



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35.



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DEPARTMENT OF AUTOMOBILE ENGINEERING

COURSE NAME : 19AUB202 – AUTOMOTIVE SYSTEMS

II YEAR / III SEMESTER

Unit 2 – Steering System

Topic : Desirable Characteristics and Principle of Steering System



INTRODUCTION



- ❖ Steering system is a crucial component that allows the driver to control the direction of the vehicle's movement.
- ❖ It provides a means for the driver to turn the front wheels, determining the vehicle's path and allowing it to navigate safely on the road.





DESIRABLE CHARACTERISTICS



- The steering system should respond quickly to driver input, allowing for precise control of the vehicle's direction.
- Responsiveness is essential for safety and maneuverability.
- Drivers should be able to predict how the vehicle will respond to steering inputs.
- A predictable steering system enhances driver confidence and reduces the likelihood of accidents.
- A good steering system provides feedback to the driver through the steering wheel, allowing them to feel the road surface and the vehicle's behavior.
- This tactile feedback helps the driver make informed decisions while driving.



DESIRABLE CHARACTERISTICS



- The steering system should maintain stability at various speeds and under different road conditions.
- It should prevent excessive or unexpected steering wheel movements that could lead to loss of control.
- A steering system should offer fine control for both small and large steering inputs.
- The steering system should not require excessive physical effort from the driver.
- Power steering systems are commonly used to reduce the effort needed to turn the steering wheel, making driving more comfortable.



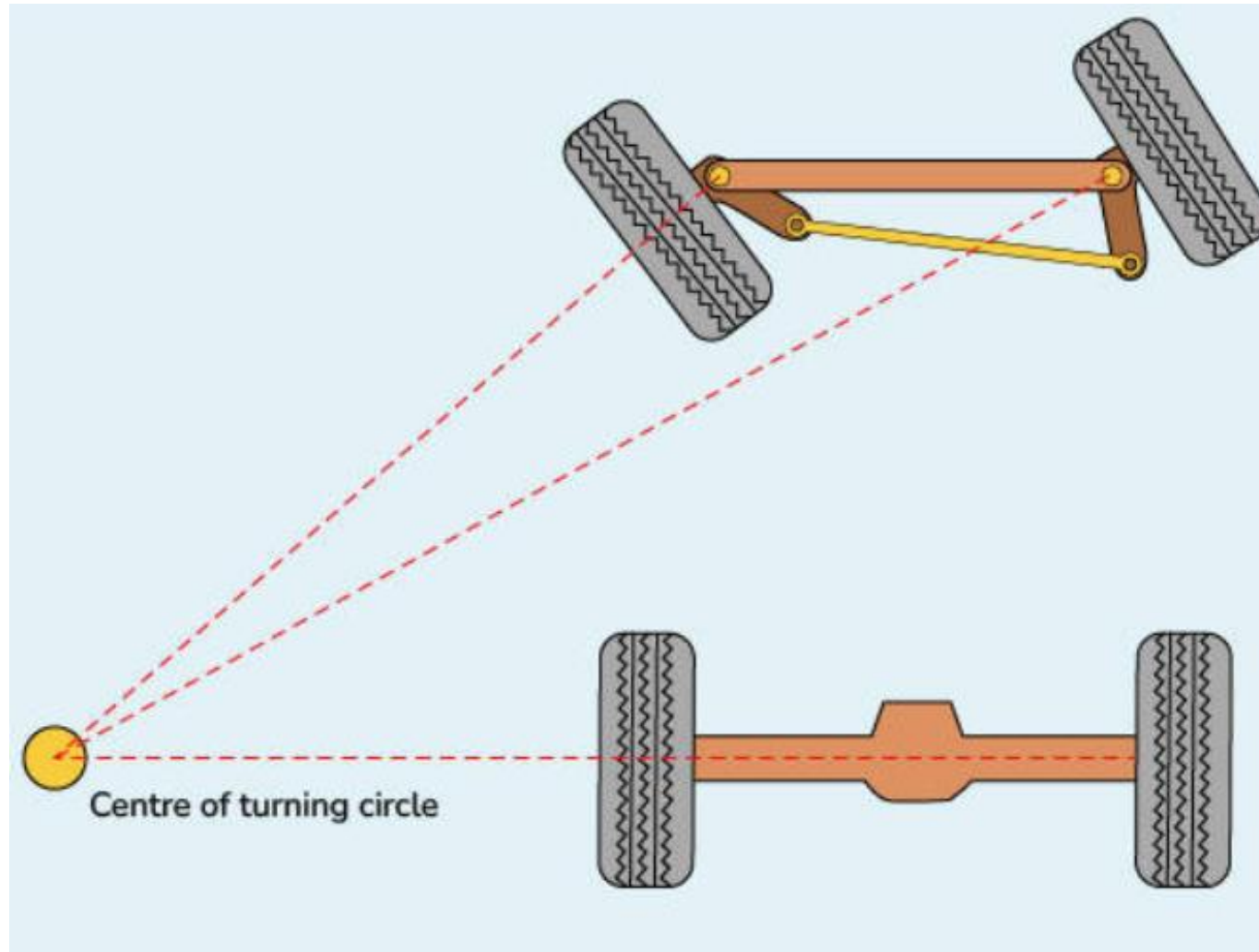
DESIRABLE CHARACTERISTICS



- The steering system should be robust and durable, able to withstand daily use and potential shocks from rough roads or potholes.
- A steering system that requires minimal maintenance and is designed for long-term reliability is desirable for cost-effectiveness and safety.
- Effective noise and vibration damping in the steering system contribute to a comfortable driving experience.

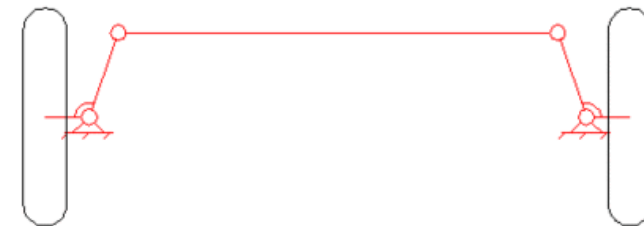
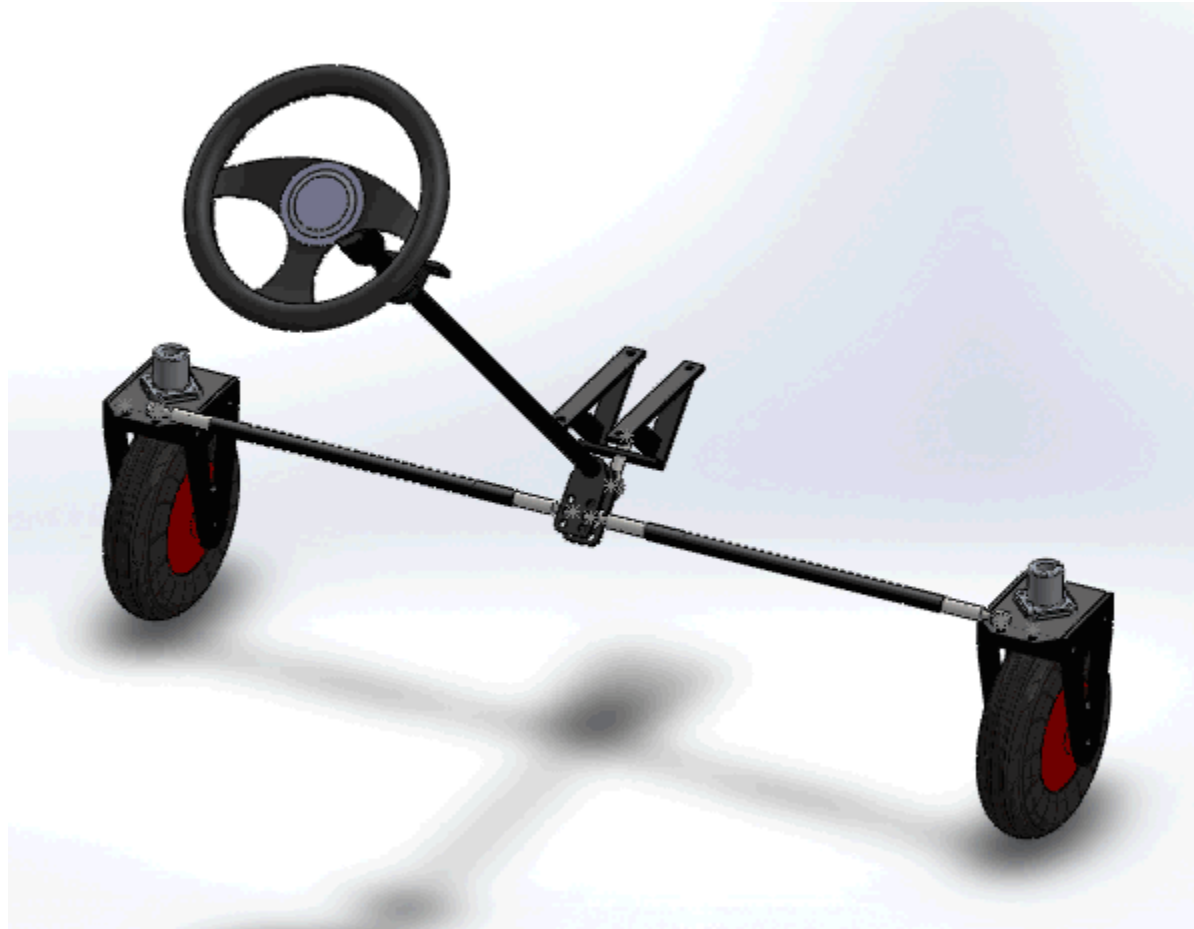


PRINCIPLE OF STEERING





ACKERMANN PRINCIPLE





PRINCIPLE OF STEERING



- In a simple two-wheel steering system (front wheels), the outer wheel follows a wider turning radius than the inner wheel when the vehicle makes a turn.
- Because the outer wheel covers a longer distance in the same amount of time.
- The Ackermann principle ensures that all four wheels achieve the same turning angle during a turn, even though the outer wheels travel a longer distance.
- To achieve this, the inner front wheel is turned at a sharper angle than the outer front wheel.
- This compensates for the longer path the outer wheel travels, allowing both wheels to follow their respective turning radii.



BENEFITS OF ACKERMANN STEERING



- **Improved cornering stability:** By ensuring that all four wheels follow their respective turning radii, the vehicle maintains better stability during turns.
- **Reduced tire wear:** When the wheels turn at appropriate angles, tire scrubbing and wear are minimized, extending tire life.
- **Smoother handling:** The Ackermann principle helps achieve smoother, more predictable handling and reduces the likelihood of understeer or oversteer during turns.



THANK YOU !!!