Automotive Turbocharger Market Assessment, By Type [Fixed Geometry Turbochargers, Wastegate Turbochargers, Variable Geometry Turbochargers], By Fuel Type [Diesel, Gasoline], By Vehicle Type [Passenger Car, Light Commercial Vehicle, Heavy Commercial Vehicle], By Sales Channel [Original Equipment Manufacturer, Aftermarket], By Region, Opportunities and Forecast, 2018-2032F

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Report description:

Global automotive turbocharger market is projected to witness a CAGR of 8.11% during the forecast period 2025-2032, growing from USD 15.46 billion in 2024 to USD 28.85 billion in 2032. Demand for efficiency in fuel consumption increases since users seek better mileage with fluctuations in fuel prices, thereby the increasing environmental awareness contributes significantly to the growth of turbochargers. Turbochargers enhance engine efficiency in smaller sizes, allowing significant power output and reducing fuel consumption. Strict emission standards imposed by the governments of different nations, encourage car manufacturers to consider installing turbocharger systems. Another very significant factor is regulatory pressure in the case of downsizing. Engine downsizing has become popular among automotive companies that would rather make their products light and efficient. Also, turbochargers help them to have greater outputs, which would meet this trend of emission standards. Continuing improvement through electrical turbochargers further boosts performance and efficiency, making the vehicle more desirable to manufacturers as well as consumers. With growing consumer awareness of benefits from turbocharged engines regarding power output and fuel efficiency improvements, acceptance and preference have been increasing for vehicles installed with this technology.
For instance, in July 2023, the IHI corporation's Oil-free Electric Turbocharger for Fuel Cell Vehicles received the 2020 Technology Award from the Turbomachinery Society of Japan. The award was established in 1983 as an award for excellent technology to encourage the development of technology related to turbomachinery.
Stringent Emission Regulation is Expanding the Global Market Growth
Stringent emission regulations are enormously expanding the global automotive turbocharger market by forcing companies to

adopt advanced technologies that enhance engine efficiency and curb harmful emissions. Governments have been implementing stringent standards around the world to minimize the vehicle's environmental impact, which has become a critical factor in driving global automotive turbocharger market demand. For example, starting in 2025, the European Union has placed tight CO2 emission targets, including new vehicles that should not be over 93.6 grams per kilometer; meanwhile, the U.S. has set Corporate Average Fuel Economy (CAFE) standards, which obligates an average fuel economy of 54.5 miles per gallon for both cars and light trucks by 2025. These regulations force automotive manufacturers to include turbocharging technology in their designs, which enables more modest engines to deliver greater performance while still observing efficiency standards. The automotive industry has gradually realized that turbochargers are tools critical to achieving these high limits required by the standards and regulations. Turbochargers increase combustion efficiency, enhance fuel efficiency, and reduce harmful pollutants in the exhaust, thereby becoming a favorite solution for both gasoline and diesel engines.

For instance, in August 2024 Tata Motors Ltd. dropped Tata Curvv featured with BS6 Phase II-compliant 1.2-litre Direct Injection Turbo-petrol Hyperion Engine, which can produce 123bhp and 225Nm. Compared to the Revotron turbo-petrol engine, the Hyperion generates 123bhp at 5,000rpm and 225Nm of peak torque between 1,700rpm and 3,500rpm.

Technological Advancements Propelling the Market Growth

Improving engine performance and efficiency while addressing environmental concerns. One of the most remarkable innovations is the electric turbocharger, which uses an electric motor to eliminate turbo lag, a common delay in traditional turbochargers that affects throttle response. This technology allows for immediate boost, improving engine responsiveness and overall performance, particularly in hybrid and electric vehicles. For instance, in December 2023, Mercedes-Benz Group AG unveiled an electric turbocharger within its most updated version of the Mercedes-AMG C 43 4MATIC. This model features the world's very first series-production 2.0-litre four-cylinder engine featuring the electric exhaust gas turbocharger.

In addition, variable geometry turbochargers (VGT) are gaining popularity since they can optimize and boost pressure at various engine speeds. These provide better low-end torque with reduced turbo lag. This is highly sought after in modern automotive applications since manufacturers can make smaller, more efficient engines without losing power output. Advanced materials and smart sensors integrated into the turbocharger designs are also the main contributors to the market growth. These developments add to durability and performance by allowing the turbochargers to run at higher temperatures without losing efficiency. Smart sensors monitor real-time engine parameters, allowing for precise control of boost levels and combustion efficiency, resulting in effective savings on fuel consumption and emissions.

For instance, in October 2024, Kia Corporation launched a new Kia Carnival that will be offered in two variants: Limousine and Limousine Plus. Both variants will be powered by a sole 2.2-litre, four-cylinder, CRDi turbocharged diesel engine with 193hp of power and 441Nm of torque. Compared to the previous generation, the torque is up by 1Nm, and the power has decreased by 7hp.

Dominance of Passenger Cars in the Global Automotive Turbocharger Market

The passenger car segment dominates the largest market share owing to increased disposable income, rising preference for personal travel, and technological advancement in passenger cars. The growing consumer preference for vehicles with enhanced performance and fuel efficiency drives passenger car growth. Turbochargers are highly accepted due to their ability to give high power with low fuel consumption. It, therefore, remains one of the choices for manufacturers to strive for vehicles that are environmentally friendly, and consumers want them to be. It is partly attributed to the increasing numbers of passenger vehicles being rolled out with turbocharged engines by manufacturers seeking to boost efficiency in cars and live up to the environmental rules. The extensive use of turbocharging technology by passenger cars is due to a need for better fuel economy and performance, making this segment the leader in the market. The passenger car segment will continue to remain the market leader in automotive turbochargers with its innovation and incorporation of advanced technologies such as electric turbochargers and variable geometry systems.

For instance, in September 2024, BorgWarner Inc. secured an agreement to supply its turbochargers for use on the General Motors Corvette ZR1 sports car platform, the largest passenger car twin turbochargers in the market to be released to date. Paired with the automaker's 5.5-liter flat-plane crankshaft V8 engine, this unthinkable Corvette is capable of 1,064 horsepower and 828 pounds of torque.

Asia-Pacific Dominates Global Automotive Turbocharger Market

Growth in automotive manufacturing is primarily promoted due to improving socio-economic conditions and a growing middle-class population, which results in increased demand for personal vehicles in the Asia Pacific region. In addition, tight emission regulations implemented by governments in the region promoted manufacturers to opt for turbocharger technology. These regulations aim at controlling harmful carbon emissions and are enhancing fuel efficiency, with automakers being pushed towards the inclusion of turbochargers in their vehicles. To give an example, nitrogen oxide, and particulate matter are significantly reduced in vehicles in India under the BS-VI emission norms and China 6 standards, for which turbochargers are beneficial by ensuring optimum engine performance. The region's ability to adapt to changing market dynamics and regulatory requirements will likely continue to drive its growth in the coming years.

For instance, in June 2023, Garrett Motion Inc. celebrated the expansion of its Wuhan Plant in Hubei, China. The company also commemorated the production of 30 million turbochargers in China. The multi-phase expansion of Garrett Motion's Wuhan facility included its first high-speed automated production line of advanced variable nozzle technology (VNT) for turbo-passenger vehicles.

Future Market Scenario (2025 – 2032F)

- Development of electric turbochargers and variable geometry turbochargers, enhancing engine efficiency and responsiveness.
- Governments worldwide are implementing stricter standards to reduce air pollution and carbon emissions, driving the adoption of turbocharging technology.
- Increasing vehicle ownership rates driving demand for replacement parts as vehicles age, contributing to growth in the aftermarket segment.

Key Players Landscape and Outlook

The global automotive turbocharger market is highly competitive, with several key players leading the industry in innovation and growth. The leading companies are focused on improving engine performance, besides meeting stringent emission regulations, and therefore, are known for their high-end turbocharging technologies in variable geometry and electric turbochargers. In parallel, firms also provide all models of high-performance turbochargers with different types to accompany each car model but continue developing their products to increase productivity. Strategic moves such as acquisitions, mergers, and alliances amongst key players are being exercised, thus large investments in the R&D sector are much more important to innovate.

For instance, in August 2023, Cummins Inc. announced its acquisition of Meritor, Inc., a leading global supplier of drivetrain, mobility, braking, aftermarket, and electric powertrain solutions like turbochargers for commercial vehicle and industrial markets. The integration of Meritor, Inc.'s people, products, and capabilities in axle and brake technology will position Cummins as a prominent provider of integrated powertrain solutions across internal combustion and electric power applications.

Table of Contents:

1. Project Scope and Definitions
2. Research Methodology
3. Executive Summary
4. Voice of Customer
4.1. Product and Market Intelligence
4.2. Brand Awareness
4.3. Factors Considered in Purchase Decisions
4.3.1. Features and Other Value-Added Service
4.3.2. Significance
4.3.3. Fuel Type
4.3.4. Compatibility
4.3.5. Efficiency of Solutions
4.3.6. After-Sales Support
4.4. Consideration of Privacy and Regulations
5. Global Automotive Turbocharger Market Outlook, 2018-2032F
5.1. Market Size Analysis & Forecast

5.1.1.By Value
5.1.2.By Volume
5.2.Market Share Analysis & Forecast
5.2.1.By Type
5.2.1.1.Fixed Geometry Turbochargers
5.2.1.2.Wastegate Turbochargers
5.2.1.3.Variable Geometry Turbochargers
5.2.2.By Fuel Type
5.2.2.1.Diesel
5.2.2.2.Gasoline
5.2.3.By Vehicle Type
5.2.3.1.Passenger Car
5.2.3.2.Light Commercial Vehicle
5.2.3.3.Heavy Commercial Vehicle
5.2.4.By Sales Channel
5.2.4.1.Original Equipment Manufacturer
5.2.4.2.Aftermarket
5.2.5.By Region
5.2.5.1.North America
5.2.5.2.Europe
5.2.5.3.Asia-Pacific
5.2.5.4.South America
5.2.5.5.Middle East and Africa
5.2.6.By Company Market Share Analysis (Top 5 Companies and Others - By Value, 2024)
5.3.Market Map Analysis, 2024
5.3.1.By Type
5.3.2.By Fuel Type
5.3.3.By Vehicle Type
5.3.4.By Sales Channel
5.3.5.By Region
6.North America Automotive Turbocharger Market Outlook, 2018-2032F*
6.1.Market Size Analysis & Forecast
6.1.1.By Value
6.1.2.By Volume
6.2.Market Share Analysis & Forecast
6.2.1.By Type
6.2.1.1.Fixed Geometry Turbochargers
6.2.1.2.Wastegate Turbochargers
6.2.1.3.Variable Geometry Turbochargers
6.2.2.By Fuel Type
6.2.2.1.Diesel
6.2.2.2.Gasoline
6.2.3.By Vehicle Type
6.2.3.1.Passenger Car
6.2.3.2.Light Commercial Vehicle
6.2.3.3.Heavy Commercial Vehicle
6.2.4.By Sales Channel

6.2.4.1.Original Equipment Manufacturer
6.2.4.2.Aftermarket
6.2.5.By Country Share
6.2.5.1.United States
6.2.5.2.Canada
6.2.5.3.Mexico
6.3.Country Market Assessment
6.3.1.United States Automotive Turbocharger Market Outlook, 2018-2032F*
6.3.1.1.Market Size Analysis & Forecast
6.3.1.1.1.By Value
6.3.1.1.2.By Volume
6.3.1.2.Market Share Analysis & Forecast
6.3.1.2.1.By Type
6.3.1.2.1.1.Fixed Geometry Turbochargers
6.3.1.2.1.2.Wastegate Turbochargers
6.3.1.2.1.3.Variable Geometry Turbochargers
6.3.1.2.2.By Fuel Type
6.3.1.2.2.1.Diesel
6.3.1.2.2.2.Gasoline
6.3.1.2.3.By Vehicle Type
6.3.1.2.3.1.Passenger Car
6.3.1.2.3.2.Light Commercial Vehicle
6.3.1.2.3.3.Heavy Commercial Vehicle
6.3.1.2.4.By Sales Channel
6.3.1.2.4.1.Original Equipment Manufacturer
6.3.1.2.4.2.Aftermarket
6.3.2.Canada
6.3.3.Mexico
*All segments will be provided for all regions and countries covered
7.Europe Automotive Turbocharger Market Outlook, 2018-2032F
7.1.Germany
7.2.France
7.3.Italy
7.4.United Kingdom
7.5.Russia
7.6.Netherlands
7.7.Spain
7.8.Turkey
7.9.Poland
8.Asia-Pacific Automotive Turbocharger Market Outlook, 2018-2032F
8.1.India
8.2.China
8.3.Japan
8.4.Australia
8.5.Vietnam
8.6.South Korea
8.7.Indonesia

8.8. Philippines
9. South America Automotive Turbocharger Market Outlook, 2018-2032F
9.1. Brazil
9.2. Argentina
10. Middle East and Africa Automotive Turbocharger Market Outlook, 2018-2032F
10.1. Saudi Arabia
10.2. UAE
10.3. South Africa
11. Demand Supply Analysis
12. Import and Export Analysis
13. Value Chain Analysis
14. Porter's Five Forces Analysis
15. PESTLE Analysis
16. Pricing Analysis
17. Market Dynamics
17.1. Market Drivers
17.2. Market Challenges
18. Market Trends and Developments
19. Case Studies
20. Competitive Landscape
20.1. Competition Matrix of Top 5 Market Leaders
20.2. SWOT Analysis for Top 5 Players
20.3. Key Players Landscape for Top 10 Market Players
20.3.1. BorgWarner Inc.
20.3.1.1. Company Details
20.3.1.2. Key Management Personnel
20.3.1.3. Products and Services
20.3.1.4. Financials (As Reported)
20.3.1.5. Key Market Focus and Geographical Presence
20.3.1.6. Recent Developments/Collaborations/Partnerships/Mergers and Acquisition
20.3.2. Garrett Motion Inc.
20.3.3. Mitsubishi Heavy Industries, Ltd.
20.3.4. Cummins Inc.
20.3.5. ABB Ltd
20.3.6. IHI Corporation
20.3.7. Ningbo Motor Industrial Co., ltd.
20.3.8. MAHLE Aftermarket Inc.
20.3.9. Marelli Holdings Co., Ltd.
20.3.10. ADP Distributors, Inc.
*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work.
21. Strategic Recommendations
22. About Us and Disclaimer

Automotive Turbocharger Market Assessment, By Type [Fixed Geometry Turbochargers, Wastegate Turbochargers, Variable Geometry Turbochargers], By Fuel Type [Diesel, Gasoline], By Vehicle Type [Passenger Car, Light Commercial Vehicle, Heavy Commercial Vehicle], By Sales Channel [Original Equipment Manufacturer, Aftermarket], By Region, Opportunities and Forecast, 2018-2032F

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