



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUT302 – VEHICLE DYNAMICS AND STRUCTURES

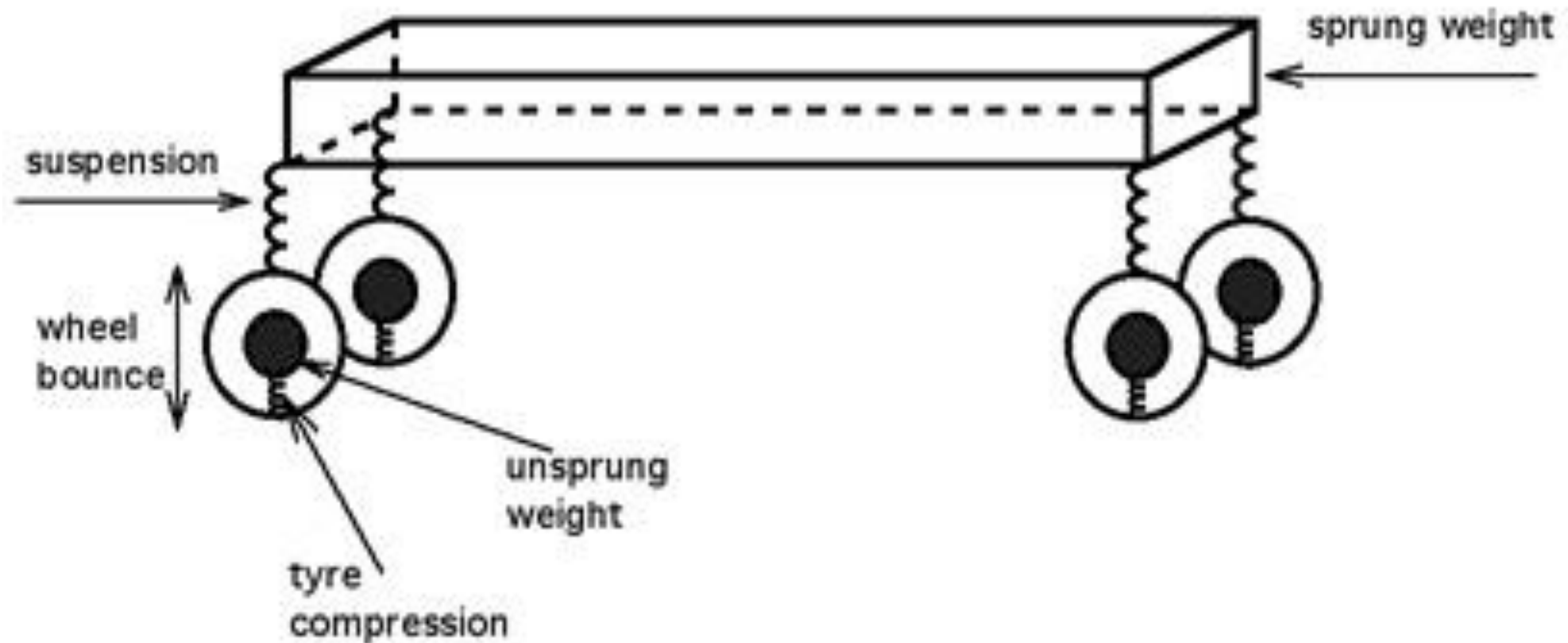
III YEAR / V SEMESTER

Unit 3 – Vertical Dynamics

Topic : Skyhook Damping



SPRUNG AND UNSPRUNG MASS





SKYHOOK DAMPING



- ❖ Skyhook damping is a concept commonly used in the field of mechanical engineering and vehicle dynamics, particularly in the context of suspension systems for vehicles.
- ❖ It is a method employed to control and improve the ride comfort and stability of a vehicle, especially in response to external disturbances and road irregularities.



SKYHOOK DAMPING



- ❖ The basic idea behind skyhook damping is to create an imaginary or "virtual" damping system that is connected between the sprung and unsprung masses of a vehicle.
- ❖ The sprung mass includes the vehicle's body and occupants, while the unsprung mass comprises the wheels, tires, and suspension components.
- ❖ In a real-world suspension system, these masses are interconnected through the suspension springs and damper



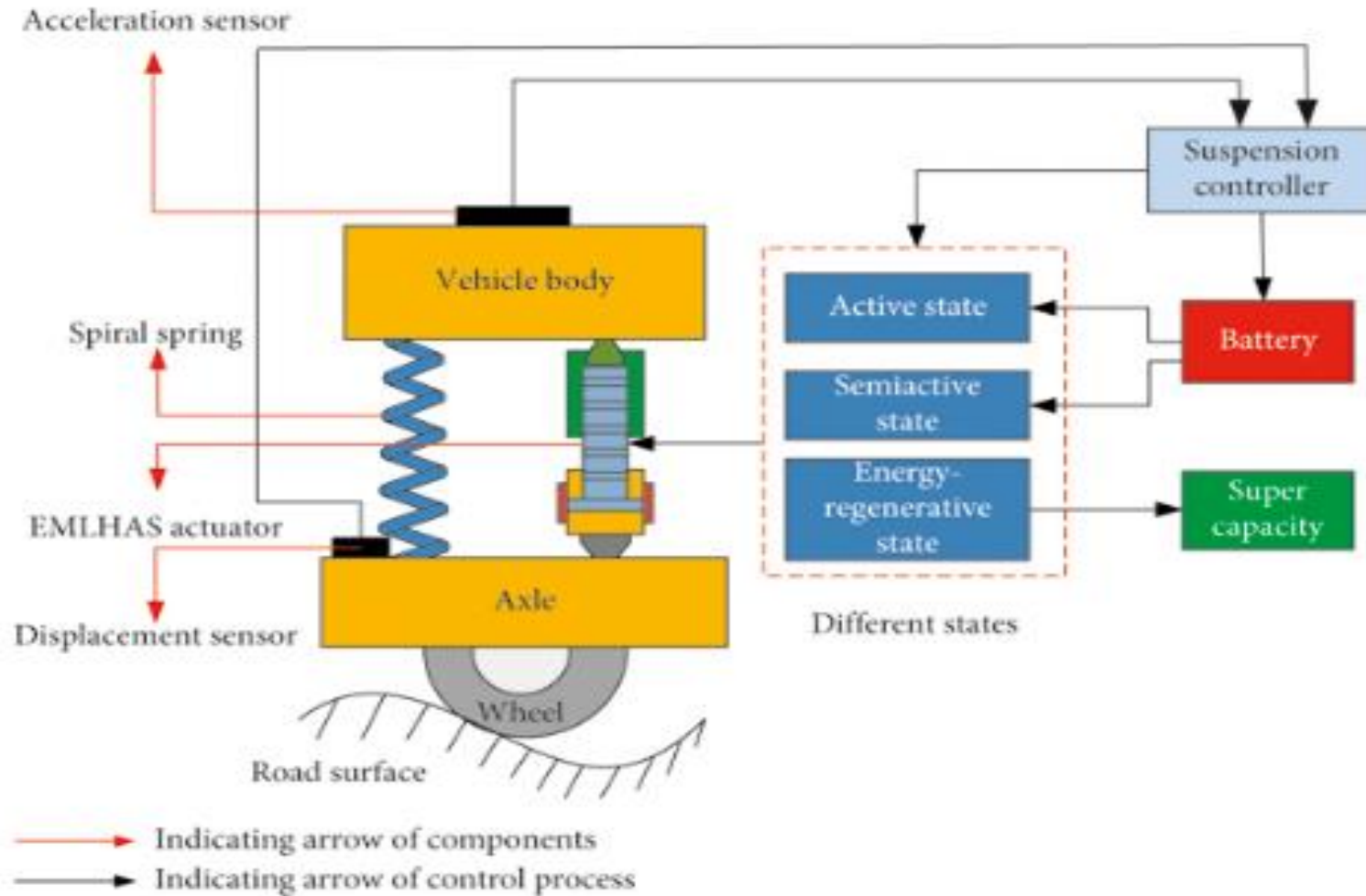
SKYHOOK DAMPING



- ❖ In a skyhook damping system, a hypothetical damping force is applied to the sprung mass as if it were connected to the unsprung mass by a skyhook.
- ❖ This virtual damping force is proportional to the relative velocity between the two masses.
- ❖ When the unsprung mass moves relative to the sprung mass, such as when encountering bumps or irregularities in the road, the virtual skyhook damper resists this motion.
- ❖ This has the effect of isolating the occupants from the harshness of road disturbances, improving ride comfort.



SKYHOOK DAMPING





SKYHOOK DAMPING

- ❖ Skyhook damping doesn't physically exist but is a control strategy that can be implemented using real dampers in a vehicle's suspension system.
- ❖ It is part of the broader field of active and semi-active suspension systems, where the damping characteristics of the shock absorbers or dampers can be adjusted in real-time to optimize ride comfort, handling, and vehicle stability.
- ❖ By using sensors and control algorithms, the vehicle's suspension system can adapt the damping forces in response to changing road conditions and driving situations.
- ❖ This allows for a smoother and more comfortable ride while maintaining good handling and stability.



SKYHOOK DAMPING





SKYHOOK DAMPING





THANK YOU !!!