshbhai Patel2, Shivanshu Rajeshbhai Parmar3 1 Department of Automobile Engineering 2 Department of Mechanical Engineering 1, 2 L.J institute of engineering and technology Abstract- Manual rack ...

This paper presents the identification of the dynamic model for a power steering system constructed using a rotary valve. The steering system is divided into two subsystems: mechanical and hydraulic. Each subsystem is modeled separately. ... The design, simulation, and experiment of high-accuracy multi-axle electro-hydraulic control servo ...

the simulation results are compared using the SD and the . ... performance and design of the control system of RSS . ... orientxpress-rotary-steering-system. Noel Alvord C, Galiunas B, ...

According to the fact that the power steering testing system can not meet the demand of production and design completely in domestic at present, the measurement system mainly used to test the ...

though its theoretical behavior all system components are represented and can be tuned according to design and construction parameters. Each tuning configuration results successfully on a particular system performance. 3. BOND GRAPH MODELING The HPAS system can be represented by using Bond Graph technique as shown in figure 2. Components are