



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 : 19AUB202 – AUTOMOTIVE SYSTEMS

II YEAR / III SEMESTER

Unit 3 – Transmission System

**Topic : Propeller Shaft, Slip Joint, Universal Joint and Construction of
Differential Unit**



PROPELLER SHAFT



- ❖ A propeller shaft, also known as a driveshaft, is a mechanical component used in various vehicles to transmit power from the transmission or gearbox to the vehicle's drive wheels.
- ❖ It plays a crucial role in the drivetrain, allowing power to be delivered from the engine to the wheels, enabling the vehicle to move.
- ❖ Propeller shafts are typically made of strong, durable materials, such as steel or aluminum, to handle the torque and rotational forces generated by the engine

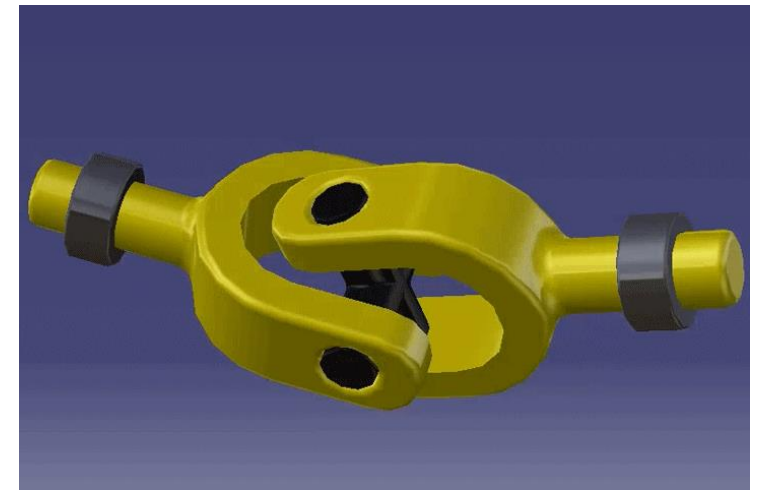




UNIVERSAL JOINT



- A universal joint, often abbreviated as U-joint, is a mechanical component used to connect two shafts at an angle that allows them to transmit torque and rotational motion.
- U-joints are commonly used in various applications, including vehicles, industrial machinery, and power transmission systems, where two shafts need to operate at different angles and still transmit power efficiently

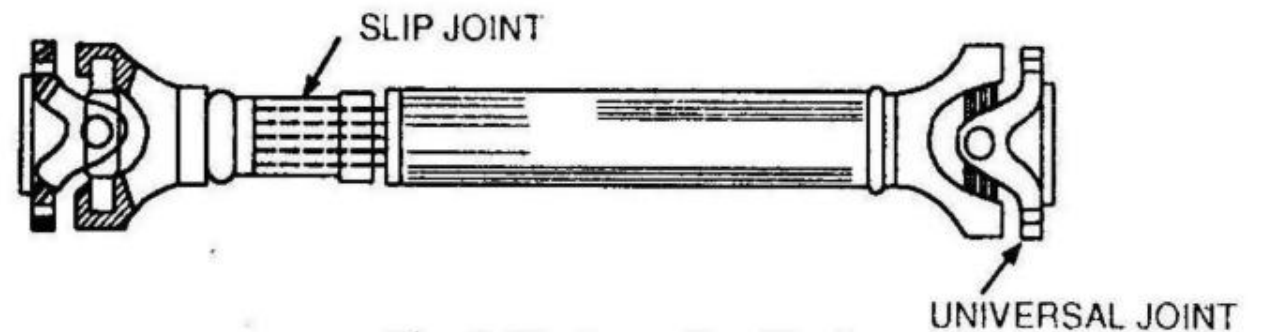




SLIP JOINT

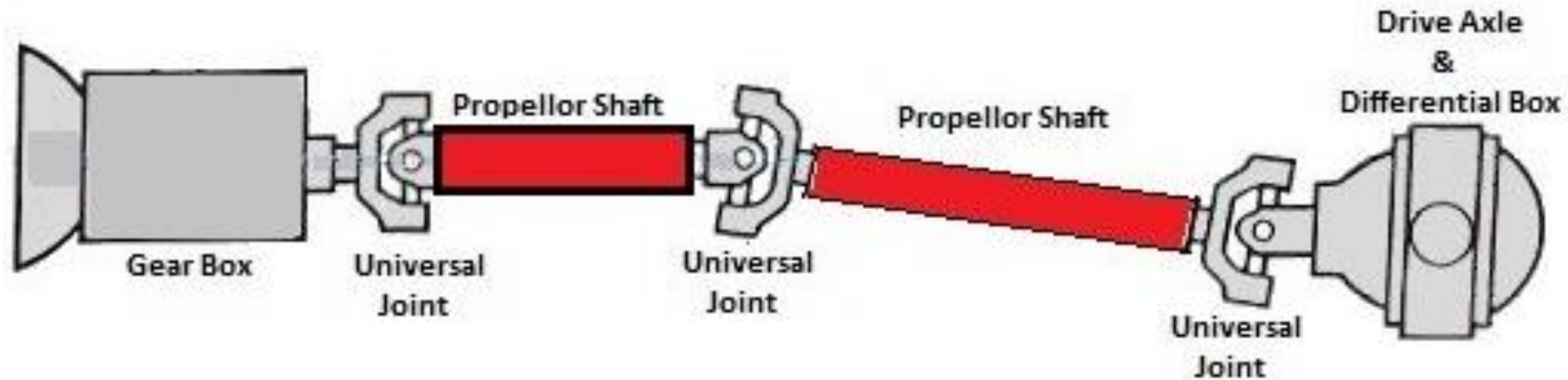


- Slip joint is used to accommodate changes in the length of the propeller shaft as the vehicle's suspension moves.
- The slip joint in a propeller shaft allows for this length adjustment while maintaining a continuous and secure connection between the transmission or gearbox and the rear axle.





PROPELLER SHAFT ASSEMBLY





DIFFERENTIAL UNIT



- A differential unit, often referred to as a "differential," is a component found in the drivetrain of many vehicles, including cars, trucks, and other wheeled vehicles.
- Its primary function is to allow the wheels on the same axle to rotate at different speeds, which is necessary when the vehicle is turning or when there is variation in traction between the left and right wheels





COMPONENTS



Differential Housing: This is the outer casing of the differential unit, which typically houses the internal components.

Pinion Gear: The pinion gear is attached to the driveshaft and transfers power from the transmission to the differential.

Ring Gear: The ring gear is attached to the differential housing and meshes with the pinion gear. It distributes power to the left and right axle shafts.

Side Gears: There is one side gear connected to each axle shaft. These side gears are responsible for transferring power from the ring gear to the axle shafts.



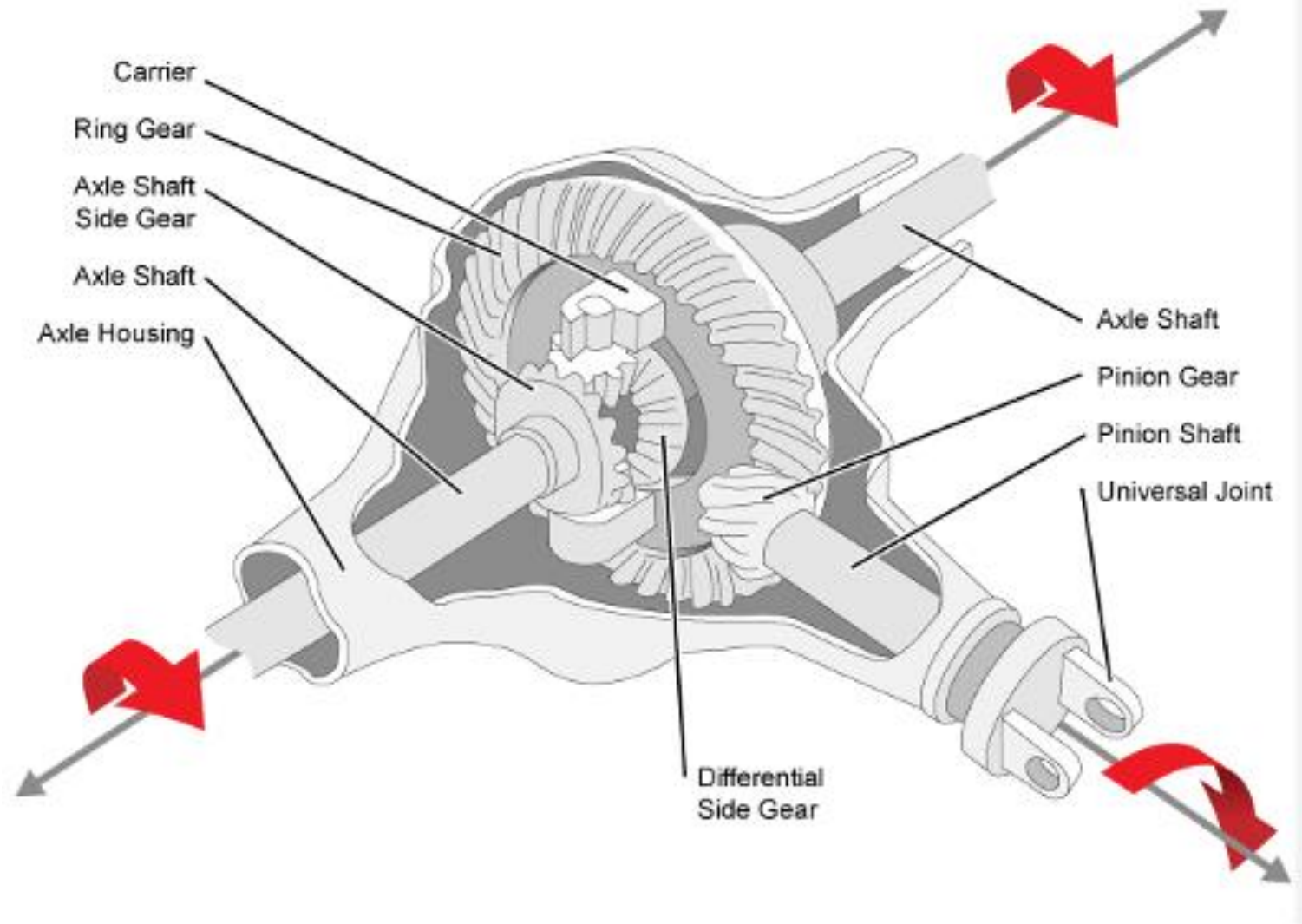
CONSTRUCTION



- ❖ **Spider Gears (Differential Gears):** Spider gears are located inside the differential housing and connect the side gears. They allow the left and right wheels to rotate at different speeds, maintaining traction and stability during turns.
- ❖ **Differential Case:** The differential case houses the spider gears and is attached to the side gears. It rotates within the differential housing and allows the side gears to rotate at different speeds.
- ❖ **Axle Shafts:** Axle shafts extend from the differential to each of the vehicle's wheels. These shafts transmit power from the differential to the wheels.

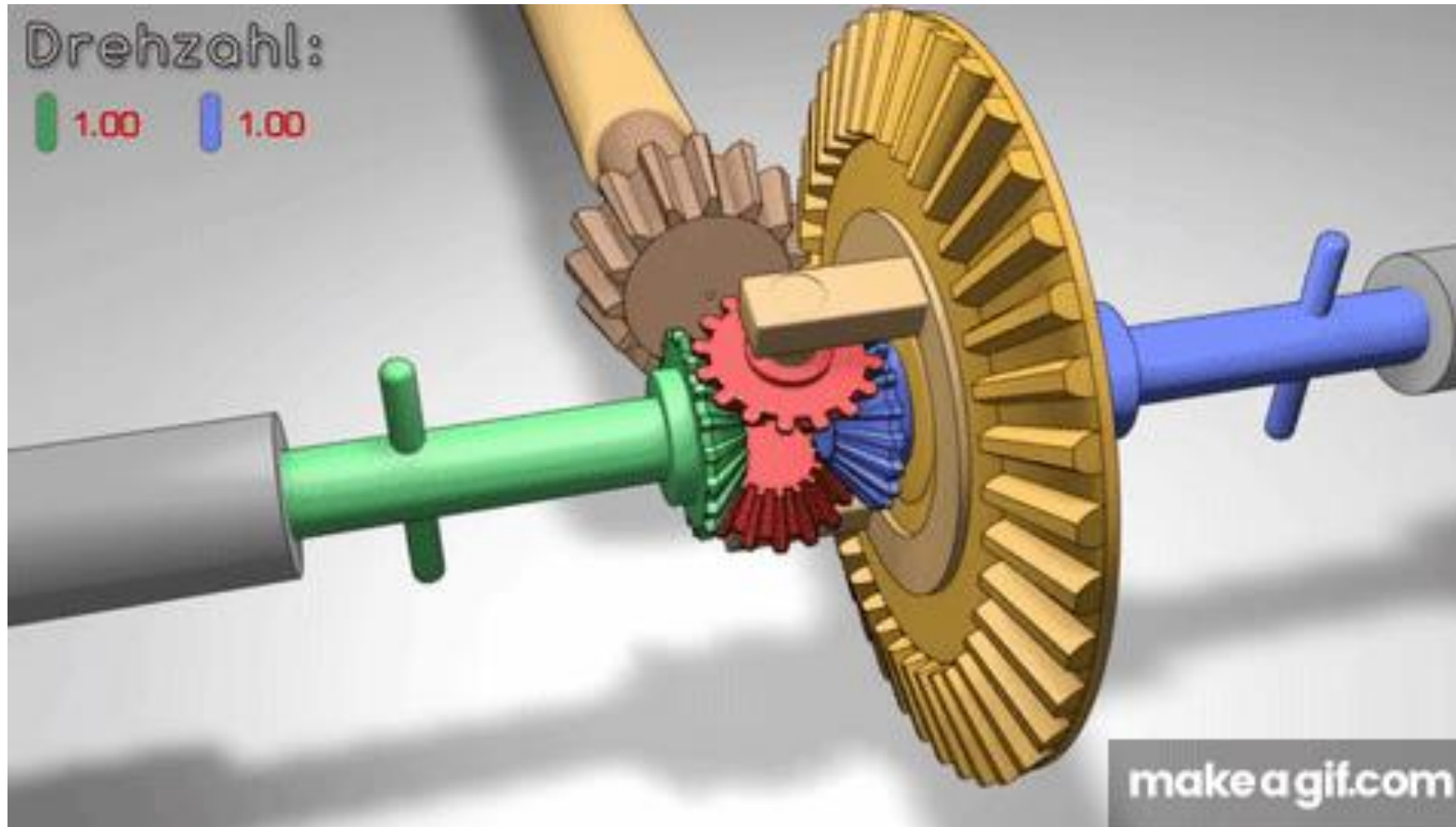


DIFFERENTIAL UNIT





DIFFERENTIAL UNIT





ADVANTAGES



- When a vehicle is moving in a straight line, both wheels on the same axle should rotate at the same speed.
- However, during turns, the outer wheel has to cover a longer distance than the inner wheel.
- The differential allows the wheels to rotate at different speeds to accommodate this difference in distance.



THANK YOU !!!