Automotive Chassis Market Assessment by Type [Backbone, Ladder, Monocoque, Modular, Others], By Material Type [High Strength Steel, Mild Steel, Aluminium Alloy, Carbon Fibre Composite, Others], By Propulsion Type [ICE, BEV, PHEV, Others], Vehicle Type [Passenger Vehicles, Light Commercial Vehicles, Heavy Commercial Vehicles, Others], By Region, Opportunities and Forecast, 2017-2031F

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Report description:

Global automotive chassis market is projected to witness a CAGR of 5.98% during the forecast period 2024-2031, growing from USD 70.17 billion in 2023 to USD 111.67 billion in 2031. The chassis is the basic structure that provides stability, control, and safety to the vehicle. Just like every automotive component, the chassis has evolved with new vehicle designs and requirements. The advent of lightweight materials, advanced design, and active safety features have transformed chassis manufacturing. Furthermore, the usage of composites and recycled materials in the production of automotive chassis is anticipated to fuel the market expansion. Higher adoption of electric and hybrid vehicles has added new elements to chassis design that cater to EV requirements.

The higher demand for lightweight vehicles for higher range, lower emissions, and fuel efficiency is pushing manufacturers to build platforms with ultra-light materials such as carbon fiber, high-strength steel, and aluminum. The materials and design are chosen considering the energy absorption capacity. Integration of electric powertrains with battery packs placed into the vehicle floor for better weight distribution and enhanced handling properties. The increased demand for chassis is attributed to the rising sales of automobiles and regulatory compliances. Hence, the key players are expanding their manufacturing facilities.

In July 2023, ZF Friedrichshafen AG announced a 50-50 partnership with Hon Hai Technology Group (Foxconn) to build passenger car chassis systems. The move is being taken to accelerate and strengthen the automotive supply chain. Foxconn would be acquiring a 50% stake in ZF Chassis modules GmbH, with an enterprise value of USD 1.1 Billion, to improve its product distribution in the internal combustion engine and electric vehicle space.

Increasing EV Adoption and Rapid Transformation in Fuel the Market

The rising adoption of electric vehicles due to fuel efficiency and improved battery technology is creating demand for automotive chassis. Hence, the vendors are expanding their manufacturing facilities to meet the growing demand. An EV chassis needs to be highly strong and rigid to resist torsional vibrations in case of a crash. The higher demand for strong EV chassis that carry heavy batteries and equipment is propelling the demand for automotive chassis globally. With no vibration-producing element in EVs, there is no demand for expensive resilient fixtures. The manufacturers stick with modular skateboard designs that carry large battery packs, lowering the center of gravity and enhancing handling and stability. It leads to the production of cost-effective chassis models that serve a long range of electric vehicles.

For instance, in May 2023, REE Automotive Ltd. allied with Japanese KYB Corp. to develop next-generation EV platforms. The partnership would assist both businesses in building a new scalable electric vehicle platform to serve a range of automobiles such as heavy-duty EVs, SUVs, MUVs, and last-mile delivery vehicles.

The evolving vehicle design including modular car bodies promotes cost-effective and flexible models. It enables component sharing involving basic chassis structure between different vehicle types such as crossovers, SUVs, and sedans.

Improvisation in Chassis to Shape the Market Dynamics

Major automotive chassis market trends include upscaled structural rigidity with the help of advanced engineering techniques and materials. Higher demand for vehicles with less vibration and noise is transforming chassis manufacturing. Reduced NVH (Noise, Vibration, and Harshness) levels require the addition of additional insulation, damping materials, and specific component placement. These chassis comprise properties like structural rigidity and connected features.

Apart from the structural rigidity, the trends follow active safety features comprising electronic stability control, autonomous braking, and forward collision warning. The chassis structure plays crucial role in enhancing vehicle security. Sensor placement in the chassis with the integration of actuator systems helps the vehicle detect potential safety threats and mitigate accidents. The chassis digitization and advancement techniques are being adopted by the major automotive manufacturers.

For instance, in September 2023, BMW GmbH and Qualcomm Technologies came together as Qualcomm's Snapdragon Digital Chassis assisting the auto giant in making vehicle chassis smart, safe, and sophisticated. The collaboration extends companies' technological ties beyond automated driving and driver assistance technologies. The project leverages the state-of-the-art, next-generation Snapdragon Cockpit Platform for BMW Group's new on-board experiences, and the next-generation, super-fast, ultra-low-latency, and ultra-smooth mobile connectivity platform for the next generation of 5G connectivity.

Government Safety Concerns and Regulatory Frameworks to Shape the Market Trajectory

The government's push for EV adoption has resulted in increasing research and development programs. It includes transformed chassis design and utilization of a long range of materials. Apart from the EV push, the government's regulation to ensure safety and environmental standards, impacts the market dynamics. These regulations comprise fuel efficiency requirements, safety guidelines, material standards, and emissions laws.

Apart from the government department related to vehicles also uses vehicle chassis numbers or VINs. The Vehicle Identification Number (VIN) is used to identify a vehicle, keep track of its history, register it, provide insurance, recall it, and prevent it from being stolen. The government authorities push for advanced technology adoption by automotive manufacturers. However, the governments roll out different operating standards for providing incentives.

For instance, in April 2023, the Government of India released a standard operating procedure for Production Linked Incentives (PLI) schemes. It allows manufacturers to submit applications for testing and certification of advanced automotive technology equipment. The scheme is composed of two components: Champion OEM, which will manufacture electric or hydrogen-powered vehicles, and Component Champions, which will manufacture high-value and advanced components.

Monocoque Segment to Fuel the Market

Based on type, the monocoque segment is expected to hold a decent share of the global automotive chassis market. The growth is attributed to its fuel efficiency delivered by its lightweight dynamics. It involves a metal framework that extends to the end point of the vehicle body. The design ends the requirement of adding weight to different parts of the vehicle for overall vehicle strengthening, which directly results in improved fuel efficiency.

These structures are modular, and the same architecture can support multiple vehicles with minimal changes, resulting in significant cost savings for the manufacturer. Furthermore, the utilization of monocoque in SUVs has increased over the years as it

delivers cost-efficient and steady support to the vehicle. The increased sales of SUVs, which have recently gained popularity, have increased in the monocoque segment. Apart from SUVs, the monocoque chassis is getting adopted in motorsport projects involving hypercars and supercars.

For instance, in June 2023, DASH-CAE Ltd. launched a new carbon fiber monocoque chassis, the TR01. The chassis delivers an affordable and dynamic solution for hypercars, enabling a price-to-performance ratio. The TR01 chassis can be further customized to meet the specific requirements of the customer, including the center console design.

Asia-Pacific Dominates Global Automotive Chassis Market

Based on region, Asia-Pacific is anticipated to hold a decent share of the market. The growth is attributed to the increased per capita income along with higher sales of passenger vehicles. Some of the world's biggest and fastest-growing economies, including China, India, and Japan, are some of the biggest automotive markets in the world. As a result, manufacturers are increasing production and launching new models in these regions to meet the rising demand, which is increasing the market size for chassis systems.

The rapid regional growth is attributed to the large-scale production and adoption of electric vehicles. Rising fuel prices and government subsidies on EVs are likely to carry forward the demand for electric and hybrid vehicles. Furthermore, automakers in emerging economies like China and India are introducing new chassis models for electric vehicles, which is expected to drive the global automotive chassis in the future.

For instance, in January 2024, Chinese EV technology firm U Power launched a skateboard chassis to accelerate EV manufacturing. The chassis system named UP Super Board reduces the development duration through the usage of plug-and-lay technology.

In December 2023, Contemporary Amperex Technology Limited (CATL) of China recently unveiled its skateboard chassis, which has a structural battery pack with a 1,000-kilometer range. In addition, Tesla's supplier CATL produced an integrated intelligent chassis (CIIC).

Future Market Scenario (2024 – 2031F)

- Electric vehicle adoption, new lightweight materials, and expanded automotive components manufacturing facilities are expected to add value to the market dynamic.
- Innovative chassis designs for electric heavy-duty vehicles along with light and fuel-efficient monocoque are anticipated to fuel the sales of automotive chassis globally.
- The adoption of aluminum alloy and carbon fiber materials along with the integrated chassis structure is expected to transform chassis manufacturing in the future.
- Modular chassis platform is likely to gain prominence during the forecast period due to higher efficiency, flexibility, faster production, and lower environmental impact.

Key Players Landscape and Outlook

The competitive landscape for the automotive chassis market holds a mixture of major automotive OEM suppliers and new entrants. The companies adopt different strategies to expand their market hold such as increased efficiency, enhanced flexibility, quicker production times, improved quality control, and simpler aftermarket maintenance. The companies collaborate, merge, and acquire to expand the distribution channels and supply chains.

In July 2023, Stellaris N.V. announced the launch of STLA Medium, the world's first BEV-by-design platform with industry-leading features such as a 700 km (485 miles) range, energy efficiency, integrated power, and charging power. The STLA Platform offers long-range paired with design flexibility to host a multitude of vehicles and propulsion configurations in the core of the market, C and D-segment sedans.

In April 2023, ZF announced an investment of approximately USD42.96 million over 2024 to increase its chassis manufacturing capacity in its new plant in Toluca, Mexico. The new plant will have high-speed assembly lines to produce just-in-time suspensions for passenger electric vehicles, including front and rear axle suspensions and corner module suspensions, which include brake components as well as drive components.

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