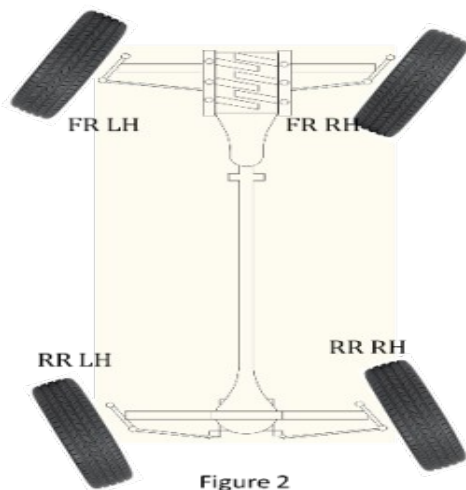


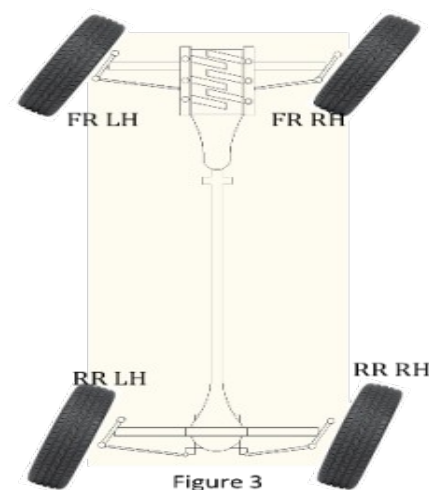
TITLE : FOUR WHEEL ACTIVE STEER VEHICLE.

AIM : The main characteristic of the vehicle is related to its response to the drivers command and to environmental factors affecting the direction of motion of vehicle. The two main basic problems in handling the vehicle are control of vehicle along the desired path and while parking doing sharp turnings. Two wheel steering system cannot maintain both of these to the required extent. A multi-functional four wheel steering system could improve directional stability at high speeds and sharp turnings at low speeds during parking of a vehicle.

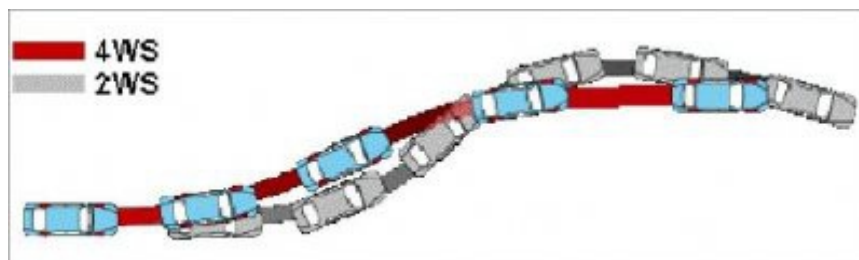
PICTURE :



Low Speed - Parking



High Speed - Parking



4WS- Four Wheel Active Steering
2WS-Two Wheel Steering (Normal)

PATH FOLLOWED BY VEHICLE WITH TWO MECHANISMS

Features:

In our project we will make a RC Vehicle with a multi-functional steering system made of "rack and pinion acherman steering mechanism" to the front power drive wheels and back wheels are steered by a two gear system for the two cases low speed & high speed and front wheel is powered by simple "pinion ring gear assembly"

Rough Timeline:

Week 1&2: (Studying, Designing & Constructing the Steering mechanism)

Turning the steering should turn the front wheels always in the same direction. But, Back wheels should be rotated in same direction or anti depending on the use which can be changed using a simple gear or pin. A motor very less rpm is attached to the steering for virtual control of steering.

Week 3&4: (Studying the Front Wheel Drive Mechanism and Integrating it with the previous Steering system and its Construction)

A single DC motor of 100-200 rpm is used to power the vehicle and power is transmitted to the wheels through crank, axles and universal joints.

Week 5: (Proper Remote Controlling and Debugging & precision making)

Controllong the main power motor and servom motor through remote intially through wired and wireless if time permits. while turning the inside wheels should turn through more angle than the outside for proper turn and both shouls turn at different rpm in order to prevent slipping. Try to use Differential if time permits(not sure).

Primary Difficulties:

Making the rotation of front and back wheels equal & parallel in high speedlane changing and opposite & equal (some pre decided ratio) in low speed or parking.

Control the servo motor to turn the steering through the angle we require accurately.

P.S. Hadn't talked to Mentors yet. But surely we'll face many more problems as we dont have much knowledge about these.

Primary Components (Rough Estimation):

(I) 1 DC MOTOR (100-200 RPM)

(II) 1 SERVO MOTOR (10-50 RPM)

(III) pinions, axles, universal joints , bearings (For power transfer and steer).

(iv) 4 wheels.

(v) A Wooden board (For fixing all these mechanisms).

Team Members:

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What do we Learn:

1) Working Mechanism of rack and pinion ackerman steering.

2) Power transfer mechanism from Engine to Wheels by turning the power through 90degrees at the differential.

(3) Way to use main DC motor and servo motors.

(4) Hard working and Group working Obviously!