

# INTRODUCTION TO AUTOMOBILE ENGINEERING

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**HELLO CLASS: GOOD MORNING!**



The term automobile is derived from the Greek word “autos”, which means self,

and the French word “mobile”, which means moving.



# FACTS

- Automobiles have around more than 100 years
  - Originally called horseless carriages
- Today more than 130 million cars in the U.S.
  - One-third of cars in the world
  - The official land-speed record (measured over one mile) is 1,227.985 km/h!!!!!!!!!!!!!!!!!!!!!!!!!!!!
- Total registered vehicles in Bangladesh **1030864**



# 007

**TOP SPEED 299 KM/H**



**ASTON MARTIN DB9 V12**



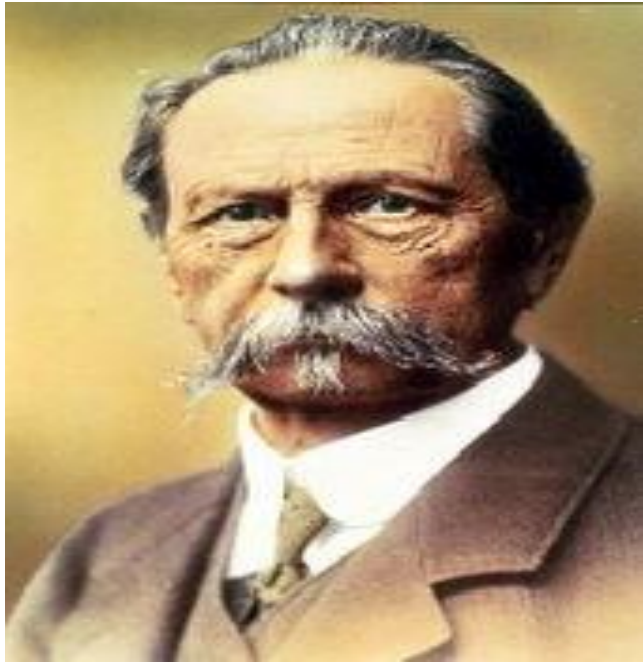
## A SHORT HISTORY LESSON!

- In 1807 François Isaac de Rivaz designed the first car powered by an internal combustion engine fueled by hydrogen
- In 1886, Karl Benz developed a petrol or gasoline powered automobile. This is also considered to be the first "production" vehicle as Benz made several other identical copies. The automobile was powered by a single cylinder two stroke engine.
- Henry Ford made mass production.

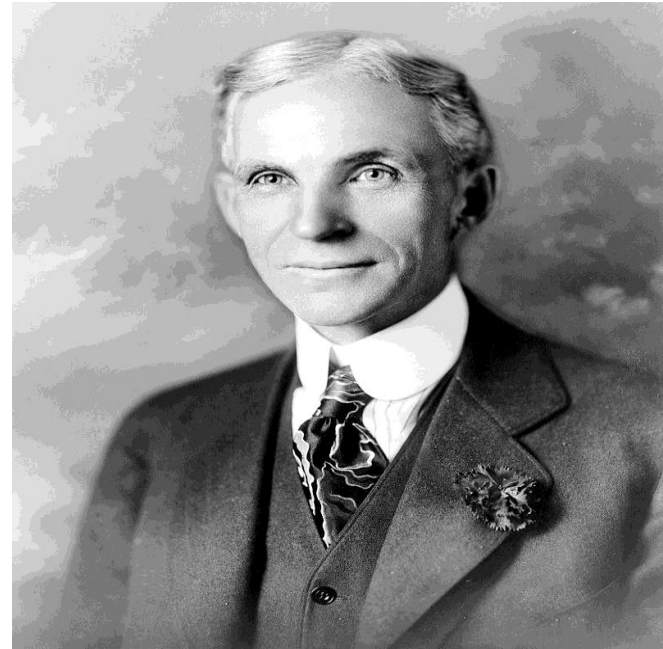




1886



Karl Benz



Henry Ford





# AUTOMOBILE

- Automobile is a vehicle driven by an internal combustion engine.
- **Automobile Engineering** is a branch of **engineering** which deals with designing, manufacturing and operating automobiles.



# Some Important Terms



# WHAT ARE PART, ASSEMBLY & COMPONENT

- A part is the smallest removable item on a car. A part is not normally disassembled.
- The word component is frequently used when referring to an electrical or electronic part. For example, a spark plug is an ignition system component that ignites the fuel in the engine.



- An assembly is a set of fitted parts designed to complete a function.
- For example, the engine is an assembly that converts fuel into useable power to move the vehicle.



# FRAME AND BODY

- The frame is the strong metal structure that provides a mounting place for the other parts of the vehicle
- The frame holds the engine, transmission, suspension, and other assemblies in position.
- The body is a steel, aluminum, fiberglass, plastic, or composite skin forming the outside of the vehicle. The body is painted to give the vehicle an attractive appearance

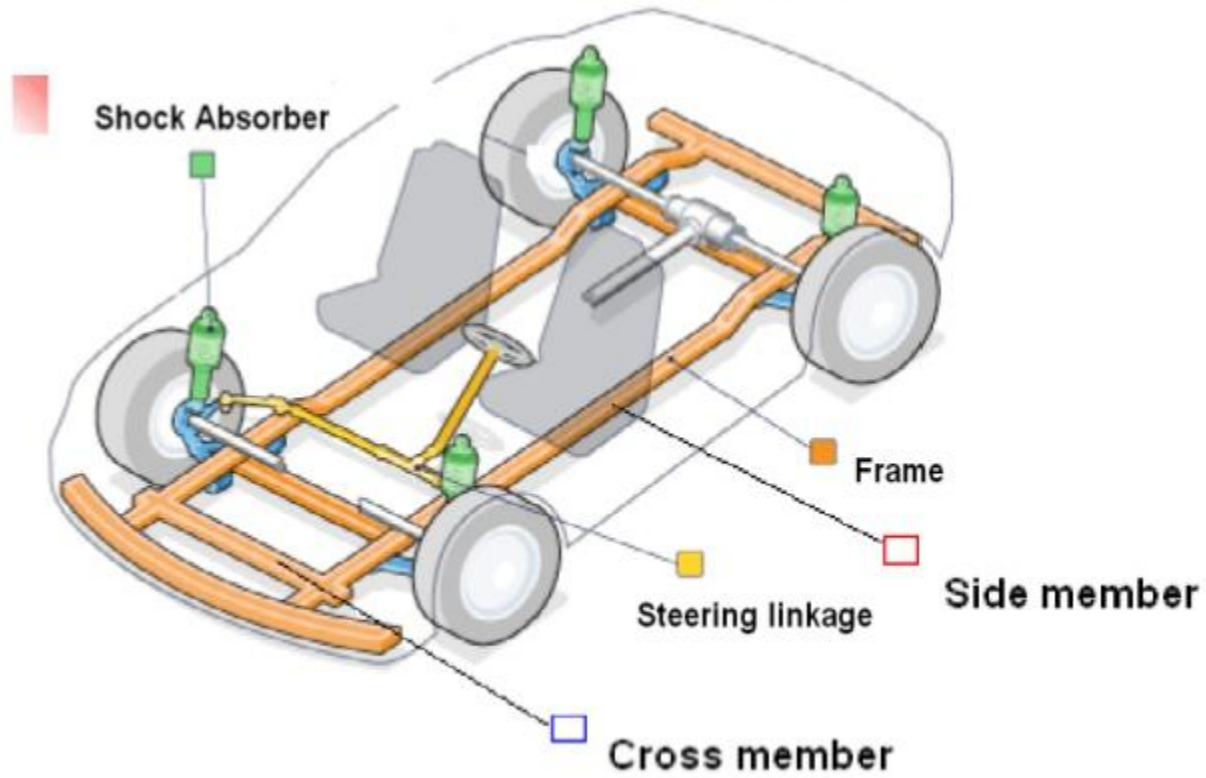


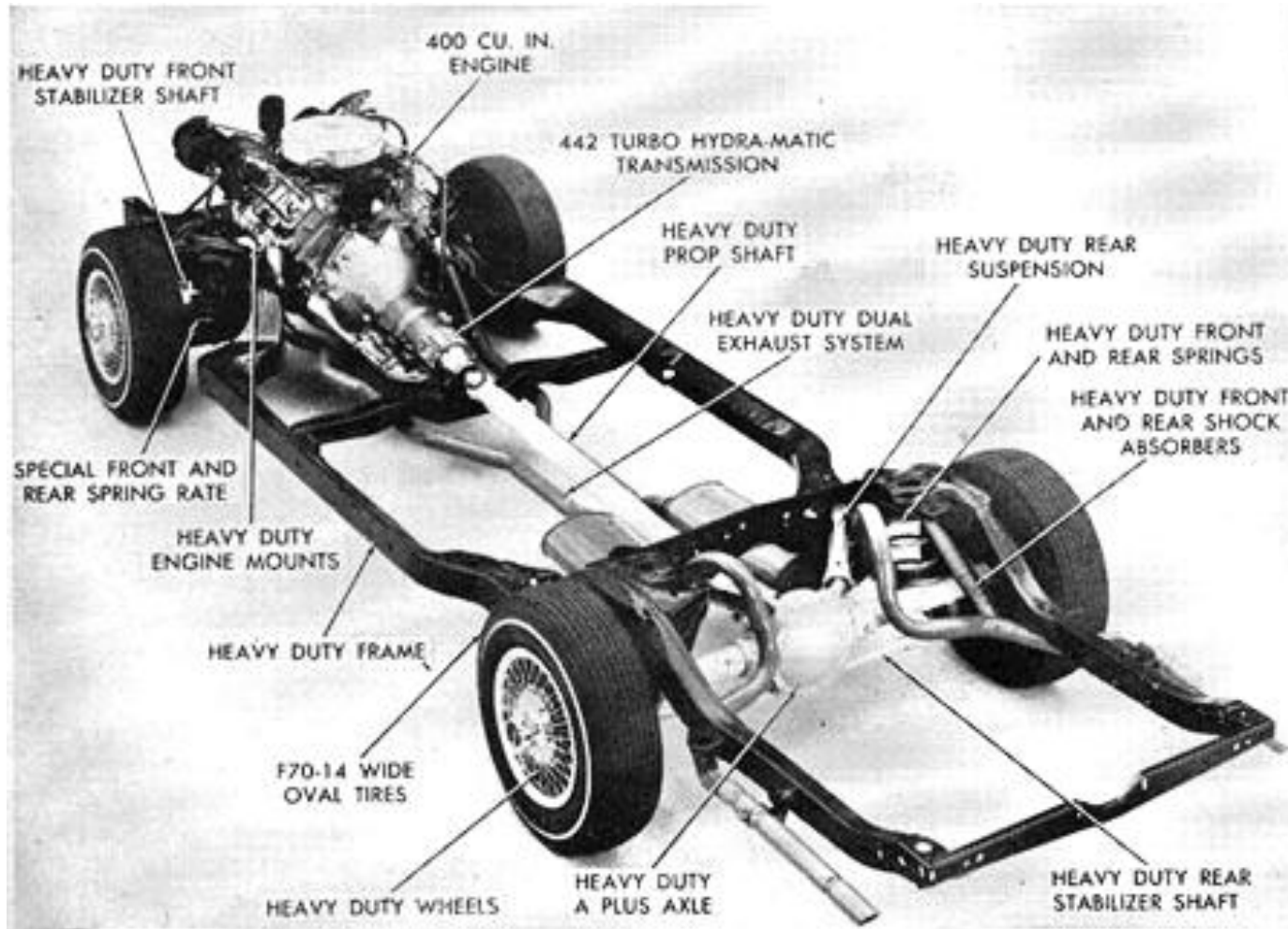
## CHASSIS OF AN AUTOMOBILE

- The term chassis is often used when referring to a vehicle's frame and everything mounted to it except the body—tires, wheels, engine, transmission, drive axle assembly, and frame.



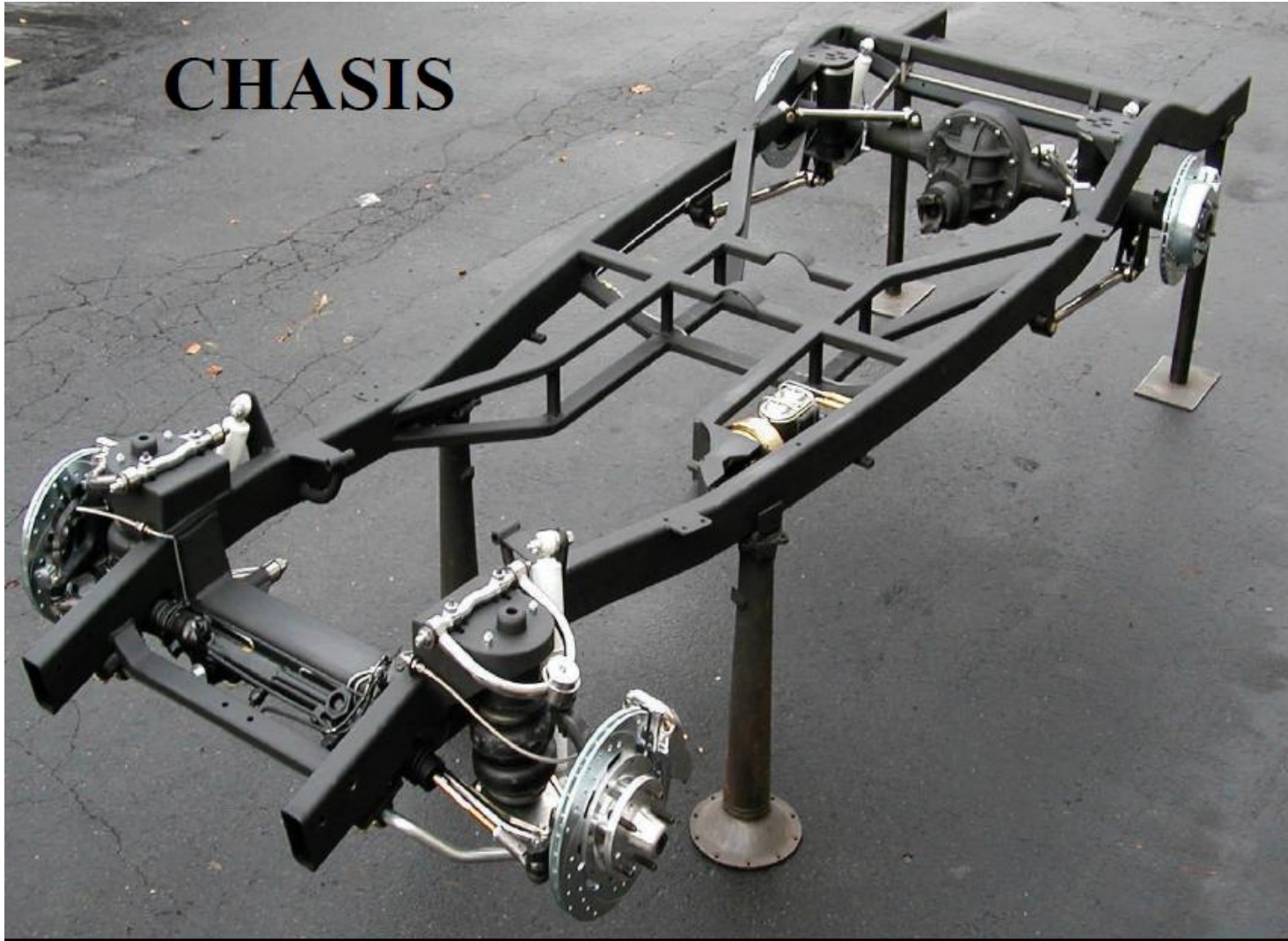
# CHASSIS







# CHASIS



# BODY FRAME

- To support the vehicle's mechanical components and body
- To deal with static and dynamic loads, without undue deflection or distortion.
  - Weight of the body, passengers, and cargo loads.
  - Vertical and torsional twisting transmitted by going over uneven surfaces.
  - Transverse lateral forces caused by road conditions, side wind, and steering the vehicle.
  - Torque from the engine and transmission.
  - Longitudinal tensile forces from starting and acceleration, as well as compression from braking.
  - Sudden impacts from collisions.



# *TYPES OF CONSTRUCTION OF AUTOMOBILE*

- *1. Body-over-frame construction*
- *2. Unibody construction*



- A **unibody frame** is a type of vehicle construction where the both the body of the car and the **chassis** forms a single unit; reinforcements are then added to other specific sections of the car.
- **Body-on-frame** is an automobile construction method by which a separate body is mounted on a relatively rigid frame or chassis that carries the engine and drivetrain.



## BASIC FEATURES OF AUTOMOTIVE BODY:

- **Body and frame**—support and enclose the vehicle
- **Engine**—provides dependable, efficient power for the vehicle
- **Computer systems**—monitor and control various vehicle systems.
- **Fuel system**—provides a combustible air-fuel mixture to power the engine.



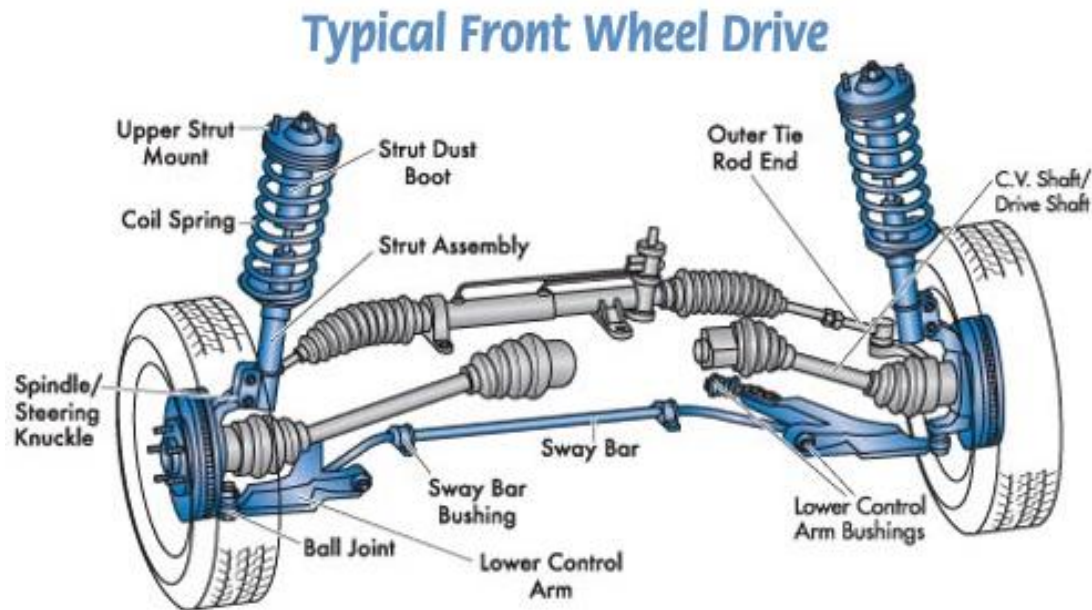
- **Electrical system**—generates and/or distributes the power needed to operate the vehicle's electrical and electronic components.
- **Cooling and lubrication systems**—prevent engine damage and wear by regulating engine operating temperature and reducing friction between internal engine parts.



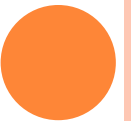
- **Exhaust and emission control systems**—quiet engine noise and reduce toxic substances emitted by the vehicle.
- **Drive train systems**—transfer power from the engine to the drive wheels.
- **Suspension, steering, and brake systems**—support and control the vehicle.
- **Accessories and safety systems**—increase occupant comfort, safety, security, and convenience.



- **Suspension** is the **system** of tires, tire air, springs, shock absorbers and linkages that connects a **vehicle** to its wheels and allows relative motion between the two.







THANK YOU

