

**ResearchInChina**  
www.researchinchina.com

# Passenger Car Intelligent Steering Industry Report, 2023

Nov. 2023

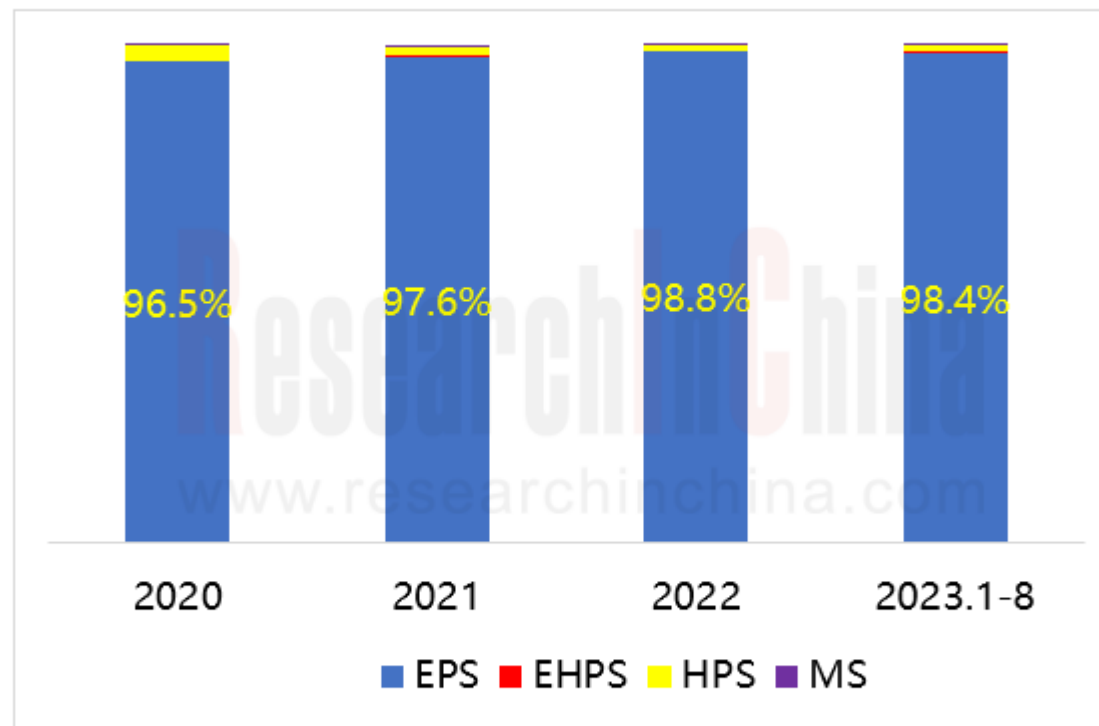
# The penetration rate of EPS in the passenger car market almost hits the peak

**Passenger Car Intelligent Steering Industry Report, 2023** released by ResearchInChina combs through and studies the status quo of passenger car intelligent steering and the product layout of OEMs, suppliers, and supply chains, and predicts the future development trends of passenger car intelligent steering.

**1. The penetration rate of electric power steering (EPS) in the passenger car market almost hits the peak, and the iteration and upgrading of products reflect the current development direction.**

From 2020 to 2023, the penetration of EPS in the Chinese passenger car market remained at a high level. In the next stage, EPS will head in the direction of high performance.

**China's Passenger Car Steering System Market Structure, 2020-2023**



Note: EPS (electric power steering), EHPS (electro-hydraulic power steering), HPS (hydraulic power steering) and MS (mechanical steering).

Source: ResearchInChina

By the installation position of booster motor, EPS can be divided into four types: column EPS (C-EPS), pinion EPS (P-EPS), rack EPS (R-EPS) and dual pinion EPS (DP-EPS). In terms of transmission efficiency from high to low, the ranking is R-EPS/DP-EPS > P-EPS > C-EPS. As mid-to-high-end smart electric vehicles boom, the steering system is being upgraded from C-EPS to R-EPS and DP-EPS. The content-per-car value of the latter two is higher than that of C-EPS, and the iteration of the EPS product structure brings value increment.

Comparison between EPSs

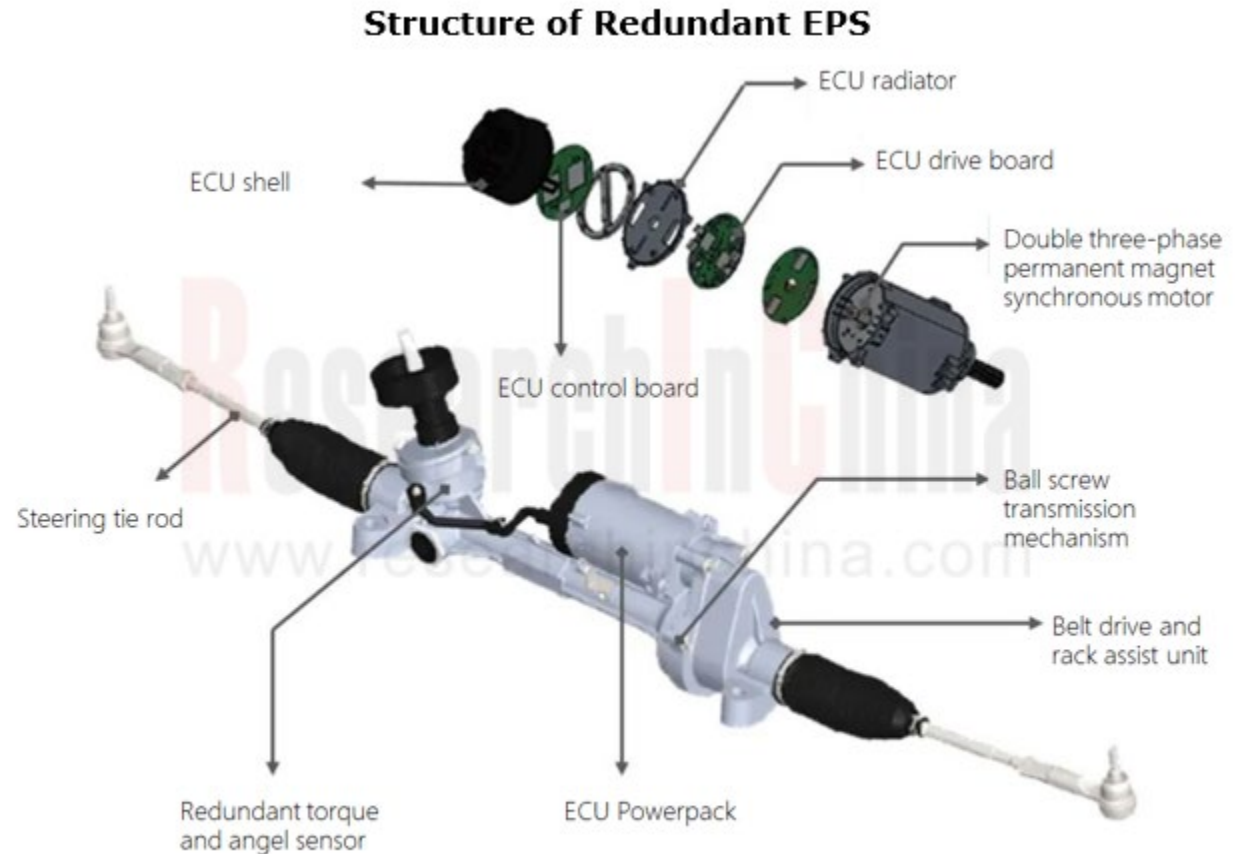
Item	C-EPS	DP-EPS	R-EPS
Boost Position	Inside the cab	Inside the cabin	Inside the cabin
Features	Low cost, reliable working environment, bad steering feel and high noise	Moderate price, good steering feeling and high modularity	High transmission efficiency, large rack force and difficult process
Models supported	Compact, small-sized, small-to-medium-sized	Medium-sized, medium-to-large-sized	Medium-to-large-sized, large-sized
Unit price (RMB)	Low	Medium	High
Layout flexibility	Medium	High	Low
NVH	Poor	Good	Good
Boost Range	5-11KN	8-12KN	6-16KN
Motor inertia	High	Low	Low
Functional expansion	Poor	Good	Good
Weight	Low	Medium	High
Development cycle	~24 months	~30 months	~30 months
Development fee	Low	Medium	High
Modularity	Relatively high	Relatively high	Relatively high
Dynamic response	General	Relatively quick	Very quick
Installation rate	High	Medium	Low

Source: ResearchInChina

# Redundant EPS and rear wheel steering become the transitional form

**2. In the process of upgrading from EPS to SBW (steer-by-wire), redundant EPS and rear wheel steering become the transitional form.**

L3 driving assistance requires EPS to still have a certain power-assisting capability in the event of a single point failure. Under this requirement, redundant EPS becomes the key component of L3+ intelligent driving systems.



Source: Trinova

## OEMs and suppliers have made related product layout:

At present, OEMs and suppliers have made related product layout:

\* **Bosch HASCO's HE3r B3**, which was rolled out in April 2023, adopts a 50%+50% redundancy solution. The two control loops have independent power supplies and communication modules and work together. If a functional failure occurs on either of them, 50% of the steering force can cover most working conditions and ensure constant driving.

\* **T-RES**, a redundant electronically controlled steering system of Trinova, integrates dual winding motors, dual drive circuits, dual sensors and dual power management systems to meet the redundancy requirements of L3 autonomous driving.

\* The fully redundant **DP-EPS of NASN** has the maximum rack force of 13.5kN, suitable for medium SUVs, large SUVs, MPVs, pickup trucks and other passenger vehicles. The whole series uses 6-phase dual winding motors to satisfy the requirements of ADAS and L3+ autonomous driving.







\* **HYCET** under Great Wall Motor is about to mass-produce dual redundant EPS with the maximum thrust of 14kN to enable L3+ autonomous driving.

Redundant EPS will become a core technology in L3+ intelligent driving scenarios before mass production and application of steer-by-wire.

Rear wheel steering, as a supplement to front wheel steering, was originally used in large luxury cars and SUVs, such as BMW 5/7 Series and Audi Q7/8. On the one hand, rear wheel steering technology based on electrical operation is easier to implement on an all-electric platform. On the other hand, electric vehicles on an all-electric platform generally have a long wheelbase (the battery must be placed between the front and rear axles) which increases the turning radius, while rear wheel steering technology offers much higher flexibility. In recent years, as electrification has become widespread rapidly, rear wheel steering has landed on more models such as Xpeng X9, AITO M9 and IM L7.

# Some New Energy Vehicle Models with Rear Wheel Steering

## Some New Energy Vehicle Models with Rear Wheel Steering

Model	Rear Wheel Steering Product	Model Picture
IM L7	Launched in 2022, equipped with the four-wheel steering all-wheel drive system as a standard configuration	
Xpeng X9	Expected to be launched in 2023, equipped with the rear wheel steering system as a standard configuration	
HiPhi Y	Launched in July 2023, equipped with the full-speed active rear wheel steering as a standard configuration	
AITO M9	Expected to be released in 2023, equipped with the rear wheel follow-up steering	
Mercedes-Benz EQS	The upgrade service of the rear wheel active steering system is introduced, with the rear wheel active steering angle upgraded from 4.5° to 10°. Fee: RMB4,998/year	
Lotus Eletre	Equipped with up to 3.5° rear wheel active steering technology	

Source: ResearchInChina

# Suppliers and OEMs quicken their pace of deploying steer-by-wire, with more production models

## 3. Suppliers and OEMs quicken their pace of deploying steer-by-wire, with more production models.






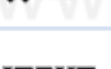



### OEMs:

- \* Toyota and Tesla have submitted patent applications for steer-by-wire technology.
- \* Great Wall Motor and Changan adopt their self-developed steer-by-wire products to deploy steer-by-wire.
- \* Geely and Hella have jointly developed a steer-by-wire (SBW) system which is production-ready.
- \* NIO and ZF cooperate on steer-by-wire products.

### Suppliers:

- \* Nexteer Automotive has secured steer-by-wire system orders from two OEMs.
- \* Bethel Automotive Safety Systems, together with Chery's subsidiary Ruizhi Lianneng, acquired Wanda Auto for a layout shift to steer-by-wire R&D.
- \* JTEKT's steer-by-wire system was available to Toyota bZ4X in 2022 and will land on Lexus RZ in 2024.

## Steer-by-wire Layout of Some OEMs and Suppliers (see report for the complete form)

	Company	SBW Products & Layout	SOP
1	 TOYOTA	The overseas version of Toyota bZ4X is equipped with JTEKT's steer-by-wire system OMG.	Mass-produced
2	 LEXUS	RZ, a brand-new all-electric vehicle, debuted with an all-new variable-ratio electronic steering-by-wire system + special-shaped steering wheel.	Mass-produced
3	 TESLA	Tesla is expected to announce in Q2 2024 that it will use steer-by-wire technology to match with the Yoke steering wheels in new Model S and Model X.	-
5	 长城汽车 Great Wall	HYCET under Great Wall Motor is pre-developing steer-by-wire and rear wheel steering products ahead of counterparts.	-
6	 吉利汽车 GEELY AUTO	Geely and Hella have jointly developed a steer-by-wire (SBW) system solution which is production-ready.	2026
7	 NIO	NIO cooperates with ZF to develop steer-by-wire products.	-
9	 JTEKT	JTEKT's steer-by-wire system was mounted on Toyota bZ4X in 2022 and will land on Lexus RZ in North America in 2024.	Mass-produced
11	 nexteer AUTOMOTIVE	SBW has been ordered by two OEMs.	-
16	 BTL	Bethel Automotive Safety Systems, together with Chery's subsidiary Ruizhi Lianneng, acquired Wanda Auto and announced development of steer-by-wire.	-

Source: ResearchInChina

# The policy environment has become more relaxed in recent years

At present, many OEMs and suppliers make many deployments in steer-by-wire, but with a low product penetration. Nexteer Automotive forecasts that it is difficult for steer-by-wire to gain pace in the next 2 or 3 years.

**The policy environment has become more relaxed in recent years.** The development of steer-by-wire is driven by the demand for intelligent chassis and stimulated by policies. From the implementation of the new national automotive steering standard to the release of Steer-by-wire Technology Roadmap, steer-by-wire has been production-ready in terms of policies.

- On January 1, 2022, the new national automotive steering standard was officially implemented, deleting the 20-year-old requirement that full-power steering mechanisms should not be installed (steer-by-wire is full-power steering);
- In April, 2022, the exposure draft of the Steer-by-wire Technology Roadmap was officially released. The overall goal is to realize the world's leading steer-by-wire for L3+ and L4+ autonomous driving in 2025 and 2030, with the penetration of steer-by-wire up to 5% and 30% and the autonomy rate of core components (controller, motor, etc.) higher than 20% and 50%, respectively.
- In June 2023, the Ministry of Industry and Information Technology and other four ministries further proposed that "the automotive industry should focus on steer-by-wire".



# Table of Content (1)

## **1 Overview of Passenger Car Intelligent Steering Industry**

- 1.1 Development History of Passenger Car Steering
  - 1.1.1 Definition of Automotive Steering System
  - 1.1.2 Classification of Automotive Steering System
  - 1.1.3 Steering System Phase I: Mechanical Steering (MS)
  - 1.1.4 Steering System Phase II: Hydraulic Power Steering (HPS)
  - 1.1.5 Steering System Phase II: Electro-hydraulic Power Steering (EHPS)
  - 1.1.6 Steering System Phase III: Electronic Power Steering (EPS)
  - 1.1.7 Steering System Phase IV: Steer-by-wire (SBW)
- 1.2 Passenger Car EPS System
  - 1.2.1 Components of EPS
  - 1.2.2 Comparison between Different Types of EPS
  - 1.2.3 Redundant EPS Technical Solutions
  - 1.2.4 Key Redundant EPS Technologies
  - 1.2.5 Advantages of EPS Compared with Traditional Steering
  - 1.2.6 EPS Industrial Chain
  - 1.2.7 Status Quo of EPS Industry
  - 1.2.8 EPS Market Size Prediction
  - 1.2.9 Stimulating Factors for EPS Development
- 1.3 Passenger Car SBW System
  - 1.3.1 Basic Structure of SBW
  - 1.3.2 Working Principle of SBW
  - 1.3.3 Typical Layout of SBW
  - 1.3.4 Actuation & Control Strategy of SBW
  - 1.3.5 Comparison between Different Intelligent Steering Technologies (Active Steering and Four-Wheel Steering Technologies)
  - 1.3.6 Advantages and Difficulties of SBW System
  - 1.3.7 Influence of SBW on Automakers and End Consumers
  - 1.3.8 Stimulating Factors for SBW Development

- 1.3.9 SBW Market Size Prediction
- 1.3.10 Major SBW Suppliers and Status Quo of Products
- 1.3.11 SBW Layout of Automakers
- 1.4 International Development of Passenger Car SBW System
  - 1.4.1 Global Growth Trend of X-by-wire Technology
  - 1.4.2 Acceptance of SBW Users (China, Germany, India, Japan, the United States)
  - 1.4.3 Global SBW Market Size (2018-2032)
  - 1.4.4 Worldwide SBW Development
- 1.5 Policies/Standards Concerning Passenger Car Intelligent Steering
- 1.6 Development Direction of Passenger Car Intelligent Steering
- 1.7 Development Path of Passenger Car Intelligent Steering System
- 1.8 Key SBW Technologies
- 1.9 Passenger Car Intelligent Chassis Roadmap - SBW
- 1.10 SBW Goals (2025-2030)
- 1.11 Requirements on SBW for L2~L4+ Autonomous Driving System
- 1.12 SBW Patents: Technical Topic Analysis, Innovative Word Cloud, Patent Maps, Filing Ranking

## **2 Automotive Intelligent Steering Layout of Chinese and Foreign Passenger Car OEMs**

- 2.1 Infiniti
  - 2.1.1 Composition of Active SBW System
  - 2.1.2 Principle of Active SBW System
  - 2.1.3 Advantages and Difficulties of Active SBW System
  - 2.1.4 Q50 Is the World's First Production Car Equipped with SBW
  - 2.1.5 Q50L Is Equipped with Active SBW System
- 2.2 Toyota
  - 2.2.1 The bZ4X All-electric Model Equipped with SBW System
  - 2.2.2 SBW Technology Patents

# Table of Content (2)

- 2.2.3 Block Diagram of SBW System
- 2.2.4 SBW System Safety and Interactive Logic Design
- 2.3 Tesla
  - 2.3.1 SBW System Patent Filing
  - 2.3.2 SBW System Implementation Plan
- 2.4 Mercedes-Benz's Next-generation S-class Flagship Sedan Will Adopt a Special-Shaped Steering Wheel and SBW System
- 2.5 Audi R8 LMS GT3 Equipped with SBW Technology
- 2.5 Audi "Skysphere" Concept Car Equipped with Rear Wheel Steering Technology
- 2.6 Changan Automobile Retrofits Changan CX30 with SBW System
- 2.6 Changan Change Technology Unveiled Its Intelligent SBW Products
- 2.7 Great Wall Motor's Smart Chassis-by-Wire Integrates SBW System
- 2.7 Features of Great Wall Motor's SBW System
- 2.7 HYCET, a High-Tech Enterprise under Great Wall Motor
- 2.8 Geely and Hella Jointly Develop All-electric SBW System
- 2.8 Geely and Lotus jointly build an Intelligent SBW Project
- 2.8 Weikenxi Technology, a Subsidiary of the Controlling Shareholder of Geely Group
- 2.9 BYD's Yisifang Architecture Can Realize Steering Redundancy
- 2.9 Features of BYD's SBW System
- 2.9 FinDreams Powertrain, a Subsidiary of BYD
- 2.10 Hongqi E-HS9 Adopts Electric Steering Redundancy System
- 2.10 Hongqi's All-electric Concept Car Equipped with Rear Wheel Steering Technology
- 2.11 Dongfeng Warrior Equipped with Rear Wheel Steering Technology
- 2.12 Voyah's SBW Development Planning
- 2.13 Features of Chery's SBW System
- .....
- 2.21 ZEEKR 001 Comes Standard with Variable Steering Ratio System
- 2.22 Xpeng X9 is the Only MPV Model with Rear Wheel Steering as Standard in the World

## **3 Foreign Passenger Car Intelligent Steering System Integrators**

- 3.1 Bosch
  - 3.1.1 Development History of Automotive Steering System
  - 3.1.2 EPS System (1)
  - 3.1.3 EPS System (2)
  - 3.1.4 EPS System (3)
  - 3.1.5 EPS System (4)
  - 3.1.6 SBW System
  - 3.1.7 Passenger Car Steering System
  - 3.1.8 The Next-generation Vehicle Control System
  - 3.1.9 Cooperation with Arnold NextG
  - 3.1.10 Future Steering System Planning
  - 3.1.11 Steering System Layout in China
  - 3.1.12 Hasco's Steering Product Series
  - 3.1.13 Hasco Independently Develops Its EPS System Platform
  - 3.1.14 Hasco's SBW
  - 3.1.15 Hasco's EPS System Project Is Put into Production
  - 3.1.16 Production of Hasco's Steering System Parts
- 3.2 Nexteer Automotive
  - 3.2.1 Steering Product Layout
  - 3.2.2 Distribution of Customers
  - 3.2.3 Main Supporting Projects in H1 2023
  - 3.2.4 Main Supporting Projects in 2022
  - 3.2.5 Steering Products
  - 3.2.6 Passenger Car Steering Products
- 3.3 Schaeffler
  - 3.3.1 Profile
  - 3.3.2 Products and Solutions
  - 3.3.3 SBW Technology

# Table of Content (3)

- 3.3.4 Features of SBW System
- 3.3.5 Strategic Cooperation in SBW
- 3.3.6 Intelligent Rear Wheel Steering System and Steering Wheel Actuator
- 3.3.7 Integrated Chassis-by-wire and Intelligent SBW Module
- 3.4 ZF
  - 3.4.1 Rear Axle Steering
  - 3.4.2 Rear Axle Steering 2.0
- 3.5 Mando
  - 3.5.1 Steering Products
  - 3.5.2 EPS and SBW
- 3.6 NSK
  - 3.6.1 Steering Products
  - 3.6.2 SBW Products
  - 3.6.3 SBW Force Feedback Actuator and Road Wheel Actuator
- 3.7 JTEKT
  - 3.7.1 Steering Products and Their Adapted Models
  - 3.7.2 Steering System Configuration
  - 3.7.3 Classification of EPS
  - 3.7.4 SBW
- 3.8 ThyssenKrupp
  - 3.8.1 Steering System
  - 3.8.2 Views on the Development Path of Steering System
  - 3.8.3 Novel Steering Column Suitable for L3-L5
  - 3.8.4 Dual Redundancy in SBW System
  - 3.8.5 SBW Redundancy
  - 3.8.6 SBW System Redundancy Solutions
- 3.9 Hitachi Astemo
  - 3.9.1 Steering System
  - 3.9.2 EPS Gear

- 3.9.3 SBW System
- 3.9.4 Comprehensive Control Technology
- 3.10 KYB
  - 3.10.1 Steering System Products and Application Cases
- 3.11 HELLA
  - 3.11.1 HELLA Provides Sensor Technology to All-electric SBW System
  - 3.11.2 Geely and HELLA Jointly Develop All-electric SBW System

## **4 Domestic Passenger Car Intelligent Steering System Integrators**

- 4.1 Trinova
  - 4.1.1 Profile
  - 4.1.2 EPS System (1)
  - 4.1.3 EPS System (2)
  - 4.1.4 EPS System (3)
  - 4.1.5 SBW System Solutions
  - 4.1.6 SBW Electrical Architecture
  - 4.1.7 SBW Algorithm Architecture
  - 4.1.8 Key SBW Technology
  - 4.1.9 SBW Functions
  - 4.1.10 Steering System Product Planning
- 4.2 NASN
  - 4.2.1 Profile
  - 4.2.2 Product Matrix
  - 4.2.3 SBW System
  - 4.2.4 SBW Product Planning
- 4.3 Tuopu Group
  - 4.3.1 Profile
  - 4.3.2 Global Layout
  - 4.3.3 Revenue in H1 2023

# Table of Content (4)

4.3.4 Steering System Product Line	4.6.4 Passenger Car Intelligent Steering System and Mechanical Steering Gear
4.3.5 Steering System	4.6.5 Passenger Car Steering System Parts and Castings
4.3.6 SBW Solutions	4.6.6 Mass Production and R&D of Steering System
4.3.7 Customers	4.6.7 Investment and Technical Layout of Automotive Intelligent Steering Projects
4.3.8 Business Layout	4.7 HIRO
4.4 DECO Automotive	4.7.1 Profile and Product Introduction
4.4.1 Profile	4.7.2 Steering System Products
4.4.2 Technology Iteration Route	4.8 Global Technology
4.4.3 Intelligence Steering Product Matrix	4.8.1 Profile
4.4.4 Steering System Product Series	4.8.2 Steering system Layout and Future Planning
4.4.5 Passenger Car Steering Products	4.9 Wuhu Bethel Automotive Safety Systems
4.4.6 SBW Application (1)	4.9.1 Profile
4.4.7 SBW Application (2)	4.9.2 Product Layout
4.4.8 Active Rear Wheel Steering Technology	4.9.3 Distribution of Manufacturing Bases
4.4.9 Steering System Design And Development Structure	4.9.4 Production equipment
4.5 DIAS	.....
4.5.1 Profile	4.9.10 Major Customers
4.5.2 Development History and Future Planning of Automotive Steering System	4.10 Tongyu Automotive
4.5.3 The Second-generation Steering Product	4.10.1 Profile
4.5.4 The Third-generation Steering Product	4.10.2 Future Mass Production Plan for SBW System
4.5.5 The Fourth-generation Steering Product	4.11 HYCET
4.5.6 The Fifth-generation Steering Product	4.11.1 Profile
4.5.7 Innovative Functional Features of DiAS' Intelligent Steering System	4.11.2 Product Roadmap
4.5.8 Models with Steering Products	4.11.3 Pricing of Series
4.5.9 Strategic Cooperation in SBW	4.11.4 Core Product Advantages
4.6 Zhejiang Shibao	4.11.5 Passenger Car Steering Research and Application Models
4.6.1 Profile	4.12 TSING AUTO Intelligent Chassis
4.6.2 Development History of Steering System	4.12.1 Main Products and Future Mass Production Planning
4.6.3 Passenger Car EPS System	4.12.2 Redundant System Architecture

# Table of Content (5)

- 4.12.3 SBW Components and SBW Road Sense Collaborative Controller
- 4.12.4 SBW: Road Sense Collaborative System Architecture and Performance
- 4.12.5 SBW: Road Sense Collaborative Control Framework
- 4.12.6 SBW: Controller Architecture
- 4.13 Henglong Group
- 4.13.1 Passenger Car Steering Products (1)
- 4.13.2 Passenger Car Steering Products (2)
- 4.13.3 Passenger Car Steering Products (3)
- 4.13.4 Passenger Car Steering Gear
- 4.13.5 Passenger Car Steering Column
- 4.13.6 Other Passenger Car Steering Products
- 4.14 eCDAG
- 4.14.1 Profile and Major Customers
- 4.14.2 EPS System and Applicable Models
- 4.14.3 Rear Wheel Steering System
- 4.14.4 Steering System Features
- 4.14.5 EPP Products
- 4.14.6 EPS Assembly Products
- 4.14.7 Practical Application of Passenger Car Steering System
- 4.15 Yubei Koyo Steering System
- 4.15.1 Intelligent Electric Steering System for Passenger Cars
- 4.15.2 Passenger Car Steering Gear
- 4.15.3 Steering System Parts
- 4.15.4 SBW Was Accepted by the First Batch of Customers
- 4.16 JWD Automotive Technology
- 4.16.1 Profile
- 4.16.2 SBW System
- 4.16.3 Future Development Planning
- 4.17 Yilida

- 4.17.1 EPS System
- 4.17.2 EPS and Steering Motors (1)
- 4.17.3 EPS and Steering Motors (2)
- 4.17.4 EPS and Steering Motors (3)
- 4.18 SBW Products of Shanghai Weikenxi Technology Co., Ltd.
- 4.19 EPS System of Jingwei Hirain Technologies
- 4.20 Intelligent SBW System of Teemo (Ningbo) Technology Co., Ltd.
- 4.21 Steering Products and Customers of China Automotive Systems, Inc.
- 4.22 SBW of Change Technology

## **5 Passenger Car Steering Motor Suppliers**

- 5.1 Basic Principle and Status Quo of Steering Motors
  - 5.1.1 Steering Motor Overview
  - 5.1.2 Status Quo of Steering Motor Market
- 5.2 Nidec
  - 5.2.1 Revenue and Steering Motor R&D Planning
  - 5.2.2 Motor Product Layout
  - 5.2.3 Steering Motor Products
- 5.3 Bosch
  - 5.3.1 Development History of Steering Motors
  - 5.3.2 Steering Motor Products
- 5.4 Johnson Electric
  - 5.4.1 Product Layout
  - 5.4.2 Steering Motor Products
  - 5.4.3 Customers
- 5.5 Ningbo Dechang Electric Machinery Manufacturing
  - 5.5.1 Motor Product Layout
  - 5.5.2 EPS Business Layout and Designation
  - 5.5.3 Core EPS Technology and Mass Production Scale

# Table of Content (6)

5.5.4 Brushless DC Motors

5.6 Dare

5.6.1 Revenue

5.6.2 Steering Products and Capacity

5.6.3 Steering Motor Products

5.7 Welling

5.7.1 Product Layout

5.7.2 EPS

5.7.3 Hand-feel Simulated Steering Motor

5.8 Steering Motor Products of Nexteer Automotive

5.9 Steering Motor Products of Dongxingchang Technology

## **6 Passenger Car Steering Sensor Suppliers**

6.1 Basic Principle and Status Quo of Steering Sensors

6.1.1 Steering Sensor Overview

6.1.2 Main Types and Development Trends of Torque Sensors

6.1.3 Layout of Steering Sensor Vendors

6.2 Hella

6.2.1 Steering Sensors (1)

6.2.2 Steering Sensors (2)

6.2.3 Steering Sensors (3)

6.2.4 Release of New Sensor Products

6.3 Others

6.3.1 Electronic Steering Sensors of Methode Electronics

6.3.2 Steering Wheel Torque Sensors of FUTEK

6.3.3 Torque Sensors of TE Connectivity

6.3.4 Steering Sensors of DECO Automotive

6.3.5 Steering Sensors of Shanghai Baolong

6.3.6 Wheel Speed Sensors of Longgan Technology

6.3.7 Steering Sensors of Bosch

## **7 Passenger Car Steering System MCU Suppliers**

7.1 Overview and Status Quo of Steering System ECU

7.1.1 Overview of Steering System ECU

7.1.2 Status Quo of Steering System ECU Market

7.2 Overview of Steering System MCU and Layout of Vendors

7.3 NXP

7.3.1 EPS Framework Diagram

7.3.2 MCU (1)

7.3.3 MCU (2)

7.3.4 MCU (3)

7.3.5 MCU (4)

7.3.6 MCU (5)

7.4 Infineon

7.4.1 EPS Framework Diagram

7.4.2 Steering System MCU

7.5 Renesas

7.5.1 Chassis and Safety-related Product Roadmap

7.5.2 EPS Framework Diagram

7.5.3 Steering System MCU

7.6 STMicroelectronics

7.6.1 EPS Framework Diagram

7.6.2 Steering System MCU

7.7 Texas Instruments

7.7.1 EPS Framework Diagram

7.7.2 Steering System MCU

7.8 Yuntu

7.8.1 Products Application Scenarios

# Table of Content (7)

7.8.2 Steering System MCU

7.9 MCU of Shanghai Thinktech

7.10 SAIC-GM-Wuling's First EPS Controller with Independent Property Rights  
Rolled off the Production Line

7.11 Geely's Subsidiary Develops MCU Chips

## **8 Development Trends of Passenger Car Intelligent Steering Industry**

8.1 Trend 1

8.2 Trend 2

8.3 Trend 3

8.4 Trend 4

8.5 Trend 5

8.6 Trend 6

8.7 Trend 7



## Beijing Headquarters


TEL: 13718845418

Email: [report@researchinchina.com](mailto:report@researchinchina.com)

Website: [ResearchInChina](http://ResearchInChina.com)

WeChat: Zuosiqiche



 [zuosiqiche](https://www.wechat.com/qrcode?qr=zuosiqiche)



## Chengdu Branch

TEL: 028-68738514

FAX: 028-86930659