Design of a Mechanical Four-Wheel Steering System

Aastik Chawla, Aakash Tayal, Abhas Jha, Aditya Salapaka

Delhi Technological University, New Delhi 110085 India

Aim

Driver selectable four wheel steering which is cheaper than most existing systems and provides a large dynamic benefit over other mechanical four wheel steering systems.

Introduction

The system will allow the vehicle to have two-wheel steering where it is required (high-speed driving) and will give the driver an option to switch to four-wheel steering and perform complex manoeuvres. We have tried combining the performance index of an electrical system with the low cost and easy maintenance of a linkage-based one. The system can be activated by the driver and disengaged as well, while the vehicle is in motion. We have considered two different types of engaging mechanism.

1) **Servo-based** which can be activated by the push of a button and gives an indication on the dashboard.

2) **Lever-activated** system, which will use a lever to switch between two-wheel and four-wheel steering modes.

Figures
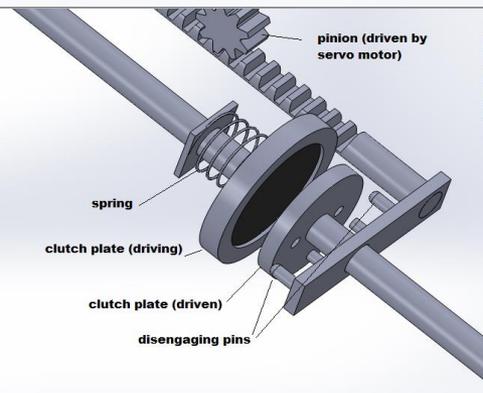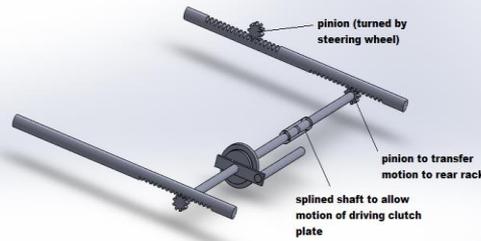
Working

When the driver activates the four-wheel steering system, the rod attached to the lever engages the clutch plates which are pushed into position against the action of the spring which is trying to keep the two clutch plates engaged. Also attached to the same sliding assembly of the engaging/disengaging pins are locking pins, which keep the rear wheels at zero position. This system connects which allows rear wheel to steer with the front wheels.

When the driver switches over to two-wheel steer system by moving the lever, the rod attached to the lever moves the engaging/disengaging pins so that the two clutch plates separate. Meanwhile, the locking pins enter the holes on the clutch plates connected to the shaft which govern the rear wheel position, thus locking the rear wheels into zero position.