



# **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 5 – Braking System**

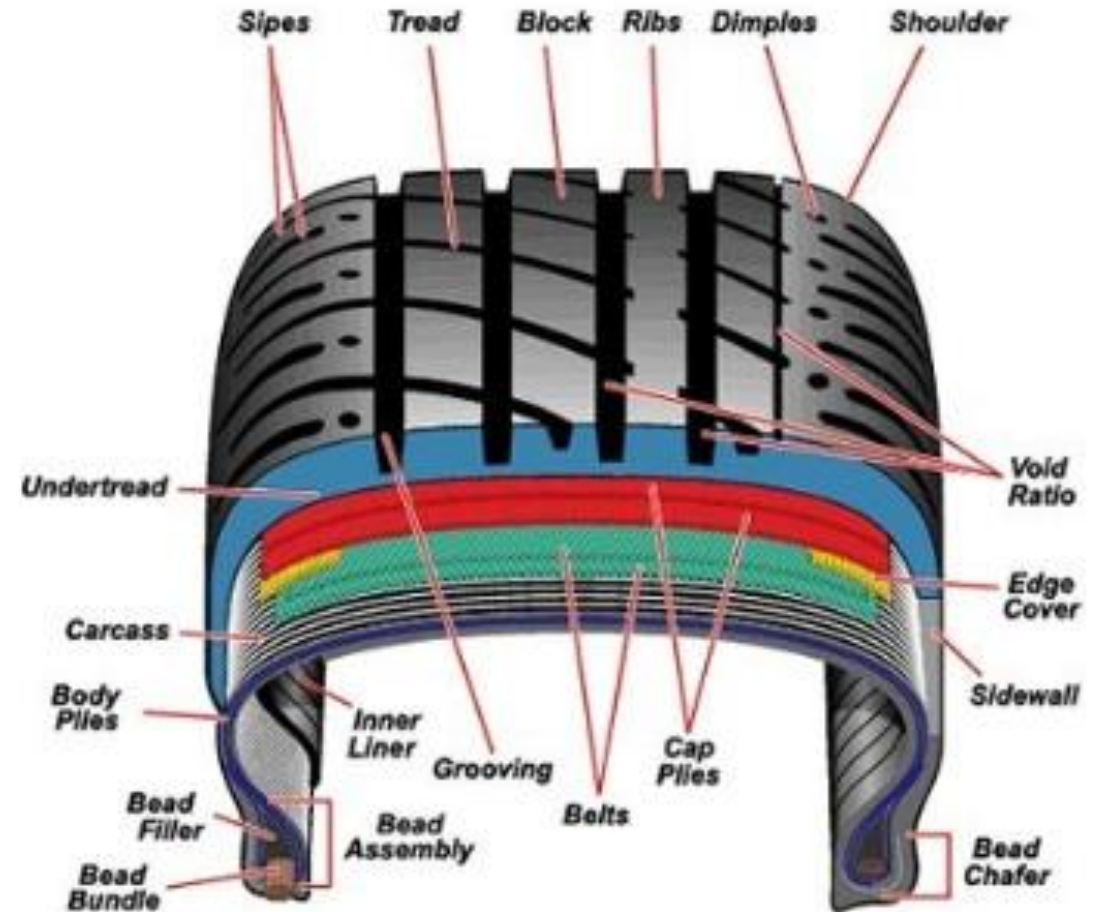
**Topic : Constructional Details of Tyres**



# TIRE STRUCTURE



- ❖ Tread
- ❖ Sidewall
- ❖ Carcass or Ply
- ❖ Beads
- ❖ Inner Liner
- ❖ Belts or Steel belts (In some tyres)
- ❖ Cushion or Under tread (In some tyres)





# TIRE STRUCTURES



## 1.Inner Liner:

- **Material:** Thin layer of rubber.
- **Function:** Forms the innermost layer of the tire, providing an airtight barrier to maintain proper tire pressure.

## ❖ Body Plies (Cord Plies):

- **Material:** Layers of fabric cords, usually made of polyester, rayon, or aramid.
- **Function:** Provides the basic structural strength and flexibility. The cords run radially from bead to bead, contributing to the tire's radial construction.



# TIRE STRUCTURES



## ❖ Belt Package:

- **Material:** Steel or other reinforcing materials.
- **Function:** Located above the body plies, the belt package stabilizes the tread area, enhancing tread life and improving handling characteristics.

## ❖ Sidewalls:

- **Material:** Reinforced rubber.
- **Function:** Forms the sides of the tire, connecting the tread to the bead. The sidewalls contribute to the tire's flexibility, allowing it to absorb shocks and provide a comfortable ride.



# TIRE STRUCTURES



## ❖ Tread:

- **Material:** Specially formulated rubber compound.
- **Function:** The outer layer of the tire that makes contact with the road. The tread provides traction, resists wear, and enhances various performance characteristics. Tread patterns vary based on the tire's intended use.

## ❖ Beads:

- **Material:** High-strength steel wires, coated with brass or other materials.
- **Function:** Forms the tire's anchor to the wheel rim. The beads anchor the tire to the wheel, ensuring a secure fit and proper alignment.



# TIRE STRUCTURES



## ❖ Carcass:

- **Combination:** Comprises body plies, belts, and inner liner.
- **Function:** The carcass is the overall structure of the tire, providing strength, flexibility, and support. It encompasses the layers from the inner liner to the outer tread.

## ❖ Sipes and Grooves:

- **Function:** Cuts (sipes) and channels (grooves) in the tread that enhance traction, especially on wet or slippery surfaces, by allowing water to escape from under the tire.



# CROSS PLY TYRES



- ❖ Cross-ply tires have a construction where the tire's plies, or layers of cord fabric, run diagonally across the tire from bead to bead. The cords alternate in direction, creating a crisscross pattern.
- ❖ The term "bias-ply" comes from the fact that the cords bias or cross each other at an angle.
- ❖ These tires are characterized by a robust and sturdy construction, making them suitable for heavy-duty applications.
- ❖ The sidewalls of bias-ply tires are often more flexible compared to radial tires, providing a smoother ride and better shock absorption.



# RADIAL PLY TYRES



- ❖ Cross-ply tires have a construction where the tire's plies, or layers of cord fabric, run diagonally across the tire from bead to bead. The cords alternate in direction, creating a crisscross pattern.
- ❖ The term "bias-ply" comes from the fact that the cords bias or cross each other at an angle.
- ❖ These tires are characterized by a robust and sturdy construction, making them suitable for heavy-duty applications.
- ❖ The sidewalls of bias-ply tires are often more flexible compared to radial tires, providing a smoother ride and better shock absorption.





Sr.No	Radial ply tyre	Cross ply tyre
1	Plies are running radially straight from bead to bead	Plies are running diagonally opposite from bead to bead
2	Stiffness of tyre is less	Stiffness of tyre is more
3	It gives ultimate comfort for speed more than 55 Km/hr.	Because of more stiffness tyre is less comfortable.
4	Steering is harder	Steering is easy
5	Tyre has firm grip with road	Tyre has lesser grip with road.
6	Radial ply tyre has more breaking grip	Cross ply tyre has less breaking grip
7	Parking of vehicle is difficult	Parking of vehicle is easy
8	It is costlier	It is cheaper than radial
9	Tread life is more	Tread life is less



THANK YOU !!!