SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.

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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUT302 – VEHICLE DYNAMICS AND STRUCTURES

III YEAR / V SEMESTER

Unit 3 – Vertical Dynamics

Topic : Air Suspension System and its properties

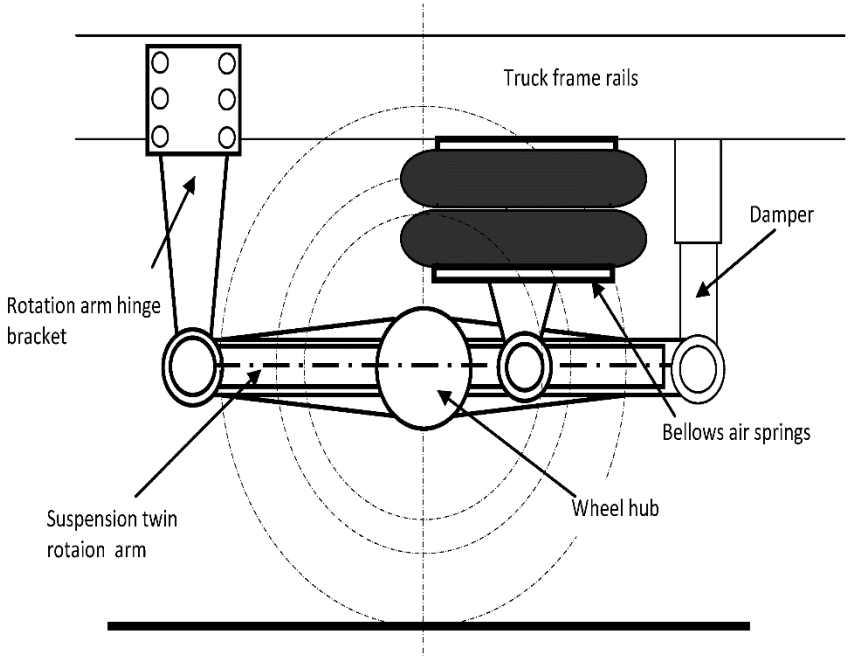
AIR SUSPENSION SYSTEM

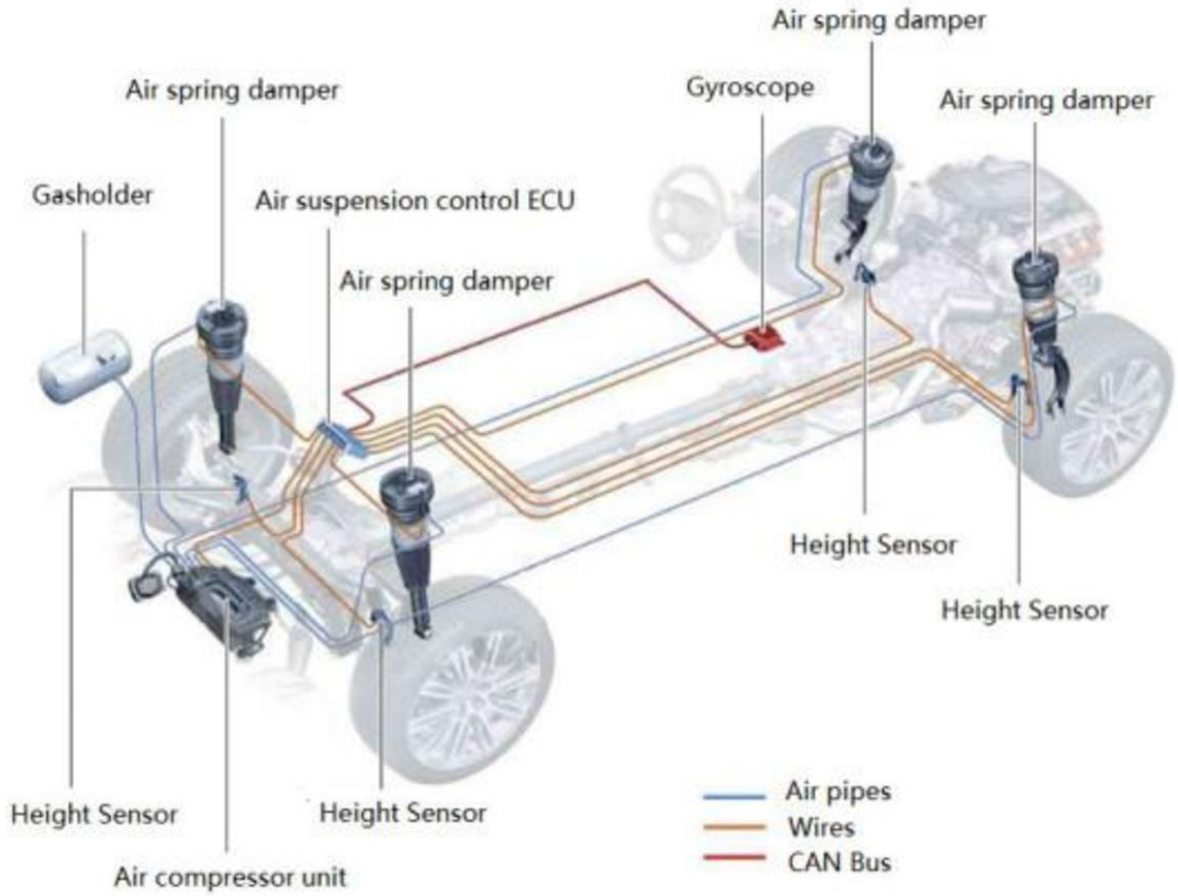
- An air suspension system is a type of vehicle suspension that uses air springs (airbags) to support the weight of the vehicle instead of traditional coil or leaf springs.
- This system can be found in various types of vehicles, including cars, trucks, buses, and even some high-end luxury and recreational vehicles (RVs)

COMPONENTS

- Air Spring
- Air Compressor
- Air Reservoir
- Sensors
  - Height Sensor
  - Load Sensor
  - Speed Sensor
- Control module
- Valves and Solenoids

AIR SUSPENSION SYSTEM





AIR SUSPENSION SYSTEM

- The air suspension system works on the principle of using compressed air to vary the height of the suspension system of the vehicle
- The bumps on the road compress airbags and they bounce up and down allowing the wheels to move. The airbags are nothing but a rubber bladder that holds air, usually made from textile-reinforced rubber or a composite of rubber and polyurethane

AIR SUSPENSION SYSTEM

- A height sensor is used to sense the change in height of the suspension when the vehicle is loaded.
- The compressed air is used to inflate the airbags and raise the chassis from the axle.
- An on-board air receiver tank that stores the compressed air is used for supply without any delay.
- The basic utility of the air suspension system is to keep the height of the vehicle constant when the load on the vehicle varies
- To provide stability to the vehicle by absorbing road shocks.

AIR SUSPENSION SYSTEM WORKING

- The air accumulator supplies air to the valves (HCV) which are attached to the frame of the vehicle.
- The valves are connected to the airbags via the supply lines.
- At the point when the load is added to the vehicle, the HCV linkage deflects and travels the valve in accordance with the load on the vehicle to keep the suspension at a constant height.
- The valving of the HCV supplies air to the airbags according to the deflection on the linkage.
- The supplied air inflates the airbags and brings the suspension back to its original position.

AIR SUSPENSION SYSTEM WORKING

- This ensures a correct ride stature and the HCV linkage moves to an unbiased position.
- The valves also return to their original state and secure the airbags to keep up the best possible ride height.
- When the weight is expelled from the vehicle or the suspension system, the load on the axle moves away and returns to its original position.
- The air is released from the airbags through the exhaust port and the linkage climbs to its neutral position.
- After this, the exhaust port is shut and the remaining air inside the airbags is locked again, keeping up the correct ride height.

PROPERTIES

- Adjustable Ride height
- Load Leveling Capability
- Improved Ride Comfort
- Enhanced Handling
- Reduced Vibration and Noise
- Improved Aerodynamics
- Adaptive and Active Control

THANK YOU !!!