

# Mechanical properties of chassis

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## Mechanical properties of chassis

What is the purpose of chassis in the car?

Chassis refers to a structural assembly of the car's body. It is a protective covering of a car, which keeps the dirt, moisture, and dust away from the moving parts. The chassis protects the driver from the parts that are on locomotion under the hood of the car, it also protects commuters from atmospheric conditions. The chassis protects the other vehicle parts from any damage, as well as holding the main parts of the vehicle together.

## Mechanical properties of chassis

The Poisson ratio, density, yield strength, and young's modulus constitute the mechanical properties of the chassis material. The rigidity of the chassis material for every unit of its weight brings out the specific stiffness of the material this specifies the mechanical property of young's modulus constitutes and density. A rigid chassis ensures an alteration in relative roll stiffness as well as the total load transfer characteristics, ensuring a linear relationship, in effect to Poisson ratio. The sheets used to make the chassis must be of high strength, with the aim of weight reduction and secure car crash, to ensure yield strength.

## Car chassis diagram

Below is a representation of the car chassis. Parts to be added to the assembly of car chassis include screws. Screws are used in joining the chassis with other parts of the vehicle to aid in easy maintenance of the spare parts. Clutch is also to be included in the chassis assembly as it connects and disconnects the engine power; which makes up a main component of the chassis for power provision. The gear box must also be added to the assembly of the chassis this part works hand in hand with the

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clutch. Steering wheel, bearing, spring, damping, stabilizer, and brakes determine the dynamics of the vehicle. Damping is used in increasing driving safety and comfort by electronically controlling damping forces for each wheel. A control unit works together with the continuous damping system to calculate the necessary damping forces and adjust the dampers when required. The chassis structure is supported by wheels and Tyre components, which hold the grip of the road and the car. Shock absorbers and springs damp the shocks and vibrations of the car and road this helps in maintaining stability and comfort of the car (Remus, Timothy, and Coddington, 274).

#### Process of making chassis

A chassis material is usually made out of steel and aluminum alloys. The chassis material must demonstrate an increase in strength by the action of paint baking after press- forming step. In the making of the chassis, initially engineers must design the framework. They use principles based on reliability and usability as per chassis specifications. The material of the chassis is next chosen, and the material cut using high quality cutters; for example plasma and laser cutters. Welders next transform the engineered concept into a reality by providing flat surfaces. The end products from the welders are then shot blasted to a white metal, and it is ready to be painted. The chassis is then painted with a urethane coat of high standards as well as a high zinc primer. Next, assembly takes place, the body of the vehicle is linked to the chassis, air and electrical lines are connected to the chassis. As a quality control procedure, engineers must inspect the vehicles made. In the hand laminating process, a mould is first made. The mould is then waxed

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and polished, later a gel is applied to it. Resin and reinforcements are sprayed on the mould made. The welders then roll out the product so as to enable a smooth product other materials are then added. Another spraying process takes place, to join the two different materials as one. The material is then shaped as desired, cooled and taken away from the mould (Remus, Timothy, and Coddington, 164).

#### Health and safety issue in producing the chassis

In chassis production, the safety of the workers must be met. The production demands a risky environment; there is the presence of highly hot temperatures, which is a safety issue. Every step in chassis production is particularly dangerous and must be regarded as a safety issue. Cooling process is also dangerous; the chemicals involved in the manufacture pose a health risk. As a precaution, the workers must have an insurance cover.

#### Work cited

Remus, Timothy, and Boyd Coddington. *Boyd Coddington's Hot Rod Engines, Drivelines & Chassis*. St. Paul, Minn: Motorbooks International, 2006. Print.