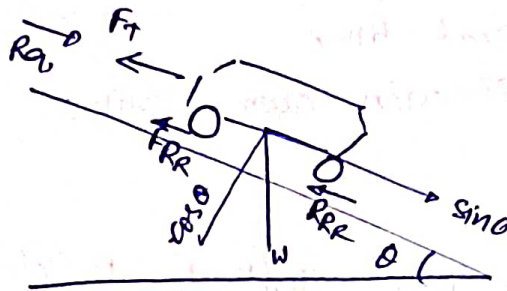


Assignment-2

Q.1. Derive the Equations of motion and maximum tractive effort for a car inclined at angle θ . Also, give the expression of maximum gradeability for a 4 wheel drive.

Solⁿ.

→ Expression for maximum tractive force at inclined at angle θ .

— We know. For 4 wheel Drive / AWD

$$\therefore F_T = F_{T_{front}} + F_{T_{Rear}}$$

for

→ gradient Resistance $R_g = mg \sin \theta$

$\therefore \theta = 90^\circ$ (maximum).

for max^m gradient of 4 wheel drive

$$R_g = mg$$

$$\therefore \sin 90 = 1.$$

Q What are the different parts of tires? Differentiate b/w types of tires on the basis of their construction?

- Parts of tires :-
1. Bead
 2. Inner liner - Body ply.
 3. Nylon cap.
 4. Belt wedge
 5. Shoulder insert.
 6. Steel belt.
 7. Bead filler
 8. Abrasion drum strip.

1. Bead :-

- It is basically spring wire similarly to clutch wire. It is made up of steel wire.
- Bead is running inside the tire. and the diameter of the Bead is slightly less than diameter of R.M.

2. Bead filler :-

- It is used to protect the rubber from the bead.

3. Inner liner :-

- It is soft rubber compound similarly like used in operation
- It is used for protect/prevent the air from leaking out

4. Body ply :-

- It is made up soft rubber compound with reinforced material. like Nylon, Kevlar, Carbon fibre.

5. Steel belt :- It is back up for reinforcement for tread

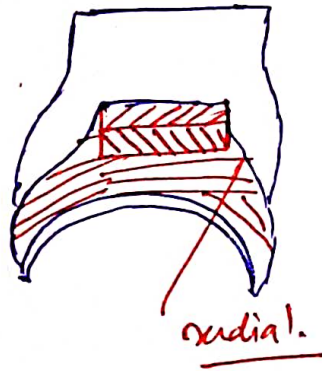
6. Shoulder insert → It is provided strength to the shoulder

7. Belt wedge →

→ on the basis of constructions, there are two types of tyre.

1. Bias ply.
2. Radial.

2. Radial.
Bias Ply.



2. Bias
Radial type

