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Automotive Electric Power Steering Market – Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type (Column Type, Pinion Type, and Dual Pinion Type), By Component Type (Steering Rack/Column, Sensor, Steering Motor, and Other), By Vehicle Type (Passenger Cars and Commercial Vehicles), By Region, Competition 2019-2029

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Abstracts

Global Automotive Electric Power Steering Market was valued at USD 22.75 Billion in 2023 and is anticipated to project robust growth in the forecast period with a CAGR of 6.21% through 2029. The global automotive electric power steering market is currently witnessing substantial growth. This growth can be attributed to the continuous advancements in automotive technology, particularly in the field of electric power steering (EPS). EPS systems not only contribute to higher fuel efficiency but also provide a smoother driving experience, enhancing overall vehicle performance. As a result, automotive manufacturers and consumers are increasingly favoring EPS technology, leading to its widespread adoption in the automotive industry. The rising consumer demand for energy-efficient vehicles further fuels the expansion of the automotive electric power steering market, as more and more individuals recognize the environmental and economic benefits of this innovative technology.

In terms of geographical distribution, the Asia-Pacific region holds a significant dominance in the global market. This can be attributed to the presence of a massive automotive industry in countries like China, Japan, and South Korea, where the demand for EPS systems is rapidly growing. The increasing adoption of electric vehicles in these

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countries is further fueling the demand for advanced and efficient EPS systems, which are crucial for enhancing the overall driving experience and ensuring better control and maneuverability. As a result, the Asia-Pacific region continues to play a vital role in shaping the future of the automotive industry and driving innovation in the field of EPS technology.

The European market, renowned for its premium automotive manufacturers, closely follows the global trends in the adoption of energy-efficient technologies. This is due to the combination of a strong presence of these manufacturers and the implementation of stringent environmental regulations that propel the demand for sustainable solutions. As a result, the European automotive industry continues to thrive by embracing innovative technologies that meet both performance and eco-friendly standards.

In North America, there is a notable surge in the demand for EPS (Electric Power Steering) systems. This escalating demand is primarily driven by the rising production of electric and hybrid vehicles, as automakers strive to meet the growing consumer preference for eco-friendly transportation options. With advancements in technology and a shift towards sustainable mobility, EPS systems have become an integral component in enhancing vehicle performance, efficiency, and overall driving experience.

In terms of market players, the global EPS market is highly competitive with key players such as JTEKT Corporation, Nexteer Automotive, ZF Friedrichshafen AG, Robert Bosch GmbH, and NSK Ltd. These companies are constantly innovating their offerings to maintain a competitive edge and meet the evolving needs of the automotive industry.

The global EPS (Electric Power Steering) market is poised for significant growth, fueled by the rising adoption of electric and hybrid vehicles on a global scale. This shift towards greener transportation solutions, coupled with the increasing demand for fuel efficiency and reduced emissions, is driving the need for advanced EPS systems.

Furthermore, the rapid advancements in autonomous driving technology are expected to create new opportunities for EPS systems in the future. As self-driving vehicles become more prevalent, the integration of EPS technology will play a crucial role in ensuring precise and responsive steering control, enhancing the overall safety and performance of these vehicles.

With the increasing focus on sustainable mobility and the continuous advancements in automotive technology, the EPS market is expected to witness a steady expansion in

the coming years. This presents a promising outlook for industry players and underscores the importance of EPS systems in shaping the future of the automotive industry.

However, the market also faces some challenges. One of the main challenges is the high cost associated with EPS (Electronic Power Steering) systems. The initial investment required to implement these systems can be significant, which may deter some potential buyers. Additionally, concerns about the reliability and maintenance of EPS systems have been raised. As with any technology, there is always a risk of malfunctions or breakdowns, and the cost of repairs and maintenance can add up over time. These factors, if not addressed, could potentially hamper the growth of the EPS market.In conclusion, the global automotive electric power steering market is growing steadily, driven by advancements in automotive technology and increasing demand for energy-efficient vehicles. While some challenges remain, the future of the market looks promising, with new opportunities on the horizon.

Nonetheless, it's important to note that technology is constantly evolving and improving. As advancements are made, the cost of EPS systems is expected to decrease, making them more accessible to a wider range of customers. Moreover, manufacturers are investing in research and development to enhance the reliability and durability of these systems, addressing the concerns raised by potential buyers. With continued advancements and improvements, these challenges are likely to become less significant over time, opening up opportunities for further market growth.

Key Market Drivers

Fuel Efficiency and Performance Enhancement

The quest for improved fuel efficiency and enhanced vehicle performance stands out as a fundamental driver for the adoption of Automotive Electric Power Steering. EPS systems offer significant advantages over traditional hydraulic power steering systems in terms of energy efficiency. By eliminating the constant power draw of hydraulic pumps, EPS contributes to fuel savings and overall vehicle efficiency.

The electrically assisted steering mechanisms allow for dynamic adjustment of steering assistance based on driving conditions. At higher speeds, the system can reduce assistance, providing a more direct and responsive steering feel. Conversely, at lower speeds, increased assistance ensures smoother and more effortless maneuvering, enhancing the overall driving experience. As automakers prioritize fuel economy and

performance, the integration of EPS becomes instrumental in achieving these objectives.

Integration with Advanced Driver Assistance Systems (ADAS)

The proliferation of Advanced Driver Assistance Systems (ADAS) has become a significant driver for the Automotive EPS Market. ADAS technologies, such as lane-keeping assist, automated parking, and adaptive cruise control, rely on precise and responsive steering control. EPS systems, with their electronic control and feedback capabilities, seamlessly integrate with ADAS to enhance vehicle safety and automation.

Electric Power Steering enables functionalities like lane-keeping, where the system can provide steering input to keep the vehicle within its lane. Moreover, EPS facilitates the implementation of semi-autonomous and autonomous driving features by allowing for electronic control of steering inputs. The drive toward increased vehicle automation and safety standards positions EPS as a critical component in the realization of these advancements.

Weight Reduction and Space Efficiency

Automotive manufacturers are under constant pressure to improve fuel efficiency and reduce vehicle weight to meet stringent emission standards. EPS systems contribute to this objective by replacing the heavier and bulkier hydraulic components associated with traditional power steering systems. The use of lightweight electronic components and the absence of hydraulic fluids result in a significant reduction in overall vehicle weight.

Additionally, the compact design of EPS systems enhances space efficiency within the vehicle. The elimination of bulky hydraulic components creates more flexibility in vehicle design and layout, allowing for improved packaging and utilization of interior space. As automakers strive for lightweighting and design optimization, the weight reduction and space efficiency offered by EPS systems become compelling factors in their adoption.

Enhanced Driving Comfort and Customization

Electric Power Steering contributes to an enhanced driving experience by offering superior comfort and customization options. The electronic control of steering assistance allows for the adjustment of steering feel and responsiveness based on driver preferences and driving conditions. Drivers can benefit from lighter steering at low speeds for ease of parking and maneuvering, while the system can provide increased

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resistance at higher speeds for stability and control.

Moreover, EPS systems enable the integration of features such as variable steering ratios, allowing for a more direct response during spirited driving and a more relaxed feel during highway cruising. The ability to tailor steering characteristics to individual preferences enhances overall driver satisfaction and contributes to the appeal of vehicles equipped with EPS.

Regulatory Requirements and Environmental Sustainability

Stringent regulatory requirements related to vehicle emissions and fuel efficiency drive the adoption of technologies that contribute to environmental sustainability. Automotive EPS aligns with these regulatory imperatives by promoting fuel efficiency and reducing the environmental impact of vehicle operation. As governments worldwide implement stricter emission standards, automakers prioritize technologies that enable compliance while maintaining or enhancing vehicle performance.

The environmental benefits of EPS extend beyond fuel efficiency. The elimination of hydraulic fluids and the associated leaks common in traditional power steering systems reduces the risk of environmental contamination. Additionally, the energy-efficient operation of EPS systems aligns with broader sustainability goals. As regulatory frameworks evolve, Automotive EPS emerges as a key enabler for automakers to meet environmental standards and reduce the carbon footprint of their vehicle fleets.

Key Market Challenges

Cybersecurity Concerns and Electronic Vulnerabilities

As vehicles become more electronically sophisticated, the Automotive EPS Market encounters challenges related to cybersecurity. Electronic control units (ECUs) and sensors integral to EPS systems are potential targets for cyber threats. Unauthorized access to these components can compromise the safety and reliability of steering functions, posing serious risks to vehicle occupants.

The increasing connectivity of modern vehicles, often referred to as the "connected car," opens avenues for cyberattacks. As EPS systems become more integrated with in-vehicle networks and external communication interfaces, the industry must prioritize robust cybersecurity measures. Ensuring the integrity and security of electronic components is paramount, requiring continuous investment in advanced encryption

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technologies, secure communication protocols, and vigilant monitoring to detect and mitigate potential cyber threats.

Complexity and Cost of Repair and Maintenance

While EPS systems offer numerous benefits, their complexity poses challenges in terms of repair and maintenance. Traditional hydraulic power steering systems are often simpler to repair, with well-established procedures and a broad network of skilled technicians. In contrast, EPS systems involve intricate electronic components, sensors, and control modules that require specialized knowledge and tools for diagnosis and repair.

The cost of repairing or replacing EPS components can be higher than that of traditional systems. Repairing electronic components often involves the replacement of entire modules rather than individual parts. This complexity can result in increased repair costs and longer downtime for vehicle owners. Addressing these challenges requires ongoing efforts to develop standardized repair procedures, training programs for technicians, and the availability of affordable replacement components.

Reliability and Durability in Harsh Conditions

Automotive components, including EPS systems, operate in diverse and often challenging environments. Factors such as extreme temperatures, exposure to moisture, road salt, and vibration can impact the reliability and durability of EPS components. Ensuring that EPS systems can withstand these harsh conditions is crucial for maintaining vehicle performance and safety.

One specific concern is the potential for water ingress, which can compromise the functionality of electronic components. Sealing and protecting EPS components against moisture intrusion is a critical aspect of design and manufacturing. Additionally, durability testing under varied environmental conditions is essential to identify and address potential weaknesses in EPS systems. Achieving high levels of reliability in real-world driving scenarios contributes to consumer confidence and the overall success of Automotive EPS technology.

Consumer Perception and Trust

The successful adoption of Automotive Electric Power Steering hinges on consumer acceptance and trust in the technology. Consumer perception plays a significant role,

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and misconceptions or negative experiences with EPS systems can impact market penetration. Some drivers may associate electronic systems with increased complexity and potential reliability issues, contributing to skepticism about the long-term durability of EPS-equipped vehicles.

Addressing consumer perception challenges requires transparent communication about the benefits of EPS technology, including improved fuel efficiency, enhanced driving experience, and integration with advanced safety features. Providing clear information about maintenance procedures, repair costs, and the reliability of EPS systems can help build trust among consumers. Automakers and industry stakeholders must prioritize consumer education to foster a positive perception of EPS technology.

Integration with Autonomous Driving Technologies

The development and integration of autonomous driving technologies pose challenges for the Automotive EPS Market. As vehicles transition to higher levels of automation, the role of the steering system becomes more complex. While EPS systems are well-suited for integrating with advanced driver assistance systems (ADAS), achieving seamless integration with fully autonomous driving capabilities requires additional considerations.

Autonomous vehicles may not require traditional steering mechanisms, leading to a shift in the design and functionality of EPS systems. The industry must adapt EPS technology to meet the unique requirements of autonomous driving, including redundant systems for safety, fail-safe mechanisms, and integration with sophisticated sensor arrays. Balancing the demands of autonomous driving with the existing infrastructure of EPS systems presents both technical and regulatory challenges that need careful consideration.

Key Market Trends

Shift Towards Steer-by-Wire Technology

One of the prominent trends in the Automotive EPS Market is the increasing adoption of steer-by-wire technology. Steer-by-wire represents a paradigm shift from traditional mechanical steering systems, eliminating the physical connection between the steering wheel and the wheels. Instead, steer-by-wire systems rely on electronic control units (ECUs) and sensors to interpret steering inputs and communicate with the vehicle's steering components.

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Steer-by-wire technology offers several advantages, including greater design flexibility, enhanced safety features, and the potential for more advanced driver assistance systems (ADAS). By decoupling the steering wheel from the mechanical linkage, steer-by-wire enables innovative interior design options, such as the possibility of a retractable steering wheel or the creation of spacious and configurable cabin layouts. Additionally, the technology lays the foundation for the integration of autonomous driving functionalities, as steering inputs become entirely electronic.

Integration with Driver Monitoring Systems

The integration of Electric Power Steering (EPS) with driver monitoring systems is gaining traction as automakers focus on enhancing vehicle safety and driver well-being. Driver monitoring systems employ advanced sensors and cameras to track driver behavior, monitor attentiveness, and detect signs of fatigue or distraction. By integrating EPS with these systems, vehicles can provide adaptive steering assistance based on the driver's state and the driving environment.

For instance, if a driver shows signs of drowsiness or reduced attentiveness, the EPS system can adjust steering sensitivity or provide haptic feedback to encourage the driver to remain engaged. This integration contributes to both safety and comfort, creating a dynamic driving environment that responds to the driver's condition in real time. As the automotive industry progresses toward semi-autonomous and autonomous driving, the role of EPS in enhancing driver monitoring capabilities becomes increasingly pivotal.

Development of Energy-Efficient EPS Systems

Energy efficiency is a critical focus in the Automotive EPS Market, driven by the industry's commitment to sustainability and the optimization of electric vehicle (EV) performance. Manufacturers are investing in the development of energy-efficient EPS systems to minimize power consumption and contribute to the overall efficiency of electric and hybrid vehicles. Energy-efficient EPS not only aligns with environmental goals but also extends the range of electric vehicles by conserving electrical energy.

The energy efficiency trend encompasses advancements in EPS motor design, control algorithms, and power management systems. Efforts are directed toward minimizing energy losses during steering operation and maximizing regenerative capabilities to recover and store energy during braking or deceleration. As the automotive industry continues its transition toward electrification, the development of energy-efficient EPS

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systems is poised to play a crucial role in optimizing the overall efficiency and sustainability of electric and hybrid vehicles.

Enhanced Haptic Feedback and Steering Feel

The quest for an enhanced driving experience has led to a trend focusing on improving haptic feedback and steering feel in EPS-equipped vehicles. Haptic feedback refers to the tactile sensations transmitted to the driver through the steering wheel, providing a sense of connection with the road and vehicle dynamics. Automotive manufacturers are investing in advanced EPS systems that can simulate realistic and nuanced haptic feedback to enhance the driver's engagement and perception of the driving environment.

Innovations in EPS technology enable the customization of steering feel based on driving modes, vehicle settings, or driver preferences. Drivers can experience varying levels of resistance, responsiveness, and feedback, contributing to a more immersive and enjoyable driving experience. This trend aligns with the broader industry push toward creating vehicles that not only meet performance and efficiency criteria but also deliver a satisfying and personalized driving experience.

Application of Artificial Intelligence (AI) in EPS Systems

The application of Artificial Intelligence (AI) in EPS systems represents a transformative trend that enhances the adaptability and intelligence of steering technologies. AI algorithms are increasingly employed to analyze data from various sensors, cameras, and vehicle dynamics systems, allowing EPS systems to make real-time adjustments based on driving conditions, road surfaces, and the driver's behavior. This trend contributes to the development of "smart" EPS systems that continuously learn and optimize steering responses.

AI-driven EPS can adapt to individual driving styles, providing personalized steering characteristics for different drivers. Furthermore, these systems can anticipate and respond to changes in road conditions, enhancing vehicle stability and safety. The integration of AI also supports the industry's broader goals related to autonomous driving, as intelligent steering systems become integral components of the overall autonomous vehicle architecture.

Segmental Insights

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Type Analysis

The Automotive Electric Power Steering (EPS) Market is segmented into various types, chiefly Column Type, Pinion Type, and Dual Pinion Type. Column Type EPS is integrated into the steering column itself, making it compact and suitable for smaller vehicles where space saving is crucial. The Pinion Type EPS, on the other hand, is mounted on the steering rack and is known for providing better steering feedback, making it a popular choice for larger vehicles that demand more precise control. The Dual Pinion Type EPS is a variation of Pinion Type EPS. It incorporates an additional pinion gear, delivering an enhanced steering feel and accuracy. This type of EPS system is often found in performance vehicles where driver experience is paramount. Each type has distinct advantages, and the choice of EPS system is typically a balance between cost, vehicle size, and the desired level of steering feedback.

Regional Insights

The global Automotive Electric Power Steering Market is witnessing a significant expansion, driven by various regional trends. In North America, the demand for electric power steering systems is surging, fueled by the growing adoption of electric vehicles. In the European region, stringent emission norms and a strong push for sustainable transportation solutions are propelling the market forward. Meanwhile, in the Asia Pacific region, rapid urbanization and increased automotive production, especially in emerging economies like China and India, are major contributing factors to the market's growth. Lastly, Latin America and the Middle East and Africa are also witnessing steady growth in the Automotive Electric Power Steering Market, owing to increased consumer demand for fuel-efficient vehicles.

Key Market Players

- Hubei Henglong Auto System Group
- Denso Corporation
- GKN PLC
- Hitachi Automotive Systems Ltd
- Hyundai Mobis Co. Ltd

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JTEKT Corporation

Mitsubishi Electric Corporation

Nexteer Automotive

NSK Ltd

Robert Bosch GmbH

Report Scope:

In this report, the Global Automotive Electric Power Steering Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Automotive Electric Power Steering Market, By Type:

Column Type

Pinion Type

Dual Pinion Type

Automotive Electric Power Steering Market, By Component Type:

Steering Rack/Column

Sensor

Steering Motor

Other

Automotive Electric Power Steering Market, By Vehicle Type:

Passenger Cars

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Commercial Vehicles

Automotive Electric Power Steering Market, By Region:

Asia-Pacific

China

India

Japan

Indonesia

Thailand

South Korea

Australia

Europe & CIS

Germany

Spain

France

Russia

Italy

United Kingdom

Belgium

North America

United States

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Canada

Mexico

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Turkey

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Automotive Electric Power Steering Market.

Available Customizations:

Global Automotive Electric Power Steering Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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